YAMAHA

XG250

SERVICE MANUAL

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.

This model has been designed and manufactured to perform within certain specifications in regard to performance and emissions. Proper service with the correct tools is necessary to ensure that the vehicle will operate as designed. If there is any question about a service procedure, it is imperative that you contact a Yamaha dealer for any service information changes that apply to this model. This policy is intended to provide the customer with the most satisfaction from his vehicle and to conform to federal environmental quality objectives.

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:

- This Service Manual contains information regarding periodic maintenance to the emission control system. Please read this material carefully.
- Designs and specifications are subject to change without notice.

IMPORTANT MANUAL INFORMATION

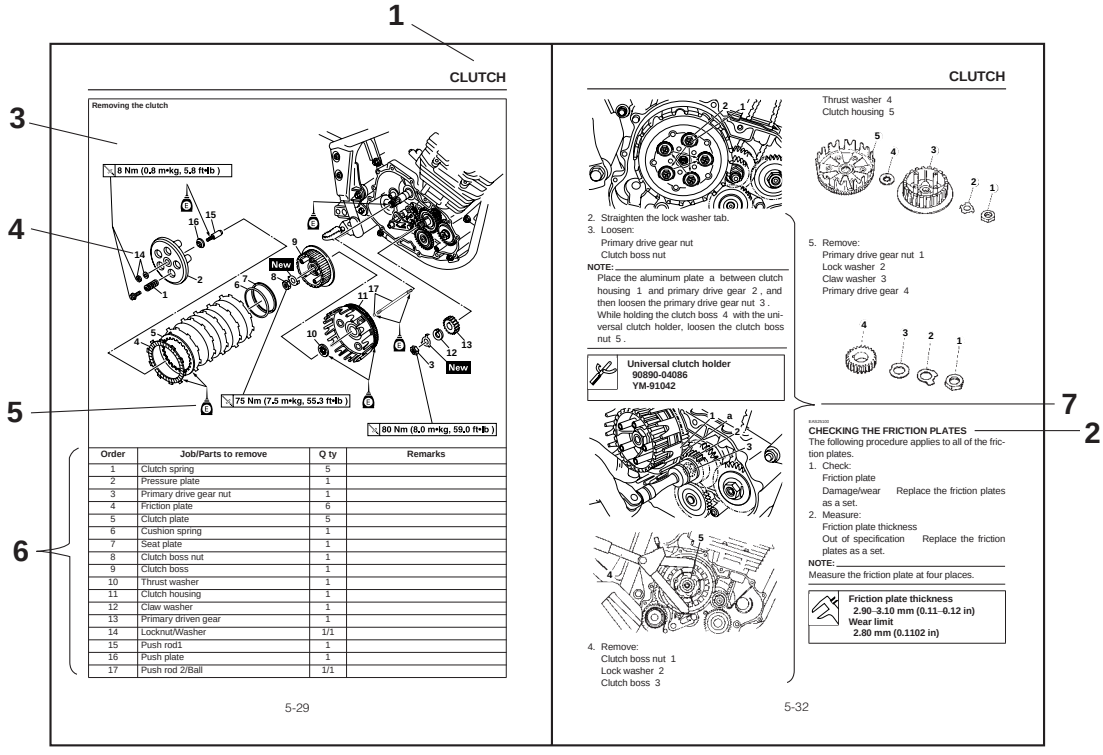
Particularly important information is distinguished in this manual by the following.

⚠	The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!
⚠ WARNING	Failure to follow WARNING instructions could result in severe injury or death to the vehicle operator, a bystander or a person checking or repairing the vehicle.
CAUTION:	A CAUTION indicates special precautions that must be taken to avoid damage to the vehicle.
NOTE:	A NOTE provides key information to make procedures easier or clearer.

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.

- The manual is divided into chapters and each chapter is divided into sections. The current section title is shown at the top of each page “1”.
- Sub-section titles appear in smaller print than the section title “2”.
- To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section “3”.
- Numbers are given in the order of the jobs in the exploded diagram. A number indicates a disassembly step “4”.
- Symbols indicate parts to be lubricated or replaced “5”.
  Refer to “SYMBOLS”.
- A job instruction chart accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc “6”.
- Jobs requiring more information (such as special tools and technical data) are described sequentially “7”.

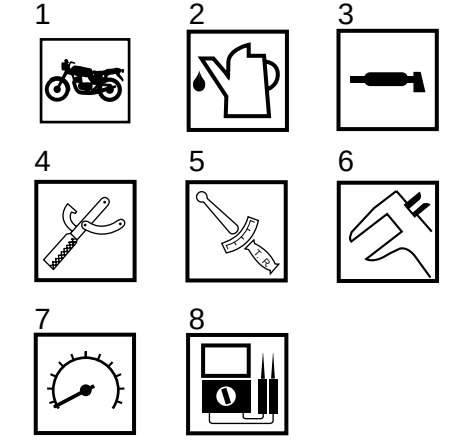


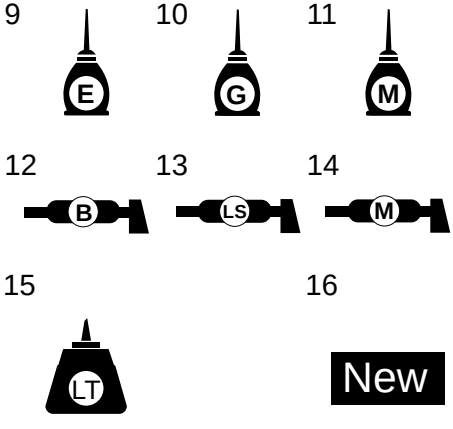
SYMBOLS

The following symbols are used in this manual for easier understanding.

NOTE:

The following symbols are not relevant to every vehicle.





1. Serviceable with engine mounted
2. Filling fluid
3. Lubricant
4. Special tool
5. Tightening torque
6. Wear limit, clearance
7. Engine speed
8. Electrical data
9. Engine oil
10. Gear oil
11. Molybdenum-disulfide oil
12. Wheel-bearing grease
13. Lithium-soap-based grease
14. Molybdenum-disulfide grease
15. Apply locking agent (LOCTITE®)
16. Replace the part

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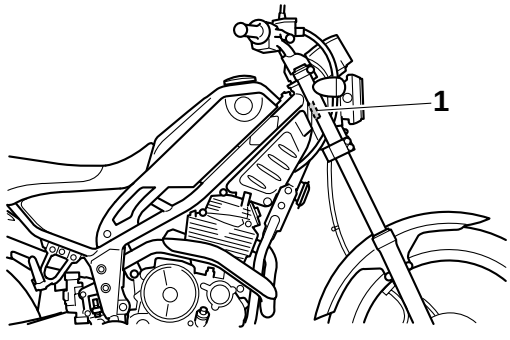
GENERAL INFORMATION

IDENTIFICATION

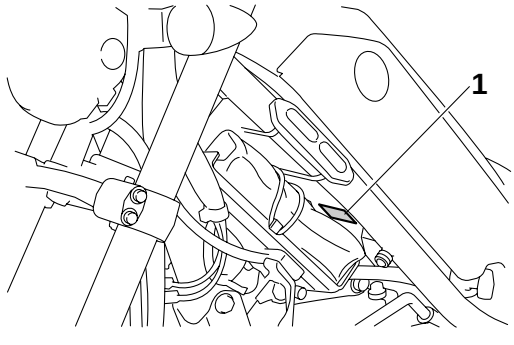
VEHICLE IDENTIFICATION NUMBER

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



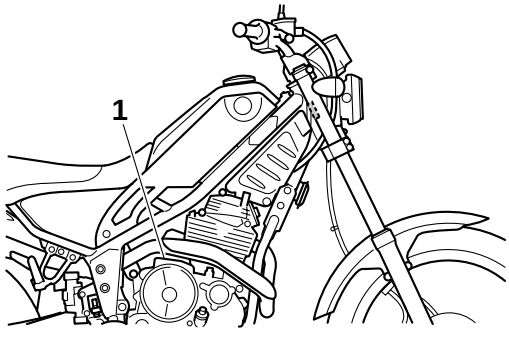
MODEL LABEL

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



ENGINE SERIAL NUMBER

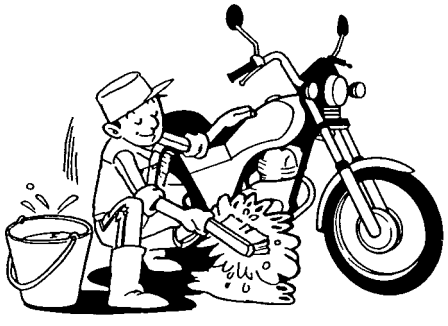
The engine serial number “1” is stamped into the elevated part of the right rear section of the engine.



IMPORTANT INFORMATION

PREPARATION FOR REMOVAL AND DISASSEMBLY

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

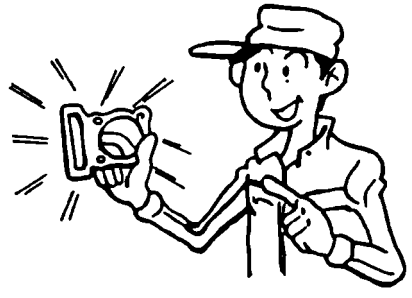


2. Use only the proper tools and cleaning equipment.
   Refer to “SPECIAL TOOLS” on page 1-5.
3. When disassembling, always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been “mated” through normal wear. Mated parts must always be reused or replaced as an assembly.

4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.

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.

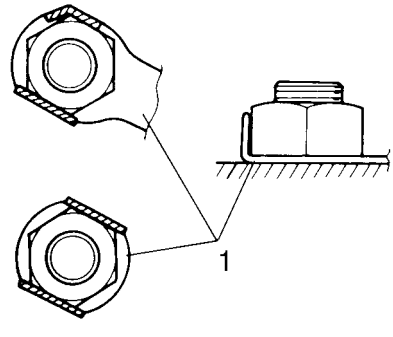


GASKETS, OIL SEALS AND O-RINGS

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

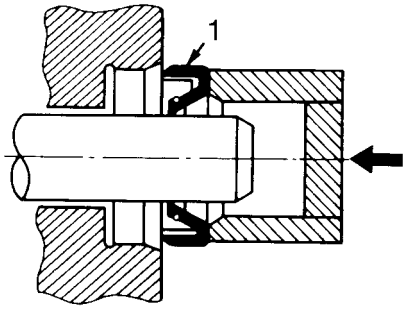
LOCK WASHERS/PLATES AND COTTER PINS

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



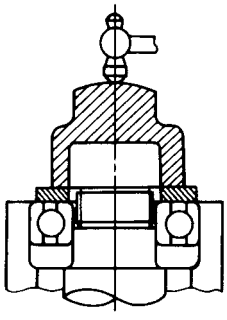
BEARINGS AND OIL SEALS

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



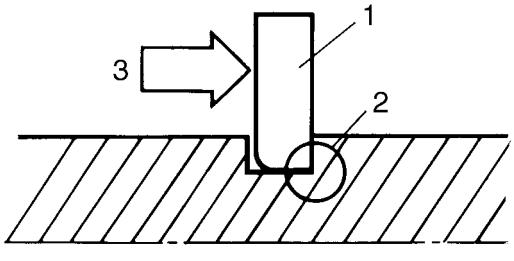
CAUTION:

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



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.

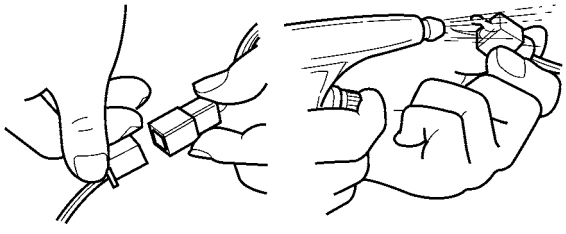


CHECKING THE CONNECTIONS

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.

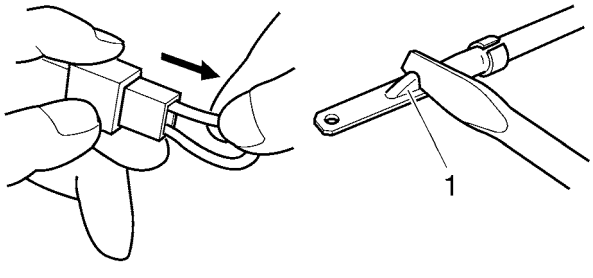


3. Check:
   - All connections

   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.

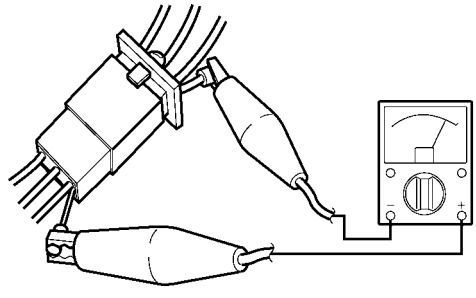
5. Check:
   - Continuity

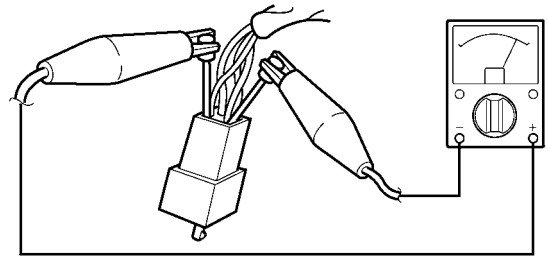
(with the pocket tester)

Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

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.



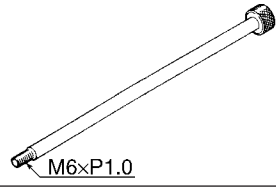
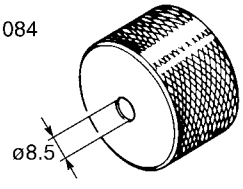
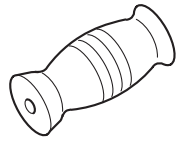
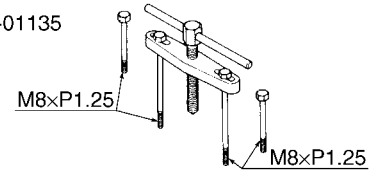
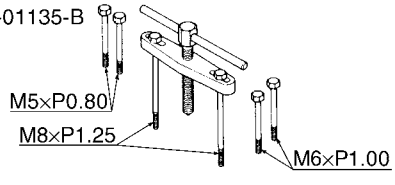
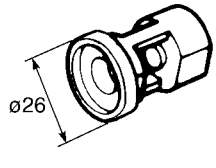


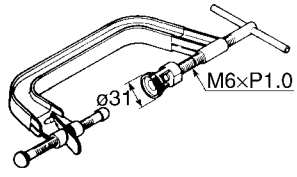
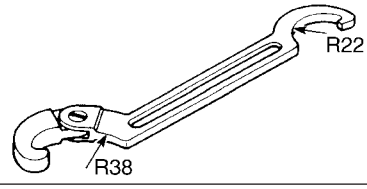
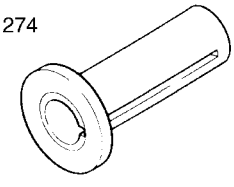
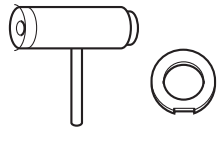
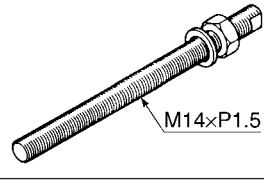
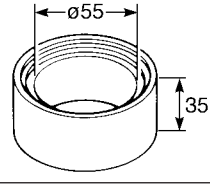
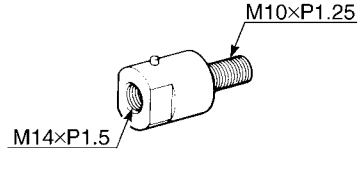
SPECIAL TOOLS

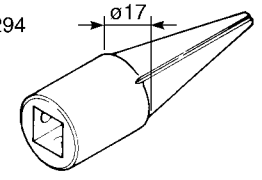
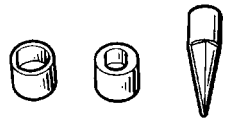
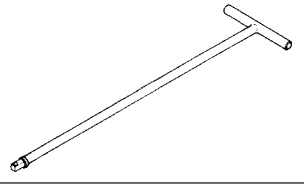
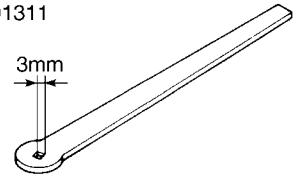
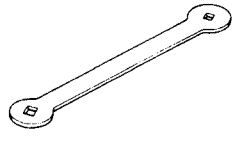
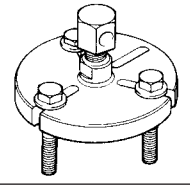
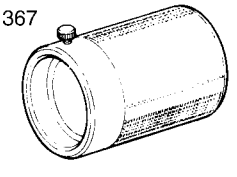
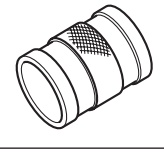
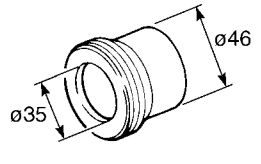
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.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

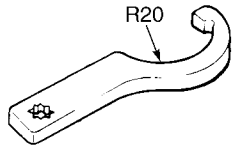
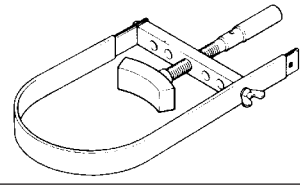
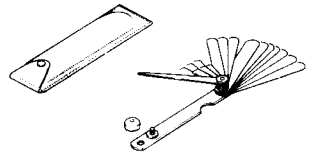
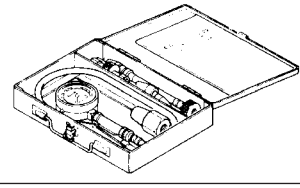
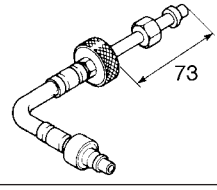
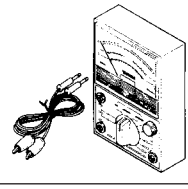
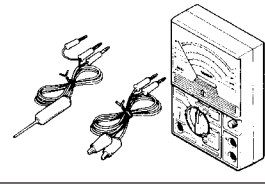
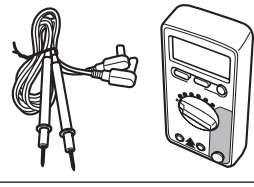
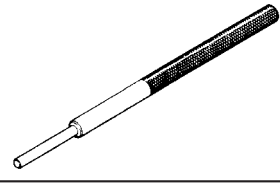
NOTE:

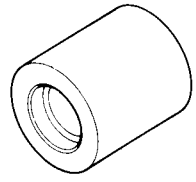
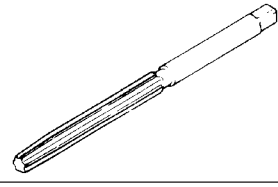
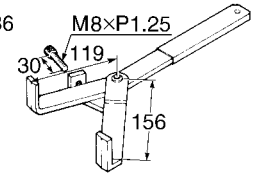
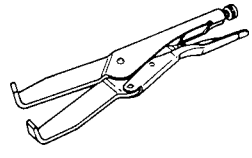
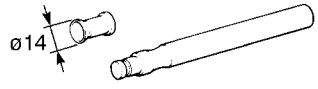
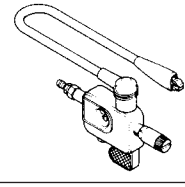
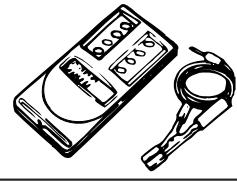
For U.S.A. and Canada, use part number starting with “YM-”, “YU-”, or “ACC-”.
For others, use part number starting with “90890-”.

Tool name/Tool No.	Illustration	Reference pages
Slide hammer bolt 90890-01083 Slide hammer bolt 6 mm YU-01083-1		5-13
Weight 90890-01084 YU-01083-3	90890-01084  YU-01083-3 	5-13
Crankcase separating tool 90890-01135 Crankcase separator YU-01135-B	90890-01135  YU-01135-B 	5-59
Valve spring compressor attachment 90890-01243 Valve spring compressor adapter (26 mm) YM-01253-1		5-18, 5-23

Tool name/Tool No.	Illustration	Reference pages
Valve spring compressor 90890-04019 YM-04019		5-18, 5-23
Ring nut wrench 90890-01268 Spanner wrench YU-01268		4-50
Crankshaft installer pot 90890-01274 Installing pot YU-90058	90890-01274  YU-90058/YU-90059 	5-61
Crankshaft installer bolt 90890-01275 Bolt YU-90060		5-61
Spacer 90890-01288		5-61
Adapter (M10) 90890-01383 Adapter #2 YU-90062		5-61

Tool name/Tool No.	Illustration	Reference pages
Damper rod holder 90890-01294 Damping rod holder set YM-01300	90890-01294  YM-01300 	4-43, 4-45
T-handle 90890-01326 T-handle 3/8" drive 60 cm long YM-01326		4-43, 4-45
Tappet adjusting tool 90890-01311 Valve adjuster 3 mm & 4 mm YM-08035-A	90890-01311  YM-08035-A 	3-4
Flywheel puller 90890-01362 Heavy duty puller YU-33270-B		5-51
Fork seal driver weight 90890-01367 Replacement hammer YM-A9409-7	90890-01367  YM-A9409-7/YM-A5142-4 	4-45, 4-46
Fork seal driver attachment (ø35) 90890-01369 Replacement 35 mm YM-A9409-5	 	4-45, 4-46

Tool name/Tool No.	Illustration	Reference pages
Steering nut wrench 90890-01403 Spanner wrench YU-33975		3-20
Sheave holder 90890-01701 Primary clutch holder YS-01880-A		5-51, 5-52
Thickness gauge 90890-03079 Narrow gauge set YM-34483		3-4
Compression gauge 90890-03081 Engine compression tester YU-33223		3-9
Extension 90890-04082		3-9
Pocket tester 90890-03112 Analog pocket tester YU-03112-C		1-4, 7-35, 7-36, 7-37, 7-41, 7-42, 7-43, 7-44, 7-45, 7-47
Pocket tester 90890-03132		3-4
Digital circuit tester 90890-03174 Model 88 Multimeter with tachometer YU-A1927		5-47
Valve guide remover (ø6) 90890-04064 Valve guide remover (6.0 mm) YM-04064-A		5-20

Tool name/Tool No.	Illustration	Reference pages
Valve guide installer (ø6) 90890-04065 Valve guide installer (6.0 mm) YM-04065-A		5-20
Valve guide reamer (ø6) 90890-04066 Valve guide reamer (6.0 mm) YM-04066		5-20
Universal clutch holder 90890-04086 YM-91042	90890-04086  YM-91042 	5-33, 5-35
Valve lapper 90890-04101 Valve lapping tool YM-A8998		5-21
Ignition checker 90890-06754 Opama pet-4000 spark checker YM-34487		7-44
Digital tachometer 90890-06760		3-4

SPECIFICATIONS

GENERAL SPECIFICATIONS

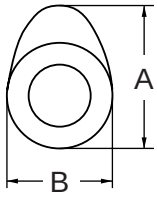
Model	
Model	4D61 4D62
Dimensions	
Overall length	2010 mm (79.1 in)
Overall width	800 mm (31.5 in)
Overall height	1145 mm (45.1 in)
Seat height	790 mm (31.1 in)
Wheelbase	1330 mm (52.4 in)
Ground clearance	280 mm (11.02 in)
Minimum turning radius	1900 mm (74.8 in)
Weight	
With oil and fuel	120.0 kg (265 lb)
Maximum load	180 kg (397 lb)

ENGINE SPECIFICATIONS

Engine	
Engine type	Air cooled 4-stroke, SOHC
Displacement	249.0 cm^3 (15.19 cu.in)
Cylinder arrangement	Forward-inclined single cylinder
Bore × stroke	74.0 × 58.0 mm (2.91 × 2.28 in)
Compression ratio	9.50 :1
Standard compression pressure (at sea level)	1200 kPa/300 r/min (170.7 psi/300 r/min) (12.0 kgf/cm^2/300 r/min)
Starting system	Electric starter
Fuel	
Recommended fuel	Regular unleaded gasoline only
Fuel tank capacity	6.0 L (1.59 US gal) (1.32 Imp.gal)
Fuel reserve amount	1.9 L (0.50 US gal) (0.42 Imp.gal)
Engine oil	
Lubrication system	Wet sump
Type	SAE10W30 or SAE10W40 or SAE15W40 or SAE20W40 or SAE20W50
Recommended engine oil grade	API service SE, SF, SG type or higher
Engine oil quantity	
Total amount	1.40 L (1.48 US qt) (1.23 Imp.qt)
Without oil filter element replacement	1.20 L (1.27 US qt) (1.06 Imp.qt)
With oil filter element replacement	1.30 L (1.37 US qt) (1.14 Imp.qt)
Oil filter type	Wire mesh
Oil pump	
Oil pump type	Trochoid
Inner-rotor-to-outer-rotor-tip clearance	0.150 mm (0.0059 in)
Limit	0.20 mm (0.0079 in)
Outer-rotor-to-oil-pump-housing clearance	0.010–0.034 mm (0.0004–0.0013 in)
Limit	0.050 mm (0.0020 in)
Oil-pump-housing-to-inner-and-outer-rotor clearance	0.04–0.09 mm (0.0016–0.0035 in)
Limit	0.15 mm (0.0059 in)
Pressure check location	HEAD CYLINDER
Spark plug (s)	
Manufacturer/model	NGK/DR7EA
Spark plug gap	0.6–0.7 mm (0.024–0.028 in)
Cylinder head	
Volume	20.50–21.50 cm^3 (1.25–1.31 cu.in)
Warpage limit	0.03 mm (0.0012 in)

Camshaft

Drive system	Chain drive (right)
Camshaft journal diameter	24.960–24.980 mm (0.9827–0.9835 in)
Camshaft lobe dimensions	
Intake A	36.520–36.620 mm (1.4378–1.4417 in)
Limit	36.460 mm (1.4354 in)
Intake B	30.201–30.301 mm (1.1890–1.1930 in)
Limit	30.151 mm (1.1870 in)
Exhaust A	36.564–36.664 mm (1.4395–1.4435 in)
Limit	36.514 mm (1.4376 in)
Exhaust B	30.216–30.316 mm (1.1896–1.1935 in)
Limit	30.166 mm (1.1876 in)
Camshaft runout limit	0.030 mm (0.0012 in)



Timing chain

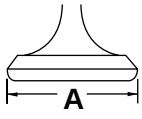
Model/number of links	DID SCR-0404 SDH/104
Tensioning system	Automatic

Rocker arm/rocker arm shaft

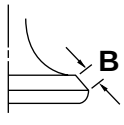
Rocker arm inside diameter	12.000–12.018 mm (0.4724–0.4731 in)
Limit	12.036 mm (0.4739 in)
Rocker arm shaft outside diameter	11.981–11.991 mm (0.4717–0.4721 in)
Limit	11.950 mm (0.4705 in)
Rocker-arm-to-rocker-arm-shaft clearance	0.009–0.037 mm (0.0004–0.0015 in)

Valve, valve seat, valve guide

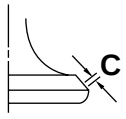
Valve clearance (cold)	
Intake	0.05–0.10 mm (0.0020–0.0039 in)
Exhaust	0.10–0.15 mm (0.0039–0.0059 in)
Valve dimensions	
Valve head diameter A (intake)	33.90–34.10 mm (1.3346–1.3425 in)
Valve head diameter A (exhaust)	28.40–28.60 mm (1.1181–1.1260 in)



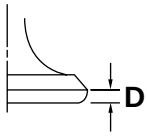
Valve face width B (intake)	2.260 mm (0.0890 in)
Valve face width B (exhaust)	2.260 mm (0.0890 in)



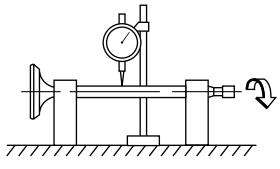
Valve seat width C (intake)	0.90–1.10 mm (0.0354–0.0433 in)
Valve seat width C (exhaust)	0.90–1.10 mm (0.0354–0.0433 in)



Valve margin thickness D (intake)	0.80–1.20 mm (0.0315–0.0472 in)
Valve margin thickness D (exhaust)	0.80–1.20 mm (0.0315–0.0472 in)



Valve stem diameter (intake)	5.975–5.990 mm (0.2352–0.2358 in)
Limit	5.950 mm (0.2343 in)
Valve stem diameter (exhaust)	5.960–5.975 mm (0.2346–0.2352 in)
Limit	5.935 mm (0.2337 in)
Valve guide inside diameter (intake)	6.000–6.012 mm (0.2362–0.2367 in)
Limit	6.042 mm (0.2379 in)
Valve guide inside diameter (exhaust)	6.000–6.012 mm (0.2362–0.2367 in)
Limit	6.042 mm (0.2379 in)
Valve-stem-to-valve-guide clearance (intake)	0.010–0.037 mm (0.0004–0.0015 in)
Limit	0.080 mm (0.0032 in)
Valve-stem-to-valve-guide clearance (exhaust)	0.025–0.052 mm (0.0010–0.0020 in)
Limit	0.100 mm (0.0039 in)
Valve stem runout	0.030 mm (0.0012 in)



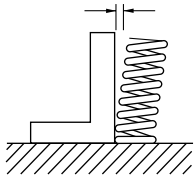
Cylinder head valve seat width (intake)	0.90–1.10 mm (0.0354–0.0433 in)
Limit	1.7 mm (0.07 in)
Cylinder head valve seat width (exhaust)	0.90–1.10 mm (0.0354–0.0433 in)
Limit	1.7 mm (0.07 in)

Valve spring

Inner spring

Free length (intake)	36.17 mm (1.42 in)
Limit	34.47 mm (1.36 in)
Free length (exhaust)	36.17 mm (1.42 in)
Limit	34.47 mm (1.36 in)
Installed length (intake)	30.50 mm (1.20 in)
Installed length (exhaust)	30.50 mm (1.20 in)
Spring rate K1 (intake)	14.70 N/mm (83.94 lb/in) (1.50 kgf/mm)
Spring rate K2 (intake)	19.00 N/mm (108.49 lb/in) (1.94 kgf/mm)
Spring rate K1 (exhaust)	14.70 N/mm (83.94 lb/in) (1.50 kgf/mm)
Spring rate K2 (exhaust)	19.00 N/mm (108.49 lb/in) (1.94 kgf/mm)
Installed compression spring force (intake)	75.00–91.70 N (16.86–20.61 lb) (7.65–9.35 kgf)
Installed compression spring force (exhaust)	75.00–91.70 N (16.86–20.61 lb) (7.65–9.35 kgf)

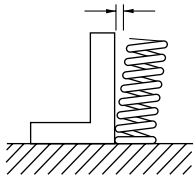
Spring tilt (intake)	2.5 °/1.6 mm
Spring tilt (exhaust)	2.5 °/1.6 mm



Winding direction (intake)	Counter clockwise
Winding direction (exhaust)	Counter clockwise

Outer spring

Free length (intake)	36.63 mm (1.44 in)
Limit	34.63 mm (1.36 in)
Free length (exhaust)	36.63 mm (1.44 in)
Limit	34.63 mm (1.36 in)
Installed length (intake)	32.00 mm (1.26 in)
Installed length (exhaust)	32.00 mm (1.26 in)
Spring rate K1 (intake)	30.90 N/mm (176.44 lb/in) (3.15 kgf/mm)
Spring rate K2 (intake)	40.80 N/mm (232.97 lb/in) (4.16 kgf/mm)
Spring rate K1 (exhaust)	30.90 N/mm (176.44 lb/in) (3.15 kgf/mm)
Spring rate K2 (exhaust)	40.80 N/mm (232.97 lb/in) (4.16 kgf/mm)
Installed compression spring force (intake)	128.50–157.90 N (28.89–35.50 lb) (13.10–16.10 kgf)
Installed compression spring force (exhaust)	128.50–157.90 N (28.89–35.50 lb) (13.10–16.10 kgf)
Spring tilt (intake)	2.5 °/1.6 mm
Spring tilt (exhaust)	2.5 °/1.6 mm



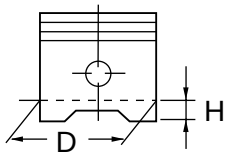
Winding direction (intake)	Clockwise
Winding direction (exhaust)	Clockwise

Cylinder

Bore	74.000–74.010 mm (2.9134–2.9138 in)
Wear limit	74.100 mm (2.9173 in)
Taper limit	0.050 mm (0.0020 in)
Out of round limit	0.010 mm (0.0004 in)
Warp limit	0.10 mm (0.0039 in)

Piston

Piston-to-cylinder clearance	0.025–0.050 mm (0.0010–0.0020 in)
Limit	0.15 mm (0.0059 in)
Diameter D	73.960–73.975 mm (2.9118–2.9124 in)
Height H	11.0 mm (0.43 in)

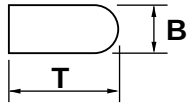


Offset	0.50 mm (0.0197 in)
Offset direction	Intake side
Piston pin bore inside diameter	16.002–16.013 mm (0.6300–0.6304 in)
Limit	16.043 mm (0.6316 in)
Piston pin outside diameter	15.991–16.000 mm (0.6296–0.6299 in)
Limit	15.970 mm (0.6287 in)
Piston-pin-to-piston-pin-bore clearance	0.002–0.022 mm (0.0001–0.0009 in)
Limit	0.073 mm (0.0029 in)

Piston ring

Top ring

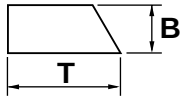
Ring type	Barrel
Dimensions (B × T)	0.90 × 2.75 mm (0.04 × 0.11 in)



End gap (installed)	0.19–0.31 mm (0.0075–0.0122 in)
Limit	0.60 mm (0.0236 in)
Ring side clearance	0.030–0.065 mm (0.0012–0.0026 in)
Limit	0.100 mm (0.0039 in)

2nd ring

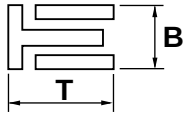
Ring type	Taper
Dimensions (B × T)	0.80 × 2.80 mm (0.03 × 0.11 in)



End gap (installed)	0.30–0.45 mm (0.0118–0.0177 in)
Limit	0.60 mm (0.0236 in)
Ring side clearance	0.020–0.055 mm (0.0008–0.0022 in)
Limit	0.100 mm (0.0039 in)

Oil ring

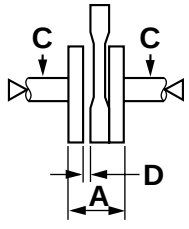
Dimensions (B × T)	1.50 × 2.60 mm (0.06 × 0.10 in)



End gap (installed)	0.10–0.35 mm (0.0039–0.0138 in)

Crankshaft

Width A	69.25–69.30 mm (2.726–2.728 in)
Runout limit C	0.030 mm (0.0012 in)
Big end side clearance D	0.350–0.850 mm (0.0138–0.0335 in)



Balancer

Balancer drive method	Gear

Clutch

Clutch type	Wet, multiple-disc
Clutch release method	Inner push, cam push
Clutch lever free play	10.0–15.0 mm (0.39–0.59 in)
Friction plate thickness	2.70–2.90 mm (0.106–0.114 in)
Wear limit	2.60 mm (0.1024 in)
Plate quantity	6 pcs
Clutch plate thickness	1.50–1.70 mm (0.059–0.067 in)
Plate quantity	5 pcs
Warpage limit	0.20 mm (0.0079 in)
Clutch spring free length	40.10 mm (1.58 in)
Minimum length	38.10 mm (1.50 in)
Spring quantity	5 pcs
Clutch housing thrust clearance	0.100–0.350 mm (0.0039–0.0138 in)
Clutch housing radial clearance	0.010–0.044 mm (0.0004–0.0017 in)
Push rod bending limit	0.500 mm (0.0197 in)

Transmission

Transmission type	Constant mesh 5-speed
Primary reduction system	Spur gear
Primary reduction ratio	74/24 (3.083)
Secondary reduction system	Chain drive
Secondary reduction ratio	45/15 (3.000)
Operation	Left foot operation
Gear ratio	
1st	37/13 (2.846)
2nd	29/16 (1.812)
3rd	29/22 (1.318)
4th	29/28 (1.035)
5th	23/28 (0.821)
Main axle runout limit	0.08 mm (0.0032 in)
Drive axle runout limit	0.08 mm (0.0032 in)
Main axle assembly width	102.20–102.40 mm (4.02–4.03 in)

Shifting mechanism	
Shift mechanism type	Shift drum and guide bar
Shift fork thickness	4.76–4.89 mm (0.1874–0.1925 in)
Air filter	
Air filter element	Oil-coated paper element
Carburetor	
Type × quantity	MV33 x 1
Manufacturer	TEIKEI
ID mark	4D61 00
Main jet	#135
Main air jet	1.20
Jet needle	5A12-3
Needle jet	E1
Pilot air jet 1	0.90
Pilot outlet	0.8 x 1.2
Pilot jet	#34
Bypass 1	0.8
Bypass 2	0.8
Bypass 3	0.8
Pilot screw turns out	1-1/4
Valve seat size	1.8
Starter jet 1	0.50
Starter jet 2	#90
Throttle valve size	33
Float height	10.5 mm (0.41 in)
Idling condition	
Engine idling speed	1300–1500 r/min
CO%	0.5–1.5 %
Intake vacuum	29.0–37.0 kPa (8.6–10.9 inHg) (218–278 mmHg)
Oil temperature	95.0–105.0 °C (203.00–221.00 °F)
Throttle cable free play	3.0–5.0 mm (0.12–0.20 in)

CHASSIS SPECIFICATIONS

Chassis	
Frame type	Semi double cradle
Caster angle	25.17 °
Trail	92.0 mm (3.62 in)
Front wheel	
Wheel type	Spoke wheel
Rim size	19x1.85
Rim material	Aluminum
Wheel travel	180.0 mm (7.09 in)
Radial wheel runout limit	2.0 mm (0.08 in)
Lateral wheel runout limit	2.0 mm (0.08 in)
Wheel axle bending limit	0.25 mm (0.01 in)
Rear wheel	
Wheel type	Spoke wheel
Rim size	16x2.15
Rim material	Aluminum
Wheel travel	172.0 mm (6.77 in)
Radial wheel runout limit	2.0 mm (0.08 in)
Lateral wheel runout limit	2.0 mm (0.08 in)
Wheel axle bending limit	0.25 mm (0.01 in)
Front tire	
Type	With tube
Size	80/100-19M/C 49P
Manufacturer/model	BRIDGESTONE/TW201
Wear limit (front)	0.8 mm (0.03 in)
Rear tire	
Type	With tube
Size	120/90-16M/C 63P
Manufacturer/model	BRIDGESTONE/TW202
Wear limit (rear)	0.8 mm (0.03 in)
Tire air pressure (measured on cold tires)	
Loading condition	0–90 kg (0–198 lb)
Front	125 kPa (18 psi) (1.25 kgf/cm^2) (1.25 bar)
Rear	150 kPa (22 psi) (1.50 kgf/cm^2) (1.50 bar)
Loading condition	90–180 kg (198–397 lb)
Front	150 kPa (22 psi) (1.50 kgf/cm^2) (1.50 bar)
Rear	175 kPa (25 psi) (1.75 kgf/cm^2) (1.75 bar)
Front brake	
Type	Single disc brake
Operation	Right hand operation
Front brake lever free play	2.0–5.0 mm (0.08–0.20 in)
Front disc brake	
Disc outside diameter × thickness	220.0 × 3.5 mm (8.66 × 0.14 in)
Brake disc thickness limit	3.0 mm (0.12 in)
Brake disc deflection limit	0.15 mm (0.0059 in)
Brake pad lining thickness (inner)	5.3 mm (0.21 in)
Limit	0.8 mm (0.03 in)
Brake pad lining thickness (outer)	5.3 mm (0.21 in)
Limit	0.8 mm (0.03 in)

Master cylinder inside diameter	11.00 mm (0.43 in)
Caliper cylinder inside diameter	26.99 mm (1.06 in)
Caliper cylinder inside diameter	22.22 mm (0.87 in)
Recommended fluid	DOT 4

Rear brake

Type	Single disc brake
Operation	Right foot operation
Brake pedal position	35.0 mm (1.38 in)
Rear disc brake	
Disc outside diameter × thickness	203.0 × 4.5 mm (7.99 × 0.18 in)
Brake disc thickness limit	4.0 mm (0.16 in)
Brake disc deflection limit	0.15 mm (0.0059 in)
Brake pad lining thickness (inner)	5.2 mm (0.20 in)
Limit	1.0 mm (0.04 in)
Brake pad lining thickness (outer)	5.2 mm (0.20 in)
Limit	1.0 mm (0.04 in)
Master cylinder inside diameter	12.7 mm (0.50 in)
Caliper cylinder inside diameter	30.23 mm (1.19 in)
Recommended fluid	DOT 4

Steering

Steering bearing type	Taper roller bearing
Lock to lock angle (left)	48.0 °
Lock to lock angle (right)	48.0 °

Front suspension

Type	Telescopic fork
Spring/shock absorber type	Coil spring/oil damper
Front fork travel	180.0 mm (7.09 in)
Fork spring free length	478.0 mm (18.82 in)
Limit	468.4 mm (18.44 in)
Spring rate K1	3.80 N/mm (21.70 lb/in) (0.39 kgf/mm)
Spring rate K2	4.60 N/mm (26.27 lb/in) (0.47 kgf/mm)
Spring stroke K1	0.0–114.0 mm (0.00–4.49 in)
Spring stroke K2	114.0–180.0 mm (4.49–7.09 in)
Optional spring available	No
Recommended oil	Fork oil 15W or equivalent
Quantity	292.0 cm^3 (9.87 US oz) (10.30 Imp.oz)
Level	125.0 mm (4.92 in)

Rear suspension

Type	Swingarm (link suspension)
Spring/shock absorber type	Coil spring/gas-oil damper
Rear shock absorber assembly travel	66.0 mm (2.60 in)
Spring free length	198.5 mm (7.81 in)
Installed length	182.5 mm (7.19 in)
Spring rate K1	66.70 N/mm (380.86 lb/in) (6.80 kgf/mm)
Optional spring available	No
Enclosed gas/air pressure (STD)	1500 kPa (213.3 psi) (15.0 kgf/cm^2)

Swingarm

Swingarm end free play limit (radial)	1.0 mm (0.04 in)
Swingarm end free play limit (axial)	1.0 mm (0.04 in)

Drive chain

Type/manufacturer	428V/DAIDO
Link quantity	124
Drive chain slack	40.0–45.0 mm (1.57–1.77 in)
15-link length limit	191.5 mm (7.54 in)

ELECTRICAL SPECIFICATIONS

Voltage	
System voltage	12 V
Ignition system	
Ignition system	CDI
Advancer type	Digital
Ignition timing (B.T.D.C.)	10.0 °/1400 r/min
CDI	
Magneto model/manufacturer	F5XT/YAMAHA
Pickup coil resistance	248.0–372.0 Ω
CDI unit model/manufacturer	5XT/YAMAHA
Ignition coil	
Model/manufacturer	2JN/YAMAHA
Minimum ignition spark gap	6.0 mm (0.24 in)
Primary coil resistance	0.18–0.28 Ω
Secondary coil resistance	6.30–9.50 kΩ
Spark plug cap	
Material	Resin
Resistance	10.0 kΩ
AC magneto	
Model/manufacturer	F5XT/YAMAHA
Standard output	14.0 V190 W5000 r/min
Stator coil resistance	0.56–0.84 Ω
Rectifier/regulator	
Regulator type	Semi conductor-short circuit
Model/manufacturer	SH629A-12/SHINDENGEN
No load regulated voltage	14.1–14.9 V
Rectifier capacity	10.0 A
Withstand voltage	200.0 V
Battery	
Model	YTZ7S
Voltage, capacity	12 V, 6.0 Ah
Specific gravity	1.310
Manufacturer	YUASA
Ten hour rate amperage	0.60 A
Headlight	
Bulb type	Halogen bulb
Bulb voltage, wattage × quantity	
Headlight	12 V, 60 W/55.0 W × 1
Auxiliary light	12 V, 5.0 W × 1
Tail/brake light	12 V, 5.0 W/21.0 W × 1
Front turn signal light	12 V, 10.0 W × 2
Rear turn signal light	12 V, 10.0 W × 2
Meter lighting	14 V, 3.0 W × 1
Indicator light	
Neutral indicator light	12 V, 1.7 W × 1

Turn signal indicator light	12 V, 1.7 W × 1
High beam indicator light	12 V, 1.7 W × 1

Electric starting system

System type	Constant mesh

Starter motor

Model/manufacturer	3C5/YAMAHA
Power output	0.40 kW
Brush overall length	10.0 mm (0.39 in)
Limit	3.50 mm (0.14 in)
Brush spring force	5.52–8.28 N (19.87–29.80 oz) (563–844 gf)
Commutator diameter	22.0 mm (0.87 in)
Limit	21.0 mm (0.83 in)
Mica undercut (depth)	1.50 mm (0.06 in)

Starter relay

Model/manufacturer	2768096-A/JIDECO
Amperage	180.0 A

Horn

Horn type	Plane
Quantity	1 pcs
Model/manufacturer	HF-12/NIKKO
Maximum amperage	3.0 A
Coil resistance	1.01–1.11 Ω
Performance	108–116 dB/2m

Turn signal relay

Relay type	Full transistor
Model/manufacturer	FE218BH/DENSO
Built-in, self-canceling device	No
Turn signal blinking frequency	75.0–95.0 cycles/min
Wattage	10 W × 2.0 +3.4 W

Starting circuit cut-off relay

Model/manufacturer	ACM33211 M04/MATSUSHITA

Carburetor warmer

Resistance	4.7–9.5 Ω

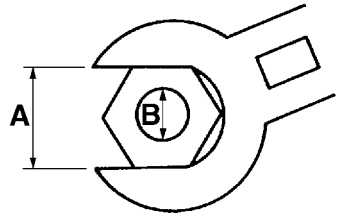
Fuse

Fuse	20.0 A
Reserve fuse	20.0 A

TIGHTENING TORQUES

GENERAL TIGHTENING TORQUE SPECIFICATIONS

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



A. Distance between flats
B. Outside thread diameter

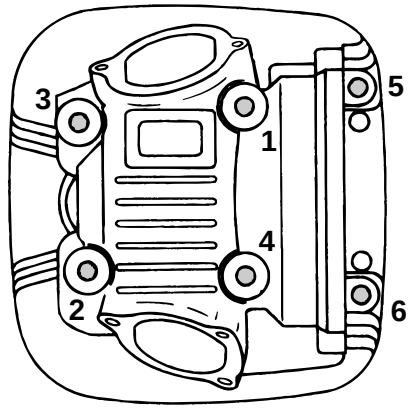
A (nut)	B (bolt)	General tightening torques		
		Nm	m•kg	ft•lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13.0	94

ENGINE TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Cylinder head (upper)	M8	4	22 Nm (2.2 m•kg, 16 ft•lb)	E
Cylinder head	M8	2	20 Nm (2.0 m•kg, 14 ft•lb)	
Camshaft lock plate	M6	2	8 Nm (0.8 m•kg, 5.8 ft•lb)	LT
Cylinder head side cover (1 and 2)	M55	1/1	18 Nm (1.8 m•kg, 13 ft•lb)	
Cylinder head side cover 3	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Cylinder head breather plate	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	LT
Spark plug	M12	1	18 Nm (1.8 m•kg, 13 ft•lb)	
Cylinder head stud bolt	M8	2	15 Nm (1.5 m•kg, 11 ft•lb)	
Oil gallery bolt	M6	1	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Left crankcase cover	M6	9	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Pickup coil rotor	M10	1	60 Nm (6.0 m•kg, 44 ft•lb)	
Balancer weight gear	M12	1	55 Nm (5.5 m•kg, 40 ft•lb)	
Valve clearance adjusting locknut	M6	2	14 Nm (1.4 m•kg, 10 ft•lb)	
Camshaft sprocket	M10	1	60 Nm (6.0 m•kg, 44 ft•lb)	
Timing chain tensioner cap bolt	M6	1	8 Nm (0.8 m•kg, 5.8 ft•lb)	

Item	Thread size	Q'ty	Tightening torque	Remarks
Timing chain guide (intake side)	M6	1	8 Nm (0.8 m•kg, 5.8 ft•lb)	
Oil filter element cover (under)	M6	3	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Oil delivery pipe	M10	2	20 Nm (2.0 m•kg, 14 ft•lb)	
Oil delivery pipe and cylinder	M8	2	17 Nm (1.7 m•kg, 12 ft•lb)	
Oil pump assembly	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Oil pump assembly (crankcase)	M6	1	6 Nm (0.6 m•kg, 4.3 ft•lb)	
Air filter case	M6	3	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Carburetor joint clamp screw	M4	1	2 Nm (0.2 m•kg, 1.4 ft•lb)	
Air cut-off valve	M6	1	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Exhaust pipe nut	M8	2	18 Nm (1.8 m•kg, 13 ft•lb)	
Muffler joint	M8	1	20 Nm (2.0 m•kg, 14 ft•lb)	
Muffler (front)	M8	1	40 Nm (4.0 m•kg, 29 ft•lb)	
Muffler (rear)	M8	1	42 Nm (4.2 m•kg, 30 ft•lb)	
Left crankcase cover	M6	1	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Right crankcase cover	M6	14	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Crankcase	M6	12	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Oil drain bolt	M12	1	20 Nm (2.0 m•kg, 14 ft•lb)	
Ground lead, clutch cable holder	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Neutral switch lead clamp	M6	1	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Starter idle gear cover	M6	3	8 Nm (0.8 m•kg, 5.8 ft•lb)	
Starter clutch	M8	3	30 Nm (3.0 m•kg, 22 ft•lb)	
Primary drive gear nut	M16	1	80 Nm (8.0 m•kg, 58 ft•lb)	
Clutch boss nut	M16	1	75 Nm (7.5 m•kg, 54 ft•lb)	
Clutch spring	M6	5	8 Nm (0.8 m•kg, 5.8 ft•lb)	
Push lever adjusting screw locknut	M6	1	8 Nm (0.8 m•kg, 5.8 ft•lb)	
Push lever shaft	M8	1	12 Nm (1.2 m•kg, 8.6 ft•lb)	
Drive sprocket nut	M18	1	110 Nm (11.0 m•kg, 80 ft•lb)	
Stopper lever	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Neutral switch	M10	1	20 Nm (2.0 m•kg, 14 ft•lb)	
Starter motor	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Stator coil	M6	3	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Pickup coil	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	

Cylinder head tightening sequence:



CHASSIS TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Engine stay and frame	M8	4	30 Nm (3.0 m•kg, 22 ft•lb)	
Engine stay and engine	M10	2	72 Nm (7.2 m•kg, 52 ft•lb)	
Engine and frame (rear upper)	M10	1	72 Nm (7.2 m•kg, 52 ft•lb)	
Engine and frame (rear under)	M10	1	72 Nm (7.2 m•kg, 52 ft•lb)	
Down tube and frame (front upper)	M10	2	72 Nm (7.2 m•kg, 52 ft•lb)	
Down tube and frame (rear under)	M10	1	72 Nm (7.2 m•kg, 52 ft•lb)	
Down tube and engine	M10	2	72 Nm (7.2 m•kg, 52 ft•lb)	
Chain tensioner	M8	2	23 Nm (2.3 m•kg, 17 ft•lb)	
Helmet holder	M6	1	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Grab bar	M8	4	32 Nm (3.2 m•kg, 23 ft•lb)	
Seat	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Flap guard	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Horn	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Tool box	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Battery box	M6	3	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Rectifier/regulator	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Ignition coil	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Rear shock absorber and frame	M12	1	50 Nm (5.0 m•kg, 36 ft•lb)	

Item	Thread size	Q'ty	Tightening torque	Remarks
Rear shock absorber and relay arm	M10	1	40 Nm (4.0 m•kg, 29 ft•lb)	
Relay arm and frame	M12	1	50 Nm (5.0 m•kg, 36 ft•lb)	
Relay arm and connecting rod	M12	1	59 Nm (5.9 m•kg, 43 ft•lb)	
Connecting rod and swingarm	M12	1	59 Nm (5.9 m•kg, 43 ft•lb)	
Chain case and swingarm	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Pivot shaft	M12	1	53 Nm (5.3 m•kg, 38 ft•lb)	
Steering shaft and ring nut	M22	1	4 Nm (0.4 m•kg, 2.9 ft•lb)	See NOTE.
Steering shaft and handle	M22	1	110 Nm (11.0 m•kg, 80 ft•lb)	
Fuel tank and frame (front)	M6	1	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Fuel tank and frame (rear)	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Fuel tank and fuel cock	M6	1	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Handlebar upper holder	M8	4	23 Nm (2.3 m•kg, 17 ft•lb)	
Sidestand and nut	M10	1	44 Nm (4.4 m•kg, 32 ft•lb)	
Sidestand switch	M5	2	4 Nm (0.4 m•kg, 2.9 ft•lb)	
Rear master cylinder	M6	2	13 Nm (1.3 m•kg, 9.4 ft•lb)	
Rear footrest bracket	M8	4	23 Nm (2.3 m•kg, 17 ft•lb)	
Rear footrest bolt	M8	2	23 Nm (2.3 m•kg, 17 ft•lb)	
Front footrest cover bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Brake pedal	M10	1	30 Nm (3.0 m•kg, 22 ft•lb)	
Rear brake caliper cover	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Chain support	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Seal guard	M5	3	5 Nm (0.5 m•kg, 3.6 ft•lb)	
Front fork cap bolt	M30	1	23 Nm (2.3 m•kg, 17 ft•lb)	
Steering shaft pinch bolt	M8	4	23 Nm (2.3 m•kg, 17 ft•lb)	
Front wheel axle and nut	M14	1	85 Nm (8.5 m•kg, 61 ft•lb)	
Spoke (front)	BC3.5	—	3 Nm (0.3 m•kg, 2.2 ft•lb)	
Spoke (rear)	BC3.2	—	3 Nm (0.3 m•kg, 2.2 ft•lb)	
Front hub and brake disk	M6	6	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Front caliper and front fork leg	M10	2	40 Nm (4.0 m•kg, 29 ft•lb)	
Rear wheel axle and nut	M14	1	85 Nm (8.5 m•kg, 61 ft•lb)	
Rear hub and brake disk	M8	3	28 Nm (2.8 m•kg, 20 ft•lb)	
Rear wheel sprocket	M8	6	33 Nm (3.3 m•kg, 24 ft•lb)	
Front caliper bleed screw	M7	1	6 Nm (0.6 m•kg, 4.3 ft•lb)	

Item	Thread size	Q'ty	Tightening torque	Remarks
Rear caliper bleed screw	M8	1	6 Nm (0.6 m•kg, 4.3 ft•lb)	
Rear caliper and joint	M10	1	26 Nm (2.6 m•kg, 19 ft•lb)	
Joint and brake hose	M10	1	14 Nm (1.4 m•kg, 10 ft•lb)	
Union bolt	M10	4	30 Nm (3.0 m•kg, 22 ft•lb)	
Shift pedal	M8	1	30 Nm (3.0 m•kg, 22 ft•lb)	
Shift rod and nut	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Shift arm and engine	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Handle crown and inner tube	M8	2	23 Nm (2.3 m•kg, 17 ft•lb)	
Headlight	M6	2	9 Nm (0.9 m•kg, 6.5 ft•lb)	
Front fork leg cable guide	M5	1	0.7 Nm (0.07 m•kg, 0.5 ft•lb)	
Front brake hose and meter cable	M4	1	0.5 Nm (0.05 m•kg, 0.4 ft•lb)	
Grab bar	M6	4	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Battry leads	—	2	2 Nm (0.2 m•kg, 1.5 ft•lb)	
Master cylinder cap (front and rear)	—	4	2 Nm (0.2 m•kg, 1.5 ft•lb)	
Throttle cable and carburetor	M6	2	4 Nm (0.4 m•kg, 2.9 ft•lb)	
Brake lever adjusting bolt and lock nut	M6	1	4 Nm (0.4 m•kg, 2.9 ft•lb)	
Starter cable	—	1	4 Nm (0.4 m•kg, 2.9 ft•lb)	
Steering shaft and cable guide	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	

NOTE:

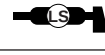
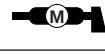
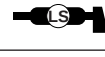
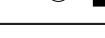
- First, tighten the lower ring nut to approximately 38 Nm (3.8 m•kg, 28 ft•lb) with a torque wrench, then loosen the lower ring nut completely.
  Retighten the lower ring nut to 4 Nm (0.4 m•kg, 2.9 ft•lb) with a torque wrench.

LUBRICATION POINTS AND LUBRICANT TYPES

ENGINE

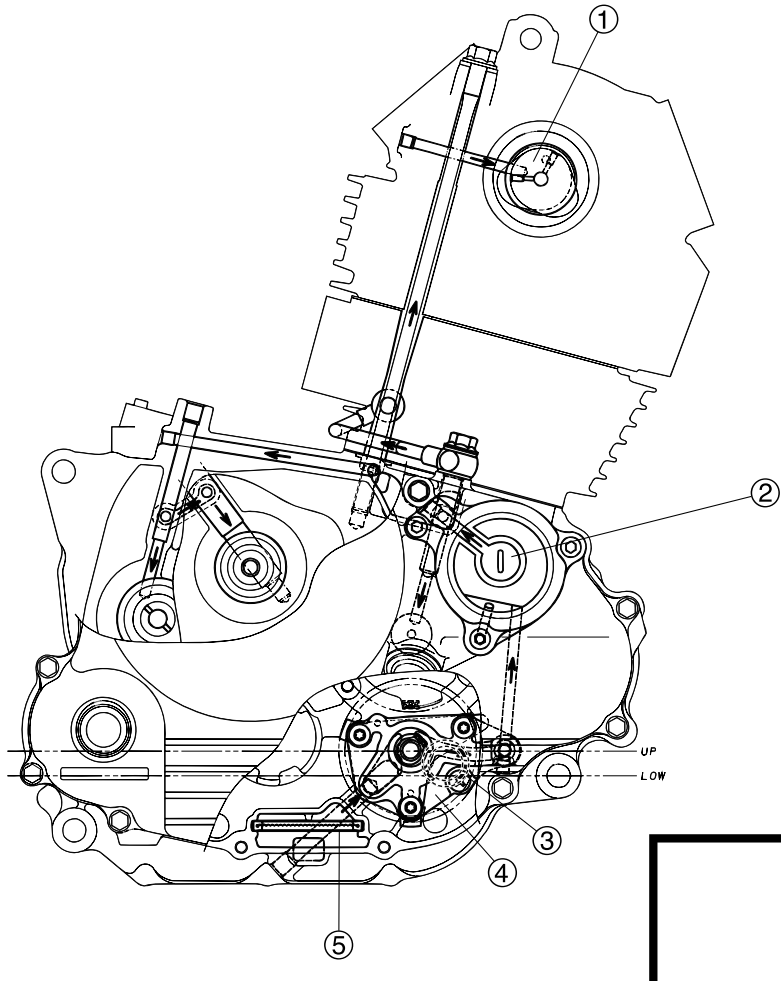
Lubrication point	Lubricant
Oil seal lips	LS
O-rings	LS
Bearings	E
Cylinder head nuts	E
Cylinder head washers	M
Crankshaft journals	E
Connecting rod small end and big end	E
Piston pins	E
Piston surfaces	E
Valve stems (intake and exhaust)	M
Valve stem ends (intake and exhaust)	M
Rocker arm shafts (intake and exhaust)	E
Camshaft	M
Valve rocker arms	M
Starter idler gears 1	E
Starter idler gears 2	E
Starter wheel gear	E
Push rods	LS
Clutch housing	E
Push lever shaft	E
Push rod ball	LS
Drive axle	M
main axle	M
Transmission gear	M
Shift fork guide bar	E
Shift drum	E
Shift shaft	E
Shift shaft pawl	LS
Crankcase matting surface	Yamaha bond No.1215

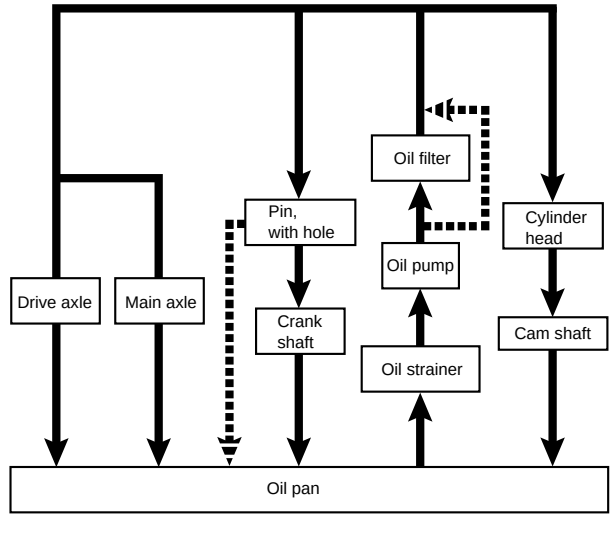
CHASSIS

Lubrication point	Lubricant
Head pipe bearing	
Head pipe steering ring seal lip	
Front wheel oil seal lip (left and right)	
Rear wheel oil seal lip (left and right)	
Brake pedal shaft	
Shift pedal shaft	
Frame, sidestand and sidestand collar moving point	
Guide tube and throttle cable	
Front brake lever bolt and pivoting point and metal moving point	Silicon grease
Rear master cylinder push rod	Silicon grease
Brake caliper and brake caliper bolt	Silicon grease
Clutch lever pivoting point and metal moving point	
Pivot shaft	
Swingarm (bush, collar and oil seal lip)	
Relay arm (bush, collar, bearing and oil seal lip)	
Relay arm, connecting rod shaft outside	
Rear wheel axle	
Sidestand switch and link point	
Frame and sidestand switch and link point	
Chain tensioner collar	
Rear footrest moving point	

LUBRICATION SYSTEM CHART AND DIAGRAMS

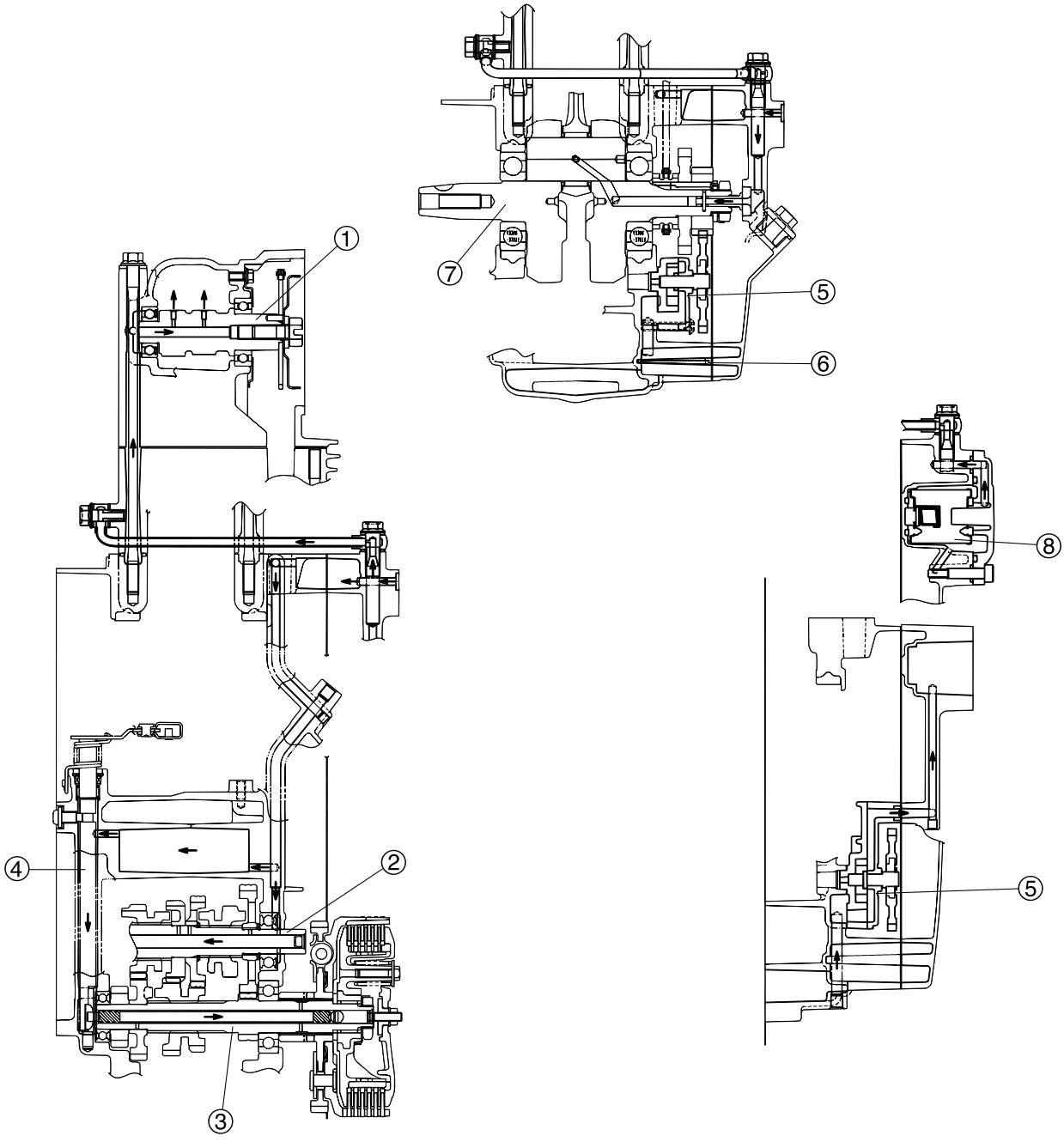
ENGINE OIL LUBRICATION CHART





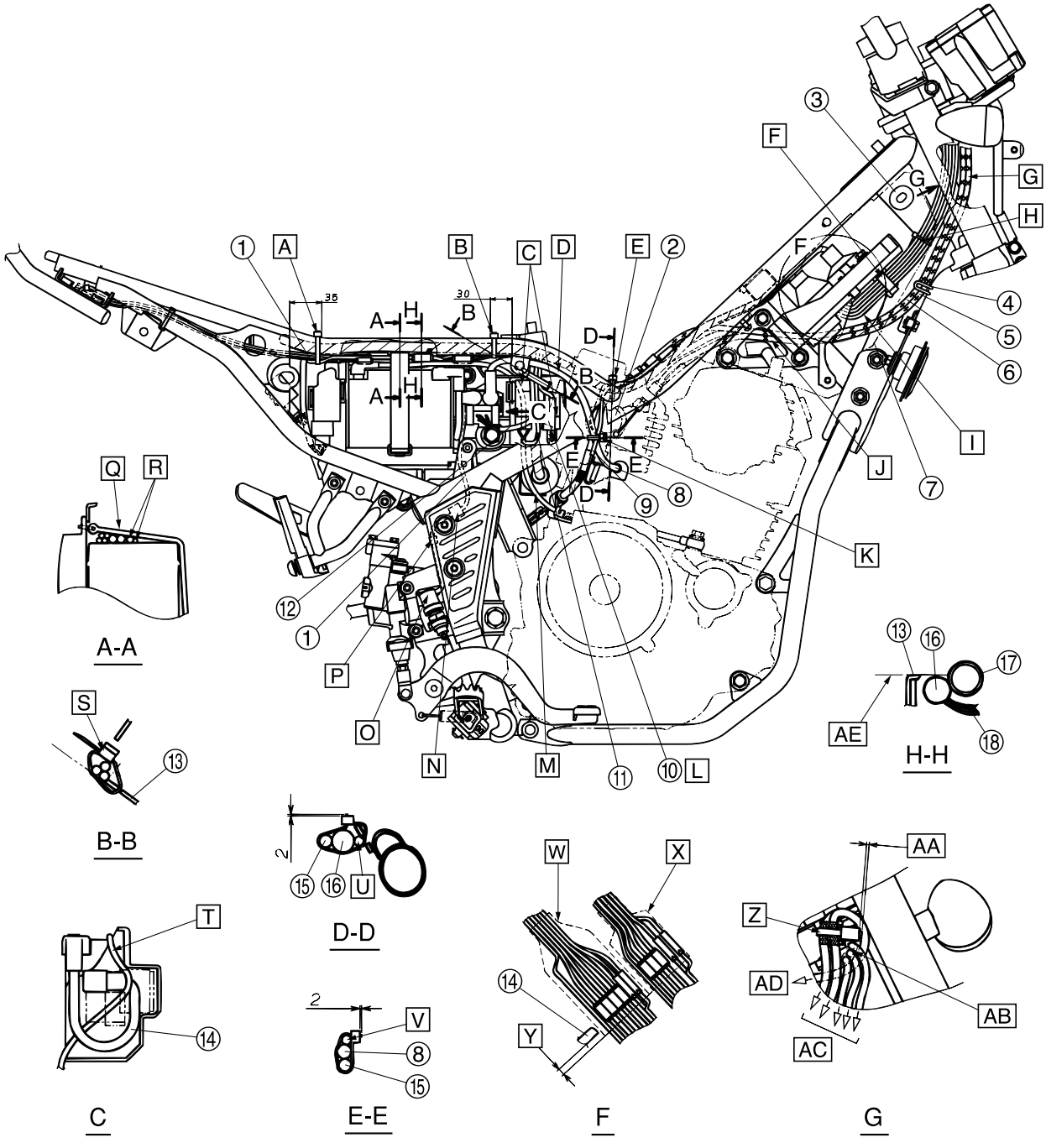
1. Camshaft
2. Oil filter element
3. Oil check window
4. Oil pump assembly
5. Oil strainer

LUBRICATION DIAGRAMS



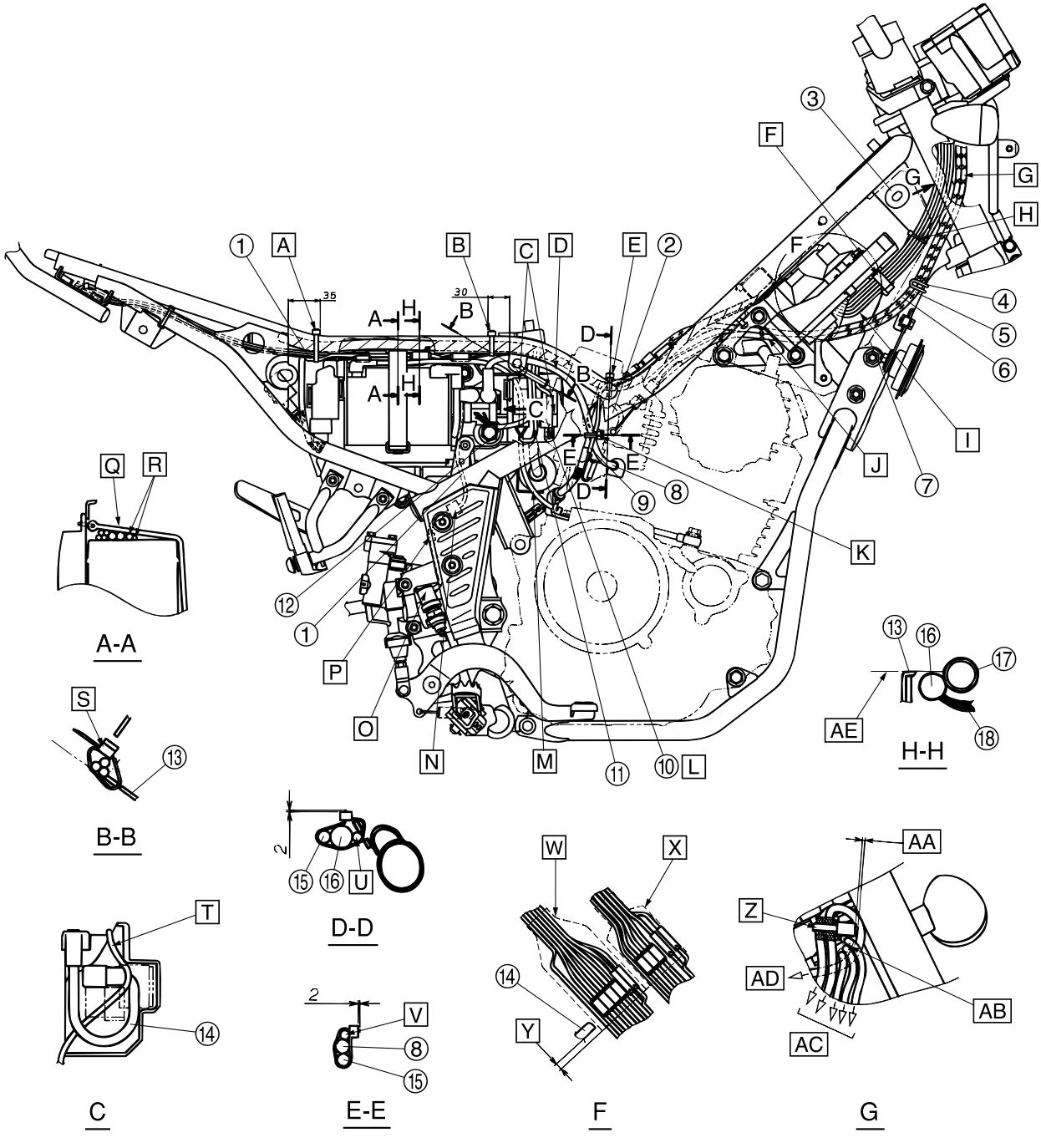
1. Camshaft
2. Drive axle
3. Main axle
4. Push lever shaft
5. Oil pump assembly
6. Oil strainer
7. Crankshaft assembly
8. Oil filter element

CABLE ROUTING



1. Rear brake switch leads
2. Throttle pulley
3. Grommet (tool box cover)
4. Cable guide(throttle cables)
5. Throttle cable (decelerator)
6. Throttle cable (accelerator)
7. Side cover
8. Starter motor lead
9. Carburetor warmer lead
10. Diode
11. Tape (gray)
12. Starter relay lead
13. Battery compartment
14. Positive battery lead
15. Clutch cable
16. Wire harness
17. Frame seat rail (right)
18. Rear turn signal lead

A. Clamp the wire harness, tail/brake light lead, rear turn signal lead, rear turn signal lead and rear brake switch lead with a band. Cut off the end of the band facing it upward. Set the relay lead to seat rail and frame stay side cover front, and ten clamp.
B. Clamp the wire harness, tail/brake light lead and battery negative lead with a band. Cut off the end of the band facing it upward.
C. Install the relay facing it forward.
D. Route the starter motor lead to the out side of each lead.
E. Clamp the wire harness, clutch cable and carburetor warmer lead with a band. Pass through the band to the gusset hole and clamp it. Make sure to face the band end upward and cut off.
F. Fasten the handlebar switch right lead, front brake light switch, front turn signal light right lead, meter lead and headlight relay with a clamp. Face the open side of the clamp downward.
G. Route the throttle cable to the outside of the lead.
H. Fasten the handlebar switch right lead, front brake light switch, front turn signal light right lead, meter lead and headlight relay with a clamp at the place around the frame gusset end. Cut the end of the clamp with facing it to the grommmet side.
I. Do not project from the side cover outside.
J. Route the throttle cable upon the breather hose.
K. Route the throttle cable to the upper side of the breather hose. Fasten the clutch cable, starter motor lead and carburetor warmer lead with the band. Make sure to face the band end to the front side of the chassis and cut off.
L. Install the diode in the battery box.
M. Route the battery negative lead behind the point where the wire harness branches off and through the inside of the battery box.
N. Fasten the rear brake switch leads with a clamp. Face the open side of the clamp to the inside of the chassis.
O. Install the rear brake switch routing the rear brake switch leads along the frame.
P. Clamp the rear brake switch lead.
Q. Push the rear turn signal lead, tail/brake light lead, rear brake switch lead into the space under battery band.
R. Install the battery negative lead outside of the each lead.
S. Fasten the starter lead and starting circuit cut-off relay with a clamp. After that, push the ratchet and the clamp head inside.
T. Installing the starter relay, route the rear brake switch lead between the battery positive leads.
U. Route the carburetor warmer lead out side of the wire harness.
V. Route the carburetor warmer lead out side of the clutch cable and the starter motor lead.
W. Store the headlight relay lead, speedometer cable, right handlebar switch lead, front brake switch lead, right turn signal light lead coupler in cover at rear.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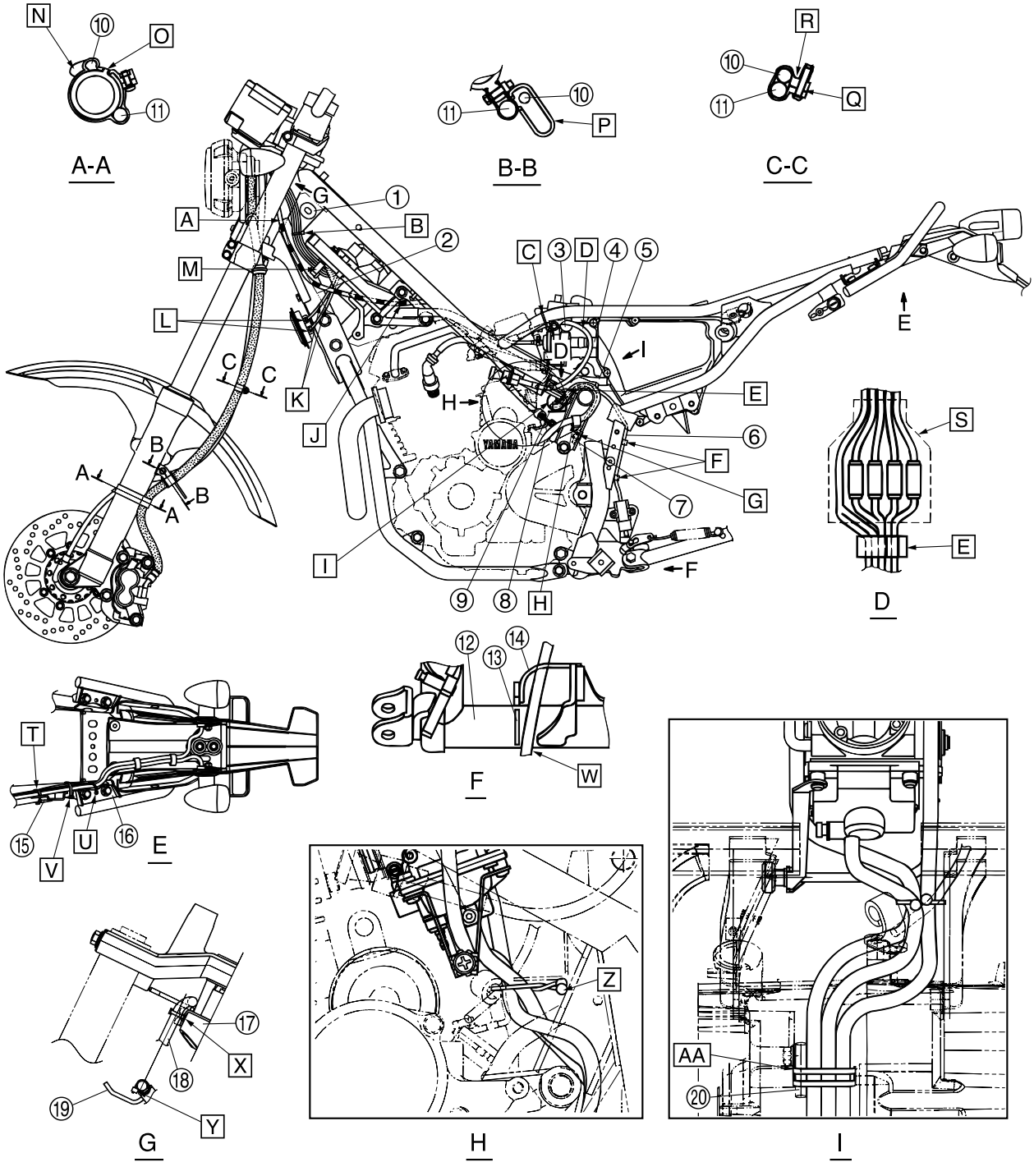
X. Store the left handlebar switch lead, clutch switch coupler, main switch lead, left turn signal light coupler in cover at front.
Y. Install the cover, and position its front/ rear below the bottom of the tool box stay.
Z. Clamp the meter lead and the headlight lead together at the center of the located point, and cut off the end of it. And, make sure to fasten the T-stud of the stay.
AA. Cut the end of the bundle less than 2 mm.
AB. Route the turn signal light right lead, handlebar switch right lead, front brake switch lead and meter lead to the upper side of the meter lead, and the head light relay.
AC. To cover.
AD. To meter and headlight.
AE. Tool box cover installing grommet.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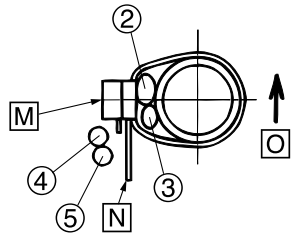
I

1. Grommet
2. Side cover
3. Side cover frame stay
4. Air induction system hose (air filter—air cut-off valve)
5. Breather hose
6. Sidestand switch lead
7. Neutral switch lead
8. Pickup coil rotor lead
9. Frame guide
10. Speedometer cable
11. Front brake hose
12. Cross tube
13. Main stand bracket
14. Cableguide (carburetor drain hose)
15. Frame (muffler bracket)
16. Grab bar (stay)
17. Main switch assembly
18. Main switch lead
19. Stay
20. Newtral switch lead

A. Route the clutch cable to the outside of the lead.
B. Clamp the handlebar switch left lead, clutch switch lead, front left turn signal light lead, main switch lead at the place around the frame gusset rear end. Cut the end of the clamp with facing it to the tool box cover installing grommet.
C. Fasten the starter cable with a clamp. Cut off the end of the clamp and face it downward.
D. Pass the starter cable through the U-shaped side cover frame stay, and the outside of the air induction system hose and breather hose.
E. Fasten the ignition coil lead, pickup coil rotor coupler, sidestand switch lead and neutral switch lead with a clamp. Face the open side upward.
F. Fasten the side stand switch lead with a clamp.
G. Fasten the neutral switch lead with a clamp. Face the open side backward.
H. Fasten the pickup coil rotor lead with a clamp. Face the open side downward.
I. Place the cover on the wireharness frame bracket.
J. Route the clutch cable to upper side of the breather hose.
K. Route the horn lead to the inside of the clutch cable.
L. install the connectors and face their heads inside to the body.
M. Fasten the left handlebar switch lead, clutch switch lead, front left turn signal light lead and main switch lead with a clamp. Face the open side downward.
N. Fasten the front brake hose and speedometer cable with a cable guide.
O. Fit the projection of the cable guide to the hole of the front fork.
P. Pass the front brake hose and speedometer cable through the cable guide. Possible to use synthetic detergent or water as lubricant during assembling the front brake hose.
Q. Clamp the front brake hose and speedometer cable. Clamp at the place covering the white painting part of the front brake hose.
R. Insert the protector into the threaded part after fastening the screw.
S. Store the ignition coil lead, pickup coil lead, sidestand switch lead, neutral switch lead in the cover.
T. Fasten the left and right turn signal light leads and the tail/brake light lead with a clamp. Pass through into the hole at the front side of the muffler bracket and then cut off the end of the clamp facing it upward.
U. Fasten the turn signal light left and right leads and the tail/brake light lead with a clamp. Pass the clamp through the hole of the grab bar and cut the end facing it out side.
V. Fasten the turn signal light left and right leads and the tail/brake light lead with a clamp. Cut off the end of the clamp facing it downward.
W. Pass the carburetor drain hose to the backside of the cross tube and the inside of the main stand frame bracket.
X. Clamp it at the hollow of the stay.
Y. After clamping, cut off the end facing it forward.
Z. Clamp the air induction system hose, carburetor drain hose and battery negative lead and then, face the end backward.
AA. Clamp the air induction system hose, carburetor drain hose, the neutral switch lead.



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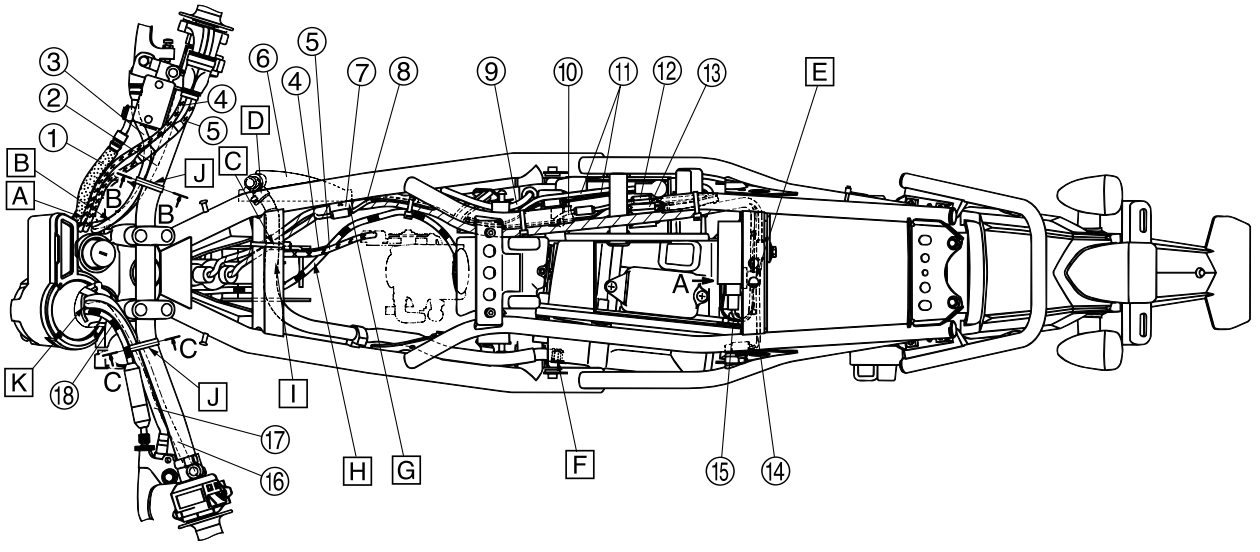

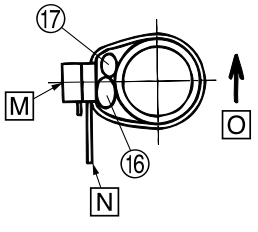

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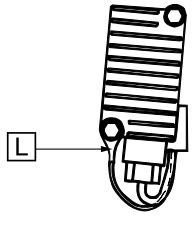
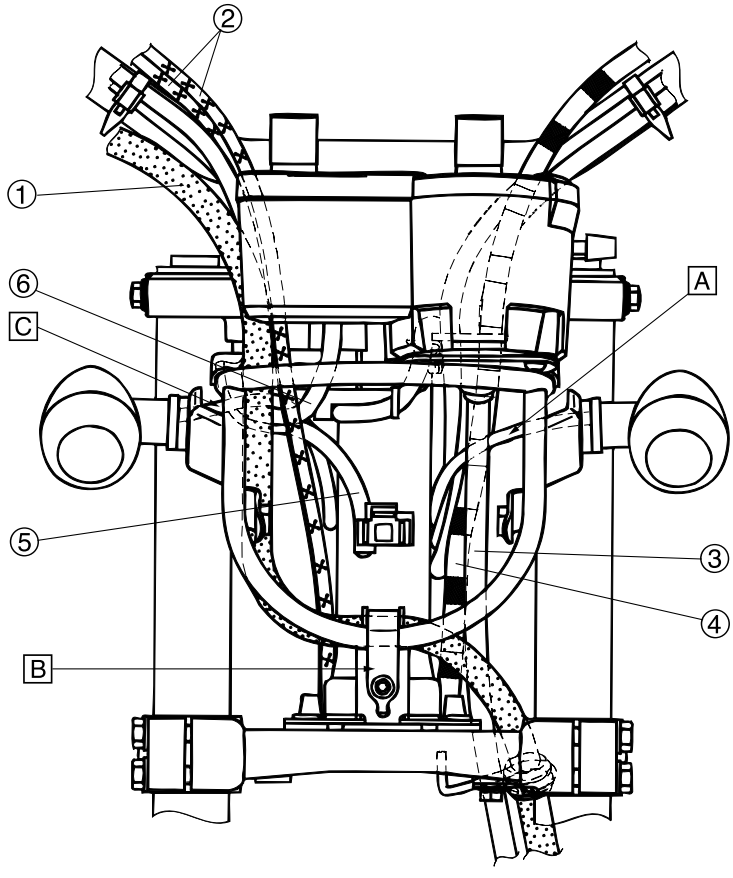


A

1. Front brake hose
2. Right handlebar switch lead
3. Front brake light switch lead
4. Throttle cable (decelerator)
5. Throttle cable (accelerator)
6. Cylinder head side cover 3
7. T-stud
8. Carburetor warmer lead
9. Starter motor lead
10. Rear brake switch lead
11. Battery negative lead
12. Tail/brake light lead
13. Rear turn signal lead
14. Thermo switch lead
15. Rectifier/regulator lead
16. Left hundlebar switch lead
17. Clutch switch lead
18. Clutch cable

A. Route the throttle cable between the front brake hose and lead.
B. Route the front brake switch lead and handlebar switch right lead behind the throttle cable.
C. Fasten the wire harness (2 harnesses) with a clamp. Cut it off and turn the edge behind the cross tube.
D. Make sure that the clip end faces to the front side.
E. Fasten the thermo switch lead, rectifier/ regulator lead and regulator ground lead with a clamp.
F. Make sure that the clip end faces to the upper side.
G. Make sure to fasten the wire harness with the T-stud.
H. Route the cutch cable between the throttle cable (decelerator) and throttle cable (accelerator).
I. Through the engine hanger hole.
J. Clamp the left handlebar switch lead and clutch switch lead at the round part of handlebar.
K. Clamp the right handlebar switch lead and front brake switch lead at the round part of the handlebar.
L. Guide the clutch cable, clutch switch lead, handlebar switch left lead and main switch lead with a stay.
M. Install the rectifirer/regurator ground lead horizontally to the body.
N. Turn toward the front of the body.
O. Turn to the ground.
P. The upper part of the body.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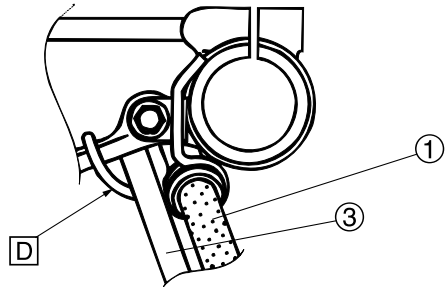
①
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D

1. Front brake hose
2. Throttle cable
3. Speedometer cable
4. Clutch cable
5. Headlight lead
6. Meter lead

A. Route the front turn signal light left lead behind the speedometer cable and in front of the clutch cable.
B. Fasten the front brake hose with a cable guide. Possible to use synthetic detergent or water as lubricant during assembling the front brake hose.
C. Route the front turn signal light right lead behind the front brake hose and throttle cable and above the meter lead and headlight lead.
D. Fasten the front brake hose and speedometer cable with a cable guide. After pushing the front brake hose into the guide, route the speedometer cable to the guide. Possible to use synthetic detergent or water as lubricant during assembling the front brake hose.

PERIODIC CHECKS AND ADJUSTMENTS

PERIODIC MAINTENANCE

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.

Periodic maintenance and lubrication chart

NOTE:

- **The annual checks must be performed every year, except if a kilometer-based maintenance is performed instead.**
- From 50000 km, repeat the maintenance intervals starting from 10000 km.
- Items marked with an asterisk should be performed by a Yamaha dealer as they require special tools, data and technical skills.

NO.		ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING (× 1000 km)					ANNUAL CHECK
				1	10	20	30	40	
1	*	**Fuel line**	• Check fuel hoses for cracks or damage.		√	√	√	√	√
2		**Spark plug**	• Check condition. • Clean and regap.		√		√		
			• Replace.			√		√	
3	*	**Valves**	• Check valve clearance. • Adjust.		√	√	√	√	
4		**Air filter element**	• Replace.					√	
5		**Clutch**	• Check operation. • Adjust.	√	√	√	√	√	
6	*	**Front brake**	• Check operation, fluid level and vehicle for fluid leakage.	√	√	√	√	√	√
			• Replace brake pads.	Whenever worn to the limit					
7	*	**Rear brake**	• Check operation, fluid level and vehicle for fluid leakage.	√	√	√	√	√	√
			• Replace brake pads.	Whenever worn to the limit					
8	*	**Brake hoses**	• Check for cracks or damage.		√	√	√	√	√
			• Replace.	Every 4 years					
9	*	**Wheels**	• Check runout, spoke tightness and for damage. • Tighten spokes if necessary.		√	√	√	√	
10	*	**Tires**	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		√	√	√	√	√
11	*	**Wheel bearings**	• Check bearing for looseness or damage.		√	√	√	√	
12	*	**Swingarm**	• Check operation and for excessive play.		√	√	√	√	
			• Lubricate with molybdenum disulfide grease.	Every 50000 km					
13		**Drive chain**	• Check chain slack, alignment and condition. • Adjust and lubricate chain with a special O-ring chain lubricant thoroughly.	Every 500 km and after washing the motorcycle or riding in the rain					

NO.		ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING (× 1000 km)					ANNUAL CHECK
				1	10	20	30	40	
14	*	**Steering bearings**	• Check bearing play and steering for roughness.	√	√	√	√	√	
			• Lubricate with lithium-soap-based grease.	Every 50000 km					
15	*	**Chassis fasteners**	• Make sure that all nuts, bolts and screws are properly tightened.		√	√	√	√	√
16		**Sidestand**	• Check operation. • Lubricate.		√	√	√	√	√
17	*	**Sidestand switch**	• Check operation.	√	√	√	√	√	√
18	*	**Front fork**	• Check operation and for oil leakage.		√	√	√	√	
19	*	**Shock absorber assembly**	• Check operation and shock absorber for oil leakage.		√	√	√	√	
20	*	**Rear suspension relay arm and connecting arm pivoting points**	• Check operation.		√	√	√	√	
			• Lubricate with molybdenum disulfide grease.			√		√	
21	*	**Carburetor**	• Check starter (choke) operation. • Adjust engine idling speed.	√	√	√	√	√	√
22		**Engine oil**	• Change. • Check oil level and vehicle for oil leakage.	√	√	√	√	√	√
23		**Engine oil filter element**	• Replace.	√		√		√	
24	*	**Front and rear brake switches**	• Check operation.	√	√	√	√	√	√
25		**Moving parts and cables**	• Lubricate.		√	√	√	√	√
26	*	**Throttle grip housing and cable**	• Check operation and free play. • Adjust the throttle cable free play if necessary. • Lubricate the throttle grip housing and cable.		√	√	√	√	√
27	*	**Lights, signals and switches**	• Check operation. • Adjust headlight beam.	√	√	√	√	√	√

EAU18680

NOTE:

- Air filter
  - This model's air filter is equipped with a disposable oil-coated paper element, which must not be cleaned with compressed air to avoid damaging it.
  - The air filter element needs to be replaced more frequently when riding in unusually wet or dusty areas.
- Hydraulic brake service
  - Regularly check and, if necessary, correct the brake fluid level.
  - Every two years replace the internal components of the brake master cylinders and calipers, and change the brake fluid.
  - Replace the brake hoses every four years and if cracked or damaged.

EAS20470
ENGINE

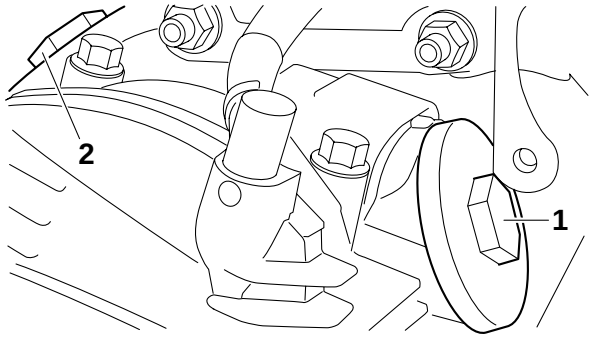
EAS20520
ADJUSTING THE VALVE CLEARANCE

The following procedure applies to all of the valves.

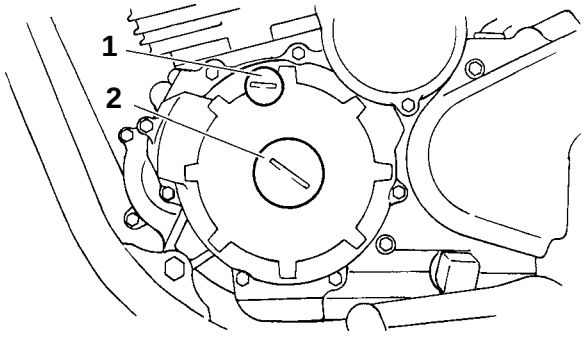
NOTE:

- 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:
   - Seat
   - Left side cover
   - Right side cover
   - Left fuel tank side cover
   - Right fuel tank side cover
     Refer to "GENERAL CHASSIS" on page 4-1.
   - Fuel tank
     Refer to "FUEL TANK" on page 6-1.
   - Spark plug cap
   - Spark plug
   - Cylinder head side cover1 "1"
   - Cylinder head side cover2 "2"
   - Cylinder head side cover3
     Refer to "CYLINDER HEAD" on page 5-5.



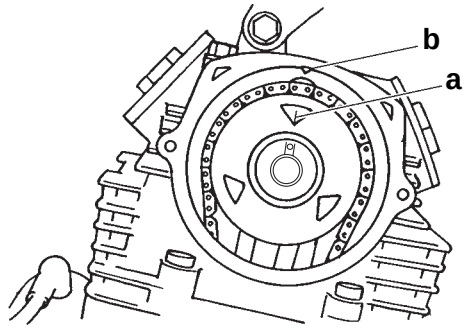
2. Remove:
   - Straight screw plug "1"
   - Center cap "2"



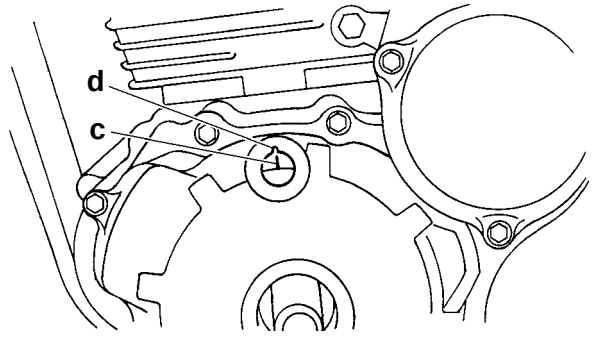
3. Measure:
   - Valve clearance
     Out of specification → Adjust.

Valve clearance (cold)
Intake
0.05–0.10 mm (0.0020–0.0039 in)
Exhaust
0.10–0.15 mm (0.0039–0.0059 in)

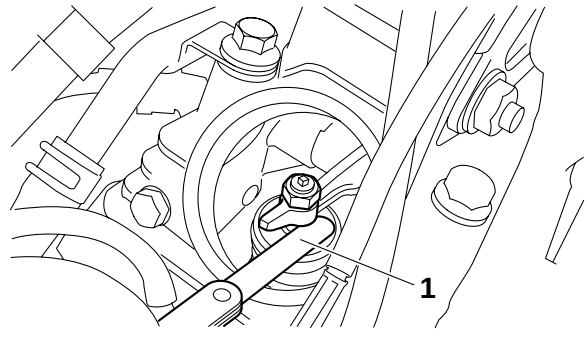
a. Turn the crankshaft counterclockwise.
b. When the piston is at TDC on the compression stroke, align the punch mark "a" in the camshaft sprocket with the stationary "b" on the cylinder head.



c. Align the TDC mark "c" on the pickup coil rotor with the stationary pointer "d" on the crankcase cover.



d. Measure the valve clearance with a thickness gauge "1".
   Out of specification → Adjust.



Thickness gauge
90890-03079
Narrow gauge set
YM-34483

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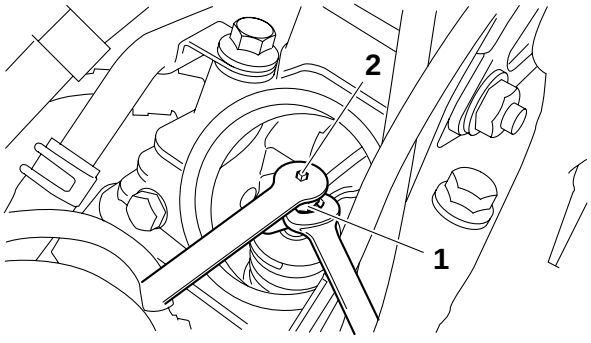
4. Adjust:
   - Valve clearance

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Loosen the locknut "1".
b. Insert a thickness gauge between the end of the adjusting screw and the valve stem.
c. Turn the adjusting screw "2" until the specified valve clearance is obtained.



Tappet adjusting tool
90890-01311
Valve adjuster 3 mm & 4 mm
YM-08035-A

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

Locknut
14 Nm (1.4 m•kg, 10 ft•lb)

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

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5. Install:
   - O-rings New
   - Cylinder head side cover 1
   - O-rings New
   - Cylinder head side cover 2

Cylinder head side cover
18 Nm (1.8 m•kg, 13 ft•lb)

- O-rings New
- Cylinder head side cover 3

Cylinder head side cover bolts
10 Nm (1.0 m•kg, 7.2 ft•lb)

- Spark plug

Spark plug
18 Nm (1.8 m•kg, 13 ft•lb)

- Spark plug caps

6. Install:
   - Fuel tank
   - Fuel tank side cover (left and right)
   - Seat/side cover (left and right)
   Refer to "GENERAL CHASSIS" on page 4-1.

EAS20580

CHECKING THE EXHAUST GAS (When the air induction system is not operating)

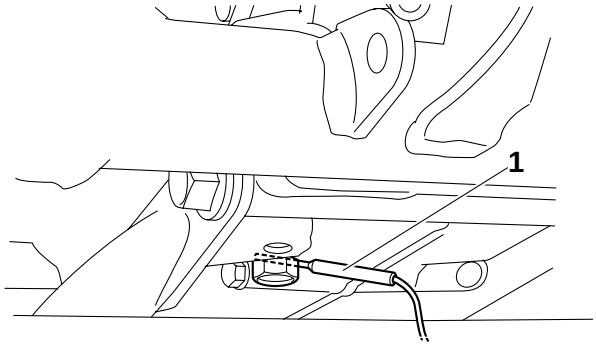
1. Stand the vehicle on a level surface.

NOTE:

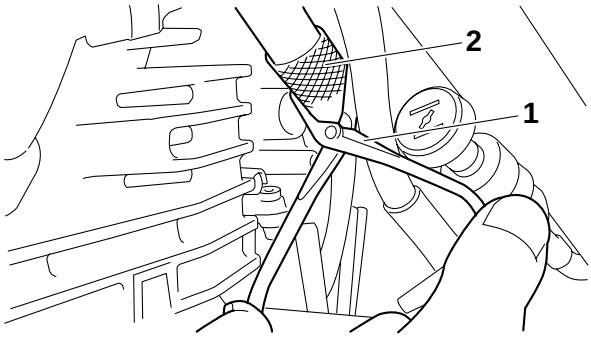
- Place the vehicle on a suitable stand.
- Make sure the vehicle is upright.
- Measure the exhaust gas at idle when the air induction system is not operating.

2. Install:
   - Temperature probe tester "1" (onto the engine oil drain bolt)
   - Digital tachometer
   - Exhaust attachment (onto the exhaust pipe)

Pocket tester
90890-03132
Digital tachometer
90890-06760



3. Install:
   - Hose clip “1”
     (To air induction system hose; “2”)



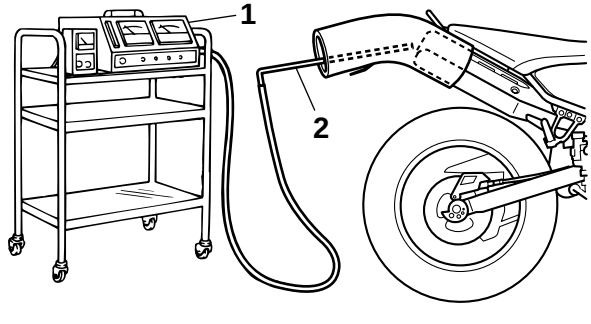
4. Start the engine and warm it up until the specified oil temperature is reached.

	Oil temperature **95.0–105.0 °C (203.00–221.00 °F)**

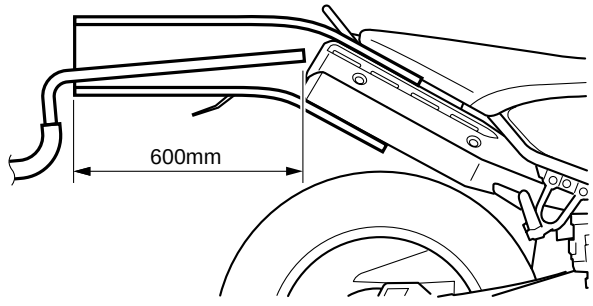
5. Measure:
   - Engine idling speed
     Out of specification → Adjust.
     Refer to “ADJUSTING THE ENGINE IDLING SPEED” on page 3-6.

	Engine idling speed **1350–1550 r/min**

6. Install:
   - CO/HC tester “1”
   - Sampling prove “2”



NOTE:
- Since it is necessary to insert the sampling probe 600 mm into the exhaust pipe, be sure to use a heat-resistant rubber tube as shown in the illustration.
- Be sure to set the heat-resistant rubber tube so that exhaust gas does not leak out.

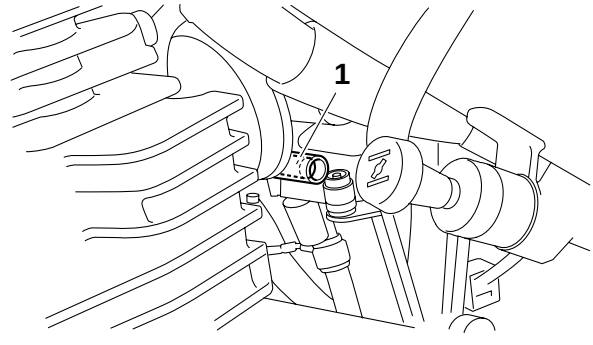


7. Measure:
   - CO density
     Out of specification → Adjust.
     Within specification → Measure the exhaust gas when the air induction system is operating.
     Refer to “CHECKING THE EXHAUST GAS” on page 3-6.

	CO% **4.0–6.0 %**

8. Adjust:
   - CO density
     Turn the pilot screw to adjust the CO density level to specification.

	Pilot screw turns out **1-1/4**



9. If the specified CO density cannot be obtained by the pilot screw, check the following items.
   - Air filter element

Refer to “REPLACING THE AIR FILTER ELEMENT” on page 3-12.
- Carburetor
  Refer to “CARBURETOR” on page 6-3.

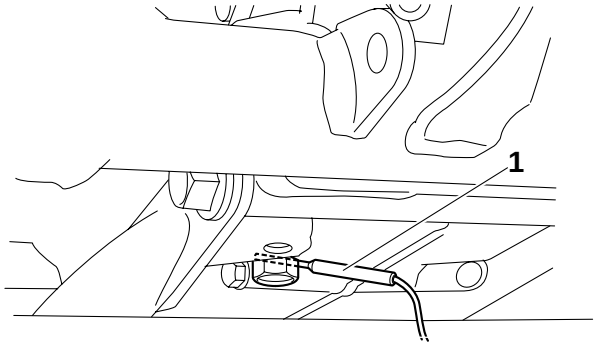
EAS20590
CHECKING THE EXHAUST GAS (When the air induction system is operating)

1. Stand the vehicle on a level surface.

NOTE:
- Place the vehicle on a suitable stand.
- Make sure the vehicle is upright.
- Measure the exhaust gas at idle when the air induction system is operating.

2. Install:
   - Temperature probe tester “1” (onto the engine oil drain bolt)
   - Digital tachometer

	**Pocket tester** **90890-03132** **Digital tachometer** **90890-06760**



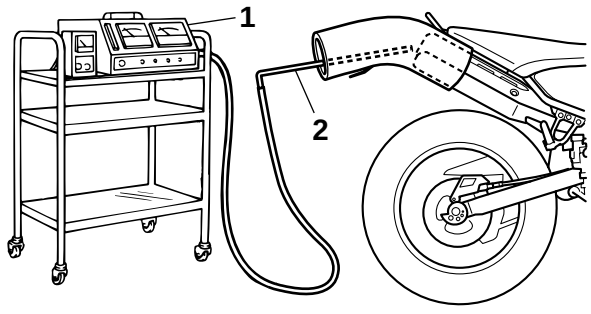
3. Start the engine and warm it up until the specified oil temperature is reached.

	**Oil temperature** **95.0–105.0 °C (203.00–221.00 °F)**

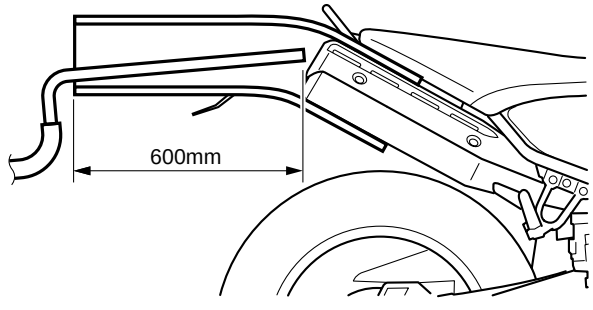
4. Measure:
   - Engine idling speed
     Out of specification → Adjust.
     Refer to “ADJUSTING THE ENGINE IDLING SPEED” on page 3-6.

	**Engine idling speed** **1300–1500 r/min**

5. Install:
   - CO/HC tester “1”
   - Sampling prove “2”



NOTE:
- Since it is necessary to insert the sampling probe 600 mm into the exhaust pipe, be sure to use a heat-resistant rubber tube as shown in the illustration.
- Be sure to set the heat-resistant rubber tube so that exhaust gas does not leak out.



6. Measure:
   - CO density
     Out of specification → Check the air induction system.
     Refer to “AIR INDUCTION SYSTEM” on page 6-9.

	**CO%** **0.5–1.5 %**

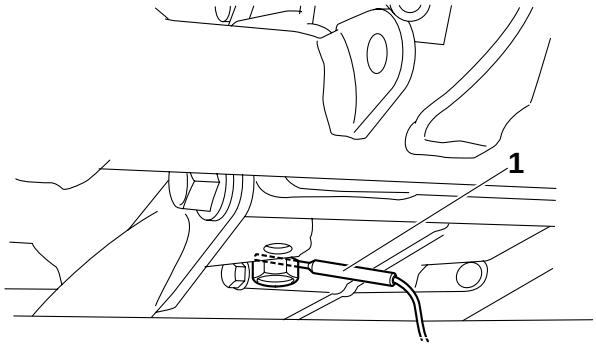
7. After checking the air induction system, recheck the exhaust gas at idle when the air induction system is operating.

EAS20610
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. Install:
   - Temperature probe tester “1” (onto the engine oil drain bolt)
   - Digital tachometer (onto the spark plug lead of cylinder #1)

Pocket tester
90890-03132
Digital tachometer
90890-06760



2. Start the engine and warm it up until the specified oil temperature is reached.

Oil temperature
95.0–105.0 °C (203.00–221.00 °F)

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

Engine idling speed
1300–1500 r/min

4. Adjust:
   - Engine idling speed

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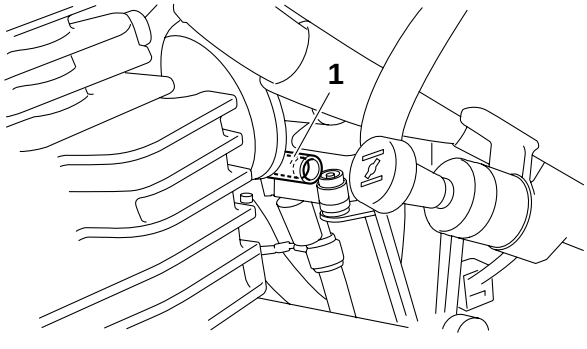
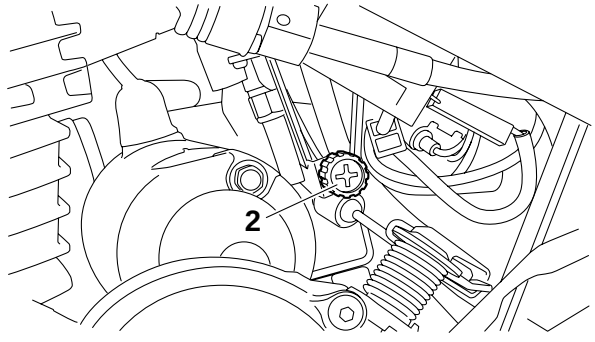
a. Turn the pilot screw “1” in until it is lightly seated.



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

Pilot screw turns out
1-1/4

c. Turn the throttle stop screw “2” until the specified engine idling speed is obtained.



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5. Adjust:
   - Throttle cable free play
     Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” on page 3-7.

Throttle cable free play
3.0–5.0 mm (0.12–0.20 in)

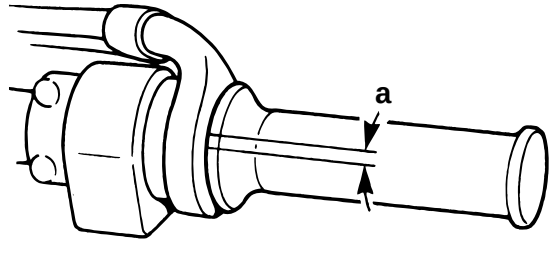
EAS20640

ADJUSTING THE THROTTLE CABLE FREE PLAY

NOTE:

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

1. Check:
   - Throttle cable free play “a”
     Out of specification → Adjust.



Throttle cable free play
3.0–5.0 mm (0.12–0.20 in)

2. Adjust:
   - Throttle cable free play

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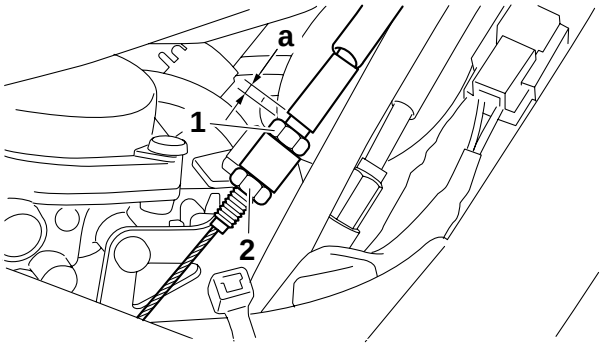
Carburetor side

a. Loosen the locknut “1” on the accelerator cable.
b. Turn the adjusting nut “2” until the length “a” is 5mm (0.197 in).
c. Tighten the locknuts “1”.



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.

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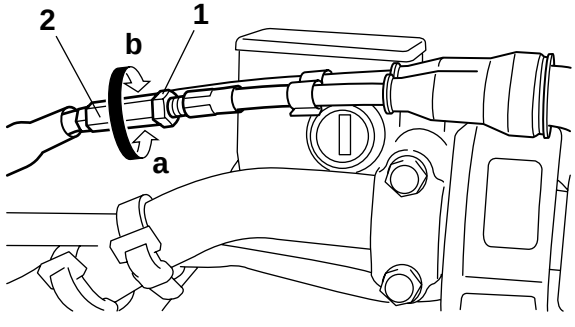
Handlebar side

a. Loosen the locknut “1”.
b. Turn the adjusting nut “2” 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.**

c. Tighten the locknut “1”.



EWA12920

⚠ WARNING

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

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EAS20690

CHECKING THE SPARK PLUG

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

ECA13330

CAUTION:

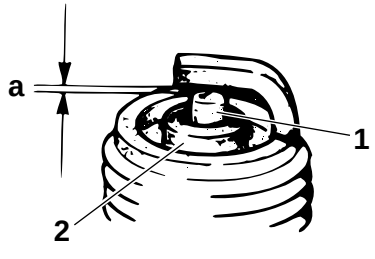
Before removing the spark plug, blow away any dirt accumulated in the spark plug well with compressed air to prevent it from falling into the cylinder.

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

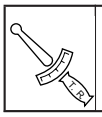
	**Manufacturer/model** **NGK/DR7EA**

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

	**Spark plug gap** **0.6–0.7 mm (0.024–0.028 in)**



7. Install:
   - Spark plug



Spark plug
18 Nm (1.8 m•kg, 13 ft•lb)

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

8. Connect:
   - Spark plug cap

EAS20710
MEASURING THE COMPRESSION PRESSURE

The following procedure applies to the cylinder.

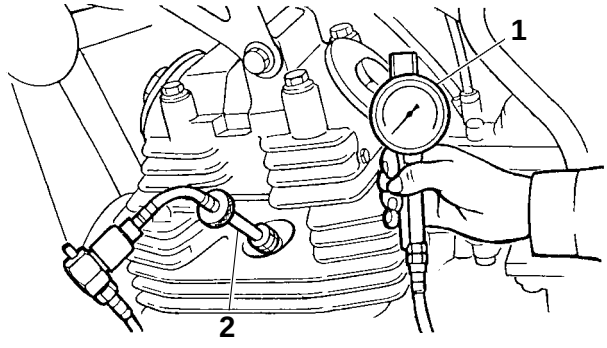
NOTE:
Insufficient compression pressure will result in a loss of performance.

1. Measure:
   - Valve clearance
     Out of specification → Adjust.
     Refer to "ADJUSTING THE VALVE CLEARANCE" on page 3-3.
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Disconnect:
   - Spark plug cap
4. Remove:
   - Spark plug

ECA13340
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.

5. Install:
   - Compression gauge "1"
   - Extension "2"

Compression gauge
90890-03081
Engine compression tester
YU-33223
Extension
90890-04082



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

Compression pressure (standard)
1200 kPa/300 r/min (12 kgf/cm^2/300 r/min)
Compression pressure (maximum)
1300 kPa/300 r/min (13 kgf/cm^2/300 r/min)
Compression pressure (minimum)
1050 kPa/300 r/min (10.5 kgf/cm^2/300 r/min)

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

EWA12960
⚠ WARNING
To prevent sparking, ground the spark plug lead before cranking the engine.

c. If the compression pressure is above the maximum specification, check the cylinder head, valve surfaces and piston crown for carbon deposits.
   Carbon deposits → Eliminate.
d. If the compression pressure is below the minimum specification, pour a teaspoonful of engine oil into the spark plug bore and measure again.
   Refer to the following table.

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

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7. Install:
   - Spark plug

Spark plug
18 Nm (1.8 m•kg, 13 ft•lb)

8. Connect:
   - Spark plug cap

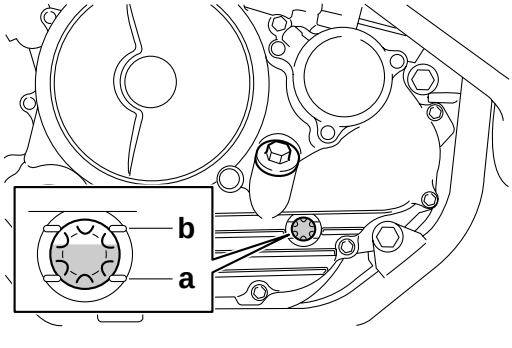
EAS20730
CHECKING THE ENGINE OIL LEVEL

1. Stand the vehicle on a level surface.

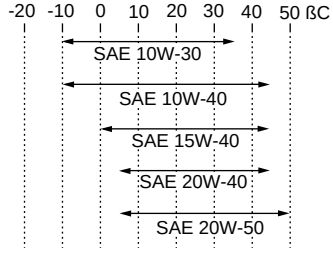
NOTE:
- Place the vehicle on a suitable stand.
- Make sure the vehicle is upright.

2. Start the engine, warm it up for several minutes, and then turn it off.
3. 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 → Add the recommended engine oil to the proper level.

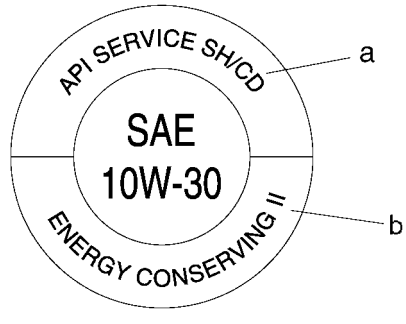
NOTE:
Before checking the engine oil level, wait a few minutes until the oil has settled.



Type
SAE10W30 or SAE10W40 or SAE15W40 or SAE20W40 or SAE20W50
•Recommended engine oil grade
API service SE, SF, SG type or higher



ECA4D601
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 “a” or higher and do not use oils labeled “ENERGY CONSERVING II” “b”.**
- **Do not allow foreign materials to enter the crankcase.**



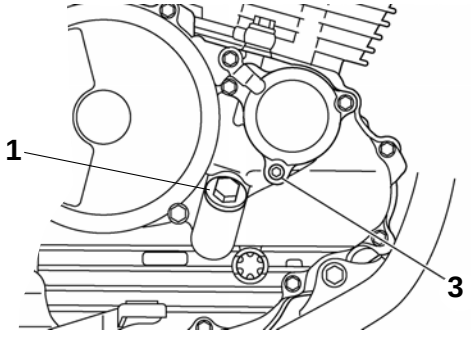
4. Start the engine, warm it up for several minutes, and then turn it off.
5. Check the engine oil level again.

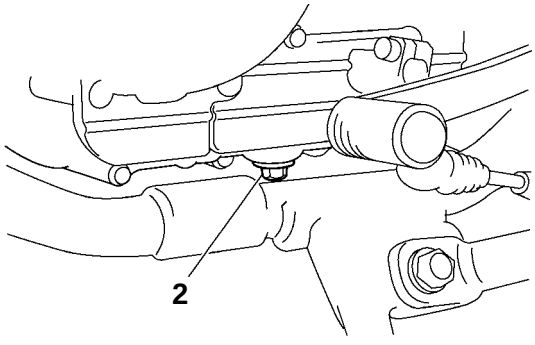
NOTE:
Before checking the engine oil level, wait a few minutes until the oil has settled.

EAS20810
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:
   - Engine oil filler bolt “1”
   - Engine oil drain bolt “2” (along with the gasket)
4. Loosen:
   - Oil filter element drain bolt “3”





5. Drain:
   - Engine oil (completely from the crankcase)
6. If the oil filter element is also to be replaced, perform the following procedure.

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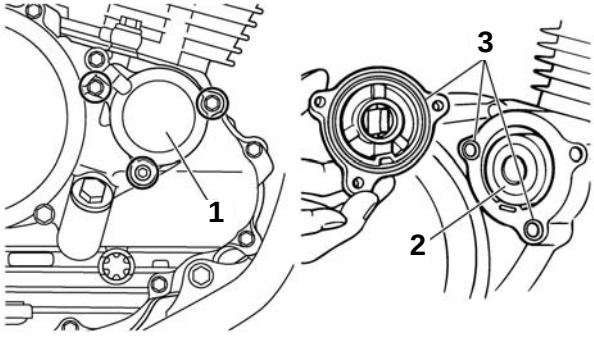
a. Remove the oil filter element cover “1” and oil filter element “2”.
b. Replace the O-rings “3”.



c. Install the new oil filter element, and then oil filter element cover.

	Oil filter element cover bolt **10 Nm (1.0 m•kg, 7.2 ft•lb)**

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7. Install:
   - Engine oil drain bolt gasket New
   - Engine oil drain bolt

	Engine oil drain bolt **20 Nm (2.0 m•kg, 14 ft•lb)**

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

	Without oil filter element replacement **1.20 L (1.27 US qt) (1.06 Imp.qt)** **With oil filter element replacement** **1.30 L (1.37 US qt) (1.14 Imp.qt)** **Engine oil quantity** **Total amount** **1.40 L (1.48 US qt) (1.23 Imp.qt)**

9. Install:
   - Engine oil filler bolt
10. Start the engine, warm it up for several minutes, and then turn it off.
11. Check:
    - Engine (for engine oil leaks)
12. Check:
    - Engine oil level
      Refer to “CHECKING THE ENGINE OIL LEVEL” on page 3-10.
13. Check:
    - Engine oil pressure

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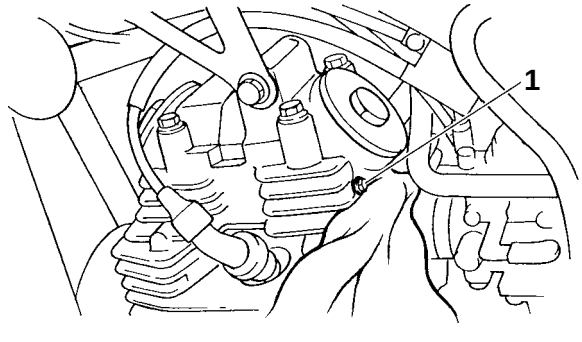
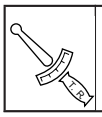
a. Slightly loosen the oil gallery bolt “1”.



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 element and the oil pump for damage or leakage. Refer to “OIL PUMP AND BLANCER WEIGHT GEAR” on page 5-38.
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** **7 Nm (0.7 m•kg, 5.1 ft•lb)**

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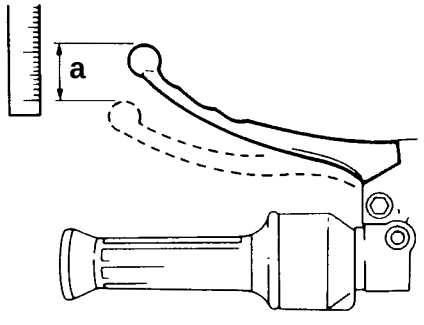
EAS20870

ADJUSTING THE CLUTCH CABLE FREE PLAY

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

	**Clutch lever free play** **10.0–15.0 mm (0.39–0.59 in)**



2. Adjust:
   - Clutch cable free play

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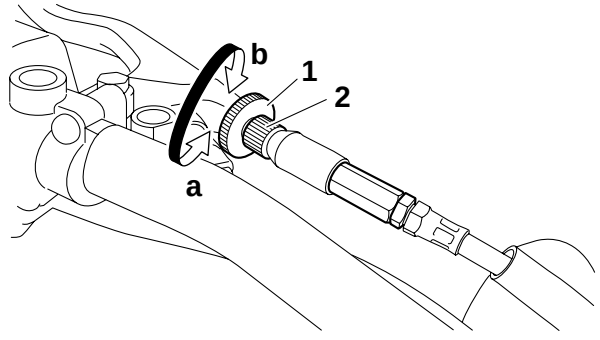
Clutch lever side

a. Loosen the locknut “1”.
b. Turn the adjusting bolt “2” in direction “a” or “b” until the specified clutch cable free play is obtained.

Direction “a”
Clutch cable free play is decreased.
Direction “b”
Clutch cable free play is increased.

c. Tighten the locknut “1”.



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

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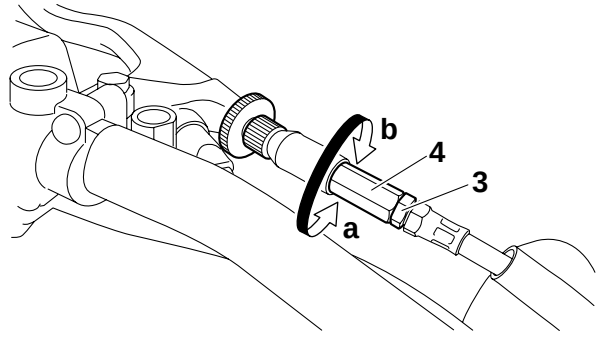
Clutch cable side

a. Loosen the locknut “3”.
b. Turn the adjusting nut “4” in direction “a” or “b” 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.

c. Tighten the locknuts “3”.



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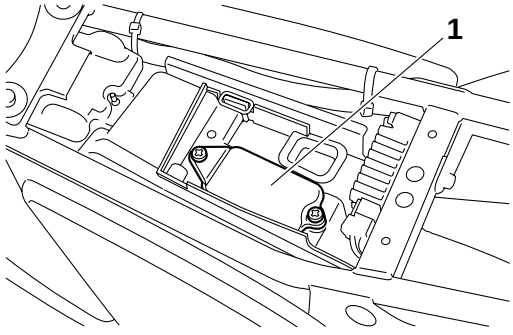
EAS20960

REPLACING THE AIR FILTER ELEMENT

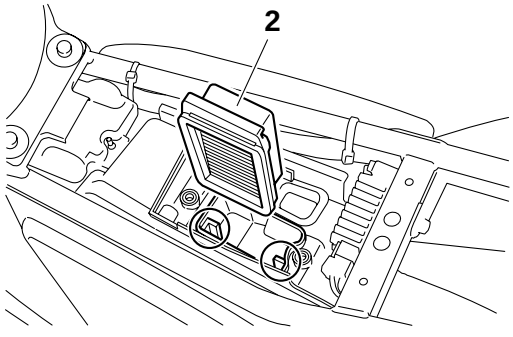
1. Remove:
   - Seat
     Refer to “GENERAL CHASSIS” on page 4-1.
2. Remove:
   - Air filter case cover “1”



3. Check:
   - Air filter element "2"
     Damage → Replace.

NOTE:

- Replace the air filter element every 20000 km (1200mil) of operation.
- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.



4. Install:
   - Air filter element
   - Air filter case cover

ECA14400

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 carburetor synchronization, leading to poor engine performance and possible overheating.

NOTE:

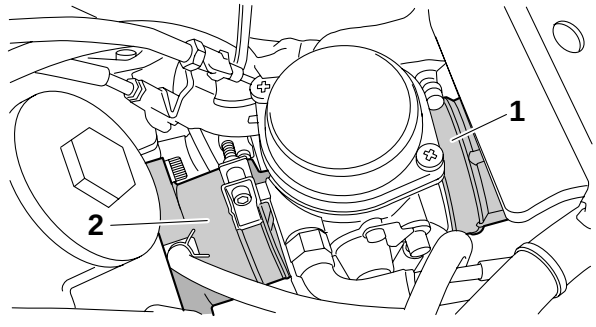
When installing the air filter element into the air filter case cover, make sure that the sealing surfaces are aligned to prevent any air leaks.

5. Install:
   - Seat
     Refer to "GENERAL CHASSIS" on page 4-1.

EAS20990

CHECKING THE CARBURETOR JOINT AND INTAKE MANIFOLD

1. Remove:
   - Left side cover
   - Right side cover
   - Seat
     Refer to "GENERAL CHASSIS" on page 4-1.
   - Fuel tank
     Refer to "FUEL TANK" on page 6-1.
2. Check:
   - Carburetor joint "1"
   - Intake manifold "2"
     Cracks/damage → Replace.
     Refer to "CARBURETOR" on page 6-3.



3. Install:
   - Fuel tank
     Refer to "FUEL TANK" on page 6-1.
   - Seat
   - Right side cover
   - Left side cover
     Refer to "GENERAL CHASSIS" on page 4-1.

EAS21030

CHECKING THE FUEL LINE

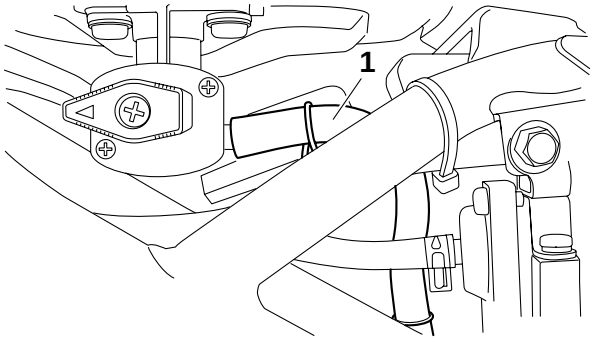
The following procedure applies to all of the fuel, vacuum and breather hoses.

1. Remove:
   - Left fuel tank side cover
   - Right fuel tank side cover
     Refer to "GENERAL CHASSIS" on page 4-1.
2. Check:
   - Fuel hose "1"
     Cracks/damage → Replace.
     Loose connection → Connect properly.

ECA14940

CAUTION:

Make sure the fuel tank breather hose is routed correctly.



3. Install:
   - Right fuel tank side cover
   - Left fuel tank side cover

   Refer to “GENERAL CHASSIS” on page 4-1.

EAS21050
CHECKING THE CYLINDER HEAD BREATHER HOSE

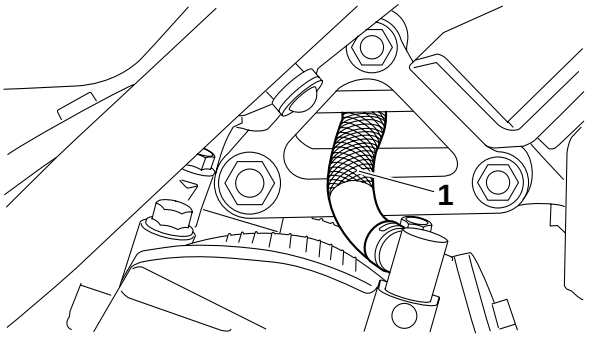
1. Check:
   - Cylinder head breather hose “1”

     Cracks/damage → Replace.

     Loose connection → Connect properly.

ECA14920
CAUTION:

Make sure the cylinder head breather hose is routed correctly.



EAS21080
CHECKING THE EXHAUST SYSTEM

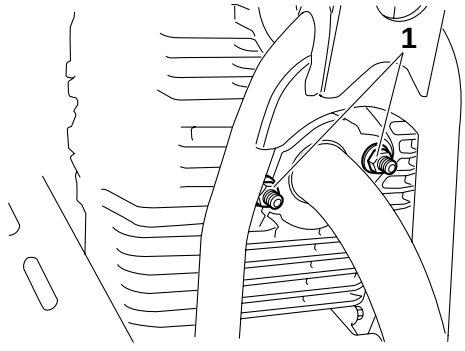
The following procedure applies to all of the exhaust pipes and gaskets.

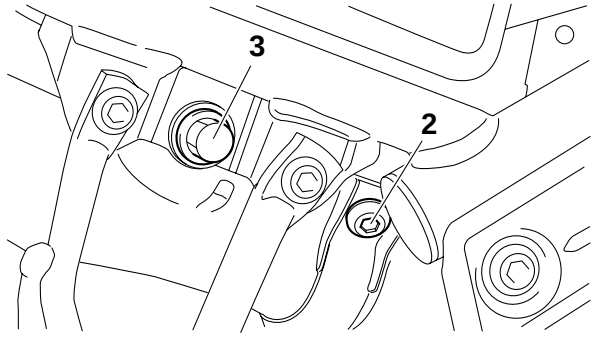
1. Check:
   - Exhaust pipe
   - Muffler
   - Exhaust pipe joint

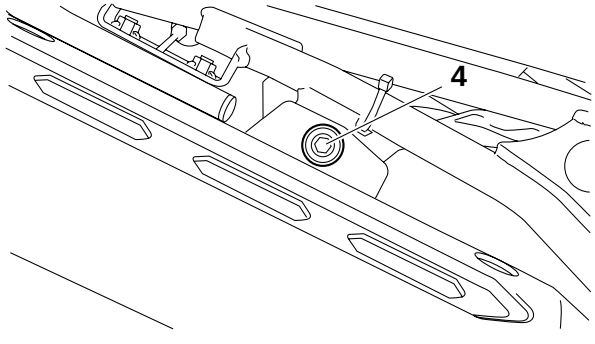
     Cracks/damage → Replace.
   - Gasket

     Exhaust gas leaks → Replace.
2. Check:
   - Tightening torque

Exhaust pipe nut “1”
18 Nm (1.8 m•kg, 13 ft•lb)
Exhaust pipe and muffler bolt “2”
20 Nm (2.0 m•kg, 14 ft•lb)
Muffler and muffler bracket bolt “3”
42 Nm (4.2 m•kg, 30 ft•lb)
Muffler and muffler bracket bolt “4”
40 Nm (4.0 m•kg, 29 ft•lb)



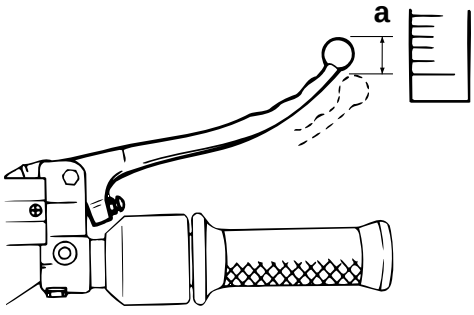




EAS21140
CHASSIS

EAS21170
ADJUSTING THE FRONT DISC BRAKE

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

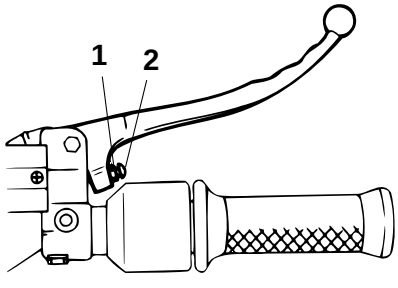


Front brake lever free play
2.0–5.0 mm (0.08–0.20 in)

2. Adjust:
   - Brake lever free play

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Loosen the locknut “1”.
b. Turn the adjusting bolt “2” until the specified brake lever free play is obtained.
c. Tighten the locknut “1”.



EWA13050
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.

ECA13490
CAUTION:

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

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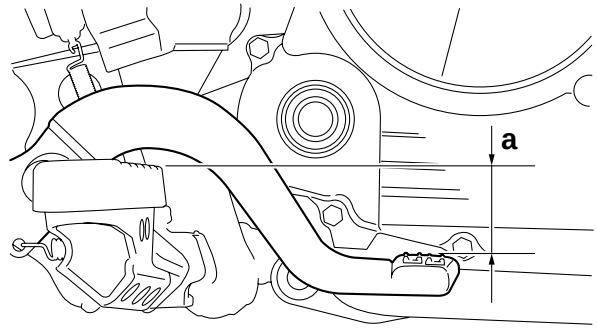
EAS21200
ADJUSTING THE REAR DISC BRAKE

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

Brake pedal position
35.0 mm (1.38 in)

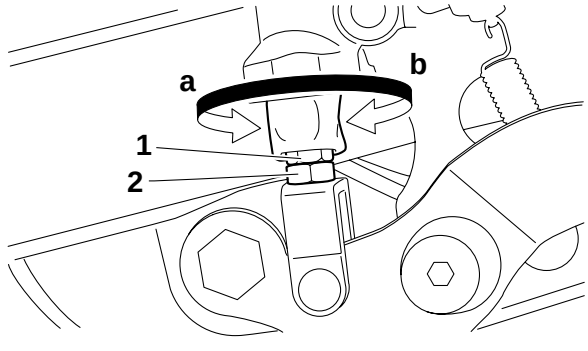


2. Adjust:
   - Brake pedal position

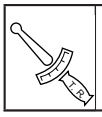
▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

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

Direction “a”
Brake pedal is lowered.
Direction “b”
Brake pedal is raised.



c. Tighten the locknut “1” to specification.

	**Locknut** **18 Nm (1.8 m•kg, 13 ft•lb)**

EWA13050

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.

ECA13510

CAUTION:

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

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3. Adjust:
   - Rear brake light switch
     Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH" on page 3-17.

EAS21240

CHECKING THE BRAKE FLUID LEVEL

1. Stand the vehicle on a level surface.

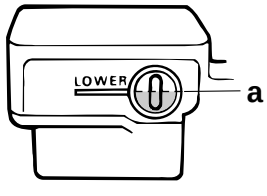
NOTE:

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

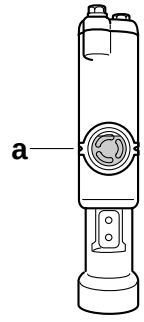
2. Check:
   - Brake fluid level
     Below the minimum level mark "a" → Add the recommended brake fluid to the proper level.

	**Recommended fluid** **DOT 4**

A



B



A. Front brake
B. Rear brake

EWA13090

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.**

ECA13540

CAUTION:

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

NOTE:

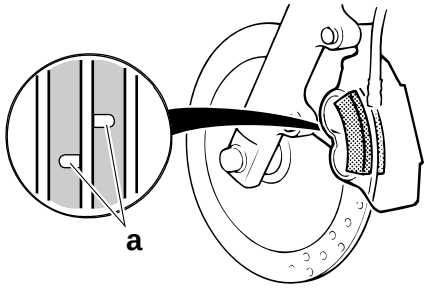
In order to ensure a correct reading of the brake fluid level, make sure the top of the brake fluid reservoir is horizontal.

EAS21250

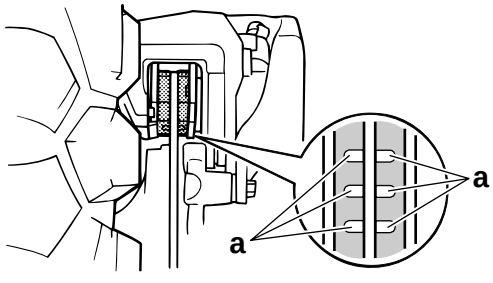
CHECKING THE FRONT BRAKE PADS

The following procedure applies to all of the brake pads.

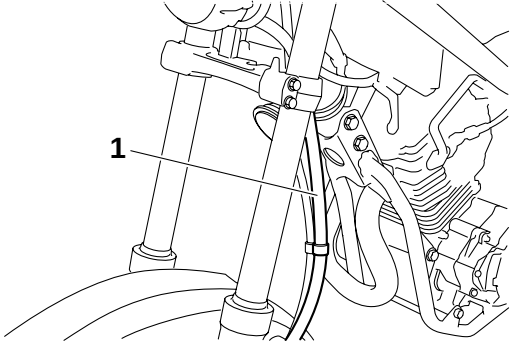
1. Operate the brake.
2. Check:
   - Front brake pad
     Wear indicators "a" almost touch the brake disc → Replace the brake pads as a set.
     Refer to "FRONT BRAKE" on page 4-13.



EAS21260
CHECKING THE REAR BRAKE PADS
The following procedure applies to all of the brake pads.
1. Operate the brake.
2. Check:
   - Rear brake pad
     Wear indicators “a” almost touch the brake disc → Replace the brake pads as a set.
     Refer to “REAR BRAKE” on page 4-26.

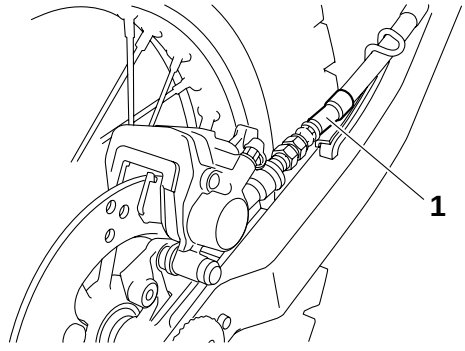


EAS21270
CHECKING THE FRONT BRAKE HOSE
1. Check:
   - Brake hose“1”
     Cracks/damage/wear → Replace.



2. Check:
   - Brake hose clamp
     Loose Connection → Tighten the clamp bolt.
3. Hold the vehicle upright and apply the front brake several times.
4. Check:
   - Brake hose
     Brake fluid leakage → Replace the damaged hose.
     Refer to “FRONT BRAKE” on page 4-13.

EAS21290
CHECKING THE REAR BRAKE HOSE
1. Check:
   - Brake hose “1”
     Cracks/damage/wear → Replace.



2. Check:
   - Brake hose clamp
     Loose Connection → Tighten the clamp bolt.
3. Hold the vehicle upright and apply the front brake several times.
4. Check:
   - Brake hose
     Brake fluid leakage → Replace the damaged hose.
     Refer to “REAR BRAKE” on page 4-26.

EAS21330
ADJUSTING THE REAR BRAKE LIGHT SWITCH
NOTE:
The rear brake light switch is operated by movement of the brake pedal. The rear brake light switch is properly adjusted when the brake light comes on just before the braking effect starts.

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

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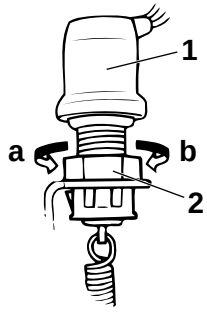
a. Hold the main body “1” of the rear brake light switch so that it does not rotate and turn the adjusting nut “2” in direction “a” or “b” until the rear brake light comes on at the proper time.

Direction “a”
Brake light comes on sooner.
Direction “b”
Brake light comes on later.



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EAS21350
BLEEDING THE HYDRAULIC BRAKE SYSTEM

EWA13100
⚠ WARNING

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

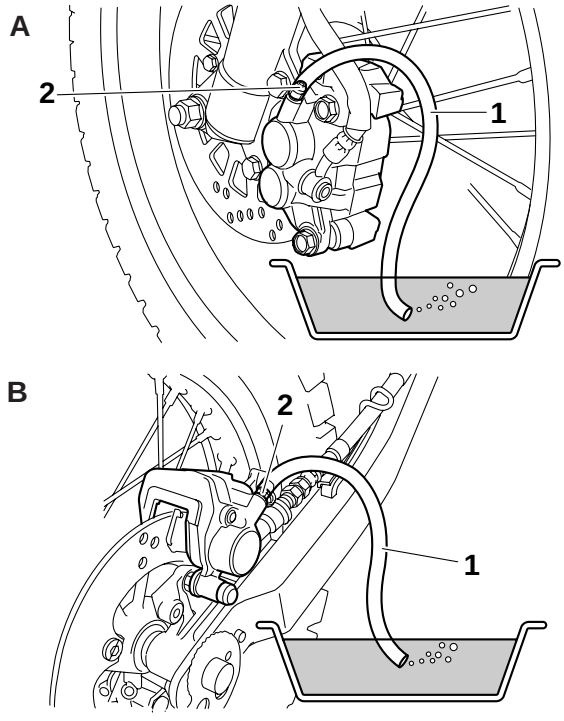
1. Remove:
   - Reservoir cap

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

2. Bleed:
   - Hydraulic brake system

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Fill the brake fluid reservoir to the proper level with the recommended brake fluid.
b. Install the diaphragm (brake master cylinder reservoir or brake fluid reservoir).
c. Connect a clear plastic hose “1” tightly to the bleed screw “2”.

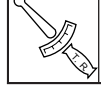


A. Front
B. Rear

d. Place the other end of the hose into a container.
e. Slowly apply the brake several times.
f. Fully pull the brake lever or fully press down the brake pedal and hold it in position.
g. Loosen the bleed screw.

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

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

	**Bleed screw** **6 Nm (0.6 m•kg, 4.3 ft•lb)**

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

LEVEL" on page 3-16.

EWA13110

⚠ WARNING

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

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EAS21420

ADJUSTING THE DRIVE CHAIN SLACK

NOTE:

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

ECA13550

CAUTION:

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

1. Stand the vehicle on a level surface.

EWA13120

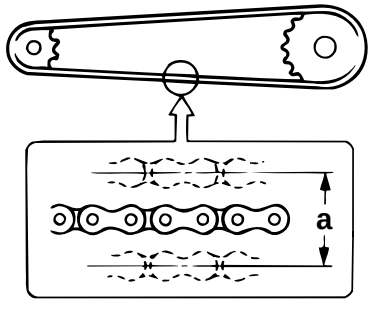
⚠ WARNING

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

NOTE:

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

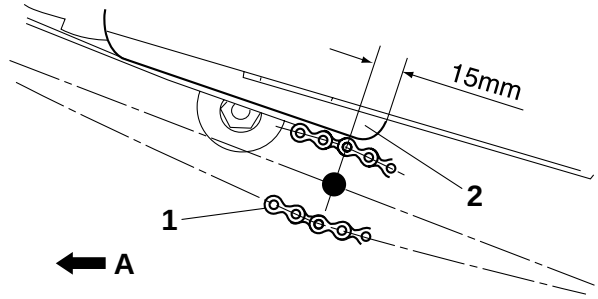
2. Spin the rear wheel several times and find the tightest position of drive chain.
3. Check:
   - Drive chain slack "a"
     Out of specification → Adjust.



Drive chain slack
40.0–45.0 mm (1.57–1.77 in)

NOTE:

Measure the drive chain "1" slack at the point that drive chain touch to the seal guard "2".



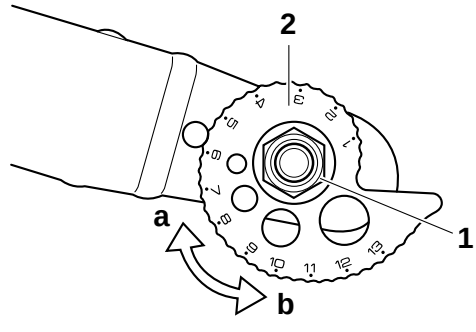
A. Forward

4. Adjust:
   - Drive chain slack

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Loosen the wheel axle nut "1".
b. Turn the drive chain adjusting plate "2" in direction "a" or "b" until the specified drive chain slack is obtained.

Direction "a"
Drive chain is tightened.
Direction "b"
Drive chain is loosened.



NOTE:

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

c. Tighten the wheel axle nut.

Wheel axle nut
85 Nm (8.5 m•kg, 61 ft•lb)

ECA13560

CAUTION:

Do not loosen the wheel axle nut after tightening it to the specified torque. If the groove in the wheel axle nut is not aligned with the cotter pin hole in the wheel axle, tighten the nut further until they are aligned.

EAS21440
LUBRICATING THE DRIVE CHAIN

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

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

EAS21510
CHECKING AND ADJUSTING THE STEERING HEAD

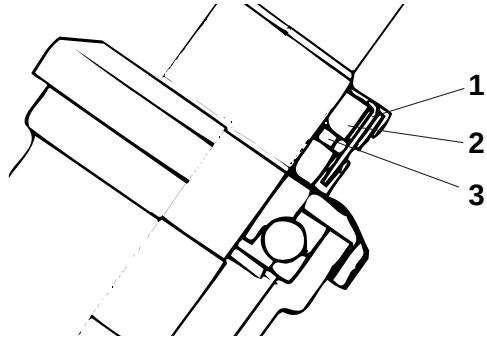
1. Stand the vehicle on a level surface.

EWA13120
WARNING
Securely support the vehicle so that there is no danger of it falling over.

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

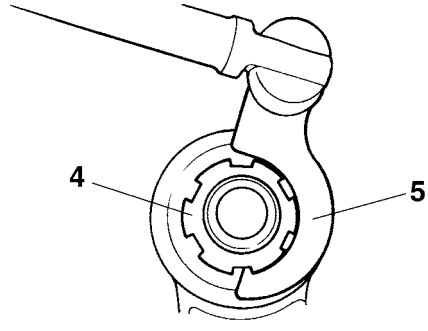
2. Check:
   - Steering head
     Grasp the bottom of the front fork legs and gently rock the front fork.
     Blinding/looseness → Adjust the steering head.
3. Remove:
   - Steering stem nut
   - Upper bracket
     Refer to "STEERING HEAD" on page 4-48.
4. Adjust:
   - Steering head

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 the specified torque with a steering nut wrench "5".

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



Steering nut wrench
90890-01403
Spanner wrench
YU-33975

Lower ring nut (initial tightening torque)
38 Nm (3.8 m•kg, 28 ft•lb)

c. Loosen the lower ring nut completely, and then tighten it to specification with a steering nut wrench.

EWA13140
WARNING
Do not overtighten the lower ring nut.

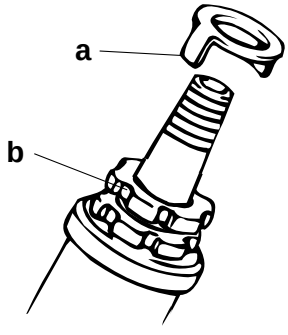
Lower ring nut (final tightening torque)
4 Nm (0.4 m•kg, 2.9 ft•lb)

d. Check the steering head for looseness or

binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings.
Refer to “STEERING HEAD” on page 4-48.

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

NOTE:
Make sure the lock washer tabs “a” sit correctly in the ring nut slots “b”.



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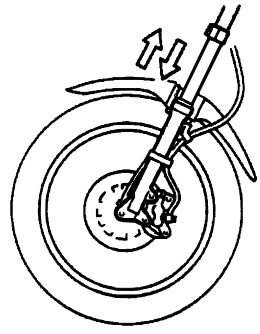
5. Install:
   - Upper bracket
   - Steering stem nut
   Refer to “STEERING HEAD” on page 4-48.

EAS21530
CHECKING THE FRONT FORK

1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING
Securely support the vehicle so that there is no danger of it falling over.

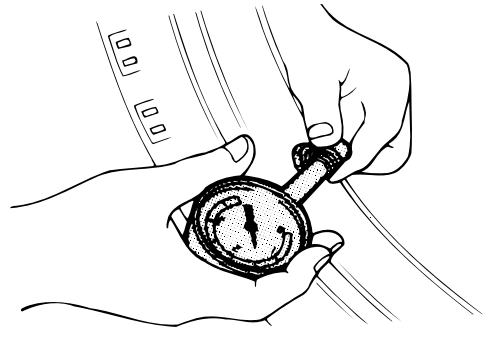
2. Check:
   - Inner tube
   Damage/scratches → Replace.
   - Oil seal
   Oil leakage → Replace.
3. Hold the vehicle upright and apply the front brake.
4. Check:
   - Front fork operation
   Push down hard on the handlebar several times and check if the front fork rebounds smoothly.
   Rough movement → Repair.
   Refer to “FRONT FORK” on page 4-41.



EAS21650
CHECKING THE TIRES

The following procedure applies to both of the tires.

1. Check:
   - Tire pressure
   Out of specification → Regulate.



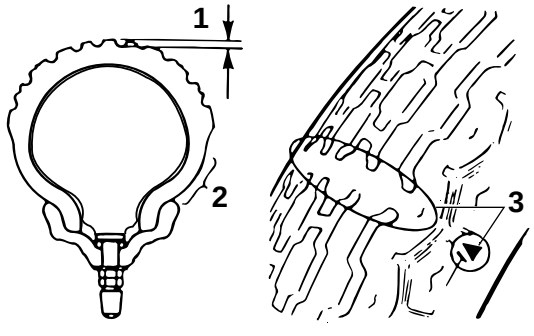
EWA13180
⚠ WARNING
- **The tire pressure should only be checked and regulated when the tire temperature equals the ambient air temperature.**
- **The tire pressure and the suspension must be adjusted according to the total weight (including cargo, rider, passenger and accessories) and the anticipated riding speed.**
- **Operation of an overloaded vehicle could cause tire damage, an accident or an injury.**

NEVER OVERLOAD THE VEHICLE.

Tire air pressure (measured on cold tires):
Loading condition
0–90 kg (0–198 lb)
Front
125 kPa (18 psi) (1.25 kgf/cm^2) (1.25 bar)
Rear
150 kPa (22 psi) (1.50 kgf/cm^2) (1.50 bar)
Loading condition
90–180 kg (198–397 lb)
Front
150 kPa (22 psi) (1.50 kgf/cm^2) (1.50 bar)
Rear
175 kPa (25 psi) (1.75 kgf/cm^2) (1.75 bar)

EWA13190
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.



1. Tire tread depth
2. Side wall
3. Wear indicator

Wear limit (front)
0.8 mm (0.03 in)
Wear limit (rear)
0.8 mm (0.03 in)

EWA14080
WARNING
- **Do not use a tubeless tire on a wheel designed only for tube tires to avoid tire failure and personal injury from sudden deflation.**
- **When using a tube tire, be sure to install the correct tube.**
- **Always replace a new tube tire and a new tube as a set.**
- **To avoid pinching the tube, make sure the wheel rim band and tube are centered in the wheel groove.**
- **Patching a punctured tube is not recommended. If it is absolutely necessary to do so, use great care and replace the tube as soon as possible with a good quality replacement.**

Tube wheel	Tube tire only
Tubeless wheel	Tube or tubeless tire

EWA14090
WARNING
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 vehicle.

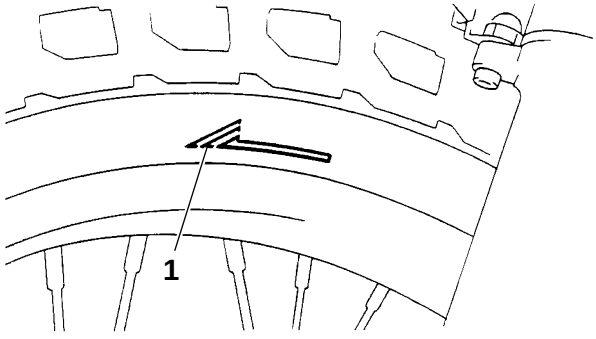
Front tire
Size
80/100-19M/C 49P
Manufacturer/model
BRIDGESTONE/TW201

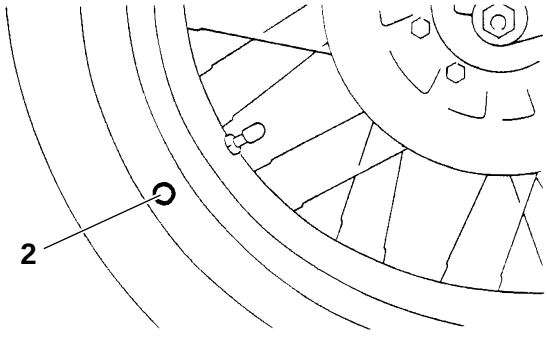
Rear tire
Size
120/90-16M/C 63P
Manufacturer/model
BRIDGESTONE/TW202

EWA13210
WARNING
New tires have a relatively low grip on the road surface until they have been slightly worn. Therefore, approximately 100 km should be traveled at normal speed before any high-speed riding is done.

NOTE:
For tires with a direction of rotation mark “1”:
- Install the tire with the mark pointing in the direction of wheel rotation.

- Align the mark “2” with the valve installation point.



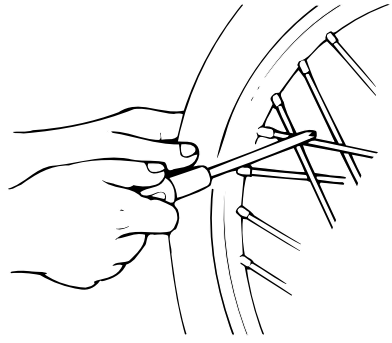


EAS21670
CHECKING THE WHEELS
The following procedure applies to both of the wheels.
1. Check:
   - Wheel
     Damage/out-of-round → Replace.

EWA13260
⚠ WARNING
Never attempt to make any repairs to the wheel.

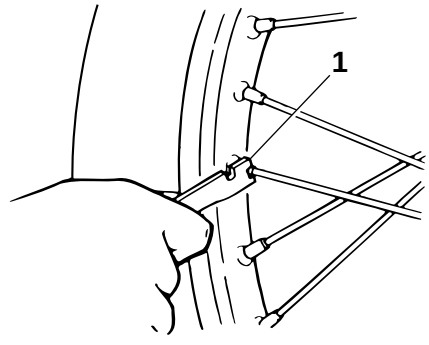
NOTE:
After a tire or wheel has been changed or replaced, always balance the wheel.

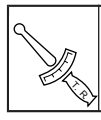
EAS21680
CHECKING AND TIGHTENING THE SPOKES
The following procedure applies to all of the spokes.
1. Check:
   - Spoke
     Bends/damage → Replace.
     Loose → Tighten.
     Tap the spokes with a screwdriver.



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

2. Tighten:
   - Spoke
     (with a spoke wrench “1”)



	**Spoke** **3 Nm (0.3 m•kg, 2.2 ft•lb)**

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

EAS21690
CHECKING AND LUBRICATING THE CABLES
The following procedure applies to all of the inner and outer cables.

EWA13270
⚠ WARNING
Damaged outer cable may cause the cable to corrode and interfere with its movement. Replace damaged outer cable and inner cables as soon as possible.

1. Check:
   - Outer cable
     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 lubricating device.

EAS21700
LUBRICATING THE LEVERS
Lubricate the pivoting point and metal-to-metal moving parts of the levers.

Recommended lubricant
Lithium-soap-based grease

EAS21710
LUBRICATING THE PEDAL
Lubricate the pivoting point and metal-to-metal moving parts of the pedal.

Recommended lubricant
Lithium-soap-based grease

EAS21720
LUBRICATING THE SIDESTAND
Lubricate the pivoting point and metal-to-metal moving parts of the sidestand.

Recommended lubricant
Lithium-soap-based grease

EAS21740
LUBRICATING THE REAR SUSPENSION
Lubricate the pivoting point and metal-to-metal moving parts of the rear suspension.

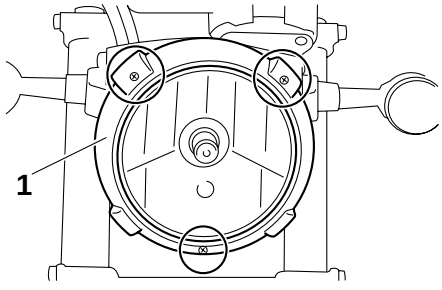
Recommended lubricant
Molybdenum disulfide grease

EAS21750
ELECTRICAL SYSTEM

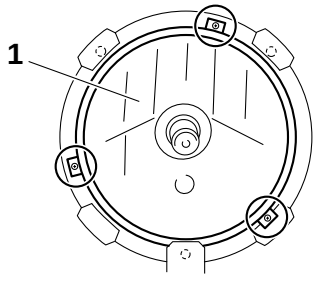
EAS21760
CHECKING AND CHARGING THE BATTERY
Refer to “ELECTRICAL COMPONENTS” on page 7-29.

EAS21770
CHECKING THE FUSES
Refer to “ELECTRICAL COMPONENTS” on page 7-29.

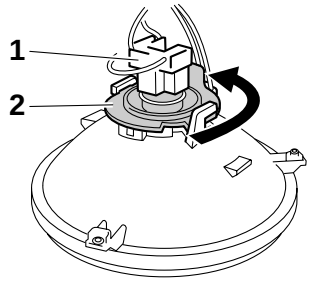
EAS21780
REPLACING THE HEADLIGHT BULB
1. Remove:
   - Headlight rim “1”



2. Remove:
   - Headlight unit “1”



3. Disconnect:
   - Headlight coupler “1”
4. Remove:
   - Headlight bulb holder “2”



5. Remove:
   - Headlight bulb

EWA13320
WARNING

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

6. Install:
   - Headlight bulb New
     Secure the new headlight bulb with the headlight bulb holder.

ECA13690
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. Install:
   - Headlight bulb holder
8. Connect:
   - Headlight coupler
9. Install:
   - Headlight unit
   - Headlight rim

EAS21800
ADJUSTING THE HEADLIGHT BEAM
1. Adjust:
   - Headlight beam (vertically)

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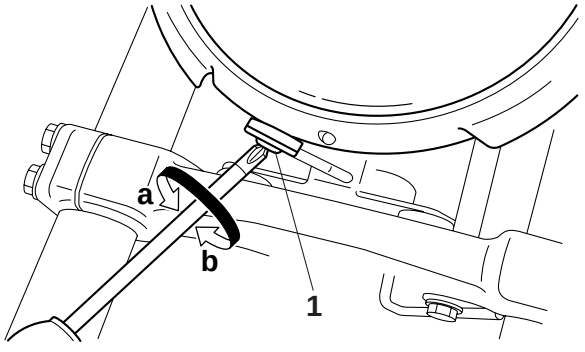
a. Turn the adjusting screw “1” in direction “a” or “b”.

Direction “a”
Headlight beam is raised.
Direction “b”
Headlight beam is lowered.



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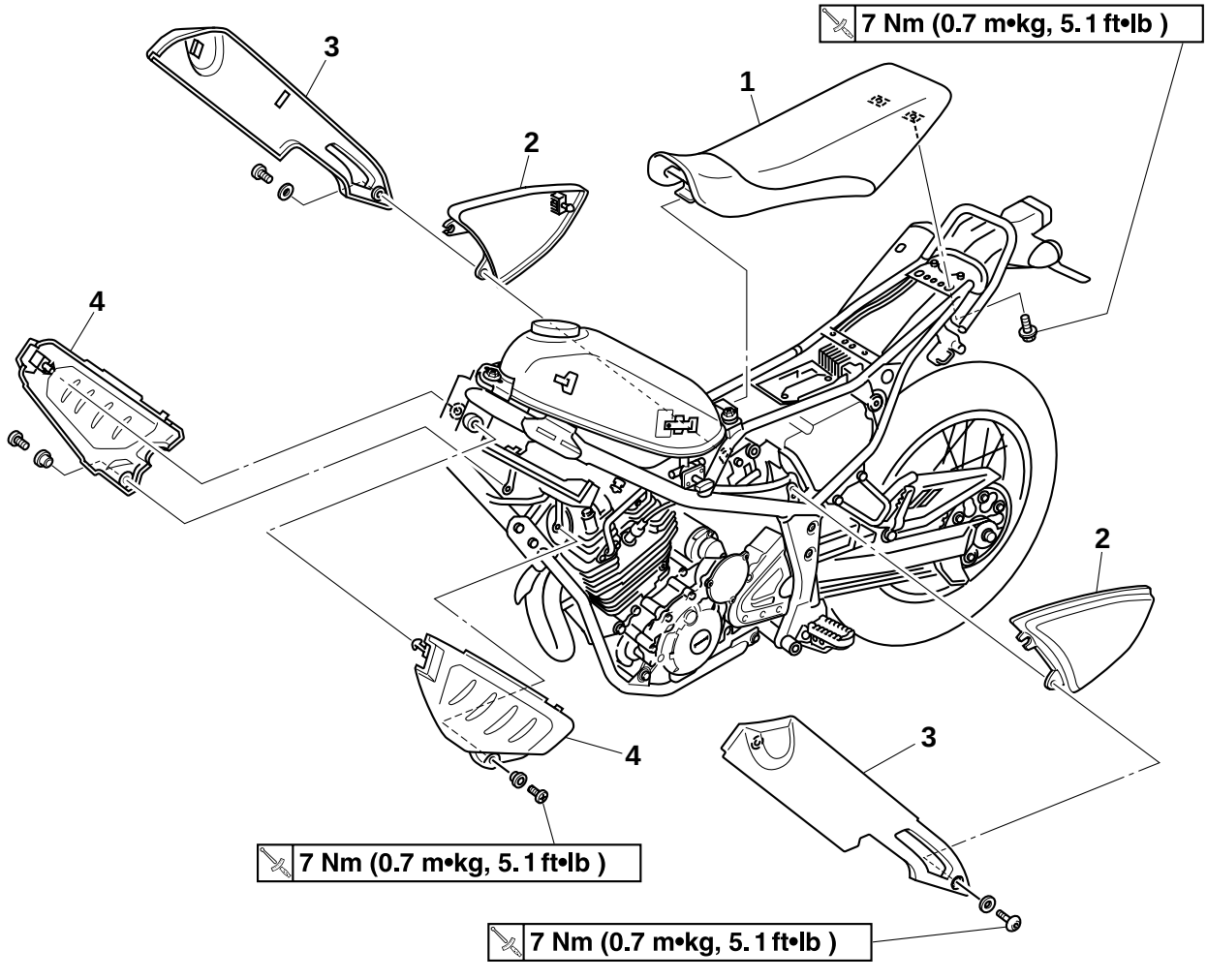
CHASSIS

EAS21830

GENERAL CHASSIS

Removing the seat, side cover

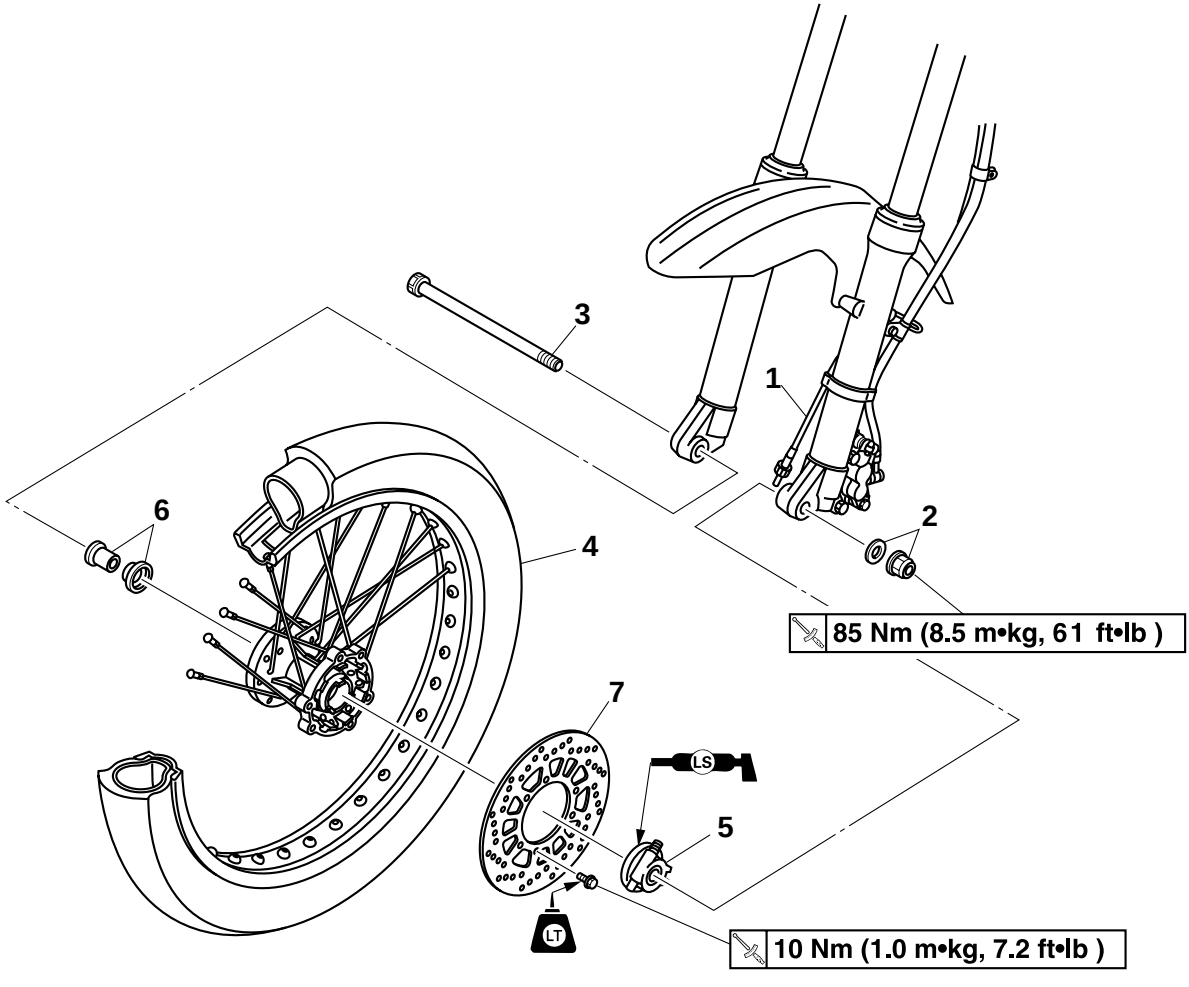


Order	Job/Parts to remove	Q'ty	Remarks
1	Seat	1	
2	Side cover (left/right)	1/1	
3	Fuel tank side cover (left/right)	1/1	
4	Tool box cover (left/right)	1/1	
			For installation, reverse the removal procedure.

EAS21870

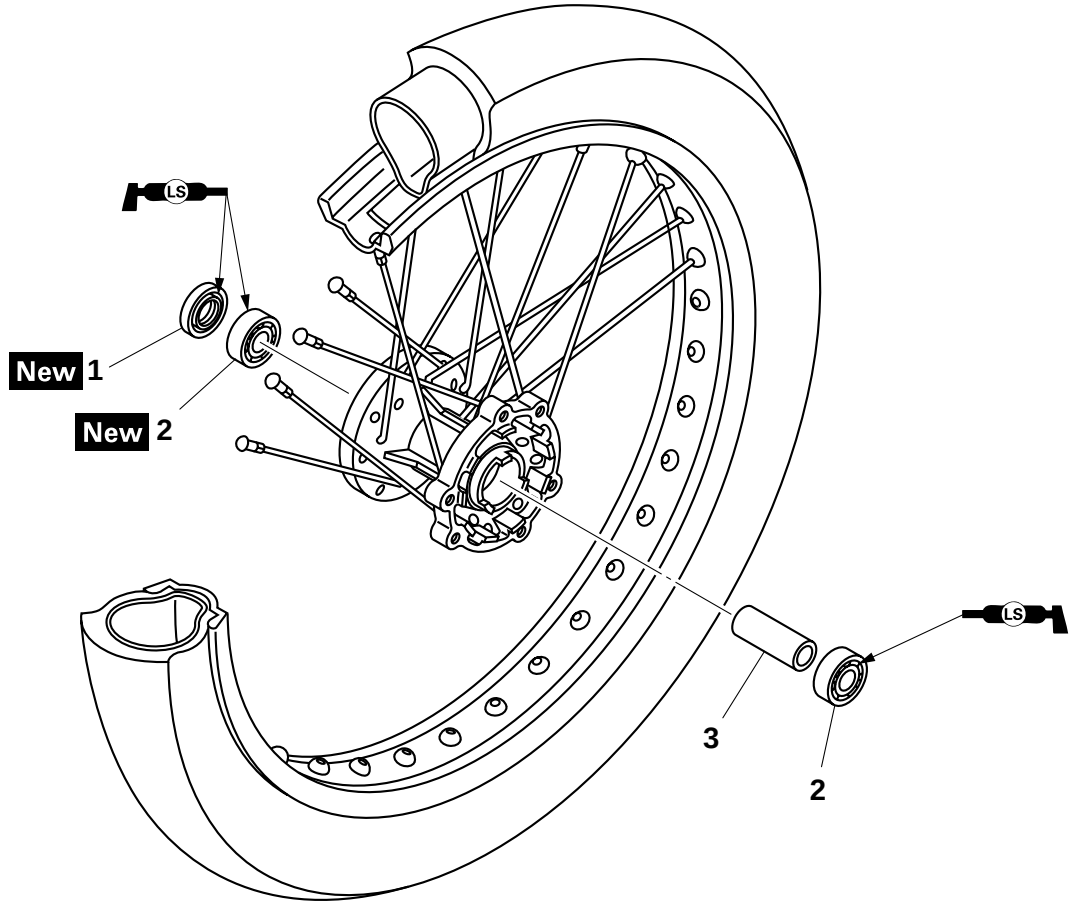
FRONT WHEEL

Removing the front wheel and brake discs



Order	Job/Parts to remove	Q'ty	Remarks
1	Speedometer cable	1	
2	Washer/Front wheel axle nut	1/1	
3	Front wheel axle	1	
4	Front wheel assembly	1	
5	Speedometer gear unit	1	
6	Collar/Spacer	1/1	
7	Front brake disc	1	
			For installation, reverse the removal procedure.

Disassembling the front wheel



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil seal	1	
2	Bearing	2	
3	Spacer	1	
			For assembly, reverse the disassembly procedure.

EAS21890
REMOVING THE FRONT WHEEL

1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

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

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

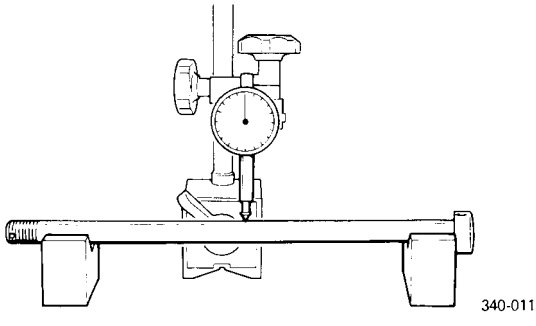
2. Remove:
   - Speedometer cable
   - Front wheel axle nut
   - Washer
   - Front wheel axle

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

3. Remove:
   - Front wheel

EAS21930
CHECKING THE FRONT WHEEL

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

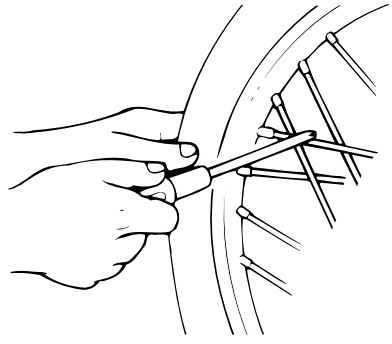


Wheel axle bending limit
0.25 mm (0.01 in)

EWA13460
⚠ WARNING

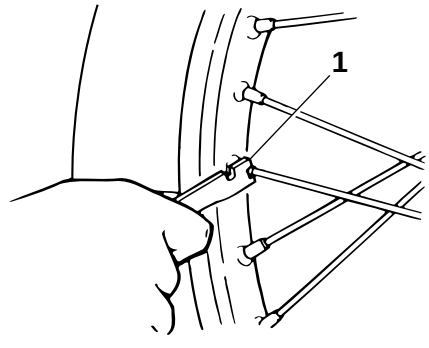
Do not attempt to straighten a bent wheel axle.

2. Check:
   - Tire
   - Front wheel
     Damage/wear → Replace.
     Refer to “CHECKING THE TIRES” on page 3-21 and “CHECKING THE WHEELS” on page 3-23.
3. Check:
   - Spokes
     Bends/damage → Replace.
     Loose → Tighten.
     Tap the spokes with a screwdriver.



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

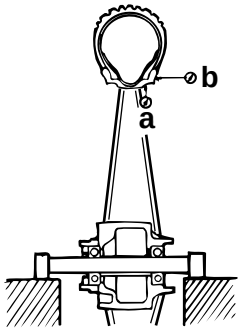
4. Tighten:
   - Spokes
     (With a spoke wrench “1”)



Spoke
3 Nm (0.3 m•kg, 2.2 ft•lb)

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

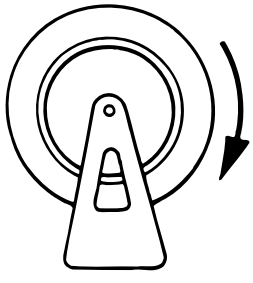
5. Measure:
   - Front wheel radial runout “a”
   - Front wheel lateral runout “b”
     Over the specified limits → Replace.



340-000

Radial wheel runout limit
2.0 mm (0.08 in)
Lateral wheel runout limit
2.0 mm (0.08 in)

6. Check:
   - Collar
     Damage/wear → Replace.
7. Check:
   - Wheel bearings
     Front wheel turns roughly or is loose → Replace the wheel bearings.
   - Oil seals
     Damage/wear → Replace.



EAS21910
DISASSEMBLING THE FRONT WHEEL

1. Remove:
   - Wheel bearings
   - Oil seals

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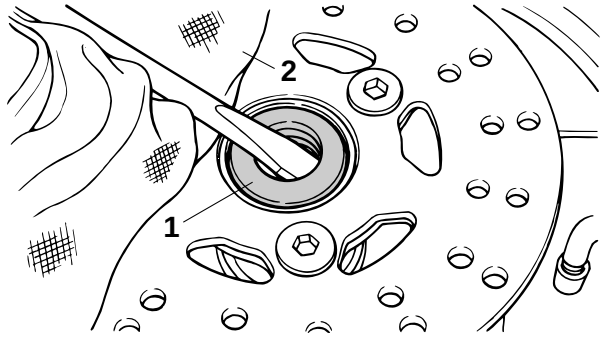
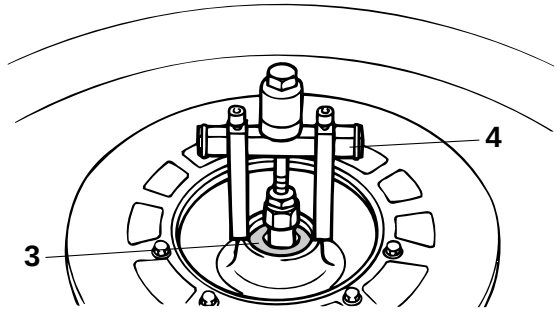
a. Clean the outside of the front wheel hub.
b. Remove the oil seals “1” with a flat-head screwdriver.

NOTE:

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



c. Remove the wheel bearings “3” with a general bearing pulle “4”.



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EAS21940
CHECKING THE SPEEDOMETER GEAR UNIT

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

EAS21960
ASSEMBLING THE FRONT WHEEL

1. Install:
   - Wheel bearings New
   - Oil seals New

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

ECA4D602

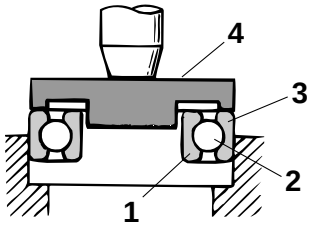
CAUTION:

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

NOTE:

Use a socket “4” that matches the diameter of

the wheel bearing outer race and oil seal.



b. Check the front brake disc.
Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-18.

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EAS21970

ADJUSTING THE FRONT WHEEL STATIC BALANCE

NOTE:

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

1. Remove:
   - Balancing weight(s)
2. Find:
   - Front wheel's heavy spot

NOTE:

Place the front wheel on a suitable balancing stand.

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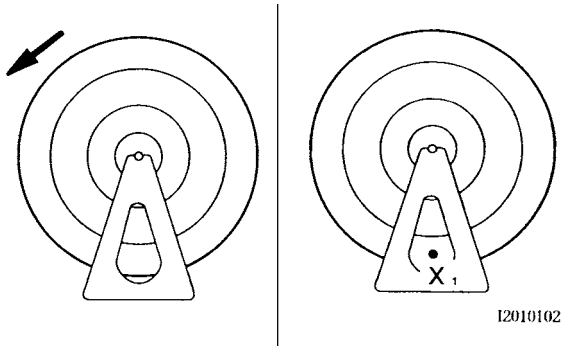
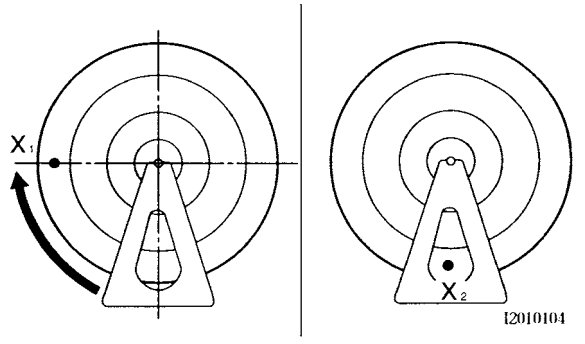
a. Spin the front wheel.
b. When the front wheel stops, put an "X_1" mark at the bottom of the wheel.



c. Turn the front wheel 90° so that the "X_1" mark is positioned as shown.
d. Release the front wheel.
e. When the wheel stops, put an "X_2" mark at the bottom of the wheel.



f. Repeat steps (d) through (f) several times until all the marks come to rest at the same spot.
g. The spot where all the marks come to rest is the front wheel's heavy spot "X".

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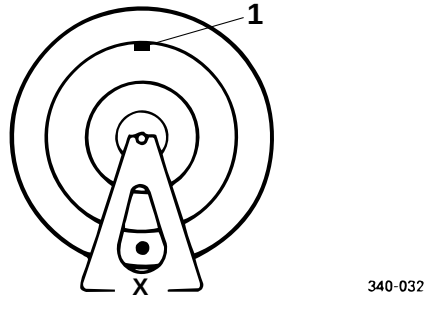
3. Adjust:
   - Front wheel static balance

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

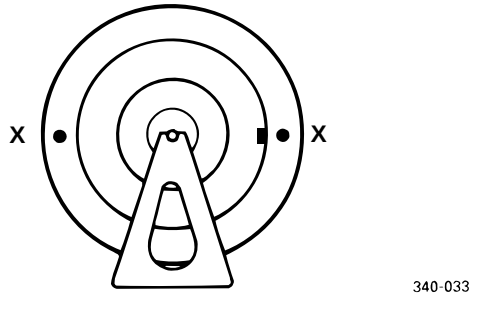
a. Install a balancing weight "1" onto the rim exactly opposite the heavy spot "X".



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 posi-

tion, install a heavier weight.
d. Repeat steps (b) and (c) until the front wheel is balanced.

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4. Check:
• Front wheel static balance

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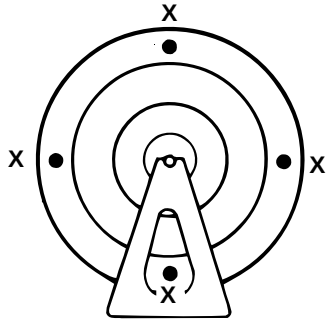
a. Turn the front wheel and make sure it stays at each position shown.



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

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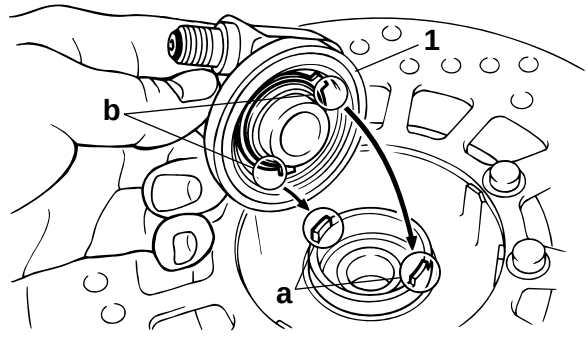
EAS21990
INSTALLING THE FRONT WHEEL (DISC)

1. Lubricate:
• Front wheel axle
• Wheel bearings
• Oil seal lips

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

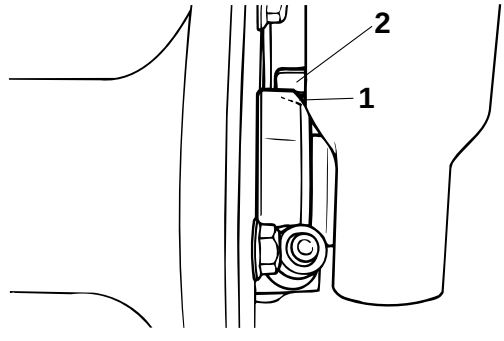
2. Install:
• Speedometer gear unit

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



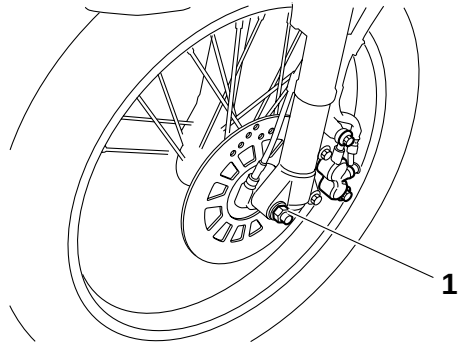
3. Install:
• Front wheel assembly
• Front wheel axle
• Speedometer cable

NOTE:
Make sure the slot "1" in the speedometer gear unit fits over the stopper "2" on the outer tube.



4. Tighten:
• Front wheel axle nut "1"

	Front wheel axle nut **85 Nm (8.5 m•kg, 61 ft•lb)**



EWA13680
WARNING
Make sure the brake hoses are routed properly.

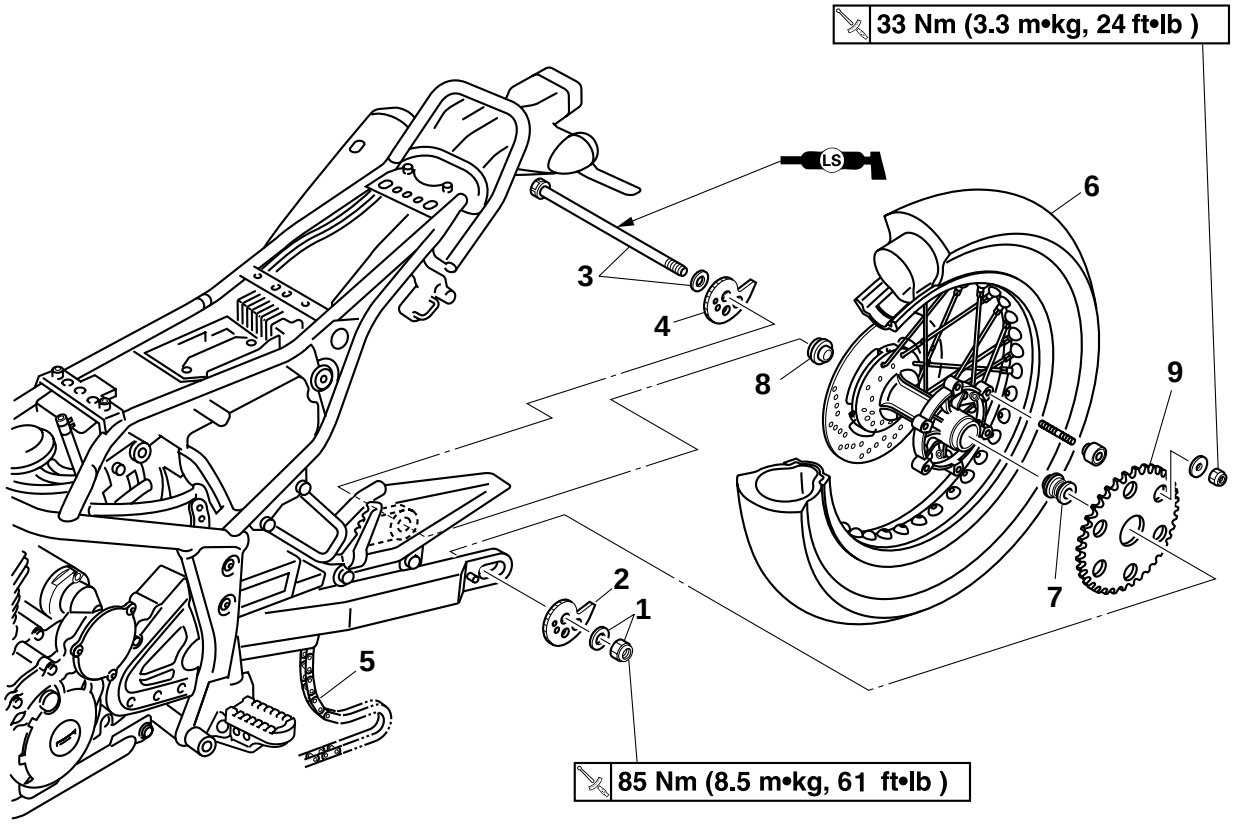
ECA14140
CAUTION:
Before tightening the wheel axle nut, push

down hard on the handlebar(s) several times and check if the front fork rebounds smoothly.

EAS22020

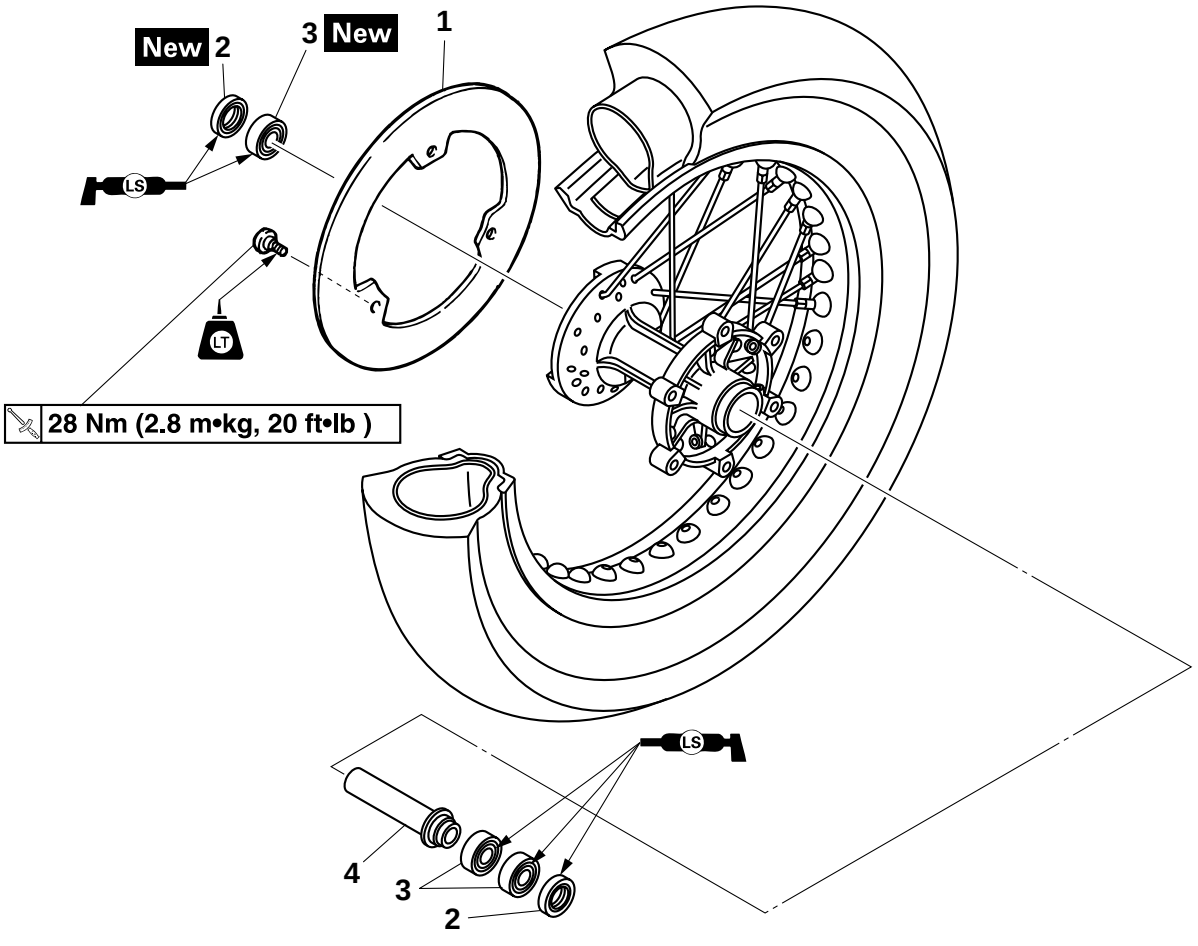
REAR WHEEL

Removing the rear wheel



Order	Job/Parts to remove	Q'ty	Remarks
1	Rear wheel axle nut/Washer	1/1	
2	Left drive chain puller	1	
3	Rear wheel axle/Washer	1/1	
4	Right drive chain puller	1	
5	Drive chain	1	
6	Rear wheel assembly	1	
7	Spacer	1	
8	Collar	1	
9	Rear wheel sprocket	1	
			For installation, reverse the removal procedure.

Disassembling the rear wheel



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake disc	1	
2	Oil seal	2	
3	Bearing	3	
4	Spacer	1	
			For assembly, reverse the disassembly procedure.

EAS22040
REMOVING THE REAR WHEEL (DISC)

1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

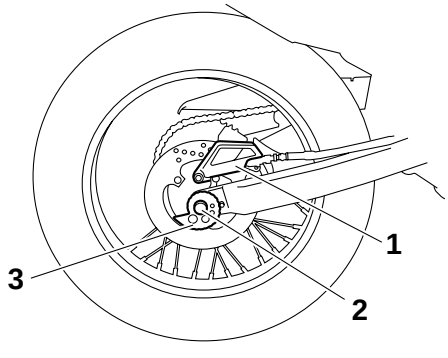
Securely support the vehicle so that there is no danger of it falling over.

NOTE:
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:
   - Rear brake caliper cover “1”

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

3. Remove:
   - Rear wheel axle nut
   - Washer
   - Left drive chain puller
   - Rear wheel axle “2”
   - Washer
   - Right drive chain puller “3”
   - Rear wheel
   - Spacer/collar



NOTE:
Push the rear wheel forward and remove the drive chain from the rear wheel sprocket.

EAS22100
CHECKING THE REAR WHEEL

1. Check:
   - Rear wheel axle
   - Rear wheel
   - Wheel bearings
   - Oil seals
   Refer to “CHECKING THE FRONT WHEEL” on page 4-4.
2. Check:
   - Tire
   - Rear wheel
   Damage/wear → Replace.
   Refer to “CHECKING THE TIRES” on page 3-21 and “CHECKING THE WHEELS” on page 3-23.
3. Check:
   - Spokes
   Refer to “CHECKING THE FRONT WHEEL” on page 4-4.
4. Measure:
   - Radial wheel runout
   - Lateral wheel runout
   Refer to “CHECKING THE FRONT WHEEL” on page 4-4.

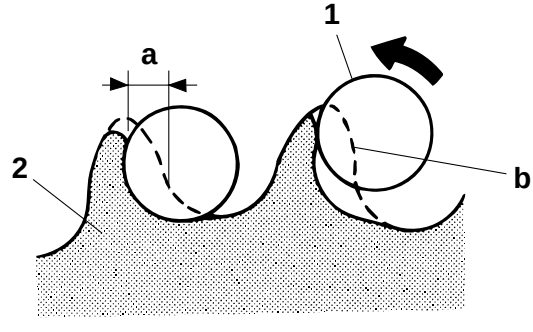
Radial wheel runout limit
2.0 mm (0.08 in)
Lateral wheel runout limit
2.0 mm (0.08 in)

EAS22080
DISASSEMBLING THE REAR WHEEL

1. Remove:
   - Oil seals
   - Wheel bearings
   Refer to “DISASSEMBLING THE FRONT WHEEL” on page 4-5.

EAS22120
CHECKING AND REPLACING THE REAR WHEEL SPROCKET

1. Check:
   - Rear wheel sprocket
   More than 1/4 tooth “a” wear → Replace the rear wheel sprocket.
   Bent teeth → Replace the rear wheel sprocket.



a. More than 1/4 tooth wear
b. Correct

1. Drive chain roller
2. Rear wheel sprocket

2. Replace:
   - Rear wheel sprocket

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

Rear wheel sprocket self-locking nut
33 Nm (3.3 m•kg, 24 ft•lb)

NOTE:
Tighten the self-locking nuts in 2 stages and in a crisscross pattern.

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EAS22140
ASSEMBLING THE REAR WHEEL

1. Install:
   - Wheel bearings New
   - Oil seals New
   Refer to "ASSEMBLING THE FRONT WHEEL" on page 4-5.

EAS22150
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.

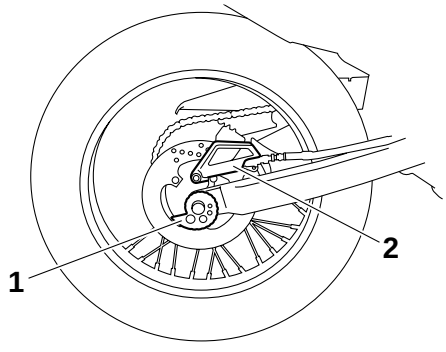
1. Adjust:
   - Rear wheel static balance
   Refer to "ADJUSTING THE FRONT WHEEL STATIC BALANCE" on page 4-6.

EAS22160
INSTALLING THE REAR WHEEL (DISC)

1. Lubricate:
   - Rear wheel axle
   - Wheel bearings
   - Oil seal lips

Recommended lubricant
Lithium-soap-based grease

2. Install:
   - Collar/Spacer
   - Rear wheel
   - Washer
   - Right drive chain puller "1"
   - Wheel axle
   - Left drive chain puller
   - Washer
   - Wheel axle nut
   - Rear brake caliper cover "2"



3. Adjust:
   - Drive chain slack
   Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-19.

Drive chain slack
40.0–45.0 mm (1.57–1.77 in)

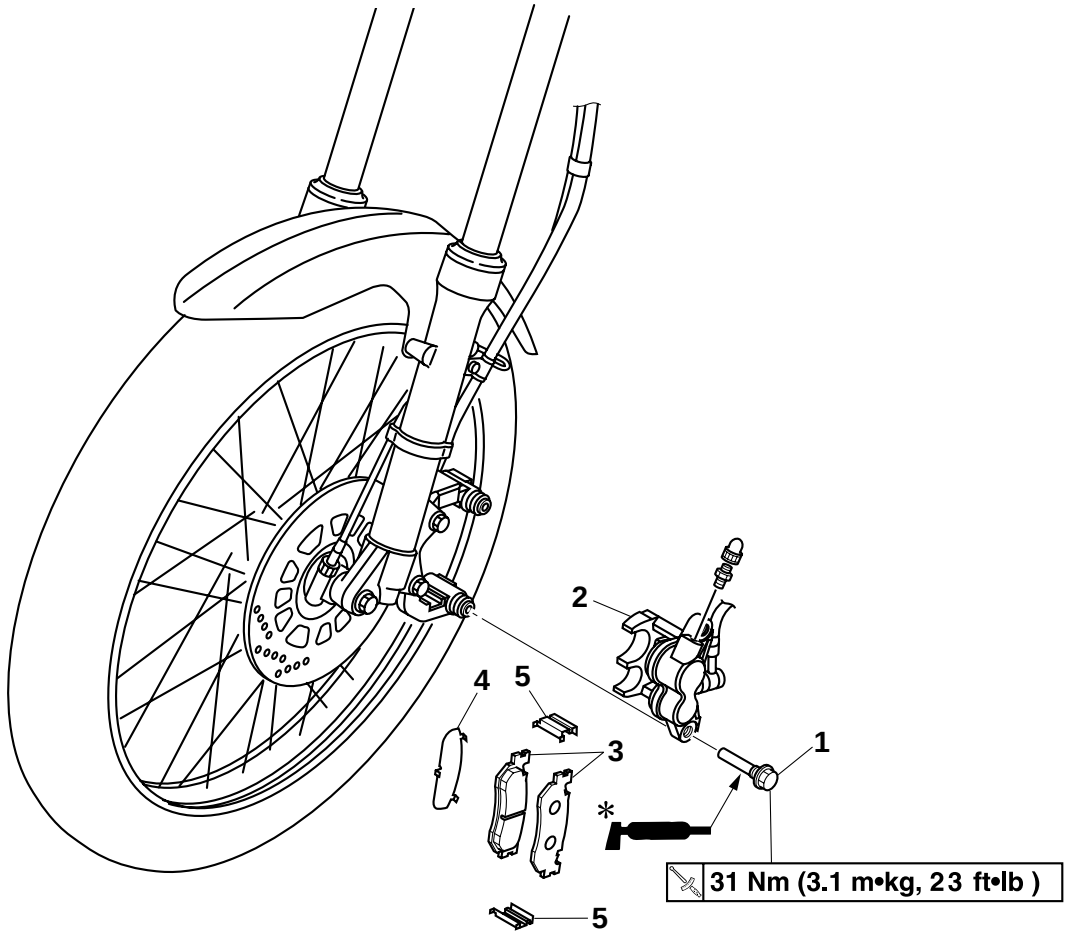
4. Tighten:
   - Rear wheel axle nut

Rear wheel axle nut
85 Nm (8.5 m•kg, 61 ft•lb)

EAS22210

FRONT BRAKE

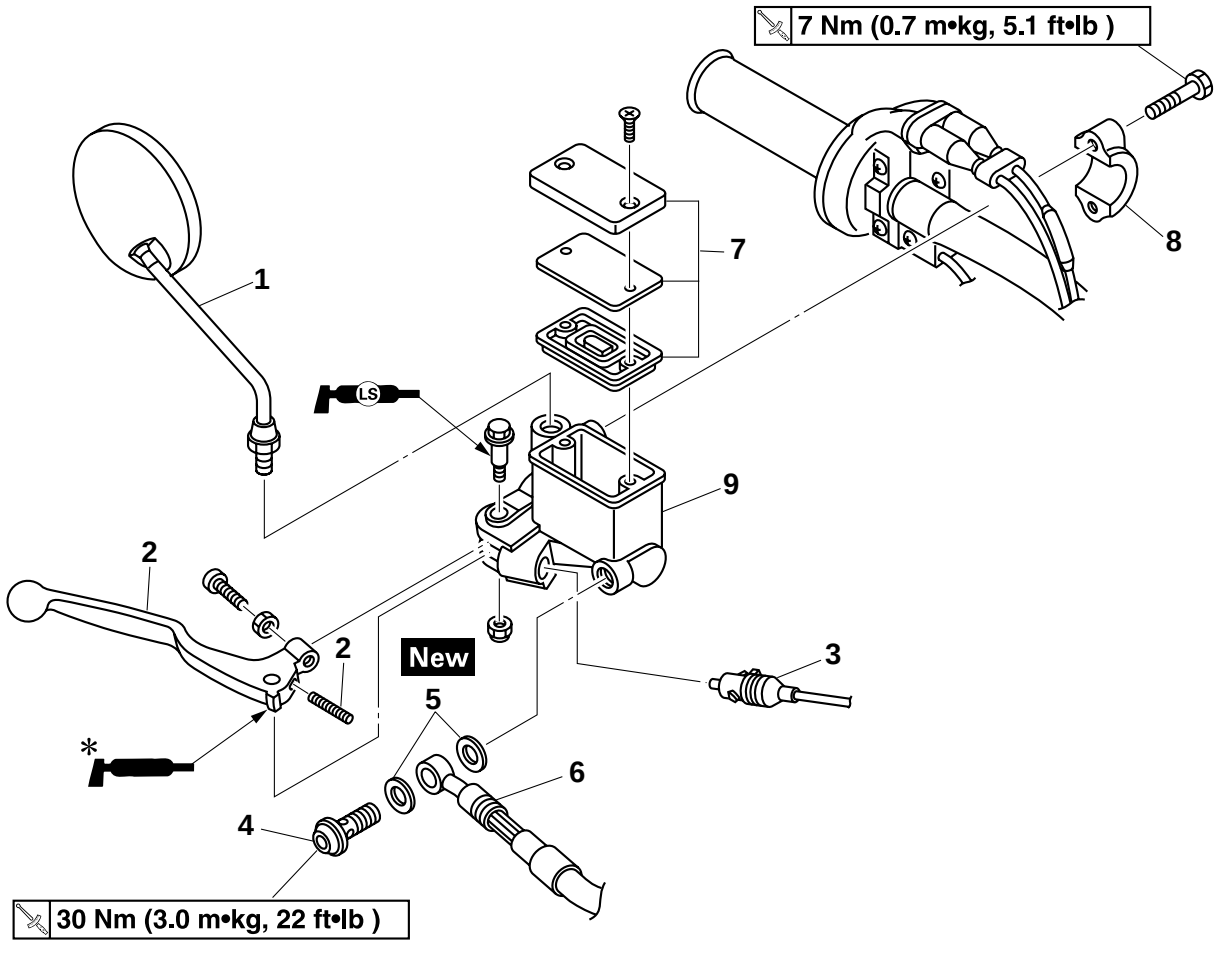
Removing the front brake pads



Order	Job/Parts to remove	Q'ty	Remarks
1	Front brake caliper bolt	1	Lower side only.
2	Front brake caliper	1	Slide the brake caliper upward.
3	Front brake pad	2	
4	Brake pad shim	1	
5	Brake pad spring	2	
			For installation, reverse the removal procedure.

*Apply silicon grease

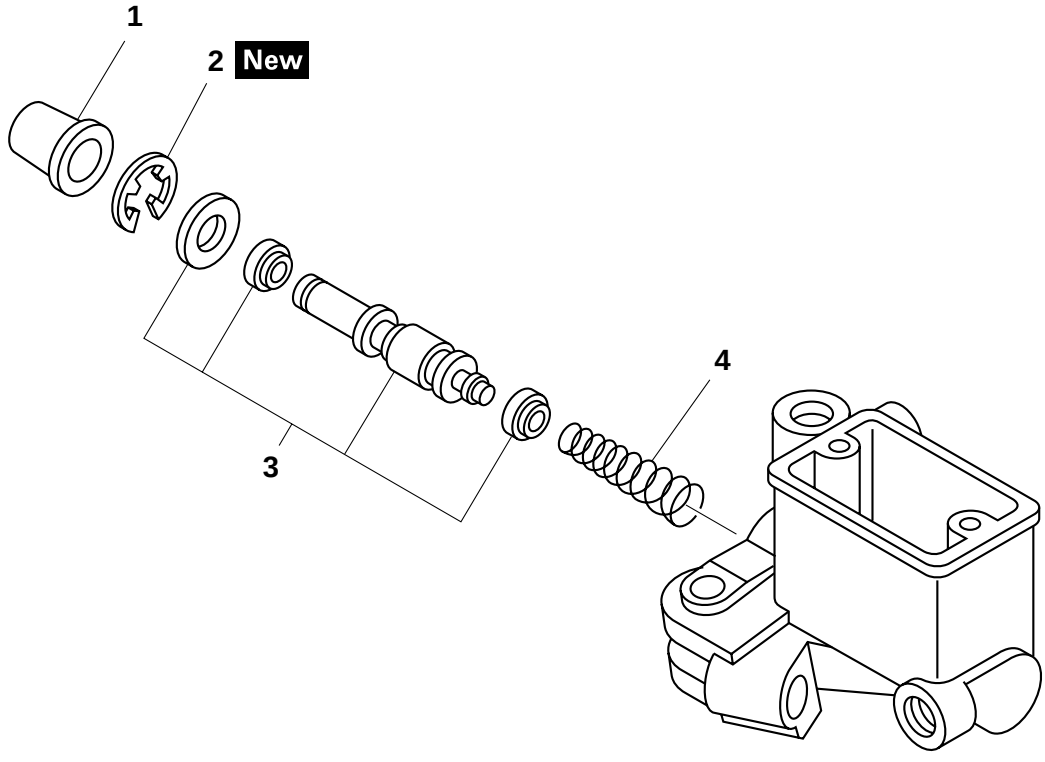
Removing the front brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-18.
1	Right rear view mirror	1	
2	Front brake lever/Compression spring	1/1	
3	Front brake light switch connector	1	Disconnect.
4	Union bolt	1	
5	Copper washers	2	
6	Front brake hose	1	
7	Brake master cylinder reservoir cap	1	
8	Front brake master cylinder holder	1	
9	Front brake master cylinder	1	
			For installation, reverse the removal procedure.

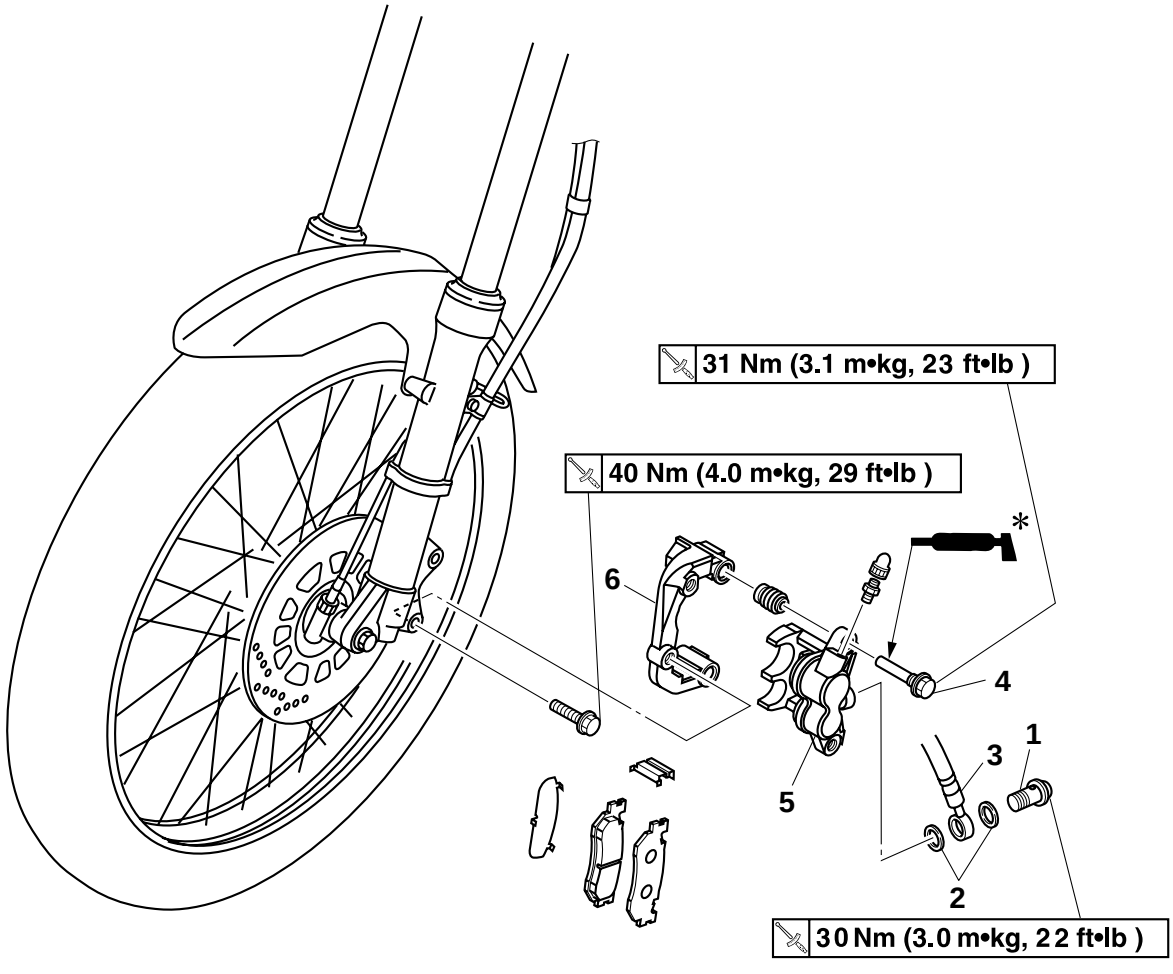
*Apply silicon grease

Disassembling the front brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
1	Master cylinder boot	1	
2	Circlip	1	
3	Master cylinder kit	1	
4	Spring	1	
			For assembly, reverse the disassembly procedure.

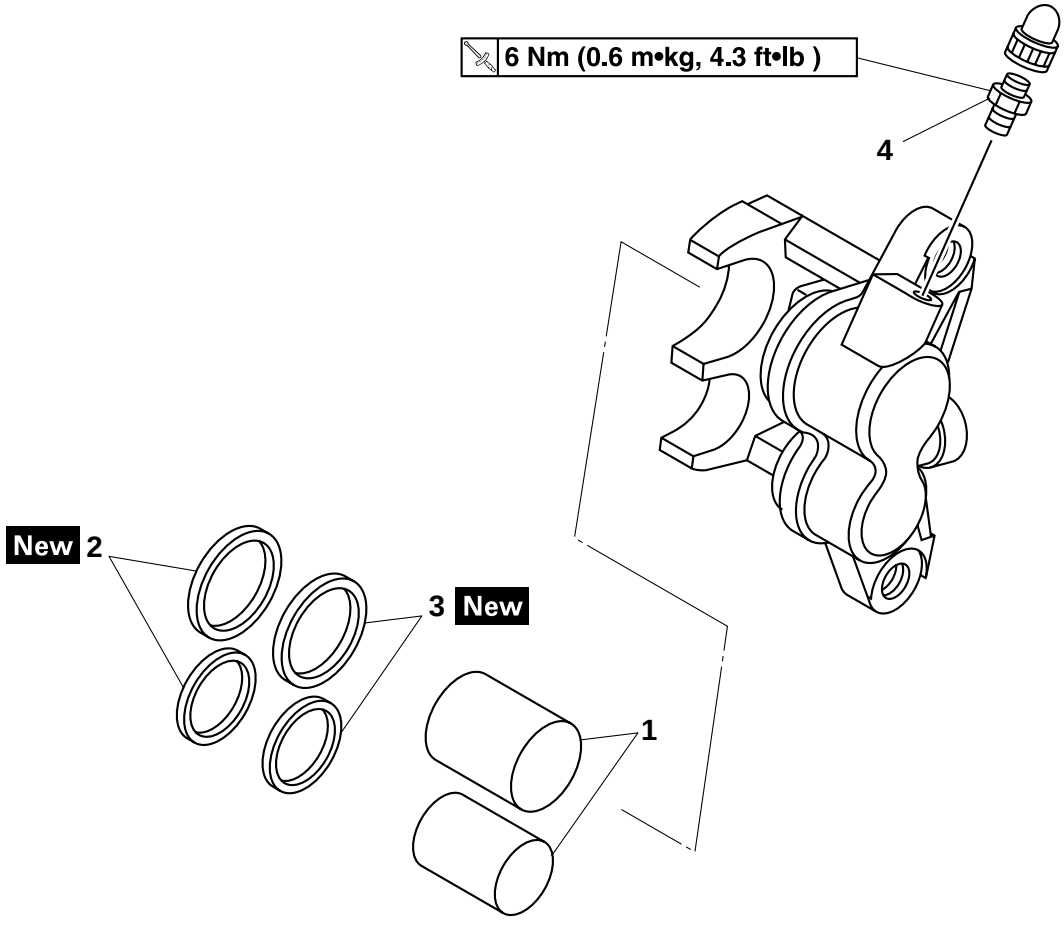
Removing the front brake calipers



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-18.
1	Union bolt	1	
2	Copper washers	2	
3	Front brake hose	1	
4	Brake caliper bolt	2	
5	Front brake caliper assembly	1	
6	Brake caliper bracket	1	
			For installation, reverse the removal procedure.

*Apply silicon grease

Disassembling the front brake calipers

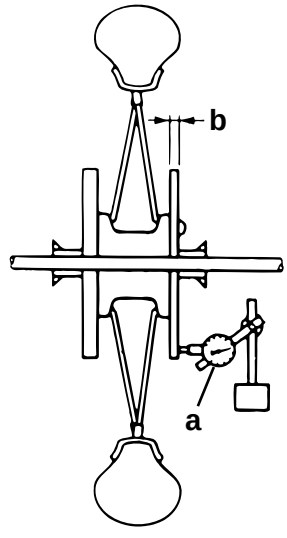


Order	Job/Parts to remove	Q'ty	Remarks
1	Brake caliper piston	2	
2	Dust seal	2	
3	Brake caliper piston seal	2	
4	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

EAS22220
INTRODUCTION
EWA14100
WARNING

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.**

EAS22230
CHECKING THE FRONT BRAKE DISC
1. Remove:
   - Front wheel
     Refer to “FRONT WHEEL” on page 4-2.
2. Check:
   - Brake disc
     Damage/galling → Replace.
3. Measure:
   - Brake disc deflection “a”
     Out of specification → Correct the brake disc deflection or replace the brake disc.



Brake disc deflection limit
0.15 mm (0.0059 in)

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a. Place the vehicle on a suitable stand so that the front wheel is elevated.
b. Before measuring the front brake disc deflection, turn the handlebar to the left or right to ensure that the front wheel is stationary.
c. Remove the brake caliper.
d. Hold the dial gauge at a right angle against the brake disc surface.
e. Measure the deflection 2–3 mm (0.08–0.12 in) below the edge of the brake disc.

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4. Measure:
   - Brake disc thickness “b”
     Measure the brake disc thickness at a few different locations.
     Out of specification → Replace.

Brake disc thickness limit
3.0 mm (0.12 in)

5. Adjust:
   - Brake disc deflection

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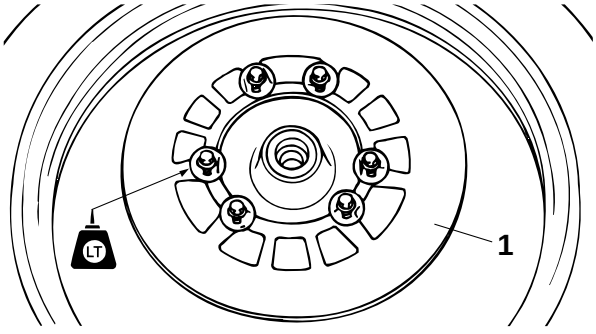
a. Remove the brake disc.
b. Rotate the brake disc by one bolt hole.

c. Install the brake disc “1”.

NOTE:

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



Brake disc bolt
10 Nm (1.0 m•kg, 7.2 ft•lb)
LOCTITE®

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

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6. Install:
   - Front wheel
     Refer to “FRONT WHEEL” on page 4-2.

EAS22270

REPLACING THE FRONT BRAKE PADS

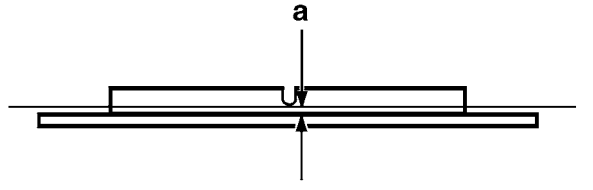
The following procedure applies brake caliper.

NOTE:

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

1. Measure:
   - Brake pad wear limit “a”
     Out of specification → Replace the brake pads as a set.

Brake pad lining thickness (inner)
5.3 mm (0.21 in)
Limit
0.8 mm (0.03 in)
Brake pad lining thickness (outer)
5.3 mm (0.21 in)
Limit
0.8 mm (0.03 in)



2. Install:
   - Brake pad spring
   - Brake pad shims
     (onto the brake pads)
   - Brake pads

NOTE:

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

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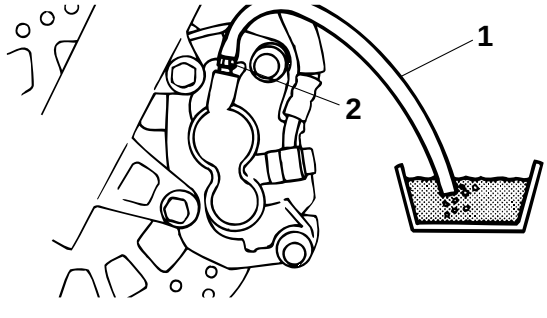
a. Connect a clear plastic hose “1” tightly to the bleed screw “2”. Put the other end of the hose into an open container.



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

Bleed screw
6 Nm (0.6 m•kg, 4.3 ft•lb)

d. Install a new brake pad shim onto each new

brake pad.

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

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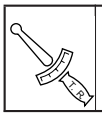
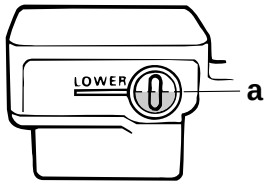
3. Install:
   - Brake caliper bolts

	**Brake caliper bolt** **31 Nm (3.1 m•kg, 23 ft•lb)**

4. 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" on page 3-16.



5. Check:
   - Brake lever operation

   Soft or spongy feeling → Bleed the brake system.
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-18.

EAS22290

REMOVING THE FRONT BRAKE CALIPER

NOTE:

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

1. Remove:
   - Union bolt
   - Copper washers
   - Brake hose

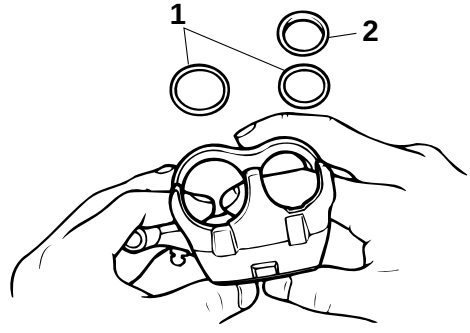
NOTE:

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

EAS22320

DISASSEMBLING THE FRONT BRAKE CALIPER

1. Remove:
   - Brake caliper pistons
   - Dust seals "1"
   - Brake caliper piston seals "2"



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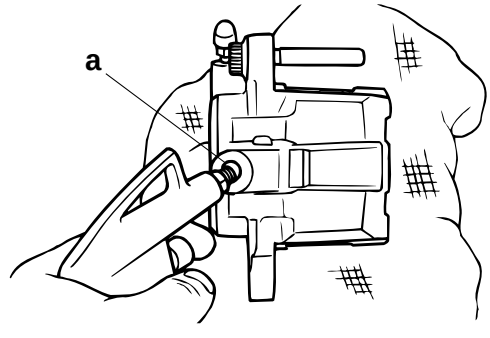
a. Blow compressed air into the brake hose joint opening "a" to force out the pistons from the brake caliper.

EWA13550

⚠ WARNING

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



b. Remove the brake caliper piston seals.

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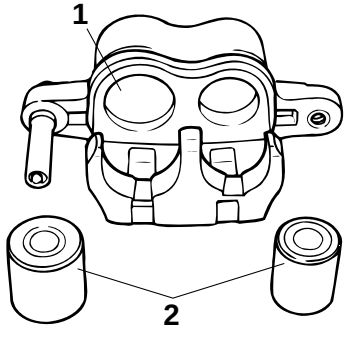
EAS22390

CHECKING THE FRONT BRAKE CALIPERS

Recommended brake component replacement schedule	
Brake pads	If necessary
Piston seals	Every two years
Brake hoses	Every four years

Recommended brake component replacement schedule	
Brake fluid	Every two years and whenever the brake is disassembled

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



EWA13600

WARNING

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

2. Check:
   - Brake caliper bracket
     Cracks/damage → Replace.

EAS22400

ASSEMBLING THE FRONT BRAKE CALIPER

EWA13620

WARNING

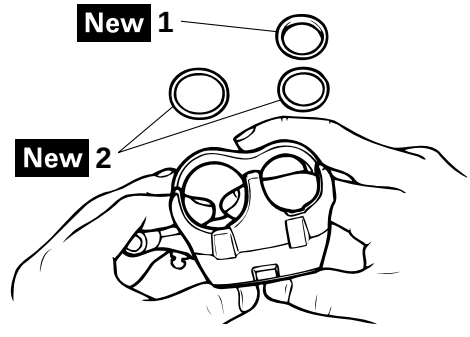
- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components as they will cause the piston seals to swell and distort.**
- **Whenever a brake caliper is disassembled, replace the brake caliper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

Recommended fluid
DOT 4

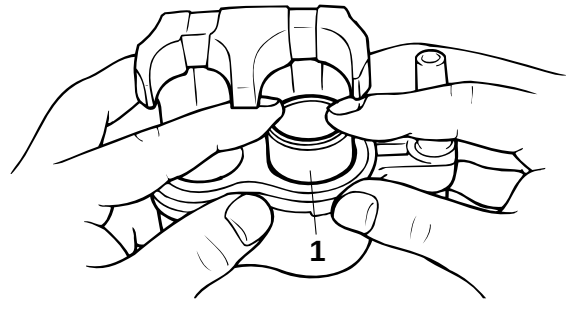
EAS22420

INSTALLING THE FRONT BRAKE CALIPER

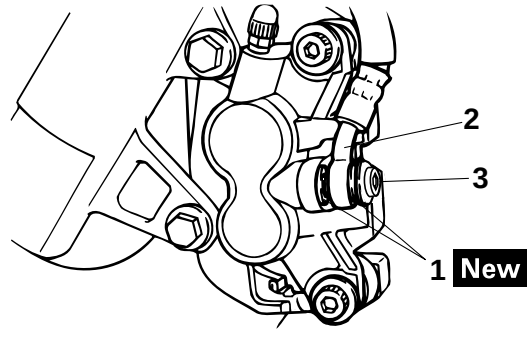
1. Install:
   - Brake caliper piston seals “1” New
   - Dust seals “2” New



2. Install:
   - Brake caliper pistons “1”



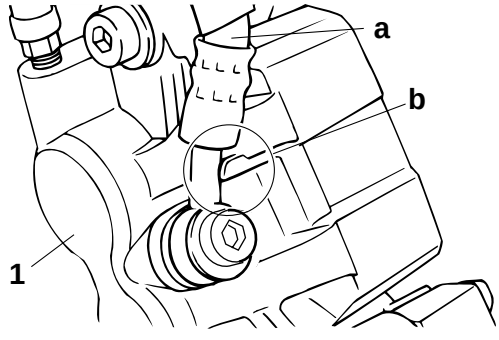
3. Install:
   - Brake caliper bracket
   - Front brake caliper
   - Copper washers “1” New
   - Front brake hose “2”
   - Union bolt “3”



Brake caliper bracket bolt
40 Nm (4.0 m•kg, 29 ft•lb)
Union bolt
30 Nm (3.0 m•kg, 22 ft•lb)

EWA13530
WARNING
Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-25.

ECA14170
CAUTION:
When installing the brake hose onto the brake caliper "1", make sure the brake pipe "a" touches the projection "b" on the brake caliper.



4. Install:
   - Brake pads
   - Brake pad shims
   - Brake pad springs
   - Brake caliper bolt

Brake caliper bolt
31 Nm (3.1 m•kg, 23 ft•lb)

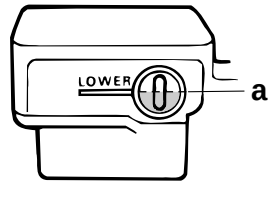
   Refer to "REPLACING THE FRONT BRAKE PADS" on page 4-19.
5. Fill:
   - Brake master cylinder reservoir
     (with the specified amount of the recommended brake fluid)

Recommended fluid
DOT 4

EWA13090
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.**

ECA13540
CAUTION:
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

6. Bleed:
   - Brake system
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-18.
7. 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" on page 3-16.



8. Check:
   - Brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-18.

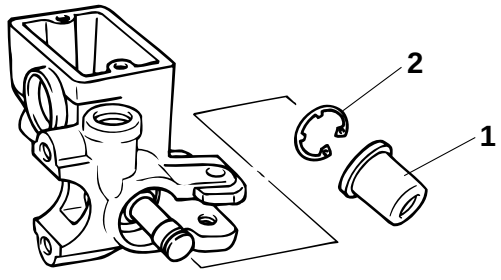
EAS22490
REMOVING THE FRONT BRAKE MASTER CYLINDER

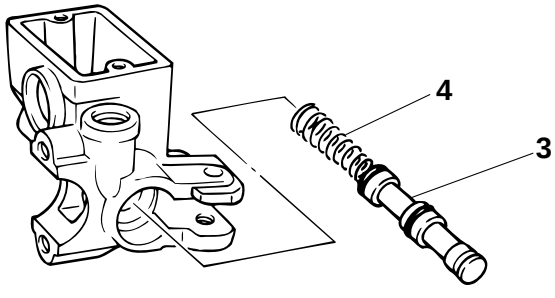
NOTE:
Before removing the front brake master cylinder, drain the brake fluid from the entire brake system.

1. Disconnect:
   - Front brake switch coupler (from the brake switch)
2. Remove:
   - Union bolt
   - Copper washers
   - Front brake hose

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

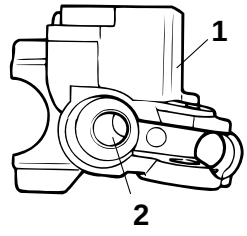
3. Remove:
   - Master cylinder boots “1”
   - Circlip “2”
   - Master cylinder kit “3”
   - Spring “4”



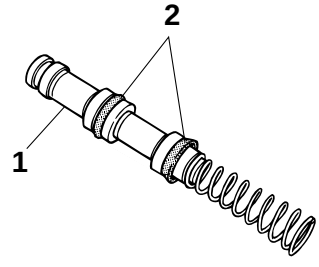


EAS22500
CHECKING THE FRONT BRAKE MASTER CYLINDER

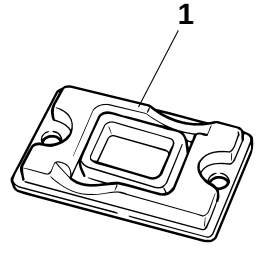
1. Check:
   - Brake master cylinder “1” Damage/scratches/wear → Replace.
   - Brake fluid delivery passages “2” (brake master cylinder body) Obstruction → Blow out with compressed air.



2. Check:
   - Brake master cylinder kit “1”
   - Brake master cylinder cup “2” Damage/scratches/wear → Replace.



3. Check:
   - Brake master cylinder reservoir cap “1”
   - Brake master cylinder reservoir diaphragm holder
   - Brake master cylinder reservoir diaphragm Damage/wear → Replace.



4. Check:
   - Brake hose Cracks/damage/wear → Replace.

EAS22520
ASSEMBLING THE FRONT BRAKE MASTER CYLINDER

EWA13520
WARNING

- **Before installation, all internal brake components should be cleaned and lubricated**

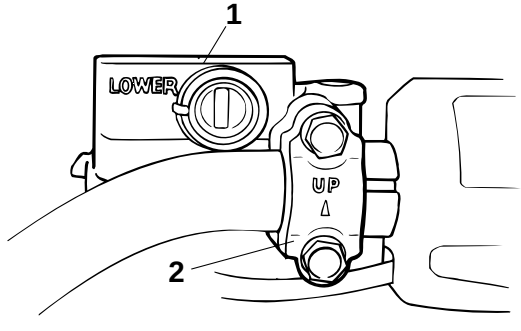
with clean or new brake fluid.
- **Never use solvents on internal brake components.**

Recommended fluid
DOT 4

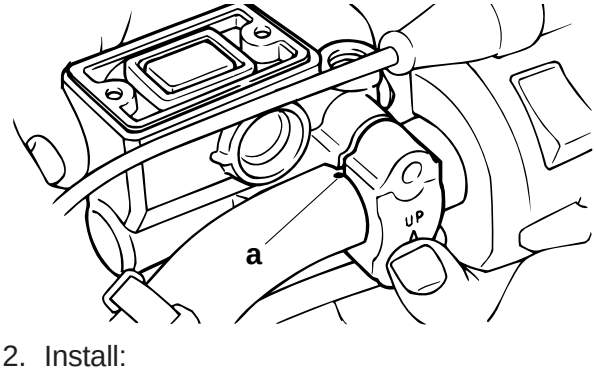
EAS22530
INSTALLING THE FRONT BRAKE MASTER CYLINDER

1. Install:
   - Front brake master cylinder "1"
   - Front brake master cylinder bracket "2"

Brake master cylinder bracket bolt
7 Nm (0.7 m•kg, 5.1 ft•lb)

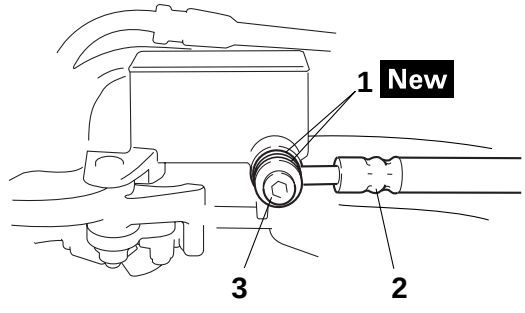


NOTE:
- Install the brake master cylinder holder with the "UP" mark facing up.
- Align the end of the brake master cylinder holder with the punch mark "a" on the handlebar.
- First, tighten the upper bolt, then the lower bolt.



2. Install:
   - Copper washers "1" New
   - Front brake hose "2"
   - Front brake union bolt "3"

Brake hose union bolt
30 Nm (3.0 m•kg, 22 ft•lb)



EWA13530
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-25.

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

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

Recommended fluid
DOT 4

EWA13540
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**

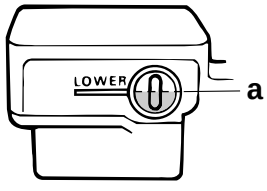
cause vapor lock.

ECA13540

CAUTION:

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

4. Bleed:
   - Brake system
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-18.
5. 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" on page 3-16.

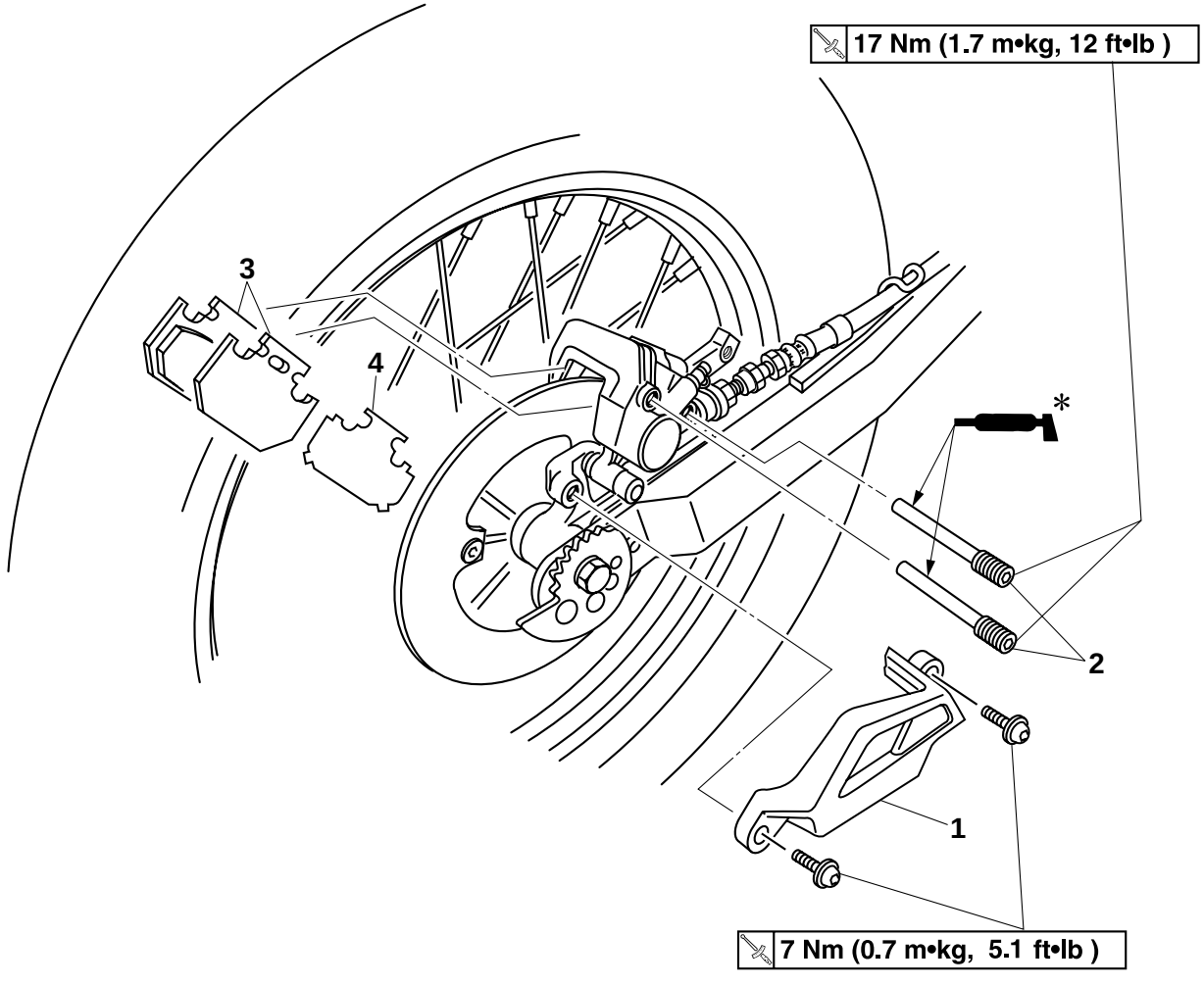


6. Check:
   - Brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-18.

EAS22550

REAR BRAKE

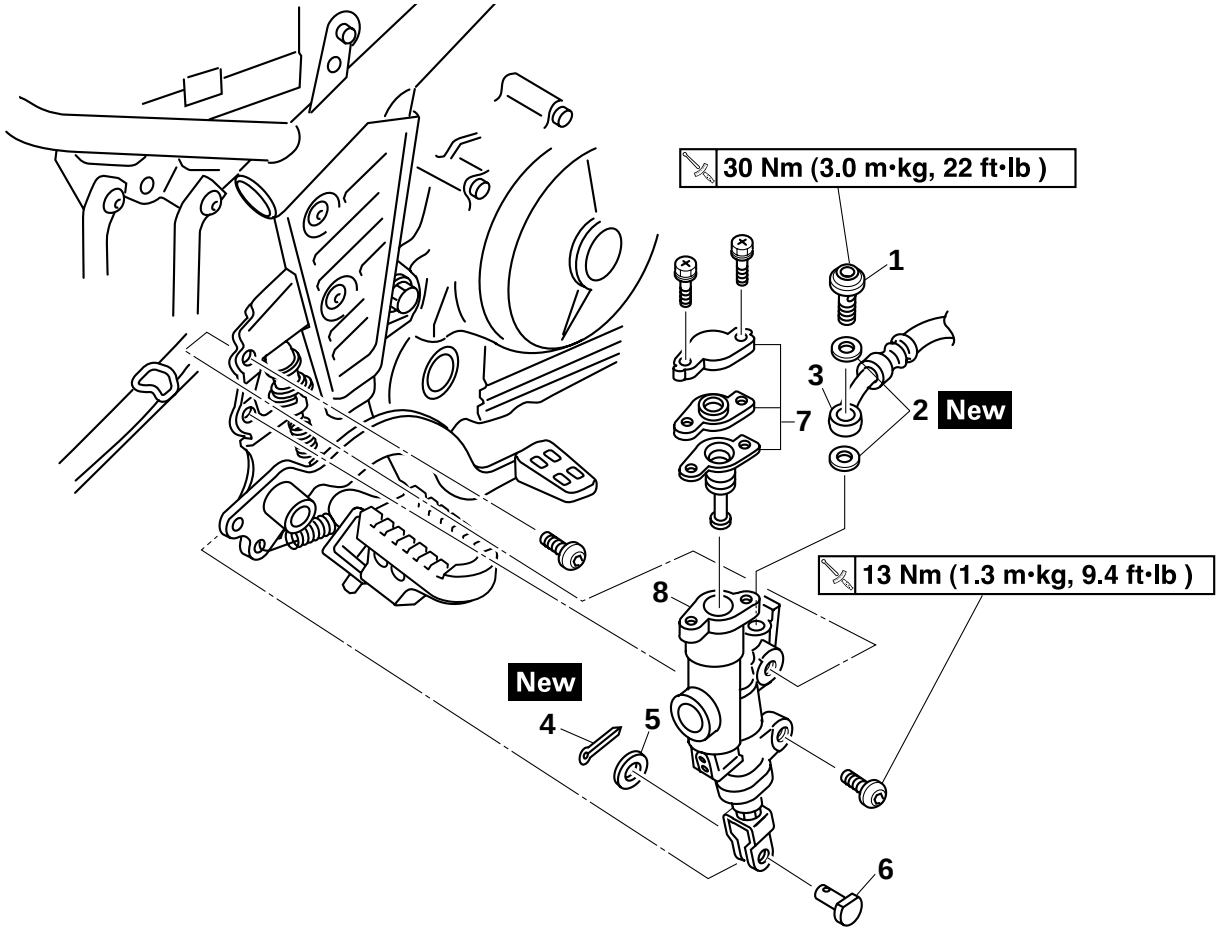
Removing the rear brake pads



Order	Job/Parts to remove	Q'ty	Remarks
1	Rear brake caliper cover	1	
2	Brake caliper bolt	2	
3	Rear brake pad	2	
4	Brake pad shim	1	
			For installation, reverse the removal procedure.

*Apply silicone grease

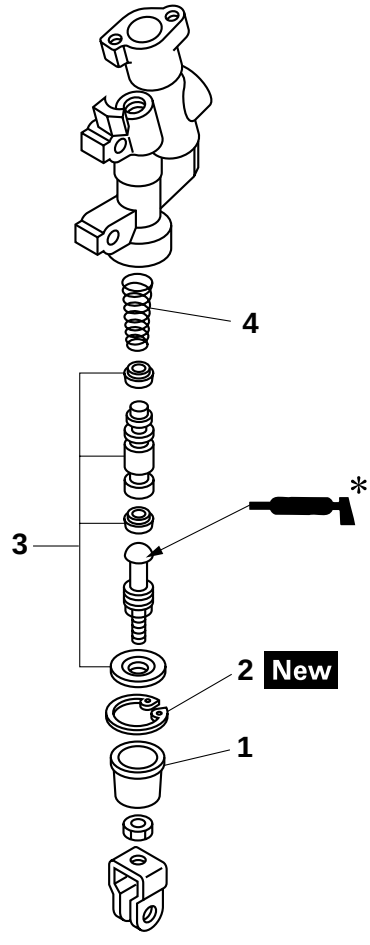
Removing the rear brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-18.
1	Union bolt	1	
2	Copper washers	2	
3	Rear brake hose	1	
4	Cotter pin	1	
5	Washer	1	
6	Clevis pin	1	
7	Master cylinder cap assembly	1	
8	Rear brake master cylinder	1	
			For installation, reverse the removal procedure.

*Apply silicone grease

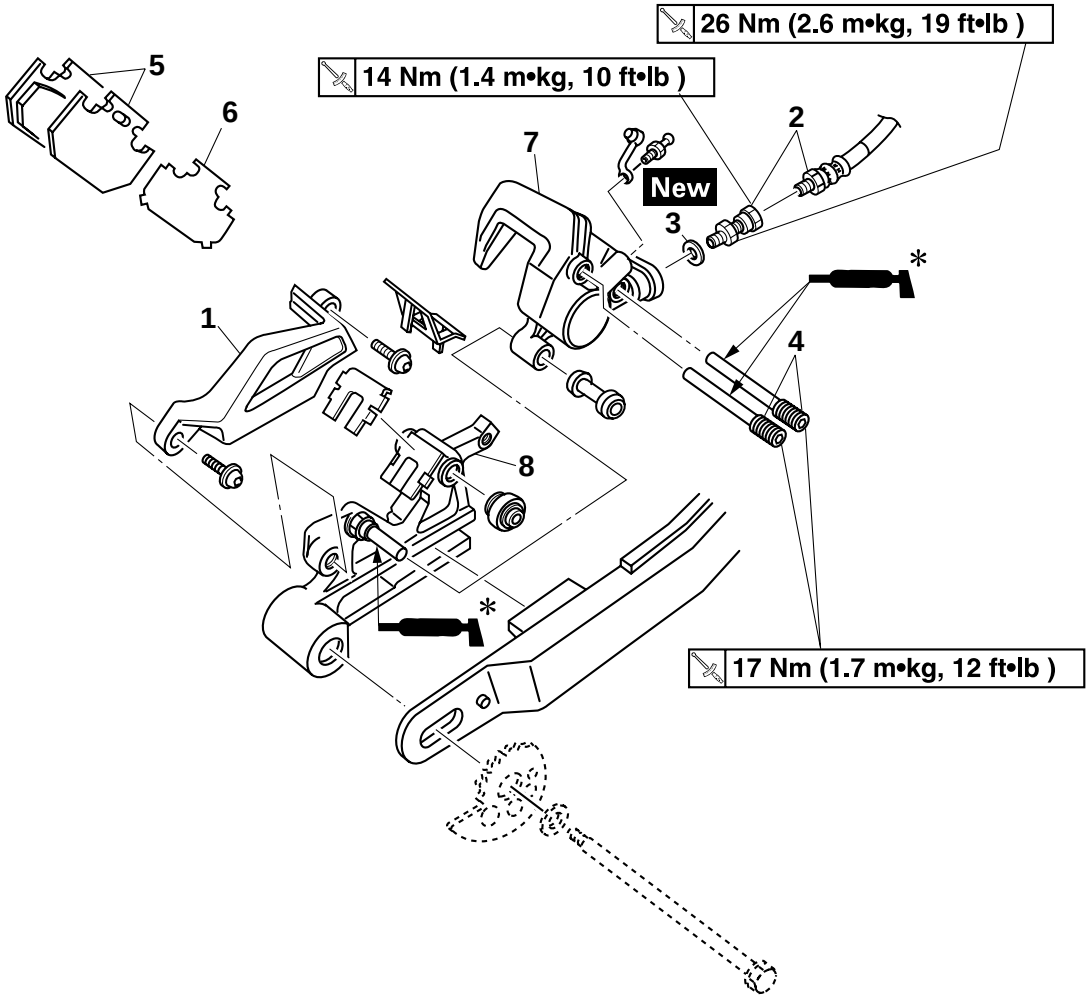
Disassembling the rear brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
1	Master cylinder boot	1	
2	Circlip	1	
3	Master cylinder kit	1	
4	Spring	1	
			For assembly, reverse the disassembly procedure.

*Apply silicone grease

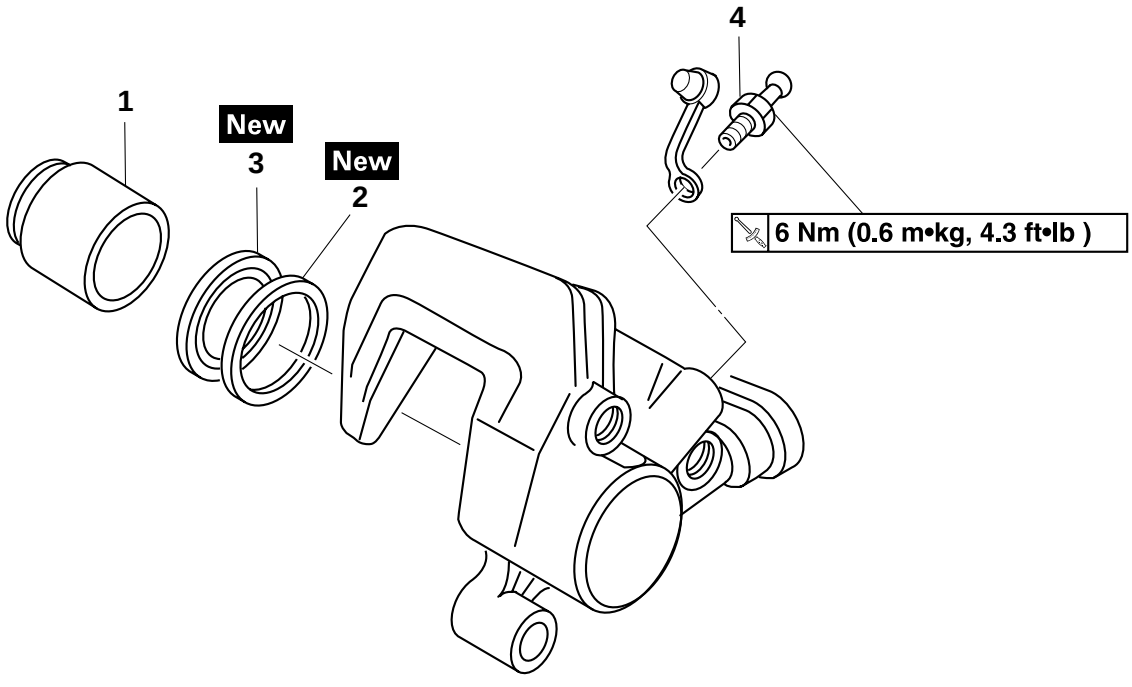
Removing the rear brake calipers



Order	Job/Parts to remove	Q'ty	Remarks
	Rear wheel		Refer to "REAR WHEEL" on page 4-9.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-18.
1	Rear brake caliper cover	1	
2	Rear brake hose assembly/Joint	1/1	
3	Copper washer	1	
4	Brake caliper bolt	2	
5	Brake pad	2	
6	Brake pad shim	1	
7	Rear brake caliper	1	
8	Brake caliper bracket	1	
			For installation, reverse the removal procedure.

*Apply silicone grease

Disassembling the rear brake calipers



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake caliper piston	1	
2	Dust seal	1	
3	Brake caliper piston seal	1	
4	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

EAS22560
INTRODUCTION
EWA14100
WARNING

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.**

EAS22570
CHECKING THE REAR BRAKE DISC
1. Remove:
   - Rear wheel
     Refer to “REAR WHEEL” on page 4-9.
2. Check:
   - Brake disc
     Damage/galling → Replace.
3. Measure:
   - Brake disc deflection
     Out of specification → Correct the brake disc deflection or replace the brake disc.
     Refer to “CHECKING THE FRONT BRAKE DISC” on page 4-18.

Brake disc deflection limit
0.15 mm (0.0059 in)

4. Measure:
   - Brake disc thickness
     Measure the brake disc thickness at a few different locations.
     Out of specification → Replace.
     Refer to “CHECKING THE FRONT BRAKE DISC” on page 4-18.

Brake disc thickness limit
4.0 mm (0.16 in)

5. Adjust:
   - Brake disc deflection
     Refer to “CHECKING THE FRONT BRAKE DISC” on page 4-18.

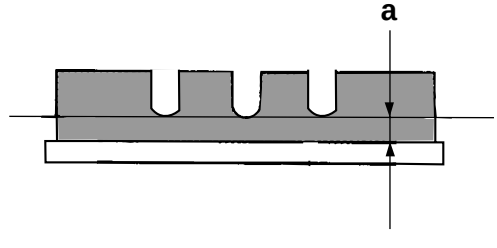
Brake disc bolt
28 Nm (2.8 m•kg, 20 ft•lb)
LOCTITE®

6. Install:
   - Rear wheel
     Refer to “REAR WHEEL” on page 4-9.

EAS22580
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. Measure:
   - Brake pad wear limit “a”
     Out of specification → Replace the brake pads as a set.

Brake pad lining thickness (inner)
5.2 mm (0.20 in)
Limit
1.0 mm (0.04 in)
Brake pad lining thickness (outer)
5.2 mm (0.20 in)
Limit
1.0 mm (0.04 in)



2. Install:
   - Brake pad shims
     (onto the brake pads)
   - Brake pads

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

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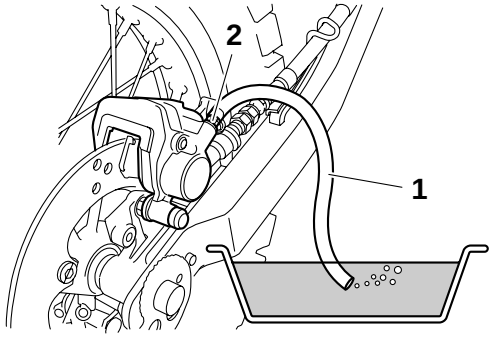
a. Connect a clear plastic hose "1" tightly to the bleed screw "2". Put the other end of the hose into an open container.



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

	Bleed screw **6 Nm (0.6 m•kg, 4.3 ft•lb)**

d. Install a new brake pad shim onto each new brake pad.
e. Install new brake pads and a new brake pad spring.

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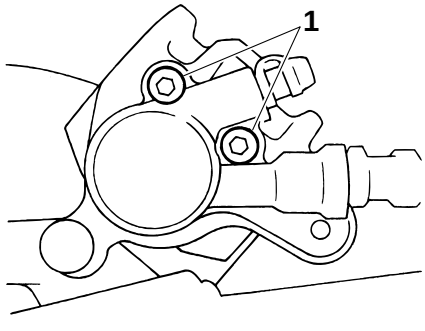
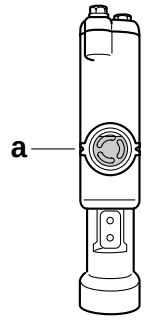
3. Install:
   • Brake caliper bolt "1"

	Brake caliper bolt **17 Nm (1.7 m•kg, 12 ft•lb)**



4. 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" on page 3-16.



5. Check:
   • Brake pedal operation
   Soft or spongy feeling → Bleed the brake system.
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-18.

EAS22590
REMOVING THE REAR BRAKE CALIPER

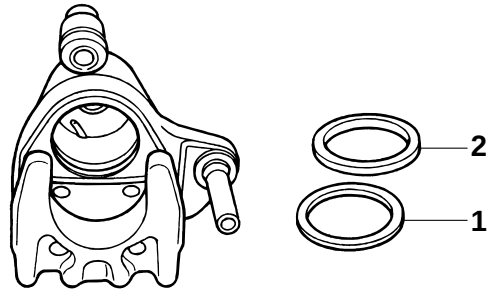
NOTE:
Before disassembling the brake caliper, drain the brake fluid from the entire brake system.

1. Remove:
   • Rear brake hose
   • Joint
   • Copper washers

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

EAS22600
DISASSEMBLING THE REAR BRAKE CALIPER

1. Remove:
   • Brake caliper piston
   • Dust seal "1"
   • Brake caliper piston seal "2"



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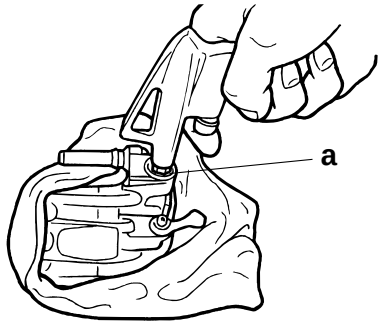
a. Blow compressed air into the brake hose joint opening “a” to force out the piston from the brake caliper.

EWA13550

⚠ WARNING

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



b. Remove the brake caliper piston seals.

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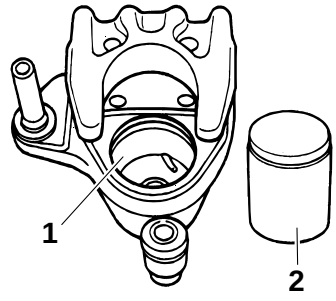
EAS22640

CHECKING THE REAR BRAKE CALIPER

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

1. Check:
   - Brake caliper cylinder “1”
     Scratches/wear → Replace the brake caliper assembly.
   - Brake caliper piston “2”
     Rust/scratches/wear → Replace the brake caliper pistons.
   - Brake caliper body
     Cracks/damage → Replace the brake caliper assembly.
   - Brake fluid delivery passages (brake caliper body)
     Obstruction → Blow out with compressed air.



EWA13610

⚠ WARNING

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

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

EAS22650

ASSEMBLING THE REAR BRAKE CALIPER

EWA13620

⚠ WARNING

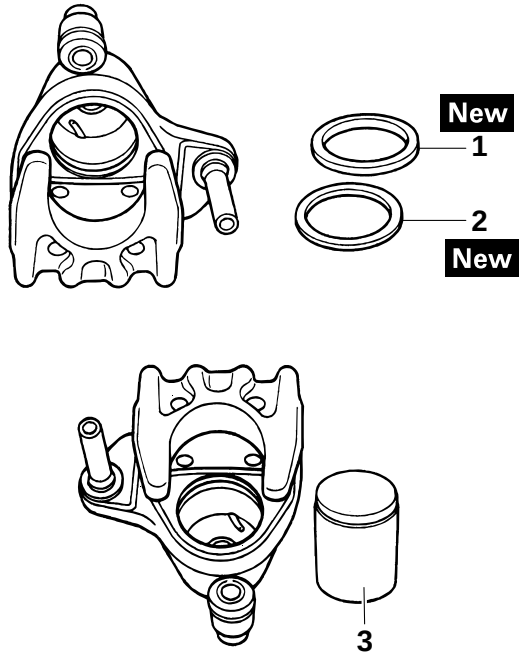
- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components as they will cause the piston seals to swell and distort.**
- **Whenever a brake caliper is disassembled, replace the brake caliper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

Recommended fluid
DOT 4

EAS22670

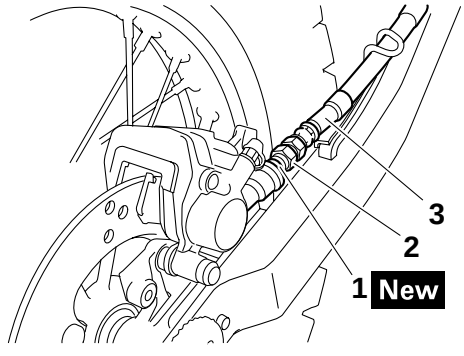
INSTALLING THE REAR BRAKE CALIPER

1. Install:
   - Brake caliper piston seal “1” New
   - Dust seal “2” New
   - Brake caliper piston “3”
   - Brake caliper bracket
   - Rear brake caliper
   - Rear wheel
   - Right drive chain puller/rear wheel axle
   - Left drive chain puller/rear wheel axle nut
     Refer to “REAR WHEEL” on page 4-9.



2. Install:
   - Copper washers “1” New
   - Joint “2”
   - Rear brake hose “3”

   Tighten the locknut.



	Joint nut **14 Nm (1.4 m•kg, 10 ft•lb)** **Locknut** **26 Nm (2.6 m•kg, 19 ft•lb)**

EWA13530

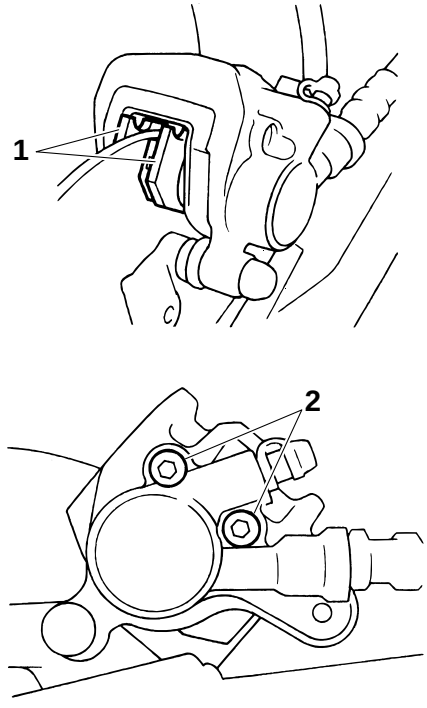
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” on page 2-25.

3. Install:
   - Brake pad springs
   - Brake pads “1”
   - Brake caliper bolt “2”

   Refer to “REPLACING THE REAR BRAKE PADS” on page 4-31.

	Brake caliper bolt **17 Nm (1.7 m•kg, 12 ft•lb)**



4. Fill:
   - Brake fluid reservoir

   (with the specified amount of the recommended brake fluid)

	Recommended fluid **DOT 4**

EWA13090

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.**

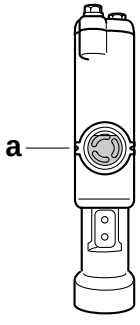
ECA13540

CAUTION:

Brake fluid may damage painted surfaces

and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

5. Bleed:
   - Brake system
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-18.
6. 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" on page 3-16.



7. Check:
   - Brake pedal operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-18.

EAS22700

REMOVING THE REAR BRAKE MASTER CYLINDER

NOTE:

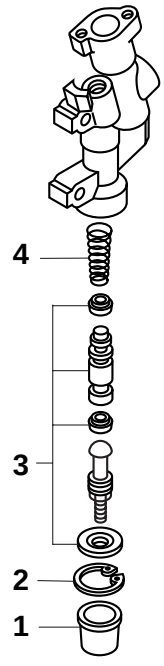
Before removing the rear brake master cylinder, drain the brake fluid from the entire brake system.

1. Remove:
   - Union bolt
   - Copper washers New
   - Rear brake hose

NOTE:

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

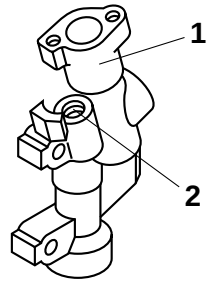
2. Remove:
   - Master cylinder boots "1"
   - Circlip "2"
   - Master cylinder kit "3"
   - Spring "4"



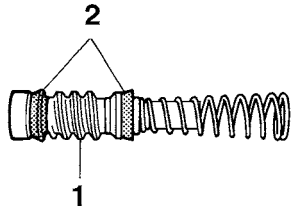
EAS22710

CHECKING THE REAR BRAKE MASTER CYLINDER

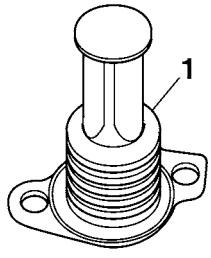
1. Check:
   - Brake master cylinder "1"
     Damage/scratches/wear → Replace.
   - Brake fluid delivery passages "2"
     (brake master cylinder body)
     Obstruction → Blow out with compressed air.



2. Check:
   - Brake master cylinder kit "1"
   - Cylinder cup "2"
     Damage/scratches/wear → Replace.



3. Check:
   - Brake master cylinder cap
   - Brake master cylinder reservoir diaphram holder
   - Brake master cylinder reservoir diaphram "1"
     Cracks/damage → Replace.



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

EAS22730
ASSEMBLING THE REAR BRAKE MASTER CYLINDER

EWA13520
WARNING

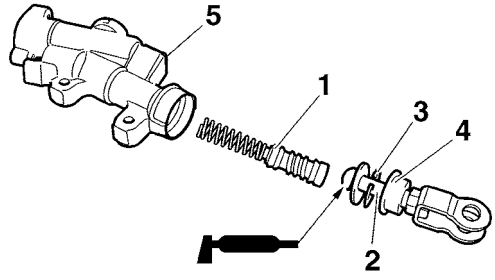
- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components.**

Recommended fluid
DOT 4

EAS22750
INSTALLING THE REAR BRAKE MASTER CYLINDER

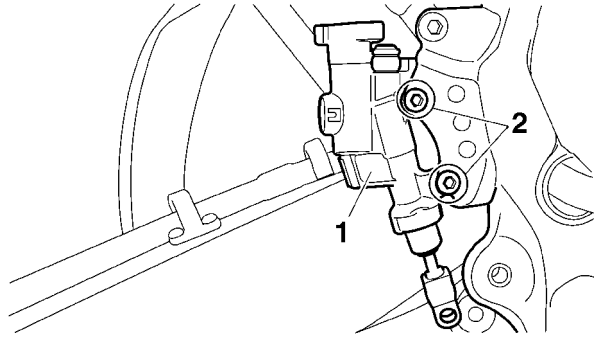
1. Install:
   - Brake master cylinder kit "1"
   - Adjusting rod "2"
   - Circlip "3" New
   - Dust boots "4"

To the brake master cylinder "5"



2. Install:
   - Rear brake master cylinder "1"
   - Brake master cylinder bolt "2"

Brake master cylinder bolt
13 Nm (1.3 m•kg, 9.4 ft•lb)



3. Install:
   - Copper washers New
   - Brake hoses
   - Union bolt

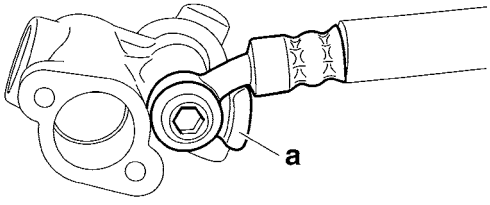
Brake hose union bolt
30 Nm (3.0 m•kg, 22 ft•lb)

EWA13530
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-25.

ECA14160
CAUTION:

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



4. Fill:
   - Brake fluid reservoir
     (to the maximum level mark)

	Recommended fluid **DOT 4**

EWA13090

WARNING

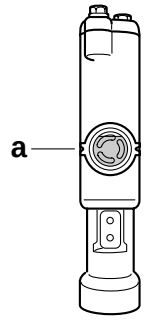
- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor 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.**

ECA13540

CAUTION:

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

5. Bleed:
   - Brake system
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-18.
6. 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" on page 3-16.

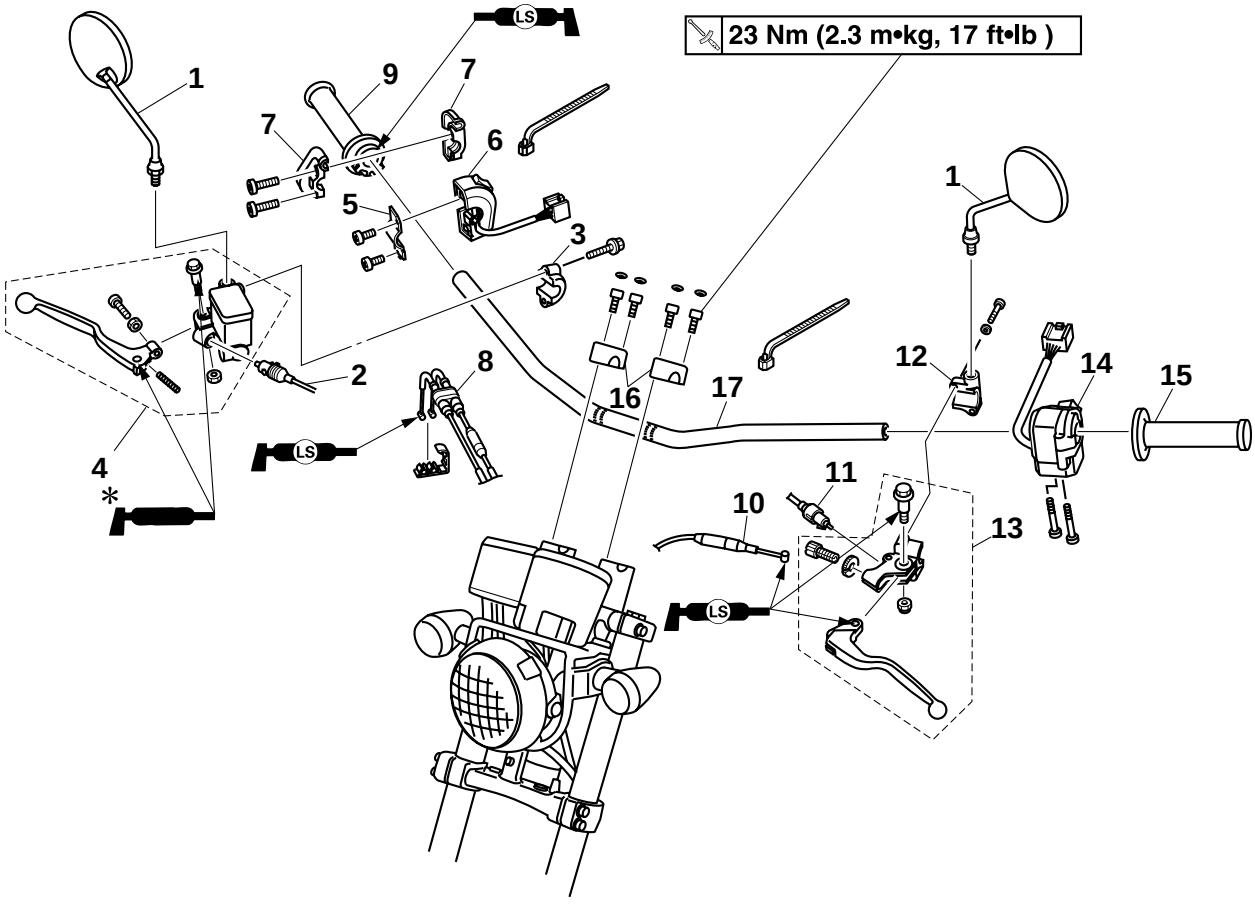


7. Check:
   - Brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-18.

EAS22840

HANDLEBAR

Removing the handlebar



Order	Job/Parts to remove	Q'ty	Remarks
1	Back view mirror (left/right)	1/1	
2	Front brake light switch	1	
3	Front brake master cylinder holder	1	
4	Master cylinder assembly	1	
5	Holder	1	
6	Right handlebar switch	1	
7	Throttle cable housing	1	
8	Throttle cable	1	
9	Throttle grip	1	
10	Clutch cable	1	
11	Clutch switch	1	
12	Bracket	1	
13	Clutch lever holder	1	
14	Left handlebar switch	1	
15	Handlebar grip	1	
16	Handlebar upper holder	2	
17	Handlebar	1	
			For installation, reverse the removal procedure.

*Apply silicone grease

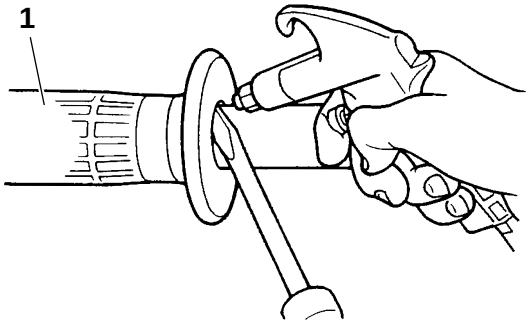
EAS22860
REMOVING THE HANDLEBAR
1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

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

2. Remove:
   - Handlebar grip “1”

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



EAS22880
CHECKING THE HANDLEBAR
1. Check:
   - Handlebar
     Bends/cracks/damage → Replace.

EWA13690
⚠ WARNING

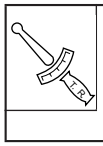
Do not attempt to straighten a bent handlebar as this may dangerously weaken it.

EAS22910
INSTALLING THE HANDLEBAR
1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

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

2. Install:
   - Handlebar “1”
   - Handlebar upper holders “2”

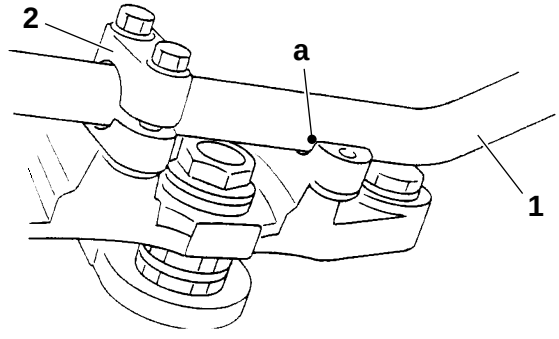


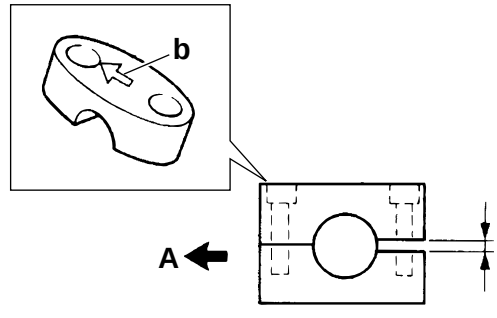
Handlebar upper holder bolt
23 Nm (2.3 m•kg, 17 ft•lb)

ECA14250
CAUTION:

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

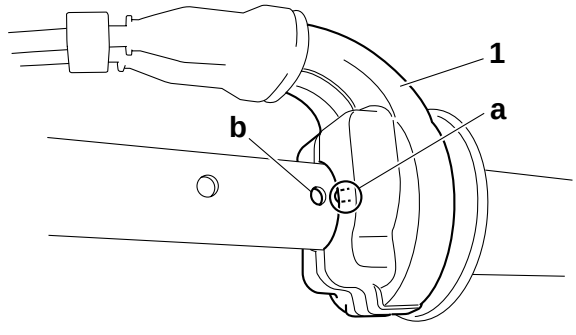
NOTE:
- Align the match mark “a” on the handlebar with the upper surface of the lower handlebar holders.
- The upper handlebar holders should be installed with the arrow marks “b” facing forward “A”.





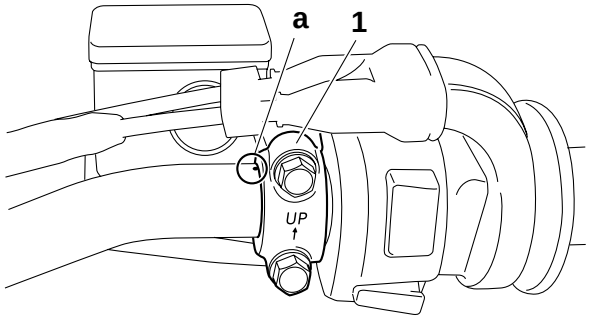
3. Install:
   - Throttle grip
   - Throttle cable housing “1”
   - Throttle cable

NOTE:
Align the projection “a” on the throttle cable housing with the hole “b” in the handlebar.



4. Install:
   - Right handlebar switch
   - Front brake master cylinder
   - Front brake master cylinder bracket “1”

NOTE:
Align the groove on the master cylinder bracket with the punch mark “a” in the handlebar.



5. Install:
   - Handlebar grip

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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.

EWA13700
WARNING
Do not touch the handlebar grip until the rubber adhesive has fully dried.

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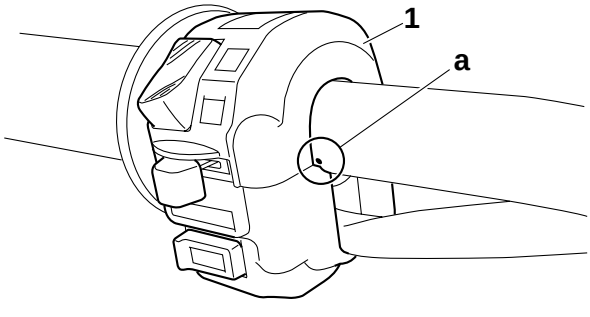
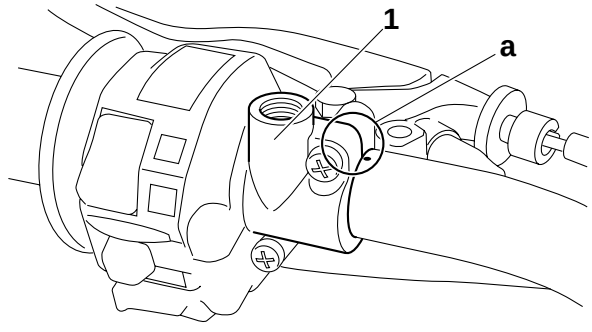
6. Install:
   - Left handlebar switch “1”

NOTE:
Align the groove on the handlebar switch with the punch mark “a” in the handlebar.



7. Install:
   - Clutch lever holder “1”
   - Clutch cable

NOTE:
Align the groove on the clutch lever holder with the punch mark “a” in the handlebar.



8. Connect:
   - Clutch switch coupler

NOTE:
Lubricate the end of the clutch cable with a thin coat of lithium-soap-based grease.

9. Adjust:
   - Clutch cable free play
     Refer to “ADJUSTING THE CLUTCH CABLE FREE PLAY” on page 3-12.

Clutch lever free play
10.0–15.0 mm (0.39–0.59 in)

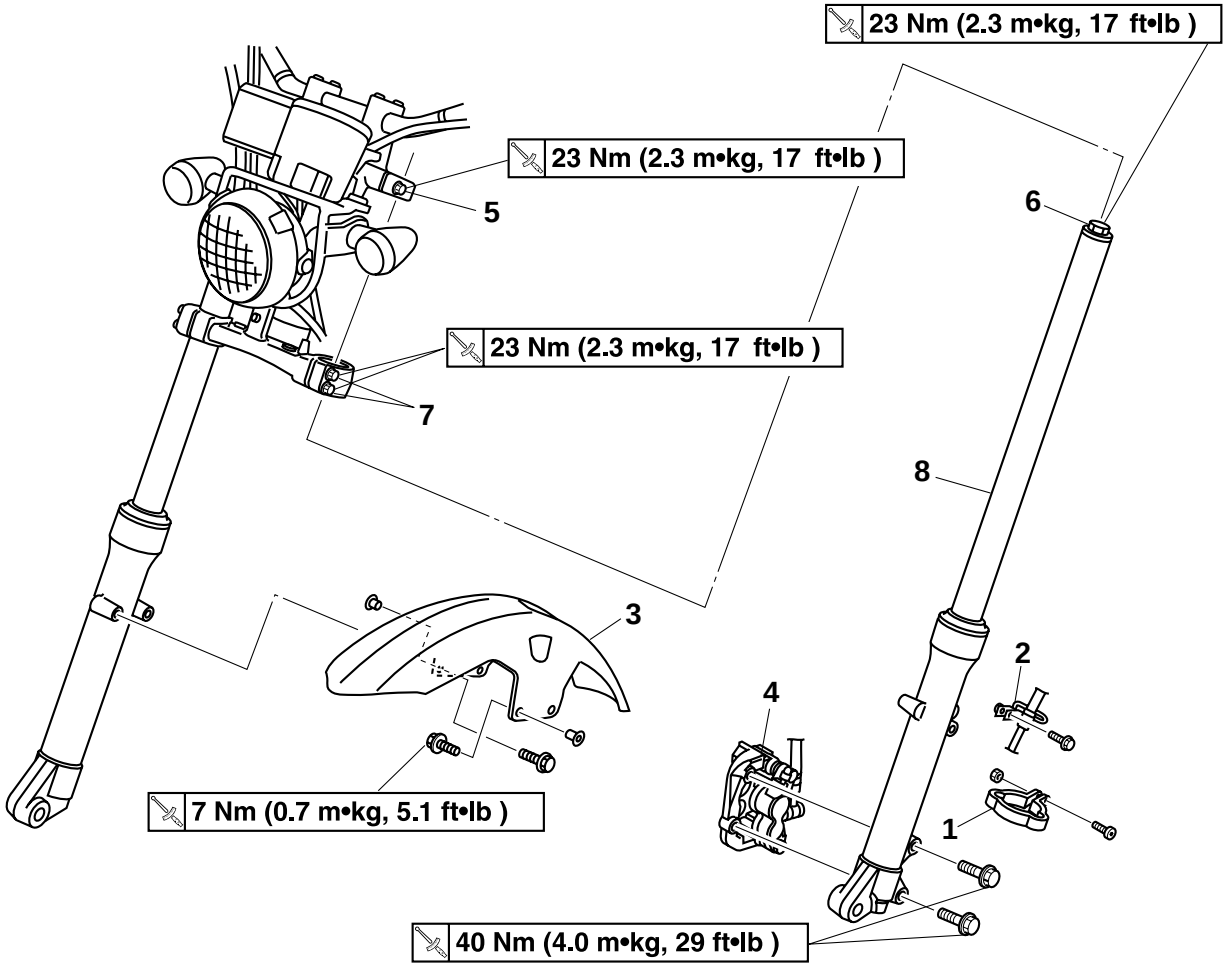
10. Adjust:
    - Throttle cable free play
      Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” on page 3-7.

Throttle cable free play
3.0–5.0 mm (0.12–0.20 in)

EAS22950

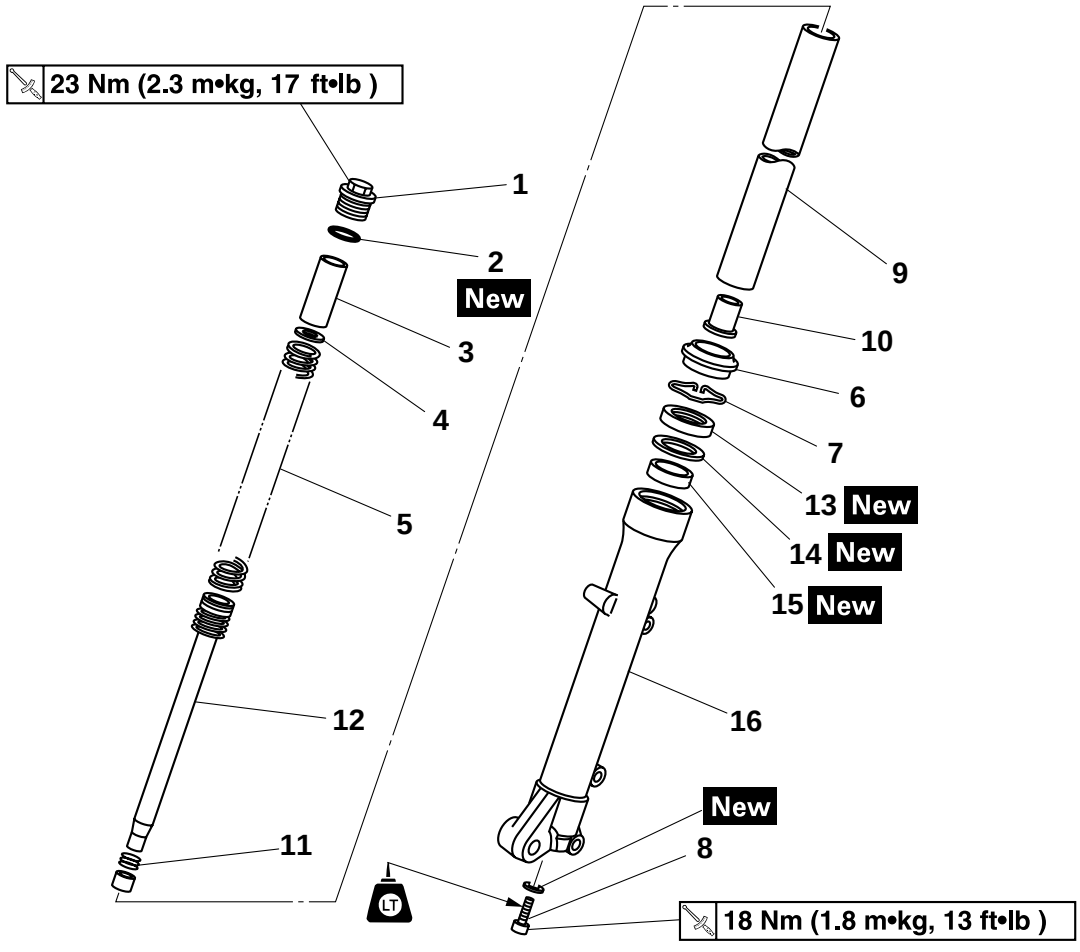
FRONT FORK

Removing the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
	Front wheel		Refer to "FRONT WHEEL" on page 4-2.
1	Brake hose holder	1	
2	Cable holder	1	
3	Front fender	1	
4	Front brake caliper	1	
5	Upper bracket pinch bolt	4	Loosen.
6	Cap bolt	2	Loosen.
7	Pinch bolt	4	Loosen.
8	Front fork	2	
			For installation, reverse the removal procedure.

Disassembling the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
1	Cap bolt	1	
2	O-ring	1	
3	Spacer	1	
4	Fork spring seat	1	
5	Fork spring	1	
6	Dust seal	1	
7	Oil seal clip	1	
8	Damper rod bolt	1	
9	Inner tube	1	
10	Oil lock piece	1	
11	Rebound spring	1	
12	Damper rod	1	
13	Oil seal	1	
14	Outer tube bushing	1	
15	Inner tube bushing	1	
16	Outer tube	1	
			For assembly, reverse the disassembly procedure.

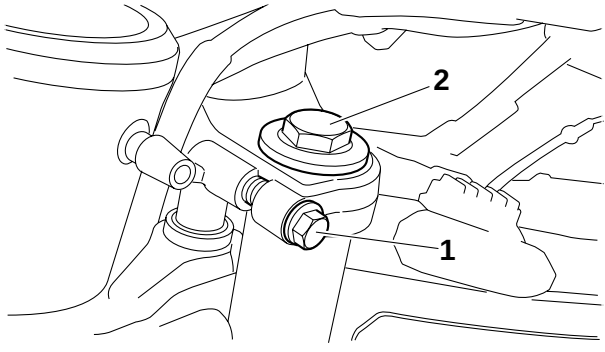
EAS22960
REMOVING THE FRONT FORK LEGS
The following procedure applies to both of the front fork legs.
1. Stand the vehicle on a level surface.

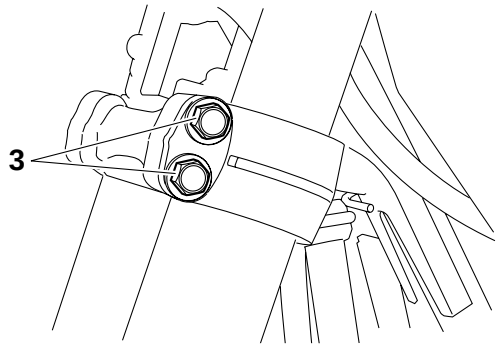
EWA13120
⚠ WARNING
Securely support the vehicle so that there is no danger of it falling over.

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

2. Loosen:
   - Upper bracket pinch bolt “1”
   - Cap bolt “2”
   - Lower bracket pinch bolt “3”

EWA13640
⚠ WARNING
Before loosening the upper and lower bracket pinch bolts, support the front fork leg.

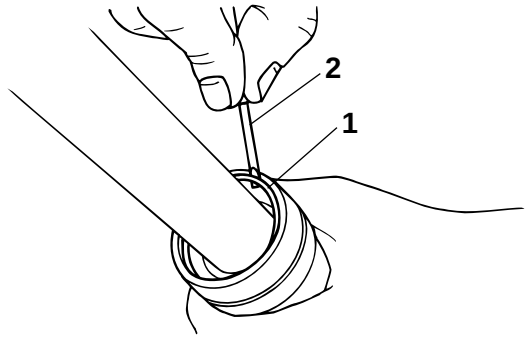




3. Remove:
   - Front fork leg

EAS22990
DISASSEMBLING THE FRONT FORK LEGS
The following procedure applies to both of the front fork legs.
1. Remove:
   - Fork spring seat
   - Fork spring
2. Drain:
   - Fork oil
3. Remove:
   - Dust seals
   - Oil seal clip “1”
     (with a flat-head screwdriver “2”)

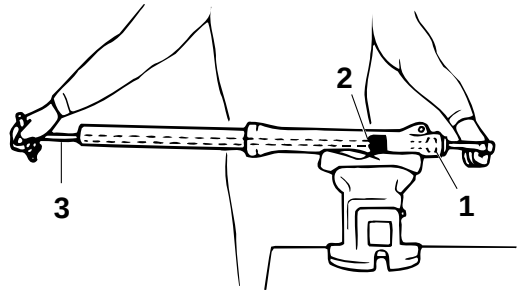
ECA14180
CAUTION:
Do not scratch the inner tube.



4. Remove:
   - Damper rod bolt “1”
   - Damper rod

NOTE:
While holding the damper rod with the damper rod holder “2” and T-handle “3”, loosen the damper rod bolt.

Damper rod holder
90890-01294
Damping rod holder set
YM-01300
T-handle
90890-01326
T-handle 3/8" drive 60 cm long
YM-01326



5. Remove:
   - Inner tube “1”

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a. Hold the front fork leg horizontally.
b. Securely clamp the brake caliper bracket in a

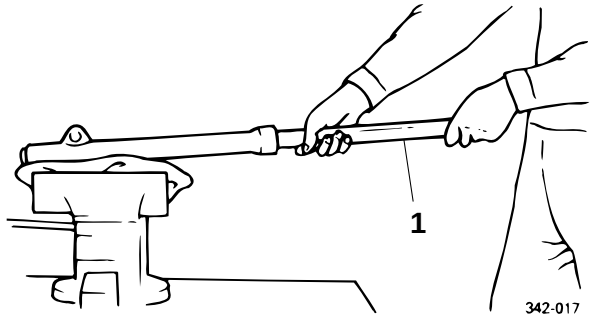
vise with soft jaws.

c. Separate the inner tube from the outer tube by pulling the inner tube forcefully but carefully.

ECA14190

CAUTION:

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



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EAS23010

CHECKING THE FRONT FORK LEGS

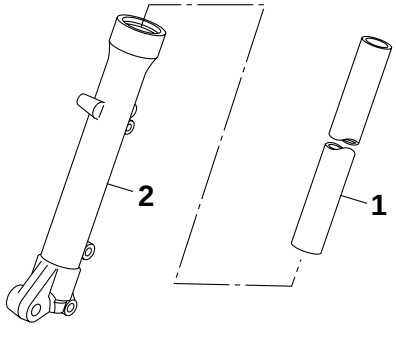
The following procedure applies to both of the front fork legs.

1. Check:
   - Inner tube “1”
   - Outer tube “2”
     Bends/damage/scratches → Replace.

EWA13650

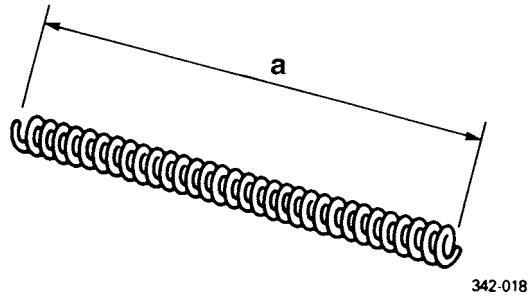
WARNING

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



2. Measure:
   - Spring free length “a”
     Out of specification → Replace.

Fork spring free length
478.0 mm (18.82 in)
Limit
468.4 mm (18.44 in)



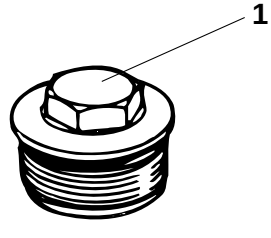
3. Check:
   - Damper rod
     Damage/wear → Replace.
     Obstruction → Blow out all of the oil passages with compressed air.
   - Oil lock piece
     Damage → Replace.

ECA14200

CAUTION:

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

4. Check:
   - Cap bolt “1”
     Damage/wear → Replace.



EAS23020

ASSEMBLING THE FRONT FORK LEGS

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

EWA13660

WARNING

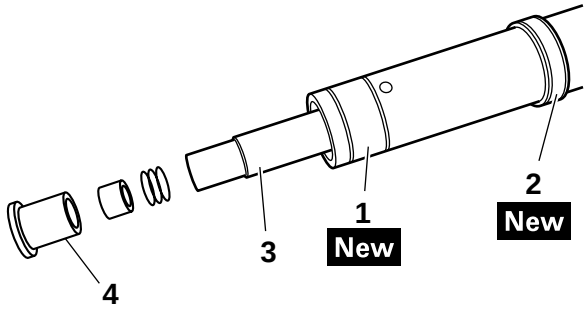
- **Make sure the oil levels in both front fork**

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:
   - Inner tube bushing "1" New
   - Outer tube bushing "2" New
   - Damper rod "3"
   - Oil lock piece "4"

ECA14210
CAUTION:
Allow the damper rod assembly 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. Lubricate:
   - Inner tube's outer surface

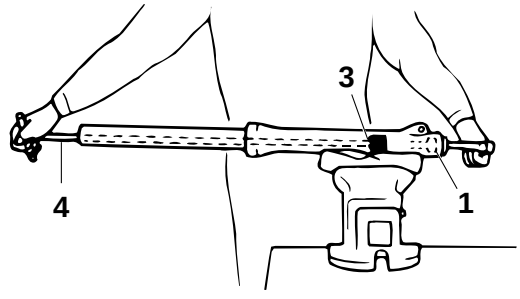
Recommended oil
Fork oil 15W or equivalent

3. Tighten:
   - Damper rod bolt "1"
   - Washer

Damper rod bolt
18 Nm (1.8 m•kg, 13 ft•lb)
LOCTITE®

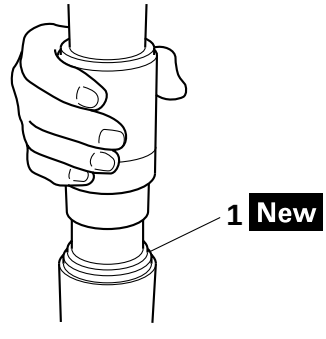
NOTE:
While holding the damper rod with the damper rod holder "3" and T-handle "4", tighten the damper rod bolt.

Damper rod holder
90890-01294
Damping rod holder set
YM-01300
T-handle
90890-01326
T-handle 3/8" drive 60 cm long
YM-01326



4. Install:
   - Oil seal "1" New
     (with the fork seal driver and adapter)

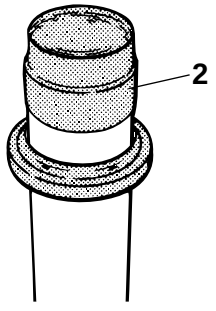
Fork seal driver weight
90890-01367
Replacement hammer
YM-A9409-7
Fork seal driver attachment (ø35)
90890-01369
Replacement 35 mm
YM-A9409-5



ECA14220
CAUTION:
Make sure the numbered side of the oil seal faces up.

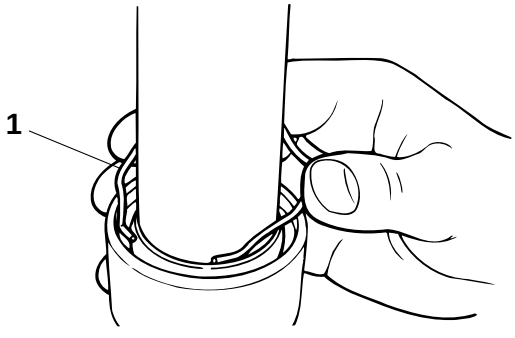
NOTE:
- Before installing the oil seal, lubricate its lips with lithium soap base grease.
- Lubricate the outer surface of the inner tube

with fork oil.
- Before installing the oil seal, cover the top of the front fork leg with a plastic bag “2” to protect the oil seal during installation.



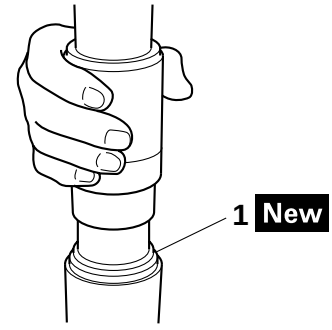
5. Install:
   - Oil seal clip “1”

NOTE:
Adjust the oil seal clip so that it fits into the outer tube’s groove.



6. Install:
   - Dust seal “1” New
     (with the fork seal driver weight)

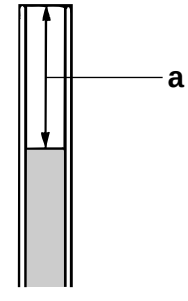
Fork seal driver weight
90890-01367
Replacement hammer
YM-A9409-7
Fork seal driver attachment (ø35)
90890-01369
Replacement 35 mm
YM-A9409-5



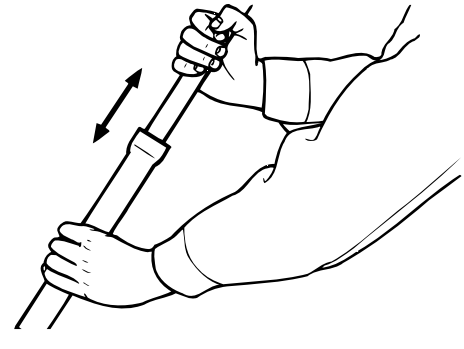
7. Fill:
   - Front fork leg
     (with the specified amount of the recommended fork oil)

Quantity
292.0 cm³ (9.87 US oz) (10.30 Imp.oz)
Recommended oil
Fork oil 15W or equivalent

Level
125.0 mm (4.92 in)



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

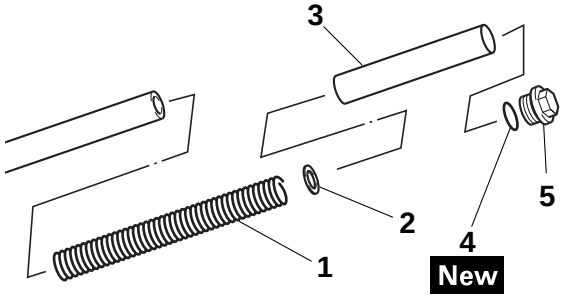


8. Install:
   - Fork spring “1”

- Fork spring seat “2”
- Spacer “3”
- O-ring “4” New
- Cap bolt “5”

NOTE:

- Install the spring with the smaller pitch facing up.
- Before installing the cap bolt, lubricate its O-ring with grease.
- Temporarily tighten the cap bolt.



EAS23050

INSTALLING THE FRONT FORK LEGS

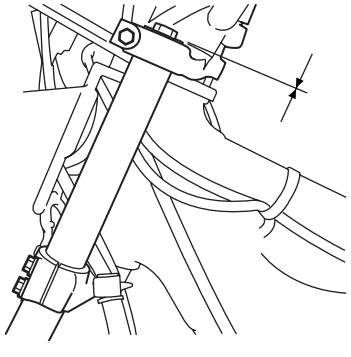
The following procedure applies to both of the front fork legs.

1. Install:
   - Front fork leg

     Temporarily tighten the upper and lower bracket pinch bolts.

NOTE:

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



2. Tighten:
   - Lower bracket pinch bolt “1”

	Lower bracket pinch bolt **23 Nm (2.3 m•kg, 17 ft•lb)**

- Cap bolt “2”

	Cap bolt **23 Nm (2.3 m•kg, 17 ft•lb)**

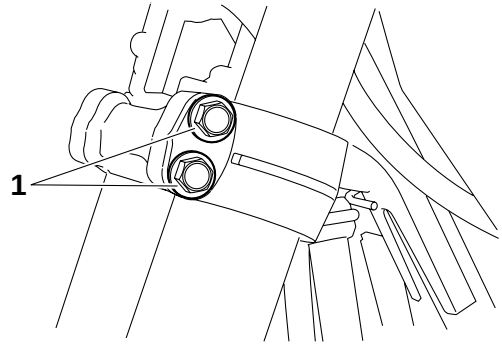
- Upper bracket pinch bolt “3”

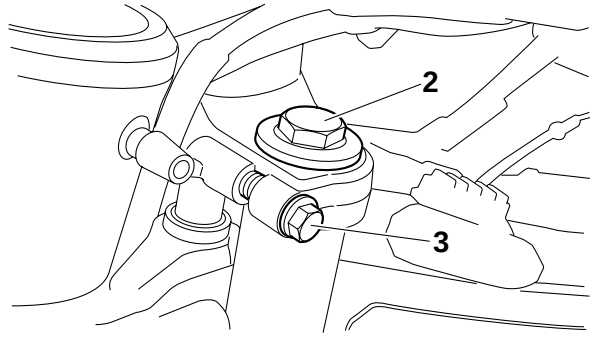
	Upper bracket pinch bolt **23 Nm (2.3 m•kg, 17 ft•lb)**

EWA13680

WARNING

Make sure the brake hoses are routed properly.

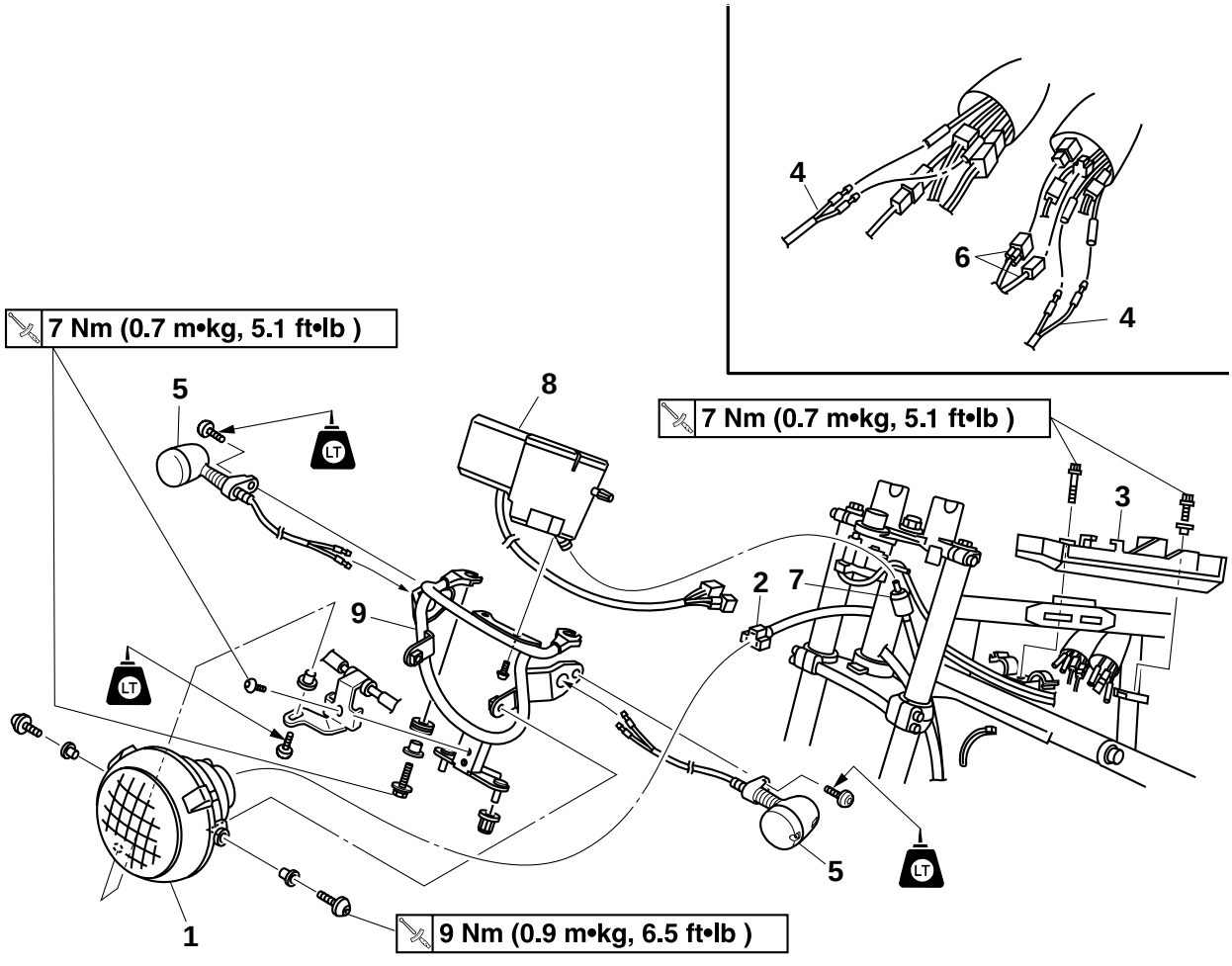




EAS23090

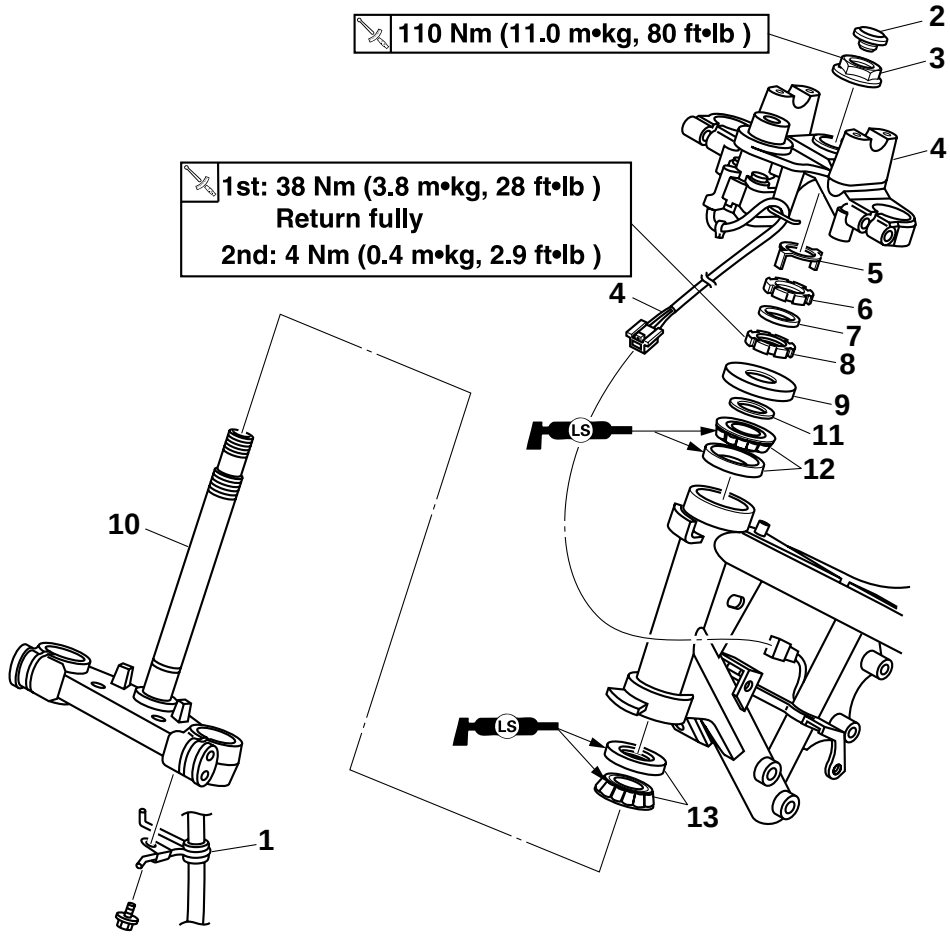
STEERING HEAD

Removing the headlight and meter



Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank		Refer to "FUEL TANK" on page 6-1.
	Handlebar		Refer to "HANDLEBAR" on page 4-38.
1	Headlight body	1	
2	Headlight coupler	1	Disconnect.
3	Tool box	1/1	
4	Front turn signal leads	2/2	
5	Front turn signal light assembly (left/right)	1/1	
6	Meter lead coupler	2	
7	Speedometer cable	1	
8	Meter	1	
9	Stay	1	
			For installation, reverse the removal procedure.

Removing the lower bracket



Order	Job/Parts to remove	Q'ty	Remarks
	Front fork		Refer to "FRONT FORK" on page 4-41.
	Handlebar		Refer to "HANDLEBAR" on page 4-38.
	Headlight		
	Meter		
1	Cable guide	1	
2	Cap	1	
3	Steering stem nut	1	
4	Main switch coupler/Upper bracket	1/1	
5	Lock washer	1	
6	Upper ring nut	1	
7	Rubber washer	1	
8	Lower ring nut	1	
9	Ball race cover	1	
10	Lower bracket	1	
11	Washer	1	
12	Bearing/bearing race	1/1	
13	Bearing/bearing race	1/1	
			For installation, reverse the removal procedure.

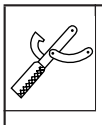
EAS23110
REMOVING THE LOWER BRACKET
1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

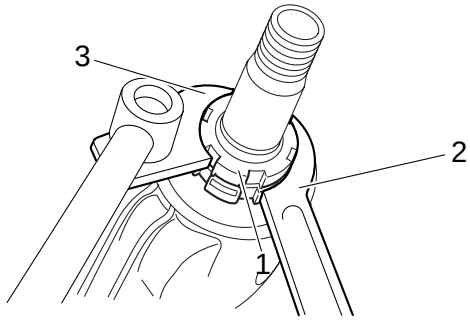
Securely support the vehicle so that there is no danger of it falling over.

2. Remove:
- Lock washer
- Upper ring nut “1”
- Rubber washer
- Lower ring nut
- Lower bracket

NOTE:
Hold the lower ring nut with the ring nut wrench “2”, and then remove the upper ring nut with the steering nut wrench “3”.



Ring nut wrench
90890-01268
Spanner wrench
YU-01268
Steering nut wrench
90890-01403
Spanner wrench
YU-33975



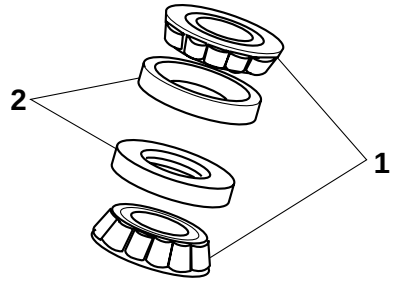
EWA13730
⚠ WARNING

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

EAS23130
CHECKING THE STEERING HEAD
1. Wash:
- Bearings
- Bearing races

Recommended cleaning solvent
Kerosene

2. Check:
- Bearings “1”
- Bearing races “2”
  Damage/pitting → Replace.



3. Replace:
- Bearings
- Bearing races

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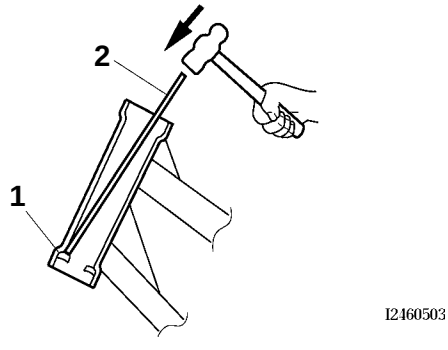
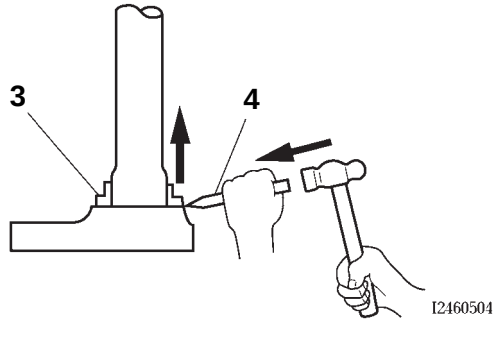
a. Remove the bearing races “1” from the steering head pipe with a long rod “2” and hammer.
b. Remove the bearing race “3” from the lower bracket with a floor chisel “4” and hammer.
c. Install a new bearing races.



I2460503



I2460504

ECA14270
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.

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

EAS23140
INSTALLING THE STEERING HEAD

1. Lubricate:
   - Upper bearing
   - Lower bearing
   - Bearing races

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

2. Install:
   - Washer
   - Ball race cover
   - Lower ring nut
   - Rubber washer
   - Upper ring nut
   - Lock washer
     Refer to “CHECKING AND ADJUSTING THE STEERING HEAD” on page 3-20.
3. Install:
   - Upper bracket
   - Steering stem nut

NOTE:
Temporarily tighten the steering stem nut.

4. Install:
   - Front fork legs
     Refer to “FRONT FORK” on page 4-41.

NOTE:
Temporarily tighten the upper and lower bracket pinch bolts.

5. Tighten:
   - Steering stem nut

	Steering stem nut **110 Nm (11.0 m•kg, 80 ft•lb)**

   - Upper bracket pinch bolts

	Upper bracket pinch bolts **23 Nm (2.3 m•kg, 17 ft•lb)**

   - Lower bracket pinch bolts

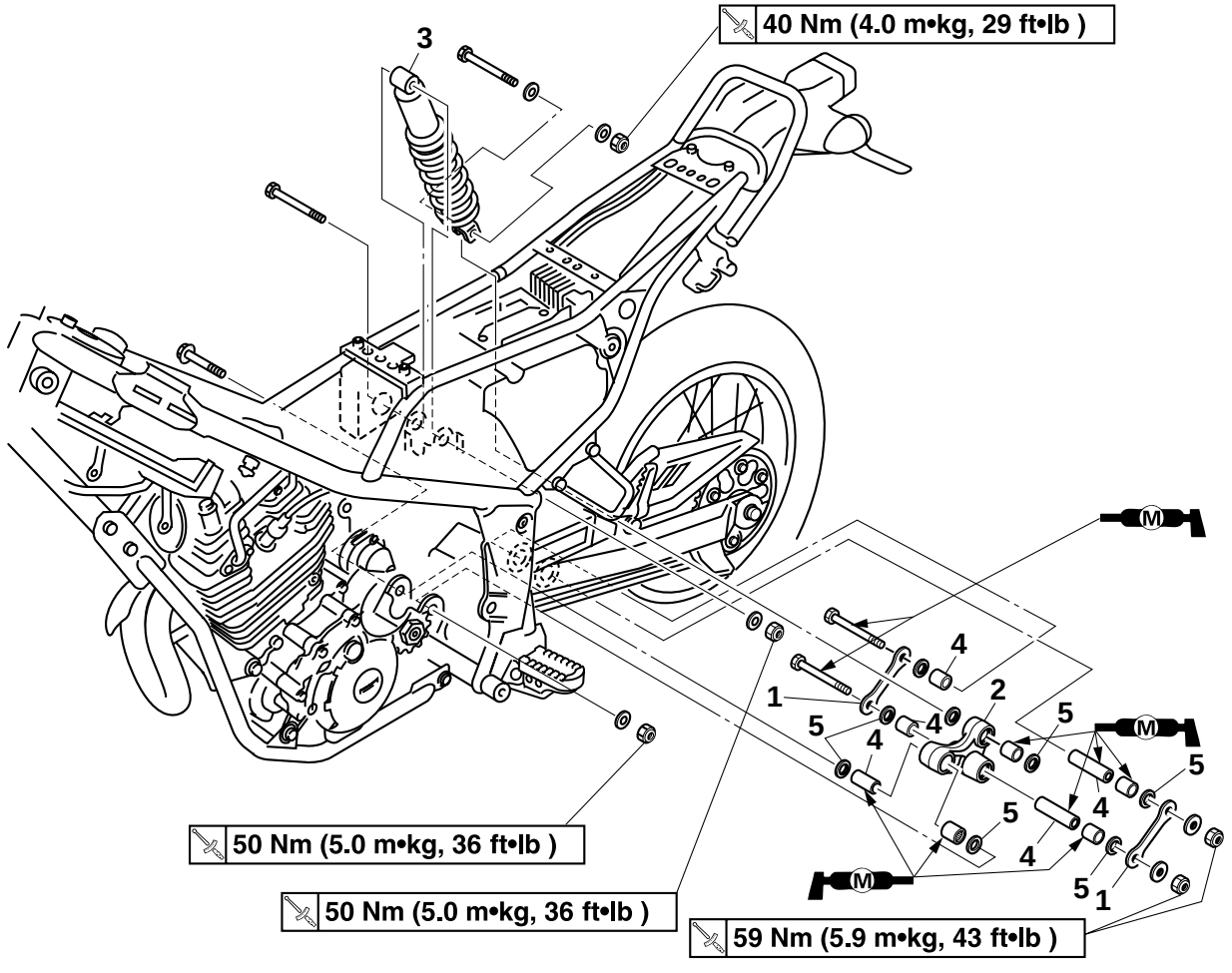
	Lower bracket pinch bolts **23 Nm (2.3 m•kg, 17 ft•lb)**

Refer to “FRONT FORK” on page 4-41.

EAS23160

REAR SHOCK ABSORBER ASSEMBLY

Removing the rear shock absorber assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Battery		Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-38.
1	Connecting rod	2	
2	Relay arm	1	
3	Rear shock absorber assembly	1	
4	Collars	3	
5	Oil seals	8	
			For installation, reverse the removal procedure.

EAS23180
HANDLING THE REAR SHOCK ABSORBER

EWA13740
⚠ 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.

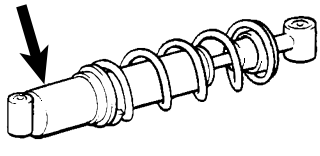
- **Do not tamper or attempt to open the rear shock absorber.**
- **Do not subject the rear shock absorber to an open flame or any other source of high heat. High heat can cause an explosion due to excessive gas pressure.**
- **Do not deform or damage the rear shock absorber in any way. Rear shock absorber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

EAS23190
DISPOSING OF A REAR SHOCK ABSORBER

1. Gas pressure must be released before disposing of a rear shock absorber. To release the gas pressure, drill a 2–3mm hole through the rear shock absorber at a point 15–20 mm from its end as shown.

EWA13760
⚠ WARNING

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



EAS23230
REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

1. Stand the vehicle on a level surface.

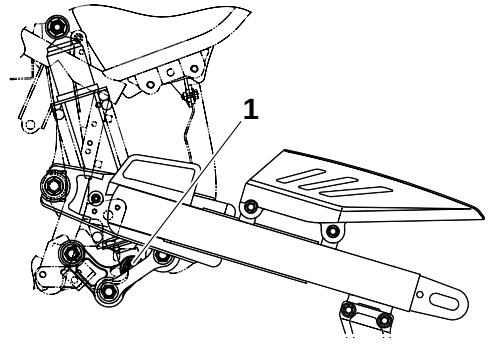
EWA13120
⚠ WARNING

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

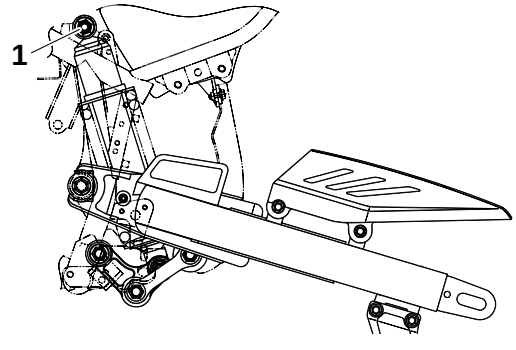
NOTE:
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:
   - Seat
   - Fuel tank side cover (left/right)
   - Side covers (left/right)
     Refer to “GENERAL CHASSIS” on page 4-1.
   - Starter relay
   - Rear wheel
     Refer to “REAR WHEEL” on page 4-9.
3. Remove:
   - Connecting rod (left and right)
   - Rear shock absorber bolt
   - Rear shock absorber lower nut “1”

NOTE:
While removing the rear shock absorber assembly lower nut, hold the swingarm so that it does not drop down.

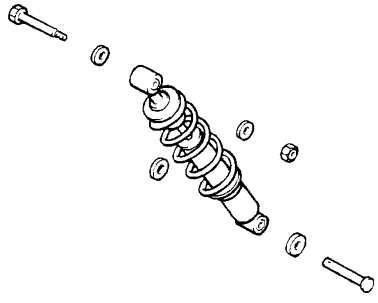


4. Remove:
   - Rear shock absorber assembly lower bolt
   - Rear shock absorber assembly upper nut “1”
   - Washer
   - Rear shock absorber assembly



EAS23240
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

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.
   - Bolts
     Bends/damage/wear → Replace.



EAS23310
INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Lubricate:
   - Spacers
   - Bearings

	Recommended lubricant **Molybdenum disulfide grease**

2. Install:
   - Rear shock absorber assembly

NOTE:

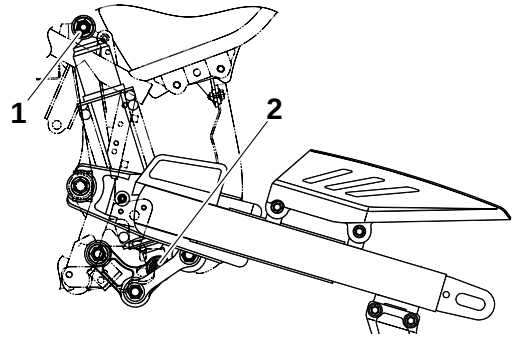
- When installing the rear shock absorber assembly, lift up the swingarm.
- Install the connecting arm front bolt from the right.

3. Tighten:
   - Rear shock absorber assembly upper nut “1”

	Rear shock absorber assembly upper nut **50 Nm (5.0 m•kg, 36 ft•lb)**

   - Rear shock absorber assembly lower nut
   - Connecting rod lower nut “2”

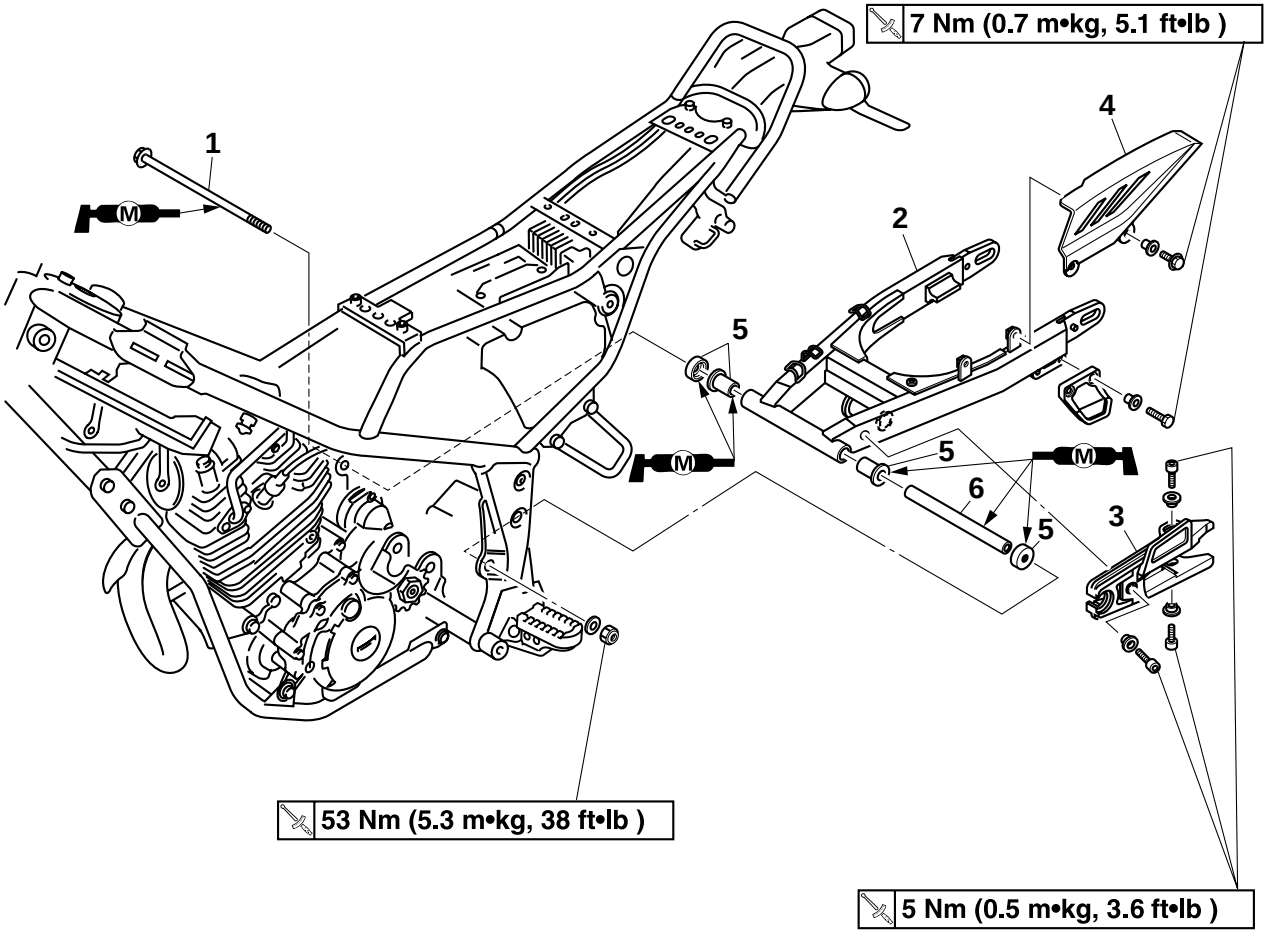
	Rear shock absorber assembly lower nut **40 Nm (4.0 m•kg, 29 ft•lb)**



EAS23330

SWINGARM

Removing the swingarm



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Battery		Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-38.
	Rear shock absorber assembly		Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-52.
	Rear wheel		Refer to "REAR WHEEL" on page 4-9.
	Rear brake caliper		Refer to "REAR BRAKE" on page 4-26.
1	Pivot shaft	1	
2	Swingarm	1	
3	Seal guard	1	
4	Drive chain case	1	
5	Dust cover/collar	2/2	
6	Spacer	1	
			For installation, reverse the removal procedure.

EAS23350
REMOVING THE SWINGARM

1. Stand the vehicle on a level surface.

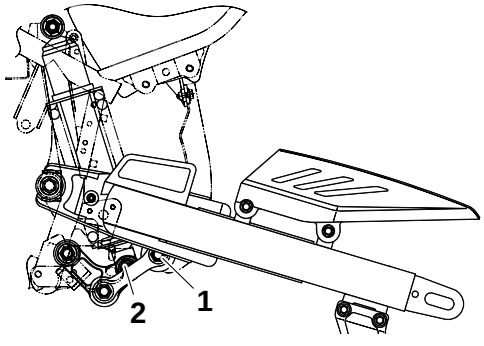
EWA13120
⚠ WARNING

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

NOTE:
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:
   - Connecting rod bolt “1”
   - Rear shock absorber bolt
   - Rear shock absorber assembly lower nut “2”

NOTE:
When removing the rear shock absorber assembly lower bolt, hold the swingarm so that it does not drop down.



3. Measure:
   - Swingarm side play
   - Swingarm vertical movement

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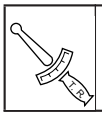
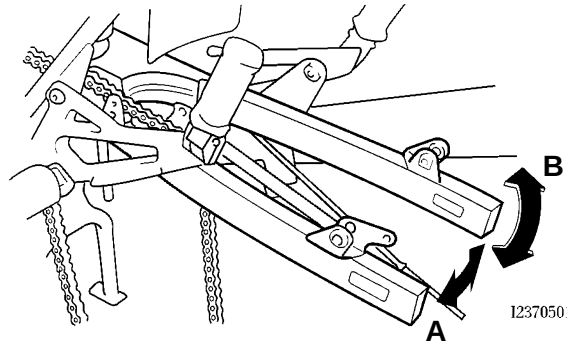
a. Measure the tightening torque of the pivot shaft nut.

	**Pivot shaft nut** **53 Nm (5.3 m•kg, 38 ft•lb)**

b. Measure the swingarm side play “A” by moving the swingarm from side to side.
c. If the swingarm side play is out of specification, check the spacers, bearings, washers, and dust covers.
d. Check the swingarm vertical movement “B” by moving the swingarm up and down.
   If swingarm vertical movement is not smooth or if there is binding, check the spacers, bearings, washers, and dust covers.



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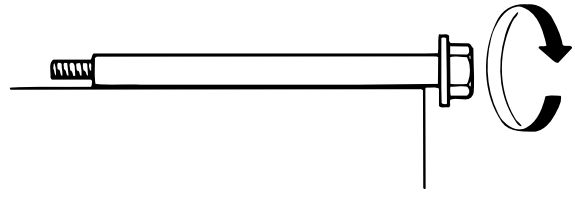
4. Remove:
   - Connecting rod (left/right)
   - Swingarm
   - Drive chain
   - Relay arm

EAS23360
CHECKING THE SWINGARM

1. Check:
   - Swingarm
     Bends/cracks/damage → Replace.
2. Check:
   - Pivot shaft
     Roll the pivot shaft on a flat surface.
     Bends → Replace.

EWA13770
⚠ WARNING

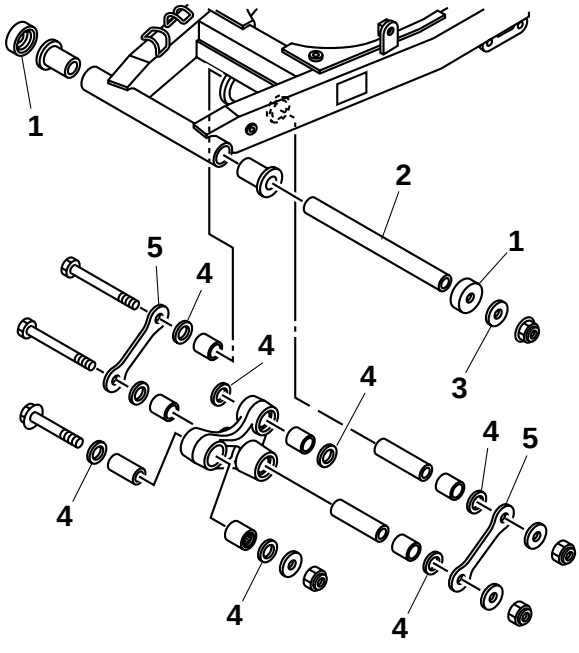
Do not attempt to straighten a bent pivot shaft.



3. Wash:
   - Pivot shaft
   - Dust covers
   - Spacer
   - Washers
   - Bearings

Recommended cleaning solvent
Kerosene

4. Check:
   - Dust covers “1”
   - Spacer “2”
   - Washers “3”
   - Oil seals “4”
     Damage/wear → Replace.
   - Bearings
     Damage/pitting → Replace.
   - Bearings “4”
   - Connecting rod “5”
     Damage/pitting → Replace.



5. Check:
   - Spacer
     Damage/scratches → Replace.

EAS23380
INSTALLING THE SWINGARM

1. Install:
   - Drive chain
2. Lubricate:
   - Bearings
   - Spacers
   - Dust covers
   - Pivot shaft

Recommended lubricant
Molybdenum disulfide grease

3. Install:
   - Relay arm
   - Connecting rod (left and right)
4. Tighten:
   - Relay-arm-to-frame nut

Relay-arm-to-frame nut
50 Nm (5.0 m•kg, 36 ft•lb)

   - Connecting rod nut

Connecting rod nut
59 Nm (5.9 m•kg, 43 ft•lb)

NOTE:
Install the connecting rod front bolt from the right.

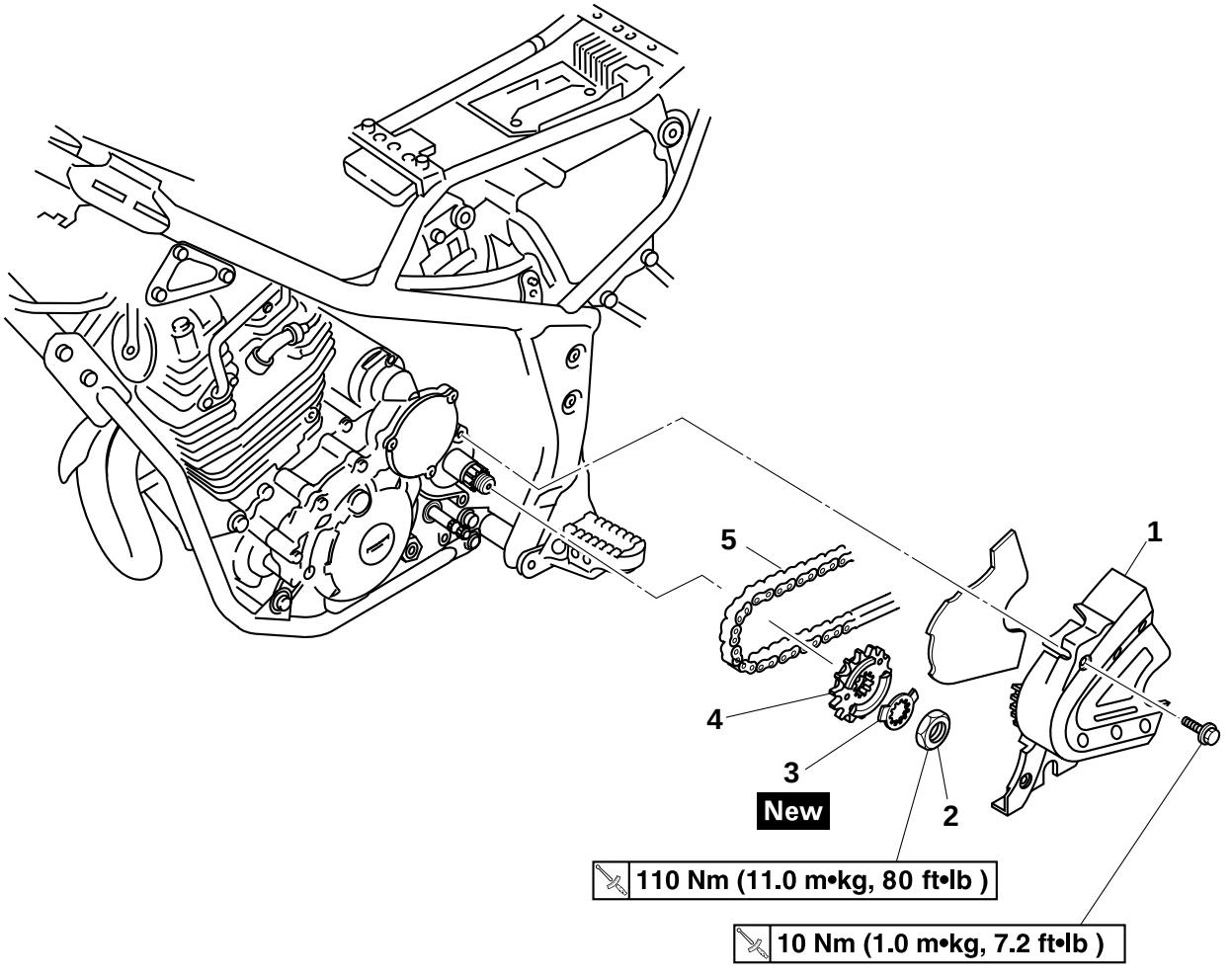
5. Install:
   - Rear shock absorber assembly
   - Rear wheel
     Refer to “REAR SHOCK ABSORBER ASSEMBLY” on page 4-52 and “REAR WHEEL” on page 4-9.
6. Adjust:
   - Drive chain slack
     Refer to “ADJUSTING THE DRIVE CHAIN SLACK” on page 3-19.

Drive chain slack
40.0–45.0 mm (1.57–1.77 in)

EAS23400

CHAIN DRIVE

Removing the drive chain



Order	Job/Parts to remove	Q'ty	Remarks
	Swingarm		Refer to "SWINGARM" on page 4-55.
1	Drive sprocket cover	1	Disconnect.
2	Nut	1	
3	Lock washer	1	Straighten the lock washer tab.
4	Drive sprocket	1	Loosen the rear wheel sprocket nut.
5	Drive chain	1	
			For installation, reverse the removal procedure.

EAS23420
REMOVING THE DRIVE CHAIN
1. Stand the vehicle on a level surface.

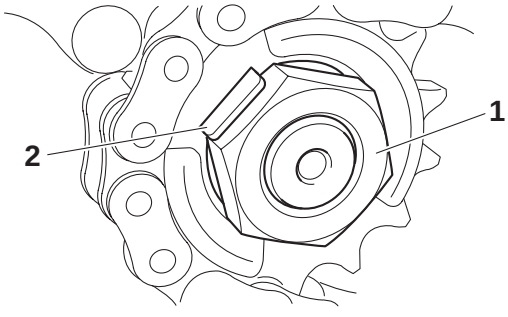
EWA13120
⚠ WARNING

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

NOTE:
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:
   - Drive sprocket nut “1”
   - Lock washer “2”

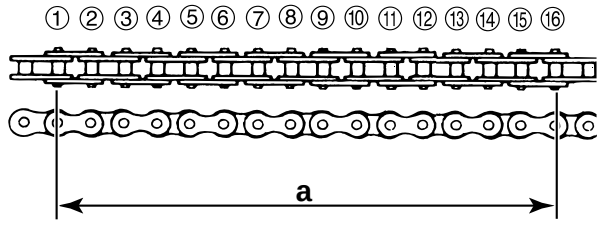
NOTE:
- Straighten the lock washer tab.
- While applying the rear brake, loosen the drive sprocket nut.
- Loosen the drive sprocket nut, and then remove the rear wheel and swingarm.



3. Remove:
   - Swingarm
     Refer to “SWINGARM” on page 4-55.

EAS23440
CHECKING THE DRIVE CHAIN
1. Measure:
   - 15-link section “a” of the drive chain
     Out of specification → Replace the drive chain, drive sprocket and rear wheel sprocket as a set.

	15-link length limit **191.5 mm (7.54 in)**



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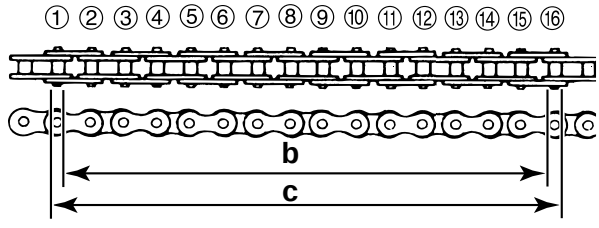
a. Measure the length of 15 links on the inner side “b” and outer side “c” of the pin and calculate the length between pin centers.
b. Length “a” between pin centers = (inner dimension “b” + outer dimension “c”)/2
c. 15-Link section “a” of the drive chain.



NOTE:
- While measuring the 15-link section, push down on the drive chain to increase its tension.
- Perform this measurement at two or three different places.

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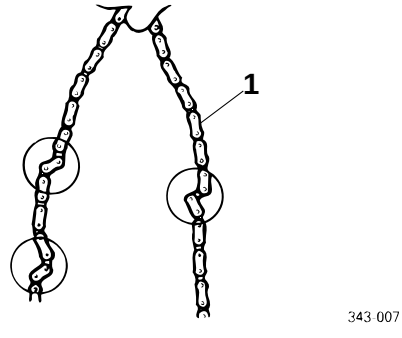
2. Check:
   - Drive chain
     Stiffness → Clean and lubricate or replace.



3. Clean:
   - Drive chain

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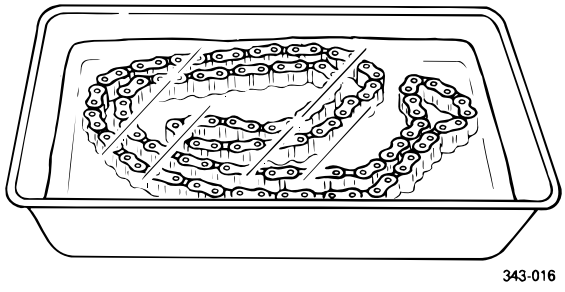
a. Wipe the drive chain with a clean cloth.
b. Put the drive chain in kerosene and remove any remaining dirt.
c. Remove the drive chain from the kerosene and completely dry it.

ECA14290

CAUTION:

- **This motorcycle has a drive chain with small rubber O-rings "1" between the drive chain side plates. Never use high-pressure water or air, steam, gasoline, certain solvents (e.g., benzine), or a coarse brush to clean the drive chain. High-pressure methods could force dirt or water into the drive chain's internals, and solvents will deteriorate the O-rings. A coarse brush can also damage the O-rings. Therefore, use only kerosene to clean the drive chain.**
- **Do not soak the drive chain in kerosene for more than ten minutes, otherwise the O-rings can be damaged.**



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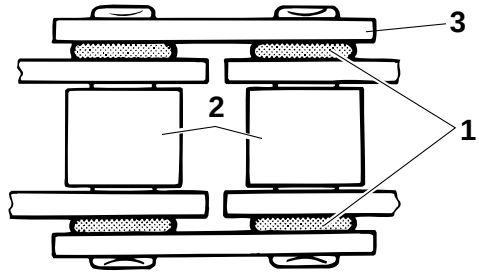
4. Check:
   - O-rings "1"
     Damage → Replace the drive chain.
   - Drive chain rollers "2"
     Damage/wear → Replace the drive chain.
   - Drive chain side plates "3"
     Damage/wear → Replace the drive chain.
     Cracks → Replace the drive chain and make sure the battery breather hose is properly routed away from the drive chain and below the swingarm.



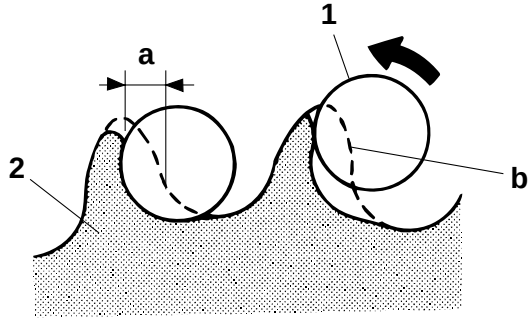
5. Lubricate:
   - Drive chain

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

EAS23460

CHECKING THE DRIVE SPROCKET

1. Check:
   - Drive sprocket
   - Rear wheel sprocket
     More than 1/4 tooth "a" wear → Replace the drive chain sprockets as a set.
     Bent teeth → Replace the drive chain sprockets as a set.



a. More than 1/4 tooth wear
b. Correct

1. Drive chain roller
2. Drive chain sprocket

EAS23470

CHECKING THE REAR WHEEL SPROCKET

Refer to "CHECKING AND REPLACING THE REAR WHEEL SPROCKET" on page 4-11.

EAS23490

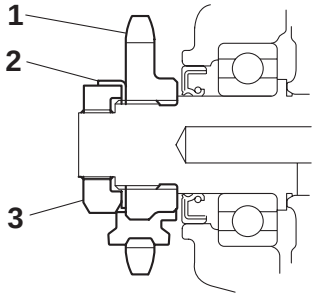
INSTALLING THE DRIVE CHAIN

1. Lubricate:
   - Drive chain

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

2. Install:
   - Drive chain
   - Drive sprocket “1”
   - Lock washer “2”
   - Drive sprocket nut “3”
     (Do not tighten.)

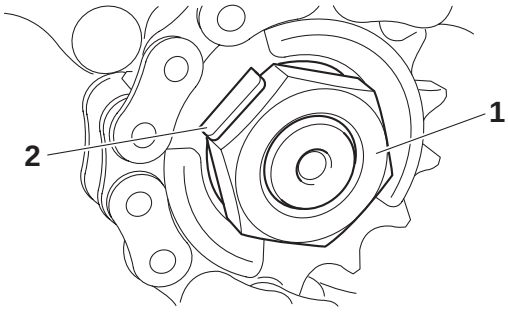
NOTE:
Install the drive sprocket and drive sprocket nut as shown.



3. Install:
   - Swingarm
     Refer to “SWINGARM” on page 4-55.
   - Rear wheel
     Refer to “REAR WHEEL” on page 4-9.
4. Tighten:
   - Drive sprocket nut “1”

Drive sprocket nut
110 Nm (11.0 m•kg, 80 ft•lb)

NOTE:
- While applying the rear brake, tighten the drive sprocket nut.
- Bend the lock washer tab “2” along a flat side of the nut.



5. Adjust:
   - Drive chain slack
     Refer to “ADJUSTING THE DRIVE CHAIN SLACK” on page 3-19.

Drive chain slack
40.0–45.0 mm (1.57–1.77 in)

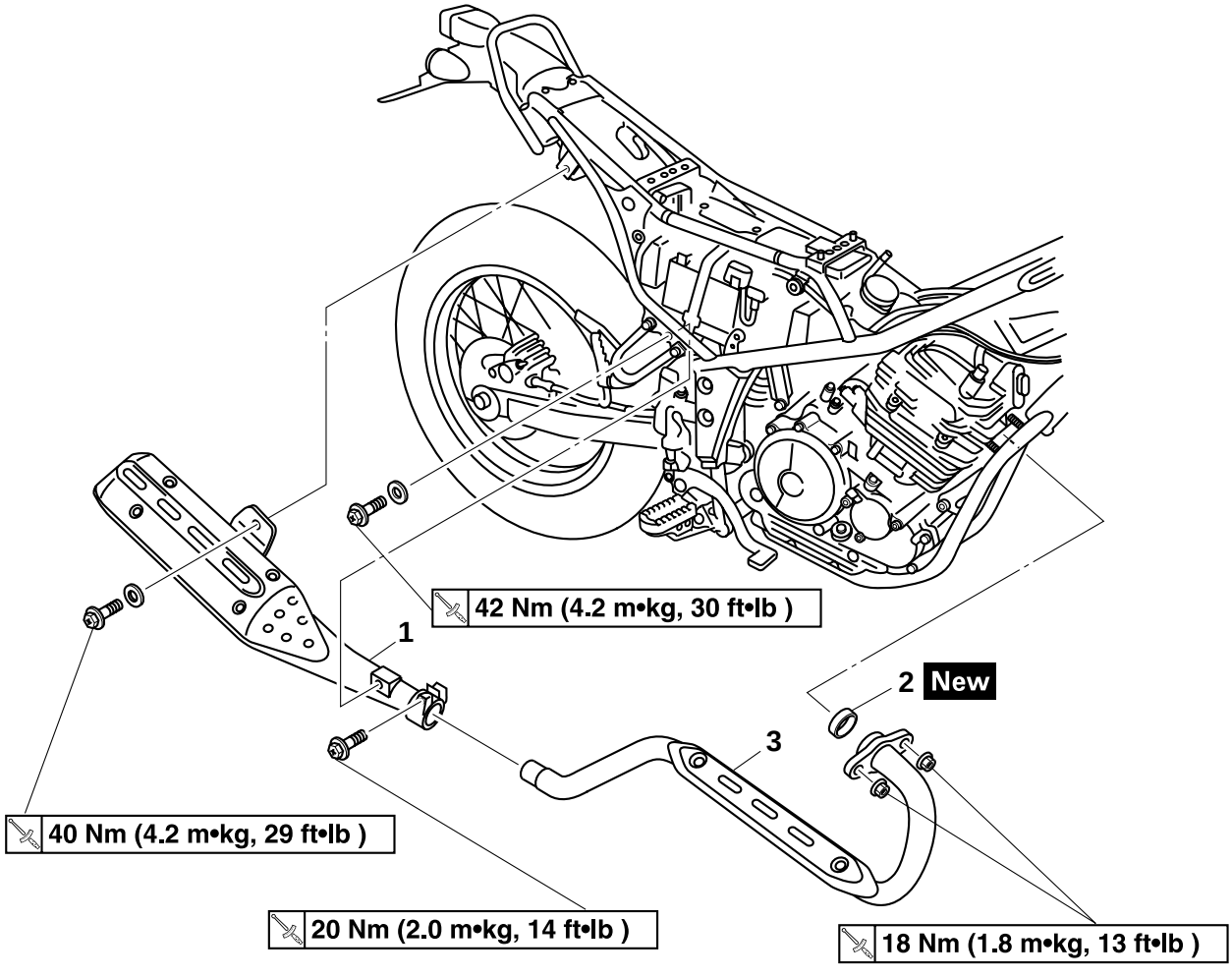
ECA13550
CAUTION:
A drive chain that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swingarm or cause an accident. Therefore, keep the drive chain slack within the specified limits.

ENGINE

EAS23710

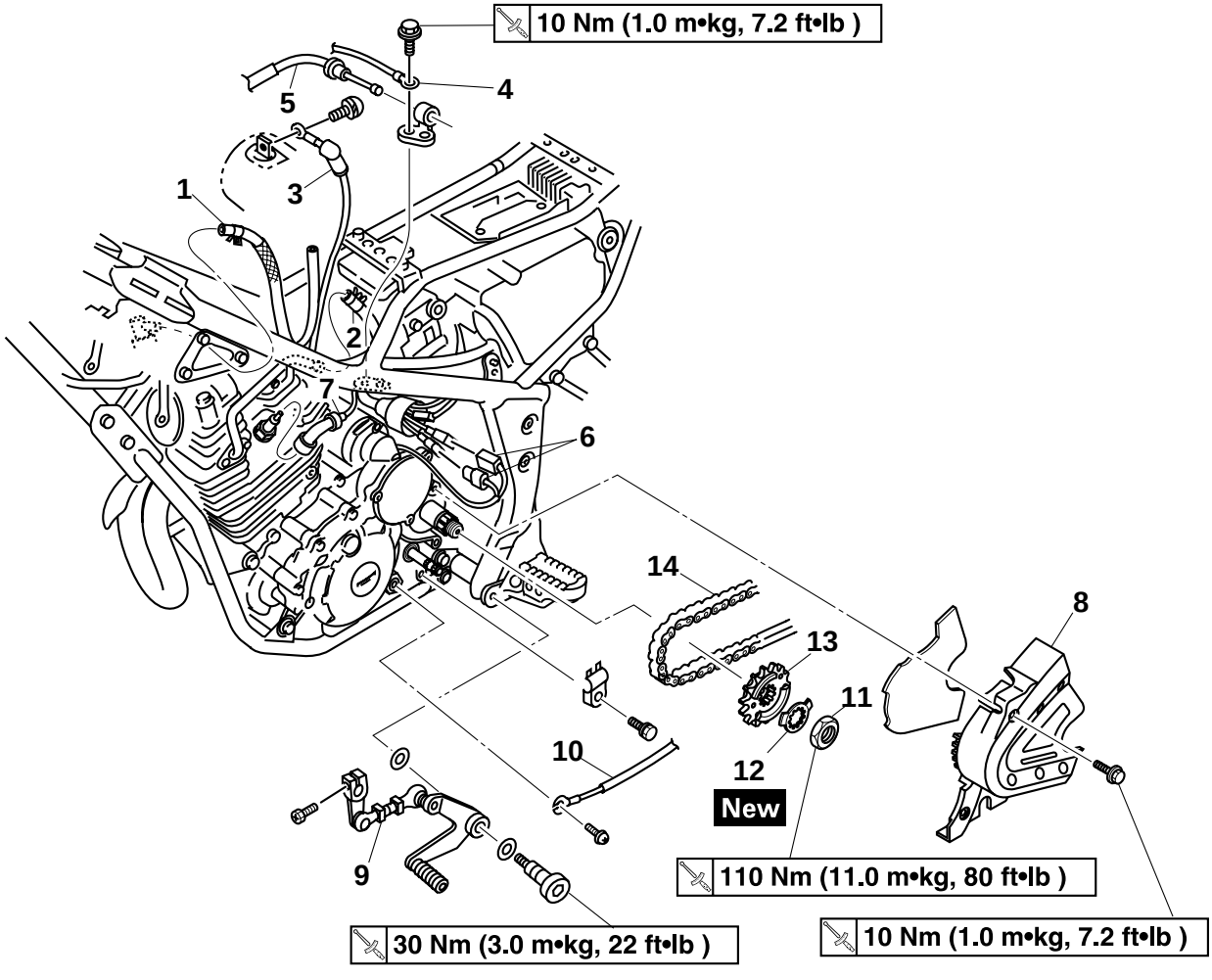
ENGINE REMOVAL

Removing the exhaust pipe



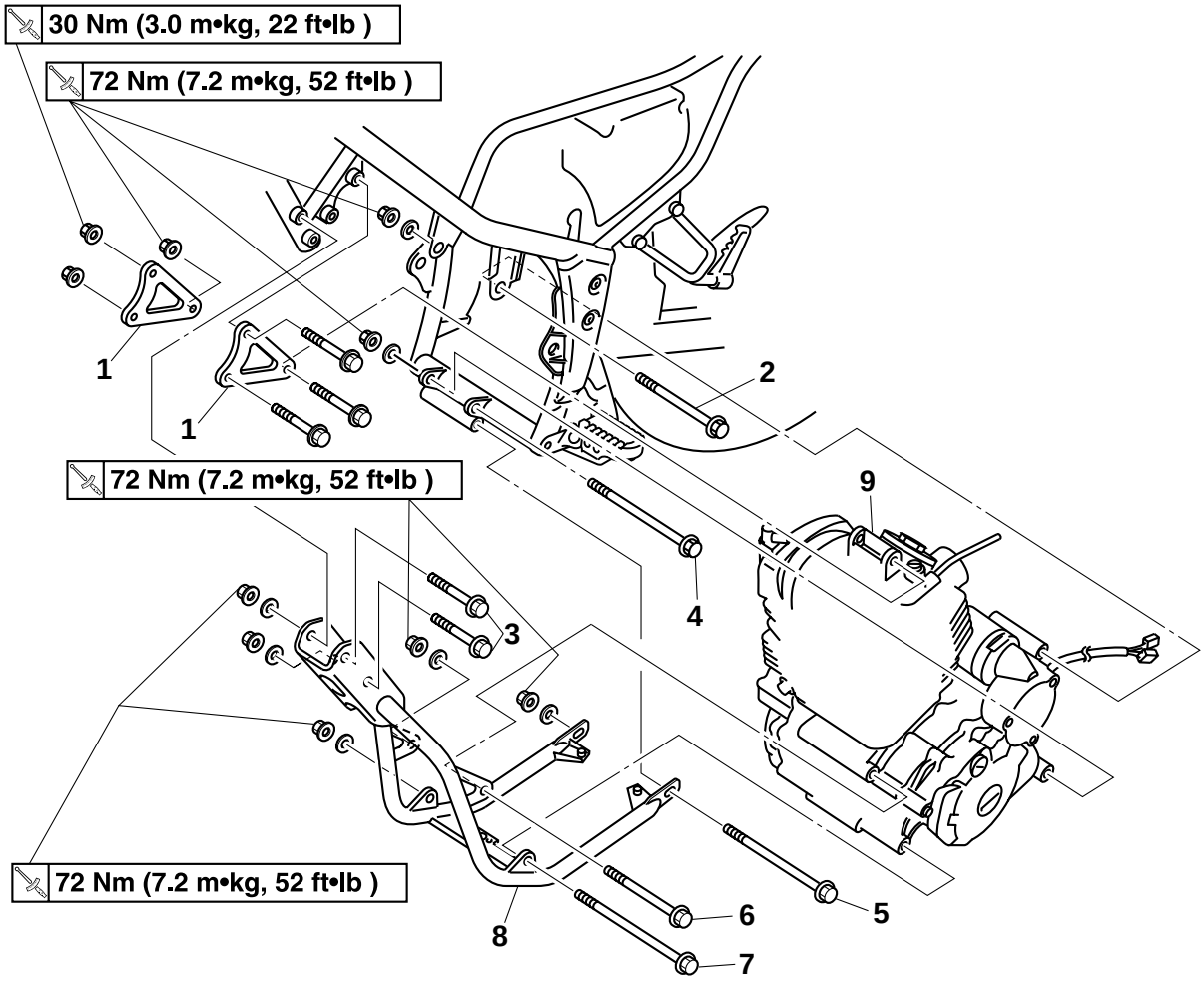
Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
1	Muffler	1	Loosen the clamp screw, and then remove from exhaust pipe.
2	Gasket	1	
3	Exhaust pipe	1	
			For installation, reverse the removal procedure.

Removing the drive sprocket



Order	Job/Parts to remove	Q'ty	Remarks
	Side cover (left/right)		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 6-1.
	Carburetor		Refer to "CARBURETOR" on page 6-3.
1	Breather hose	1	
2	Air induction system hose	1	Disconnect.
3	Starter motor lead	1	
4	Ground lead	1	
5	Clutch cable	1	
6	Pickup coil rotor lead coupler	2	Disconnect.
7	Spark plug cap	1	Disconnect.
8	Drive sprocket cover	1	Disconnect.
9	Shift pedal	1	
10	Neutral switch lead	1	
11	Nut	1	
12	Lock washer	1	Straighten the lock washer tab.
13	Drive sprocket	1	Loosen the rear wheel sprocket nut.
14	Drive chain	1	
			For installation, reverse the removal procedure.

Removing the engine



Order	Job/Parts to remove	Q'ty	Remarks
			Place a suitable stand under the frame and engine.
1	Engine bracket (left/right)	1/1	
2	Engine mounting bolt (rear upper side)	1	
3	Down tube bolts	2	
4	Engine mounting bolt (rear side)	1	
5	Engine mounting bolt (rear lower side)	1	
6	Engine mounting bolts (front upper side)	1	
7	Engine mounting bolt (front lower side)	1	
8	Down tube	1	
9	Engine	1	
			For installation, reverse the removal procedure.

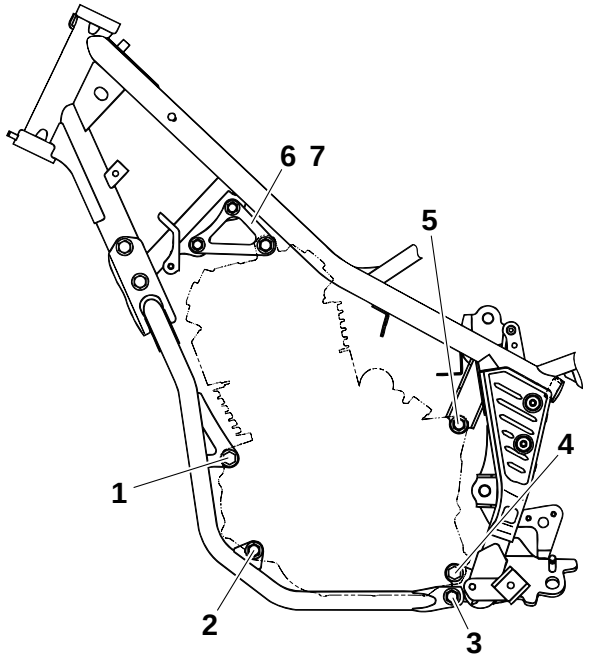
EAS23720

INSTALLING THE ENGINE

1. Install:
   - Engine mounting bolts (front upper side) “1”
   - Engine mounting bolt (front lower side) “2”
   - Engine mounting bolt (rear lower side) “3”
   - Engine mounting bolt (rear side) “4”
   - Engine mounting bolt (rear upper side) “5”
   - Left Engine bracket “6”
   - Right Engine bracket “7”

NOTE:

Do not fully tighten the bolts.



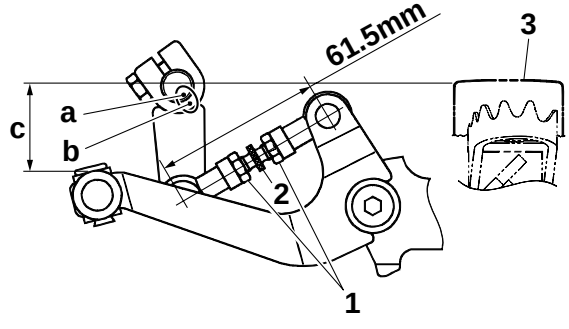
2. Tighten:
   - Engine mounting nuts (front upper side) “1”
   - Engine mounting nut (front lower side) “2”
   - Engine mounting nut (rear lower side) “3”
   - Engine mounting nut (rear side) “4”
   - Engine mounting nut (rear upper side) “5”
   - Left engine bracket nut
   - Right engine bracket nut

Engine mounting nuts (front upper side)
72 Nm (7.2 m•kg, 52 ft•lb)
Engine mounting nut (front lower side)
72 Nm (7.2 m•kg, 52 ft•lb)
Engine mounting nut (rear lower side)
72 Nm (7.2 m•kg, 52 ft•lb)
Engine mounting nut (rear side)
72 Nm (7.2 m•kg, 52 ft•lb)
Engine mounting nut (rear upper side)
72 Nm (7.2 m•kg, 52 ft•lb)
Engine bracket; nut (M10)
72 Nm (7.2 m•kg, 52 ft•lb)
Enginebracket; nut (M8)
30 Nm (3.0 m•kg, 22 ft•lb)

3. Install:
   - Shift arm

NOTE:

Align the punch mark “a” in the shift shaft with the punch mark “b” in the shift arm.



4. Install:
   - Shift arm position

NOTE:

Loosen lock nut “1” and then turn shift rod “2” so that the height difference “b” between footrest “3” and the shift pedal is between 28–34 mm.

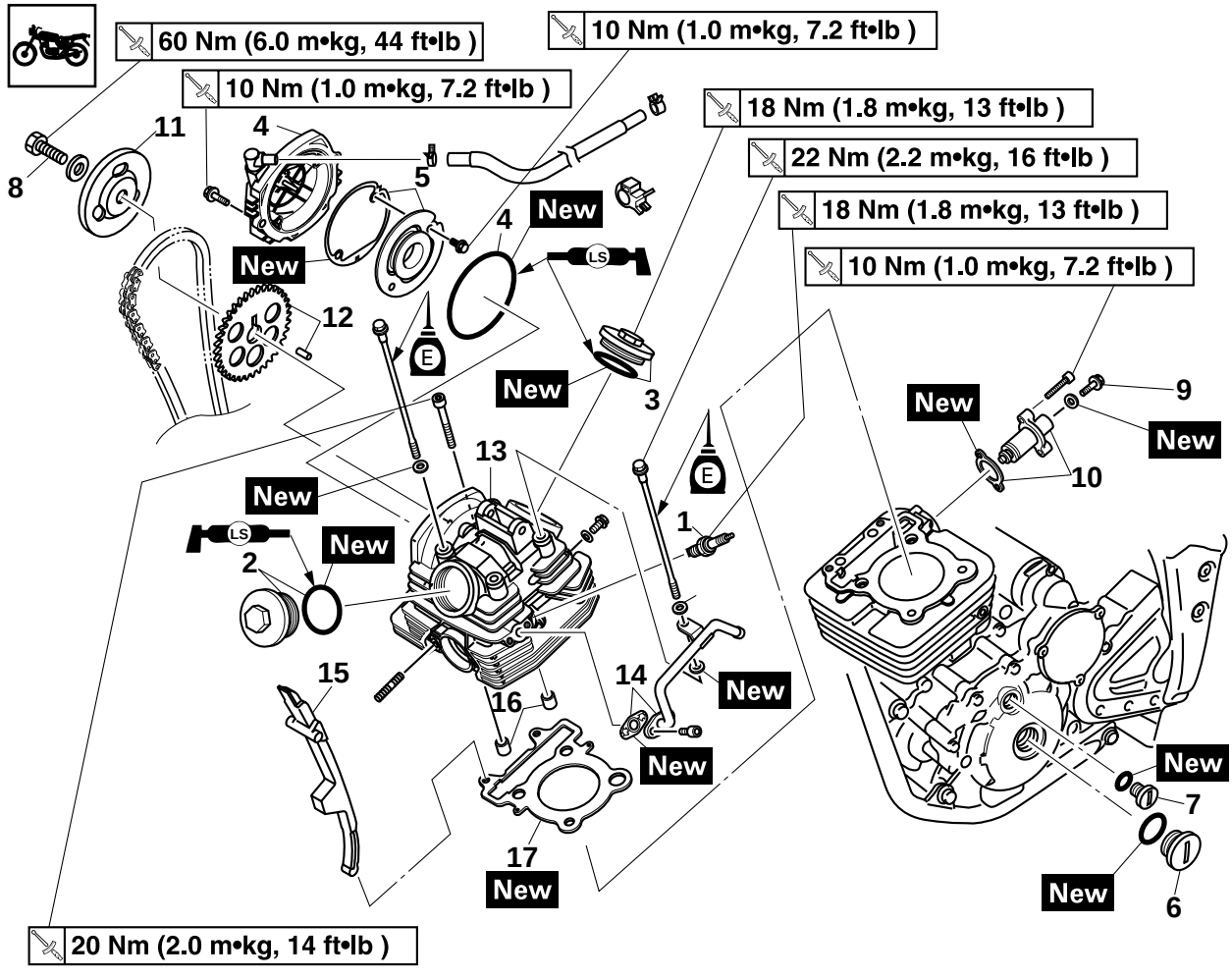
5. Install:
   - Locknut
   - Shift arm bolt

Locknut
10 Nm (1.0 m•kg, 7.2 ft•lb)
Shift arm bolt
10 Nm (1.0 m•kg, 7.2 ft•lb)

EAS24100

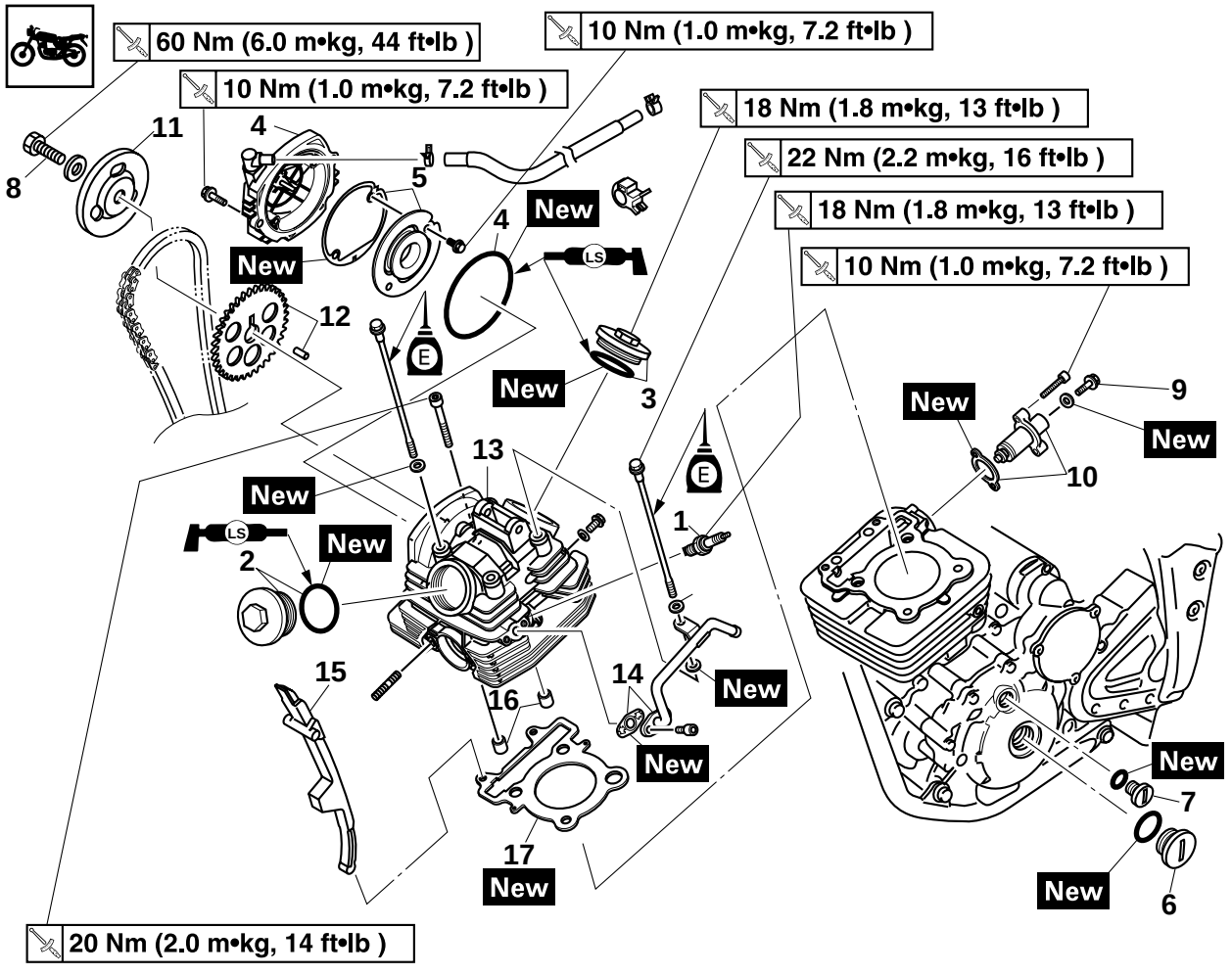
CYLINDER HEAD

Removing the cylinder head



Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank		Refer to "FUEL TANK" on page 6-1.
	Tool box		Refer to "STEERING HEAD" on page 4-48.
	Carburetor assembly		Refer to "CARBURETOR" on page 6-3.
	Spark plug cap		Refer to "ENGINE REMOVAL" on page 5-1.
	Engine bracket (left/right)		
1	Spark plug	1	
2	Cylinder head cover1/O-ring	1/1	
3	Cylinder head cover2/O-ring	1/1	
4	Cylinder head cover3/O-ring	1/1	
5	Breather pipe1/Gasket	1/1	
6	Center cap/O-ring	1/1	
7	Straight screw plug/O-ring	1/1	
8	Camshaft sprocket bolt	1	Loosen.
9	Cap bolt	1	Loosen.
10	Timing chain tensioner/gasket	1/1	
11	Breather pipe2	1	
12	Camshaft sprocket/dowelpin	1/1	
13	Cylinder head	1	
14	Air induction system pipe/gasket	1/1	

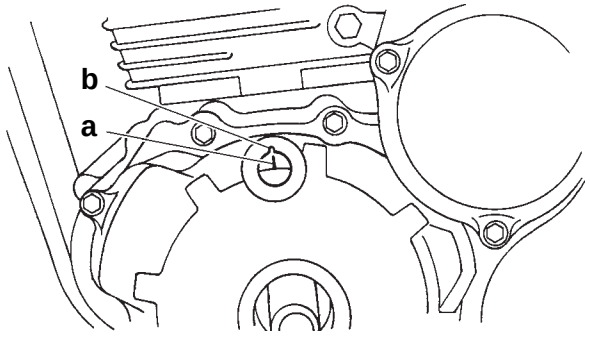
Removing the cylinder head



Order	Job/Parts to remove	Q'ty	Remarks
15	Timing chain guide	1	
16	Dowel pin	2	
17	Cylinder head gasket	1	
			For installation, reverse the removal procedure.

EAS24130
REMOVING THE CYLINDER HEAD

1. Align:
   - "I" mark "a" on the Pickup coil rotor (with the stationary pointer "b" on the crankcase cover)



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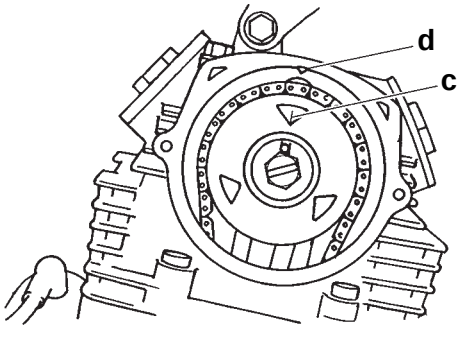
a. Turn the Pickup coil rotor counterclockwise.
b. When the piston is at TDC on the compression stroke, align the "I" mark "c" on the camshaft sprocket with the mark "d" on the cylinder head.



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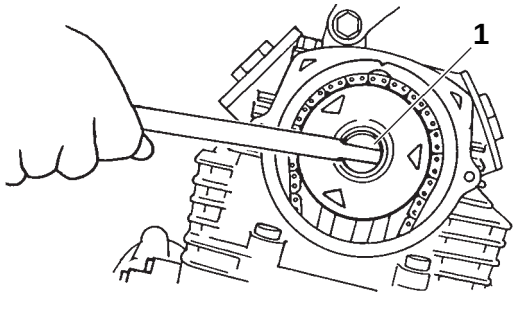
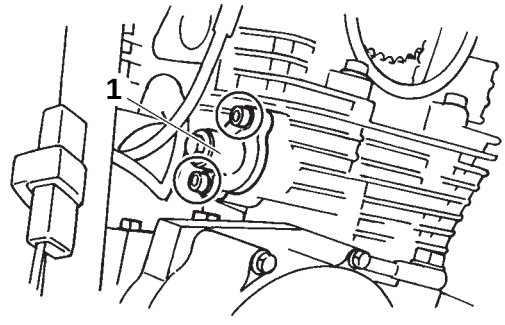
2. Loosen:
   - Camshaft sprocket bolt "1"

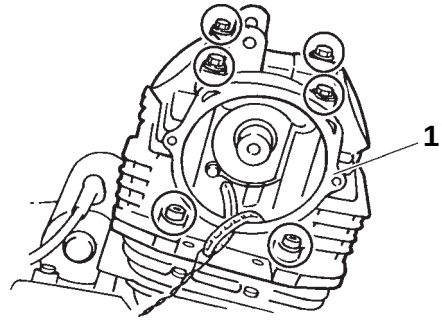


3. Remove:
   - Timing chain tensioner cap
   - Timing chain tensioner "1" (along with the gasket)
   - Camshaft sprocket bolt
   - Breather plate 2
   - Camshaft sprocket
   - Timing chain

NOTE:
To prevent the timing chain from falling into the crankcase, fasten it with a wire.



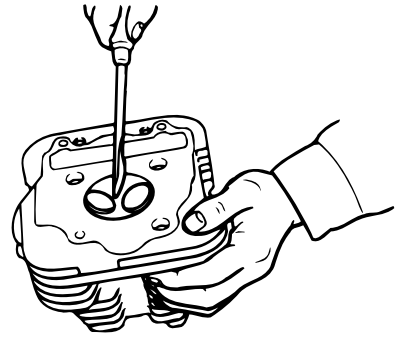
4. Remove:
   - Cylinder head "1"



EAS24160
CHECKING THE CYLINDER HEAD

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

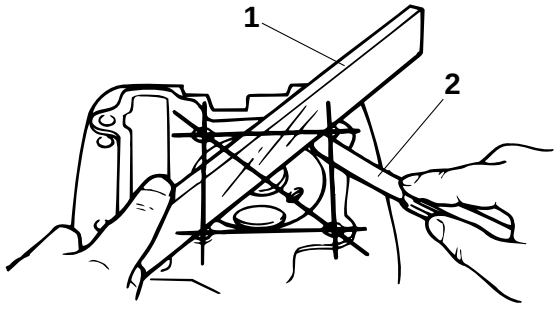
NOTE:
Do not use a sharp instrument to avoid damaging or scratching:
- Spark plug bore threads
- Valve seats



2. Check:
   - Cylinder head
     Damage/scratches → Replace.
3. Measure:
   - Cylinder head warpage
     Out of specification → Resurface the cylinder head.

Warpage limit
0.03 mm (0.0012 in)

a. Place a straightedge "1" and a thickness gauge "2" across the cylinder head.



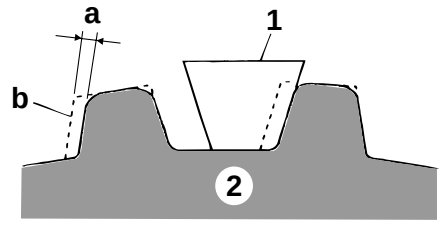
b. Measure the warpage.
c. If the limit is exceeded, resurface the cylinder head as follows.
d. Place a 400–600 grit wet sandpaper on the surface plate and resurface the cylinder head using a figure-eight sanding pattern.

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

EAS24180
CHECKING THE TIMING CHAIN GUIDES

The following procedure applies to the camshaft sprockets and timing chain guides.

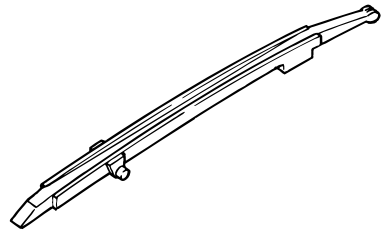
1. Check:
   - Timing chain
     Damage/stiffness → Replace the timing chain and camshaft sprocket and crankshaft sprocket as a set.
2. Check:
   - Camshaft sprocket
     More than 1/4 tooth wear "a" → Replace the timing chain and camshaft sprocket and crankshaft sprocket as a set.



a. 1/4 tooth
b. Correct

1. Timing chain
2. Camshaft sprocket

3. Check:
   - Timing chain guide (exhaust side)



EAS24190
CHECKING THE TIMING CHAIN TENSIONERS

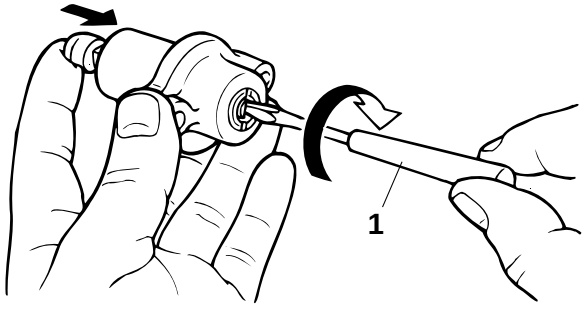
1. Check:
   - Timing chain tensioner
     Cracks/damage → Replace.
2. Check:
   - One-way cam operation
     Rough movement → Replace the timing chain tensioner housing.

a. Lightly press the timing chain tensioner rod into the timing chain tensioner housing by hand.

NOTE:
While pressing the timing chain tensioner rod, wind it clockwise with a thin screwdriver "1" until it stops.

b. Remove the screwdriver and slowly release the timing chain tensioner rod.
c. Make sure that the timing chain tensioner rod comes out of the timing chain tensioner housing smoothly. If there is rough move-

ment, replace the timing chain tensioner.



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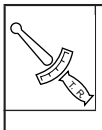
3. Check:
   - Cap bolt
   - Copper washer
   - Spring
   - One-way cam
   - Timing chain tensioner rod

   Damage/wear → Replace the defective part(s).

EAS24230
INSTALLING THE CYLINDER HEAD

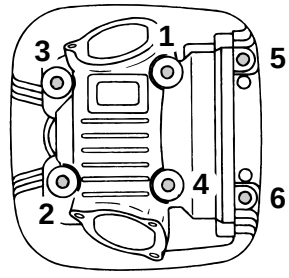
1. Install:
   - Cylinder head gasket New
   - Dowel pins
2. Install:
   - Cylinder head
   - Copper washers New
   - Air induction system pipe
3. Tighten:
   - Cylinder head bolt



Cylinder head bolt (226 mm)
22 Nm (2.2 m•kg, 16 ft•lb)
Cylinder head bolt (45 mm)
20 Nm (2.0 m•kg, 14 ft•lb)

NOTE:

- Lubricate the cylinder head bolts with engine oil.
- Tighten the cylinder head bolts in the proper tightening sequence as shown and torque them in two stages.



4. Install:
   - Camshaft sprocket
   - Dowel pin
   - Timing chain

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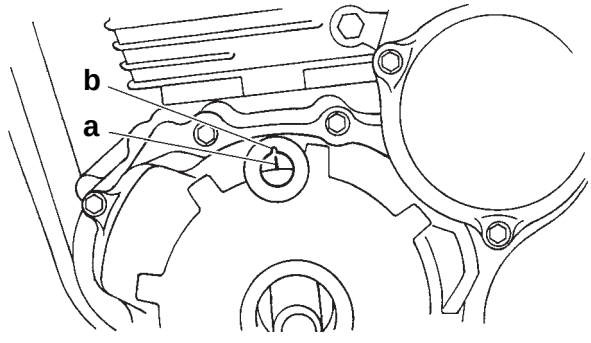
a. Turn the Pickup coil rotor counterclockwise.
b. Align the “I” mark “a” on the Pickup coil rotor with the stationary pointer “b” on the crankcase cover.



c. Remove the wire from the timing chain.
d. Install the timing chain onto the camshaft sprocket, and then install the camshaft sprocket onto the camshaft.

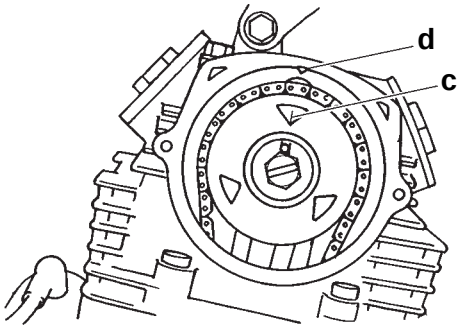
NOTE:

- When installing the camshaft sprocket, be sure to keep the timing chain as tight as possible on the exhaust side.
- Align the pin “e” on the camshaft with the slot in the camshaft sprocket.

ECA13740
CAUTION:

Do not turn the crankshaft when installing the camshaft(s) to avoid damage or improper valve timing.

e. Align the “I” mark “c” on the camshaft sprocket with the stationary pointer “d” on the cylinder head.



f. While holding the camshaft, temporarily tighten the camshaft sprocket bolts.

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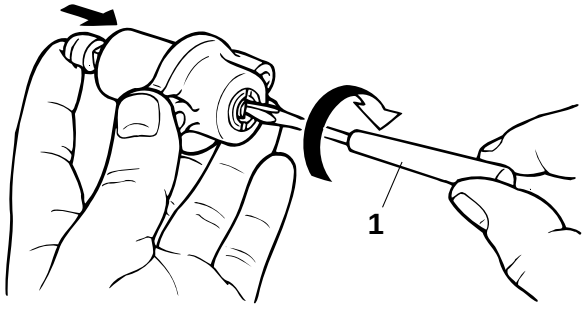
5. Install:
   - Timing chain tensioner

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

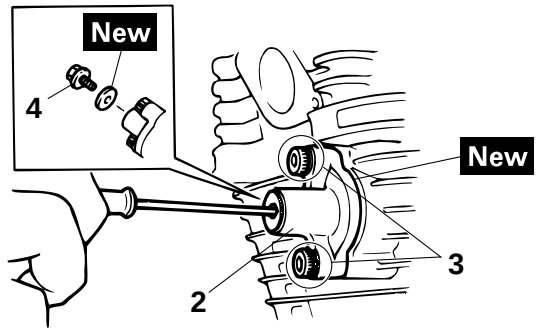
a. While lightly pressing the timing chain tensioner rod by hand, turn the tensioner rod fully clockwise with a thin screwdriver "1".



b. With the timing chain tensioner rod turned all the way into the timing chain tensioner housing (with the thin screwdriver still installed),install the new gasket and the timing chain tensioner "2" onto the body cylinder.
c. Tighten the timing chain tensioner bolts "3" to the specified torque.

	Camshaft sprocket bolt **10 Nm (1.0 m•kg, 7.2 ft•lb)**

d. Remove the screwdriver, make sure that the timing chain tensioner rod releases, and then tighten the cap bolt "4" to the specified torque.



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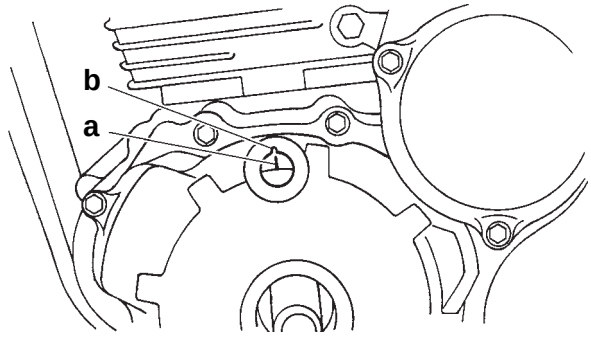
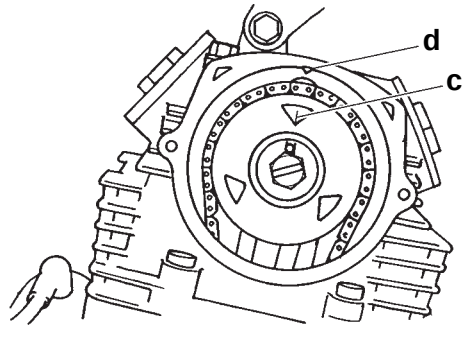
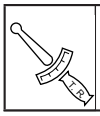
6. Turn:
   - Crankshaft
     (several turns counterclockwise)
7. Check:
   - "I" mark "a"
     Align the "I" mark on the pickup coil rotor with the stationary pointer "b" on the crankcase cover.
   - "I" mark "c"
     Align the "I" mark on the camshaft sprocket with the stationary pointer "d" on the cylinder head.
     Out of alignment → Correct.
     Refer to the installation steps above.





8. Tighten:
   - Camshaft sprocket bolts



Camshaft sprocket bolt
60 Nm (6.0 m•kg, 44 ft•lb)

ECA13750

CAUTION:

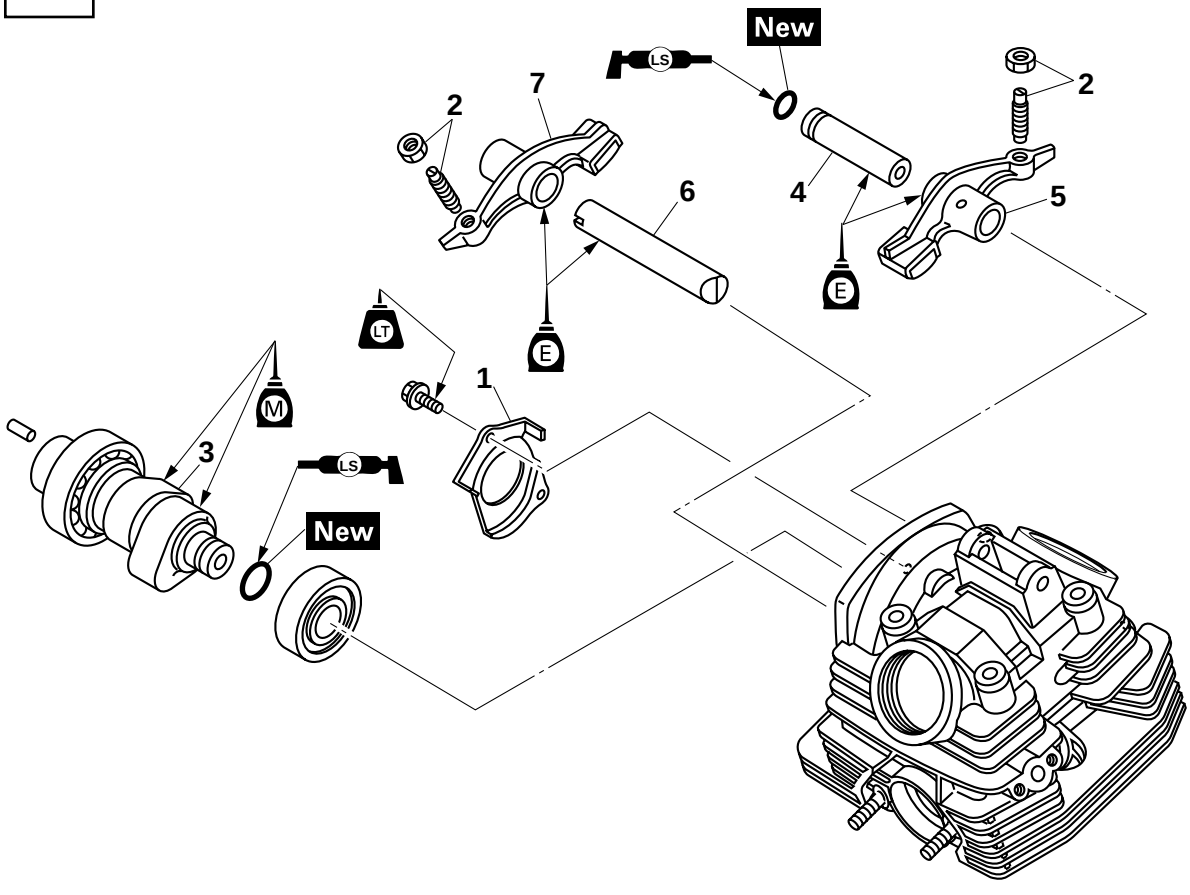
Be sure to tighten the camshaft sprocket bolts to the specified torque to avoid the possibility of the bolts coming loose and damaging the engine.

9. Measure:
   - Valve clearance
     Out of specification → Adjust.
     Refer to “ADJUSTING THE VALVE CLEARANCE” on page 3-3.

EAS23730

ROCKER ARM, CAMSHAFT

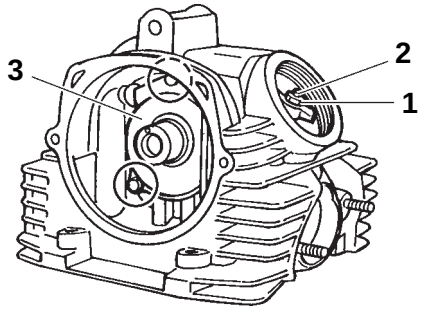
Removing the rocker arms and camshaft



Order	Job/Parts to remove	Q'ty	Remarks
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-5.
1	Stopper plate	1	
2	Locknut/valve clearance adjusting screw	2/2	
3	Camshaft	1	
4	Intake rocker arm shaft	1	
5	Intake rocker arm	1	
6	Exhaust rocker arm shaft	1	
7	Exhaust rocker arm	1	
			For installation, reverse the removal procedure.

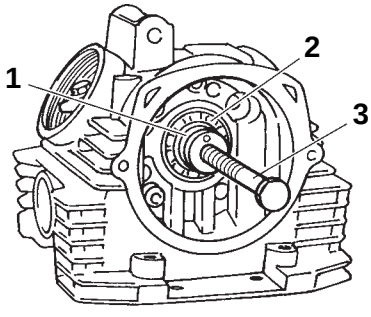
EAS23770
REMOVING THE ROCKER ARMS AND CAMSHAFT

1. Loosen:
   - Locknuts “1”
   - Valve clearance adjusting screws “2”
   - Stopper plate “3”



2. Remove:
   - Camshaft “1”
   - Bearing; “2”

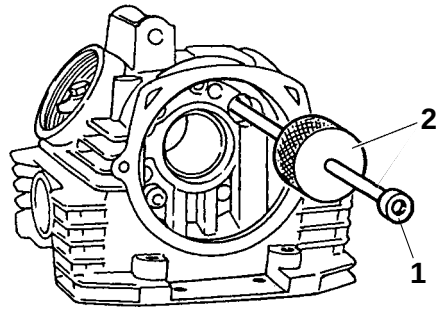
NOTE:
Screw 10 mm (0.396 in) bolt “3” into the threaded end of the camshaft and then pull out the camshaft.



3. Remove:
   - Intake rocker arm shaft
   - Exhaust rocker arm shaft
   - Intake rocker arm
   - Exhaust rocker arm

NOTE:
Remove the rocker arm shafts with the slide hammer “1” and weight “2”.

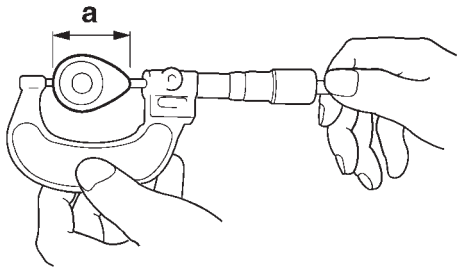
Slide hammer bolt
90890-01083
Slide hammer bolt 6 mm
YU-01083-1
Weight
90890-01084
YU-01083-3

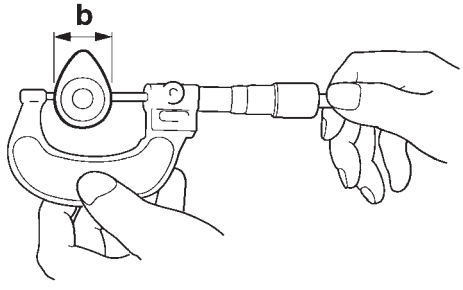


EAS23840
CHECKING THE CAMSHAFT

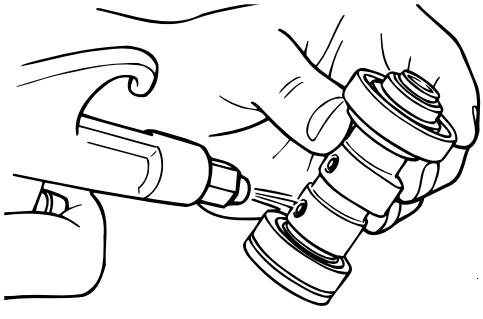
1. Check:
   - Bearing
     Damage/wear → Replace.
2. Check:
   - Camshaft lobes
     Blue discoloration/pitting/scratches → Replace the camshaft.
3. Measure:
   - Camshaft lobe dimensions “a” and “b”
     Out of specification → Replace the camshaft.

Camshaft lobe dimension limit
Intake A
36.520–36.620 mm (1.4378–1.4417 in)
Limit
36.460 mm (1.4354 in)
Intake B
30.201–30.301 mm (1.1890–1.1930 in)
Limit
30.151 mm (1.1870 in)
Exhaust A
36.564–36.664 mm (1.4395–1.4435 in)
Limit
36.514 mm (1.4376 in)
Exhaust B
30.216–30.316 mm (1.1896–1.1935 in)
Limit
30.166 mm (1.1876 in)





4. Check:
   - Camshaft oil passage
     Obstruction → Blow out with compressed air.

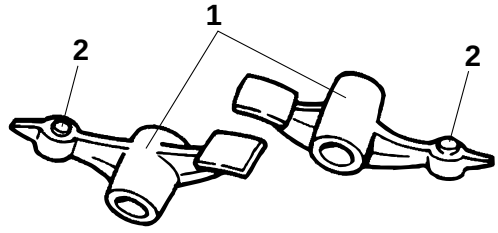


EAS23880

CHECKING THE ROCKER ARMS AND ROCKER ARM SHAFTS

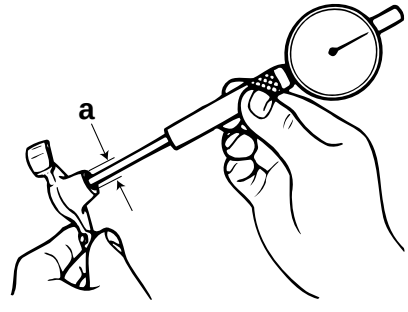
The following procedure applies to all of the rocker arms and rocker arm shafts.

1. Check:
   - Rocker arm “1”
   - Valve clearance adjusting screws “2”
     Damage/wear → Replace.



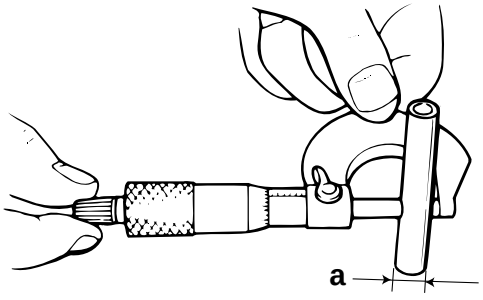
2. Check:
   - Rocker arm shaft
     Blue discoloration/excessive wear/pitting/scratches → Replace or check the lubrication system.
3. Measure:
   - Rocker arm inside diameter “a”
     Out of specification → Replace.

Rocker arm inside diameter
12.000–12.018 mm (0.4724–0.4731 in)
Limit
12.036 mm (0.4739 in)



4. Measure:
   - Rocker arm shaft outside diameter “a”
     Out of specification → Replace.

Rocker arm shaft outside diameter
11.981–11.991 mm (0.4717–0.4721 in)
Limit
11.950 mm (0.4705 in)



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.

Out of specification → Replace the defective part(s).

Rocker-arm-to-rocker-arm-shaft clearance
0.009–0.037 mm (0.0004–0.0015 in)

EAS24040
INSTALLING THE CAMSHAFT AND ROCKER ARMS

1. Lubricate:
   - Camshaft

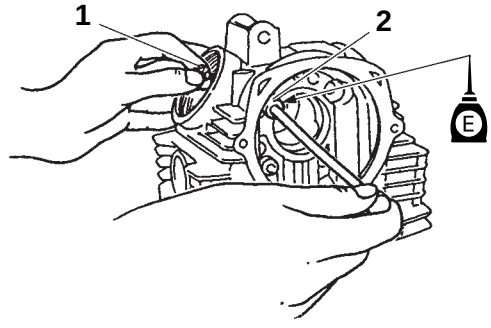
Recommended lubricant
Camshaft
Molybdenum disulfide oil
Camshaft bearing
Engine oil

2. Lubricate:
   - Rocker arm
   - Rocker arm shafts

Recommended lubricant
Engine oil

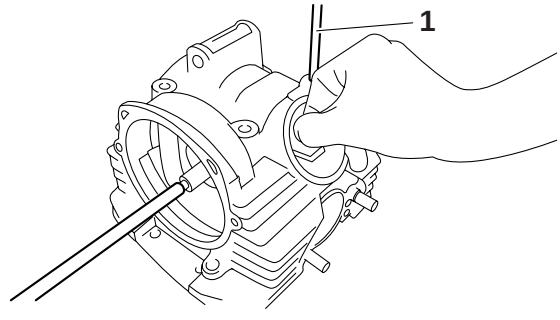
3. Install:
   - Exhaust rocker arm “1”
   - Exhaust rocker arm shaft “2”

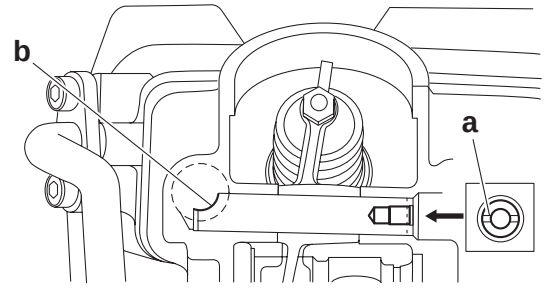
NOTE:
Make sure the exhaust rocker arm shaft is completely pushed into the cylinder head.



4. Install:
   - Intake rocker arm
   - Intake rocker arm shaft

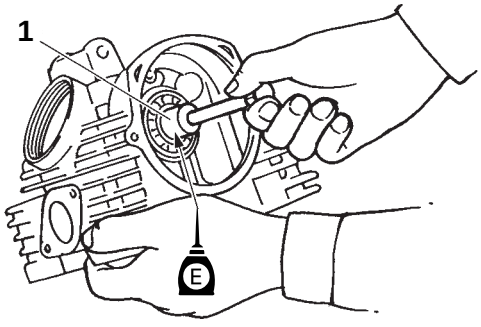
NOTE:
- Insert a cylinder head bolt (226 mm) “1” into the hole in the cylinder head and the intake rocker arm shaft as shown.
- Install the intake rocker arm shaft so that groove “a” is horizontal and aligning the notch of the pointed end “b” with the hole in the cylinder head.



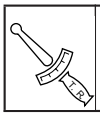


5. Install:
   - Camshaft “1”

NOTE:
Screw a 10 mm bolt into the threaded end of the camshaft and then install the camshaft.



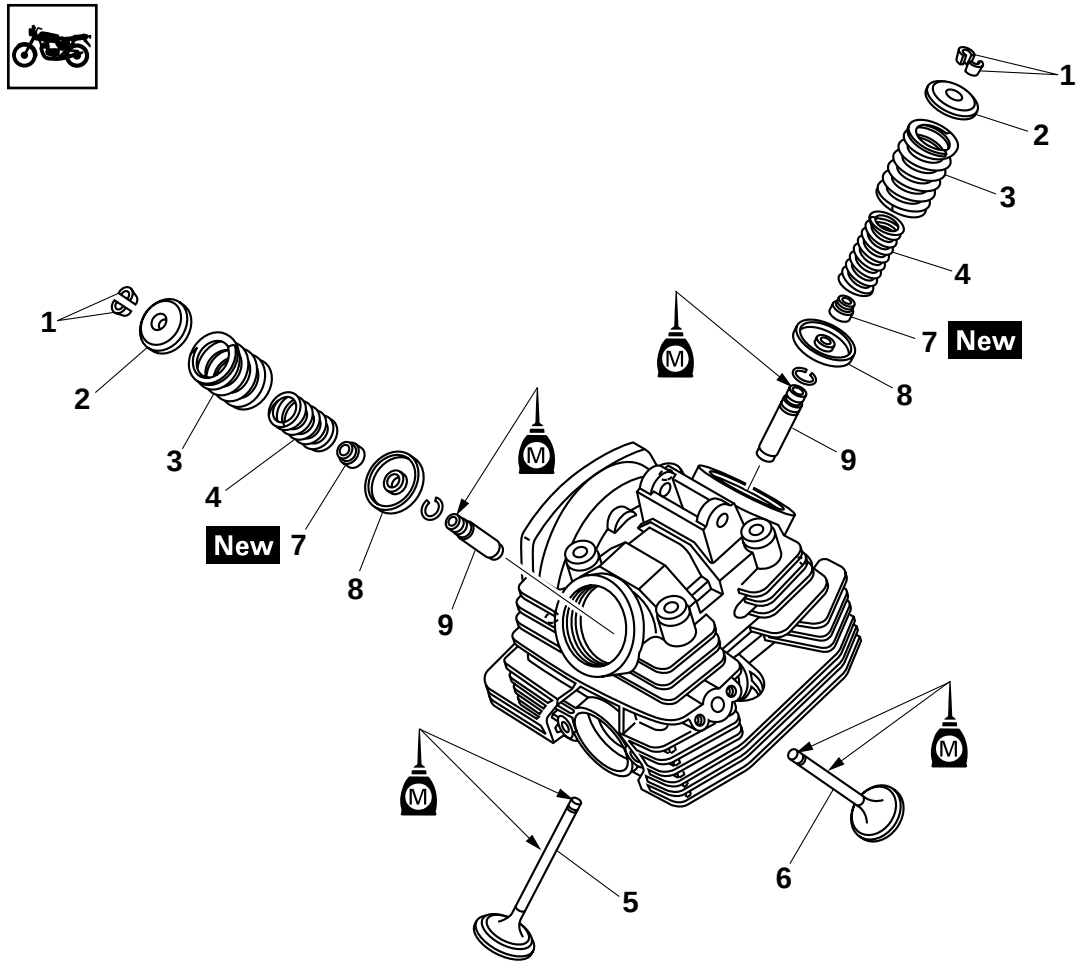
6. Install:
   - Lock plate
   - Lock plate bolt

	**Lock plate bolt** **8 Nm (0.8 m•kg, 5.8 ft•lb)**

EAS24270

VALVES AND VALVE SPRINGS

Removing the valves and valve springs



Order	Job/Parts to remove	Q'ty	Remarks
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-5.
	Rocker arm		Refer to "ROCKER ARM, CAMSHAFT" on page 5-12.
	Camshaft		
1	Valve cotter	4	
2	Valve spring retainer	2	
3	Outer valve spring	2	
4	Inner valve spring	2	
5	Intake valve	1	
6	Exhaust valve	1	
7	Valve stem seal	2	
8	Valve spring seat	2	
9	Valve guide	2	
			For installation, reverse the removal procedure.

EAS24280
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.

1. Check:
   - Valve sealing
     Leakage at the valve seat → Check the valve face, valve seat, and valve seat width.
     Refer to "CHECKING THE VALVE SEATS" on page 5-20.

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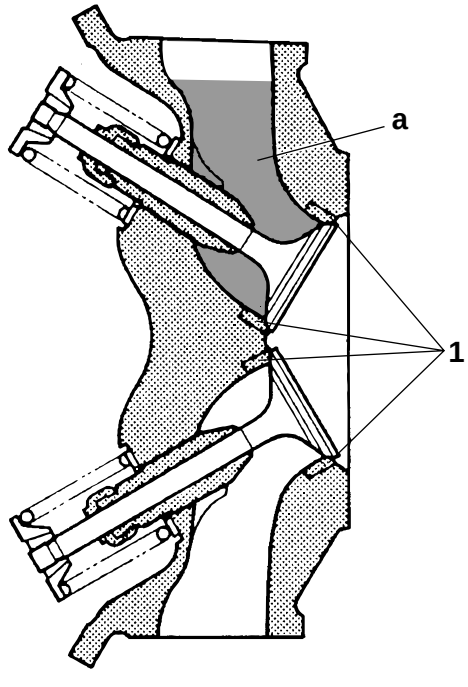
a. Pour a clean solvent "a" into the intake and exhaust ports.
b. Check that the valves properly seal.

NOTE:
There should be no leakage at the valve seat "1".



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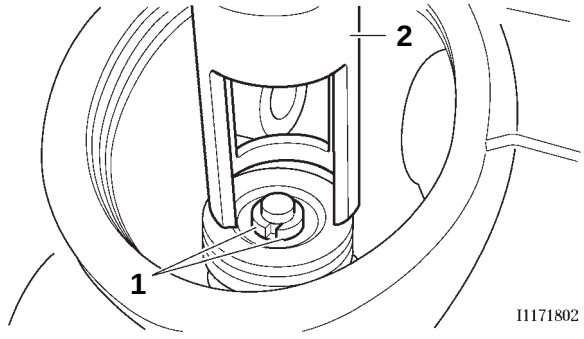
2. Remove:
   - Valve cotters "1"

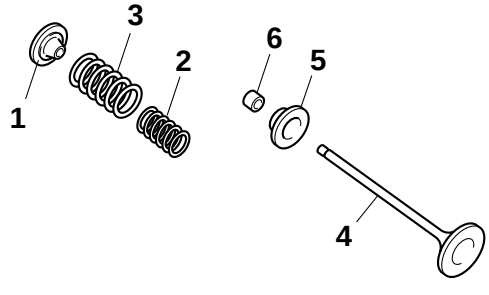
NOTE:
Remove the valve cotters by compressing the valve spring with the valve spring compressor and the valve spring compressor attachment "2".

Valve spring compressor
90890-04019
YM-04019
Valve spring compressor attachment
90890-01243
Valve spring compressor adapter (26 mm)
YM-01253-1



3. Remove:
   - Upper spring seat "1"
   - Inner valve spring "2"
   - Outer valve spring "3"
   - Valve "4"
   - Lower spring seat "5"
   - Valve stem seal "6"

NOTE:
Identify the position of each part very carefully so that it can be reinstalled in its original place.

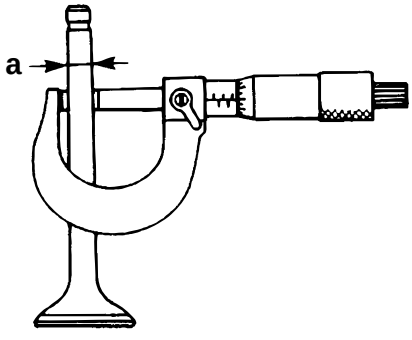


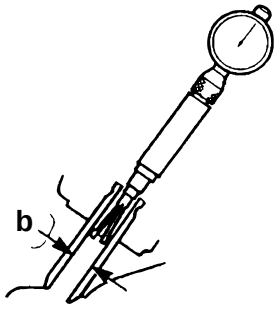
EAS24290
CHECKING THE VALVES AND VALVE GUIDES
The following procedure applies to all of the valves and valve guides.

1. Measure:
   - Valve-stem-to-valve-guide clearance
     Out of specification → Replace the valve guide.

Valve-stem-to-valve-guide clearance =
Valve guide inside diameter “a” -
Valve stem diameter “b”

Valve-stem-to-valve-guide clearance
Valve-stem-to-valve-guide clearance (intake)
0.010–0.037 mm (0.0004–0.0015 in)
Limit
0.080 mm (0.0032 in)
Valve-stem-to-valve-guide clearance (exhaust)
0.025–0.052 mm (0.0010–0.0020 in)
Limit
0.100 mm (0.0039 in)





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 (212°F) in an oven.

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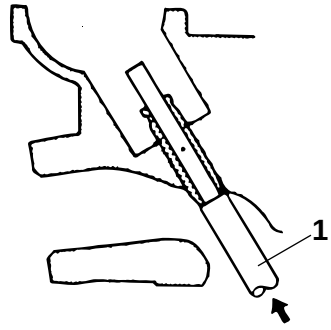
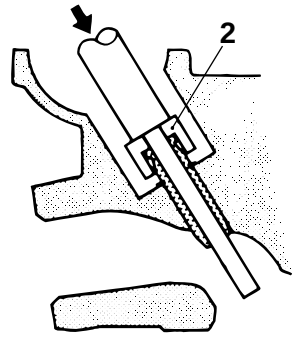
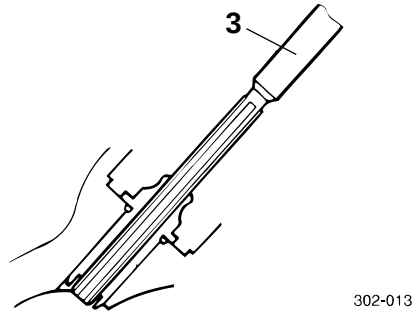
a. Remove the valve guide with the valve guide remover “1”.



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 (ø6)
90890-04064
Valve guide remover (6.0 mm)
YM-04064-A
Valve guide installer (ø6)
90890-04065
Valve guide installer (6.0 mm)
YM-04065-A
Valve guide reamer (ø6)
90890-04066
Valve guide reamer (6.0 mm)
YM-04066

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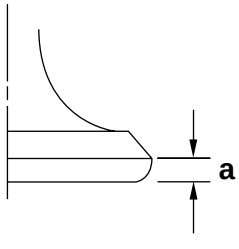
3. Eliminate:
   - Carbon deposits
     (from the valve face and valve seat)
4. Check:
   - Valve face
     Pitting/wear → Grind the valve face.
   - Valve stem end
     Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.
5. Measure:
   - Valve margin thickness D "a"
     Out of specification → Replace the valve.

Valve margin thickness
Valve margin thickness D (intake)
0.80–1.20 mm (0.0315–0.0472 in)
Valve margin thickness D (exhaust)
0.80–1.20 mm (0.0315–0.0472 in)

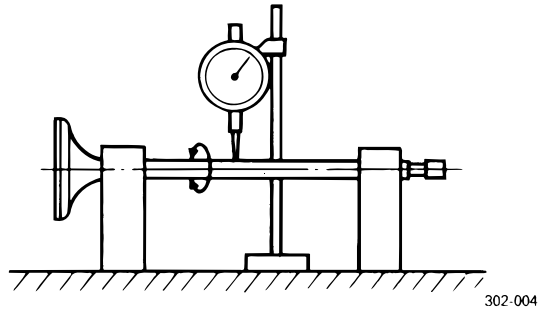


6. Measure:
   - Valve stem runout
     Out of specification → Replace the valve.

NOTE:

- 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
Valve stem runout
0.030 mm (0.0012 in)



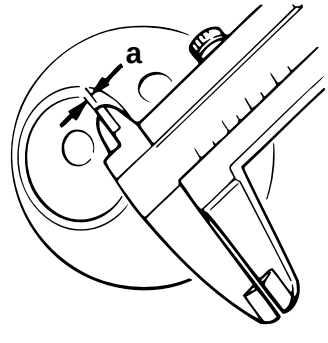
EAS24300

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 head.

Valve seat width
Valve seat width C (intake)
0.90–1.10 mm (0.0354–0.0433 in)
Valve seat width C (exhaust)
0.90–1.10 mm (0.0354–0.0433 in)



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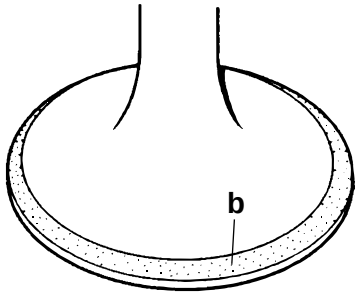
a. Apply Mechanic's blueing dye (Dykem) "b" onto the valve face.



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.
d. Measure the valve seat width.

NOTE:
Where the valve seat and valve face contacted one another, the blueing will have been removed.

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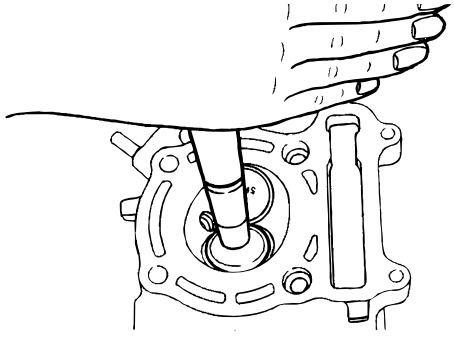
4. Lap:
   - Valve face
   - Valve seat

NOTE:
After replacing the cylinder head or replacing the valve and valve guide, the valve seat and valve face should be lapped.

Valve lapper
90890-04101
Valve lapping tool
YM-A8998



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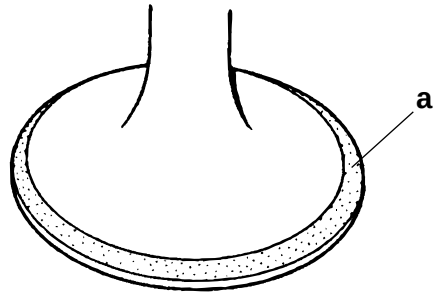
a. Apply a coarse lapping compound “a” to the valve face.

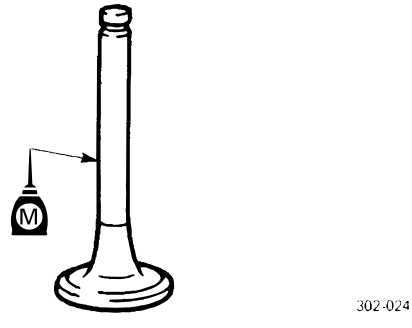
ECA13790

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

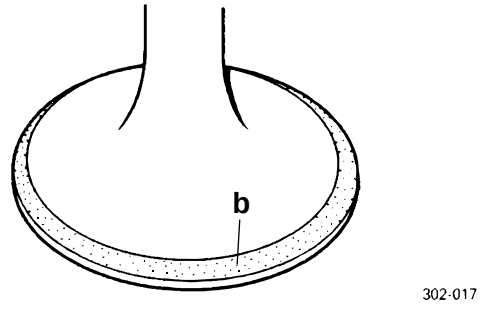


b. Apply molybdenum disulfide oil onto the valve stem.
c. Install the valve into the cylinder head.
d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

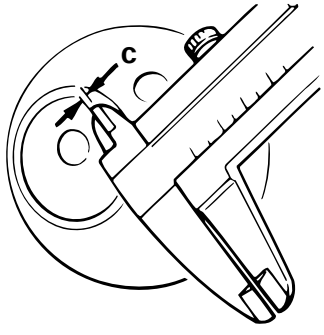
NOTE:
For the best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.



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.
i. Press the valve through the valve guide and onto the valve seat to make a clear impression.
j. Measure the valve seat width “c” again. If the valve seat width is out of specification, reface and lap the valve seat.



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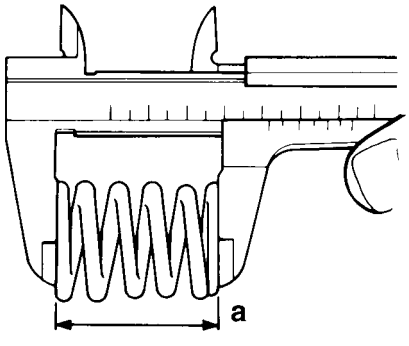
EAS24310
CHECKING THE VALVE SPRINGS

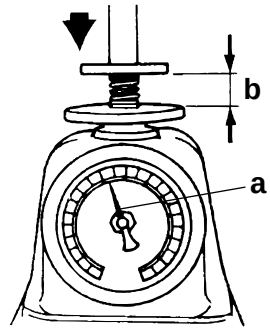
The following procedure applies to all of the valve springs.

1. Measure:
   - Valve spring free length “a”
     Out of specification → Replace the valve spring.

Inner spring
Free length (intake)
36.17 mm (1.42 in)
Free length (exhaust)
36.17 mm (1.42 in)
Outer spring
Free length (intake)
36.63 mm (1.44 in)
Free length (exhaust)
36.63 mm (1.44 in)



2. Measure:
   - Compressed valve spring force “a”
     Out of specification → Replace the valve spring.

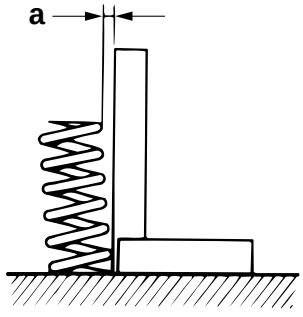


a. Compressed valve spring force
b. Installed length

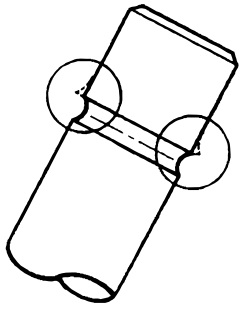
Inner spring
Installed compression spring force (intake)
75.00–91.70 N (16.86–20.61 lb) (7.65–9.35 kgf)
Installed compression spring force (exhaust)
75.00–91.70 N (16.86–20.61 lb) (7.65–9.35 kgf)
Installed length (intake)
30.50 mm (1.20 in)
Installed length (exhaust)
30.50 mm (1.20 in)
Outer spring
Installed compression spring force (intake)
128.50–157.90 N (28.89–35.50 lb) (13.10–16.10 kgf)
Installed compression spring force (exhaust)
128.50–157.90 N (28.89–35.50 lb) (13.10–16.10 kgf)
Installed length (intake)
32.00 mm (1.26 in)
Installed length (exhaust)
32.00 mm (1.26 in)

3. Measure:
   - Valve spring tilt “a”
     Out of specification → Replace the valve spring.

Inner spring
Spring tilt (intake)
2.5 °/1.6 mm
Spring tilt (exhaust)
2.5 °/1.6 mm
Outer spring
Spring tilt (intake)
2.5 °/1.6 mm
Spring tilt (exhaust)
2.5 °/1.6 mm



EAS24340
INSTALLING THE VALVES
The following procedure applies to all of the valves and related components.
1. Deburr:
   - Valve stem end
     (with an oil stone)

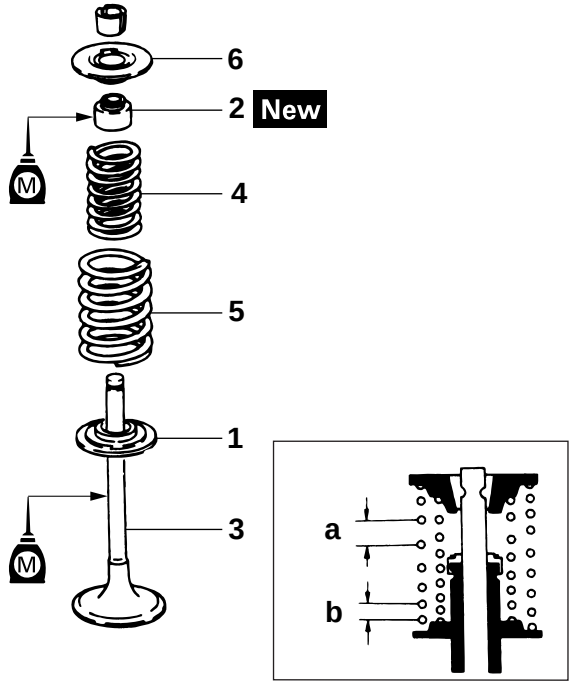


2. Lubricate:
   - Valve stem
   - Valve stem seal
     (with the recommended lubricant)

Recommended lubricant
Molybdenum disulfide oil

3. Install:
   - Lower spring seat “1” New
   - Valve stem seal “2”
   - 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.

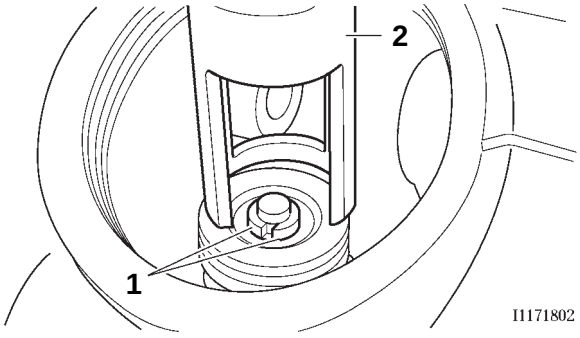


a. Larger pitch
b. Smaller pitch

4. Install:
   - Valve cotters “1”

NOTE:
Install the valve cotters by compressing the valve spring with the valve spring compressor and the valve spring compressor attachment “2”.

Valve spring compressor
90890-04019
YM-04019
Valve spring compressor attachment
90890-01243
Valve spring compressor adapter (26 mm)
YM-01253-1

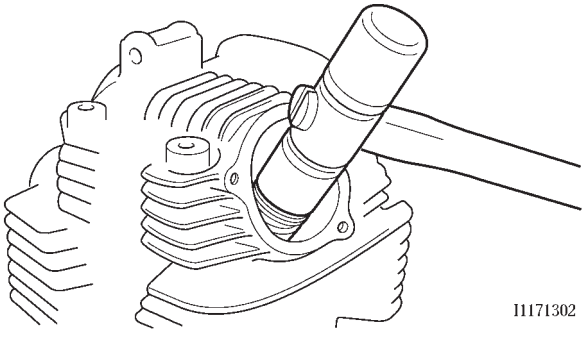


5. To secure the valve cotters “1” onto the valve stem, lightly tap the valve tip with a soft-face hammer.

ECA13800

CAUTION:

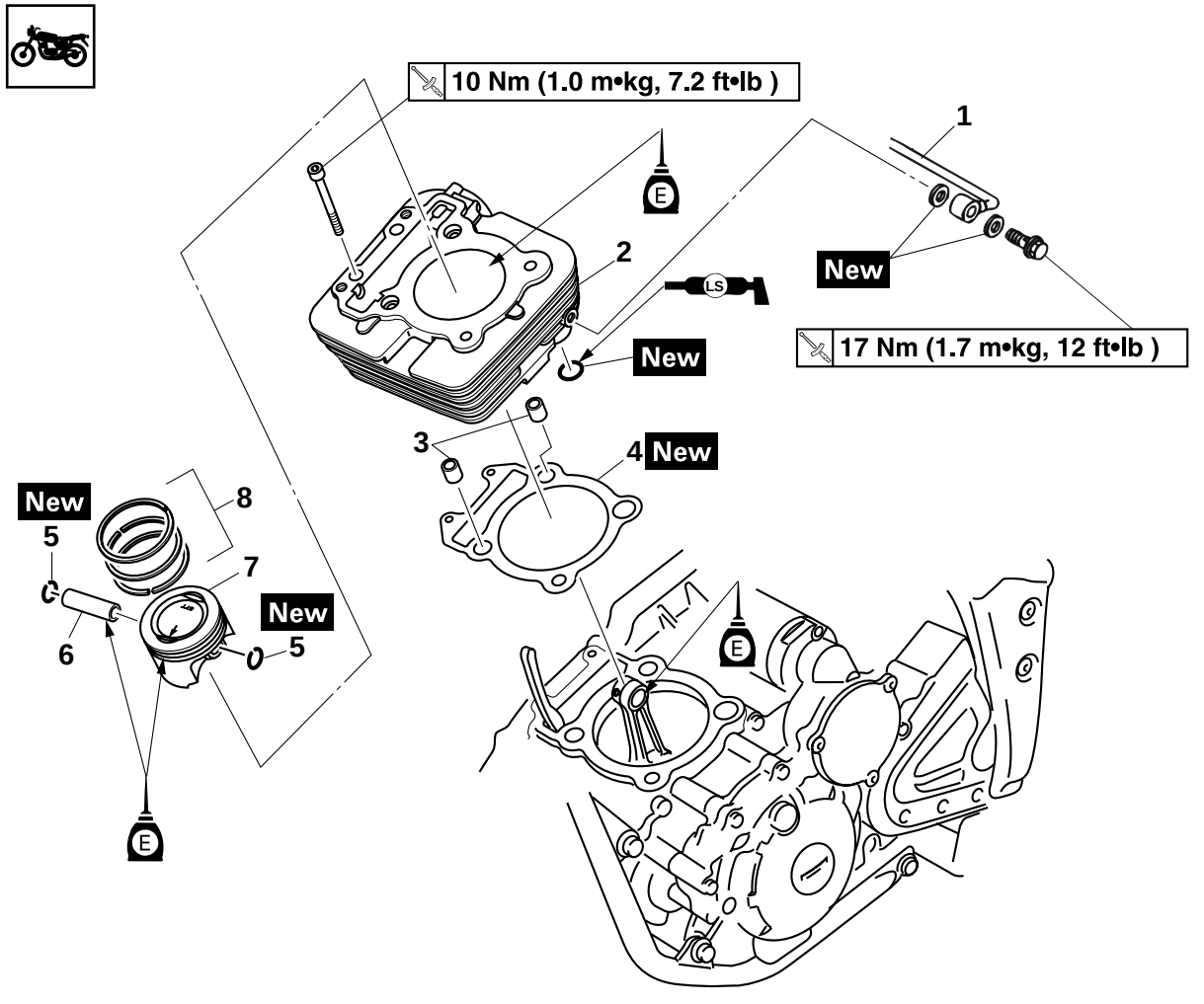
Hitting the valve tip with excessive force could damage the valve.



EAS24350

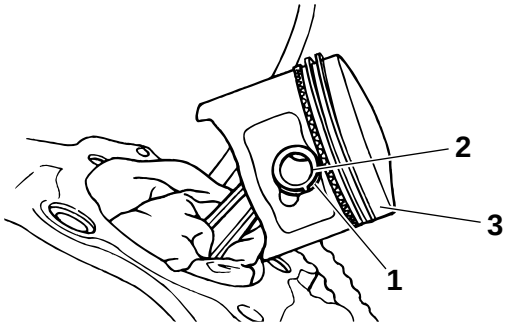
CYLINDER AND PISTON

Removing the cylinder and piston



Order	Job/Parts to remove	Q'ty	Remarks
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-5.
1	Oil delivery pipe	1	
2	Cylinder	1	
3	Dowel pin	2	
4	Cylinder gasket	1	
5	Piston pin clip	2	
6	Piston pin	1	
7	Piston	1	
8	Piston ring set	1	
			For installation, reverse the removal procedure.

EAS24380
REMOVING THE PISTON
1. Remove:
   - Piston pin clips “1”
   - Piston pin “2”
   - Piston “3”

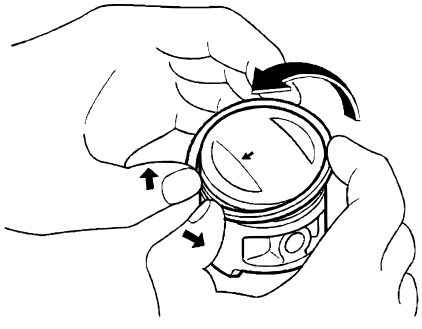


ECA13810
CAUTION:
Do not use a hammer to drive the piston pin out.

NOTE:
- Before removing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase.
- Before removing the piston pin, deburr the piston pin clip’s groove and the piston’s pin bore area. If both areas are deburred, remove them.

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.



EAS24400
CHECKING THE CYLINDER AND PISTON
1. Check:
   - Piston wall
   - Cylinder wall
     Vertical scratches → Rebore or replace the cylinder, and replace the piston and piston rings as a set.
2. Measure:
   - Piston-to-cylinder clearance

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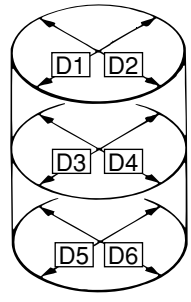
a. Measure cylinder bore “C” with the cylinder bore gauge.

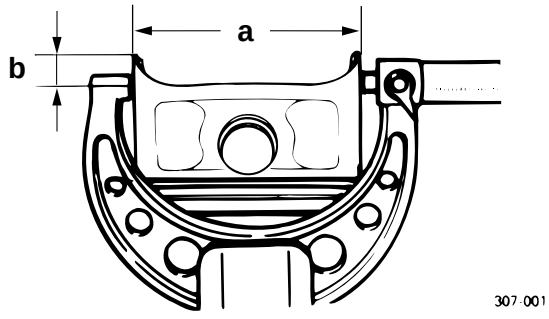


NOTE:
Measure cylinder bore “C” by taking side-to-side and front-to-back measurements of the cylinder. Then, find the average of the measurements.

Bore “C”
74.000–74.010 mm (2.9134–2.9138 in)
Wear limit
74.100 mm (2.9173 in)
Taper limit “T”
0.050 mm
Out of round limit “R”
0.050 mm

“C” = maximum of D1 – D6
“T” = maximum of D1 or D2 – maximum of D5 or D6
“R” = maximum of D1 , D3 or D5 – minimum of D2 , D4 or D6

b. If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.
c. Measure piston skirt diameter D “a” with the micrometer.



b. 11 mm (1 in) from the bottom edge of the piston

Piston size diameter "D"
Standard
73.960–73.975 mm (2.9118–2.9124 in)

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 "D"

Piston-to-cylinder clearance
0.025–0.050 mm (0.0010–0.0020 in)
Limit
0.15 mm (0.0059 in)

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

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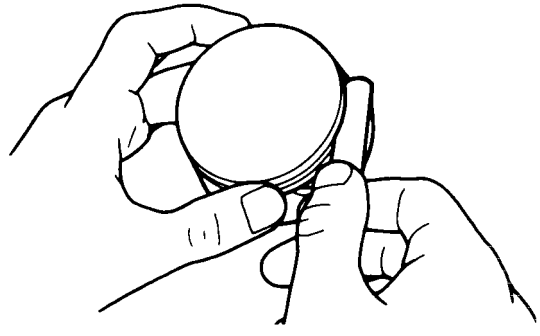
EAS24430
CHECKING THE PISTON RINGS

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

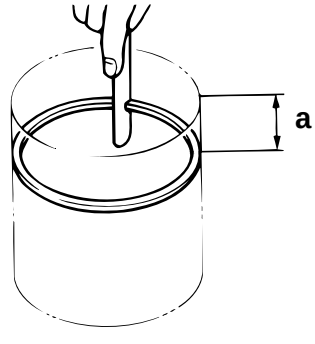
NOTE:
Before measuring the piston ring side clearance, eliminate any carbon deposits from the piston ring grooves and piston rings.

Piston ring
Top ring
Ring side clearance
0.030–0.065 mm (0.0012–0.0026 in)
Limit
0.100 mm (0.0039 in)
2nd ring
Ring side clearance
0.020–0.055 mm (0.0008–0.0022 in)
Limit
0.100 mm (0.0039 in)



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

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



a. 40 mm (1.476 in)

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

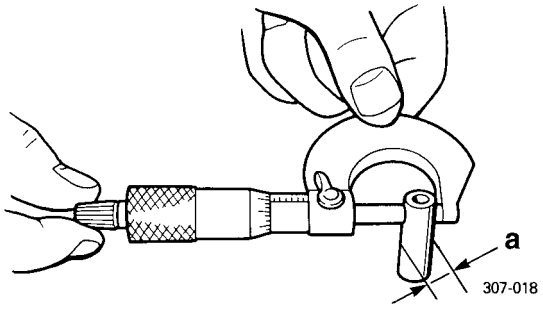
NOTE:
The oil ring expander spacer's end gap cannot be measured. If the oil ring rail's gap is excessive, replace all three piston rings.

Piston ring
Top ring
End gap (installed)
0.19–0.31 mm (0.0075–0.0122 in)
Limit
0.60 mm (0.0236 in)
2nd ring
End gap (installed)
0.30–0.45 mm (0.0118–0.0177 in)
Limit
0.60 mm (0.0236 in)
Oil ring
End gap (installed)
0.10–0.35 mm (0.0039–0.0138 in)

EAS24440
CHECKING THE PISTON PIN

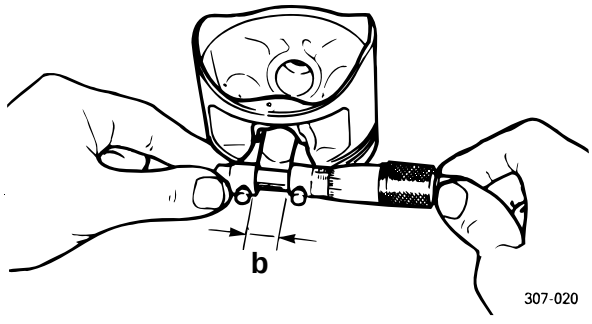
1. Check:
   - Piston pin
     Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.
2. Measure:
   - Piston pin outside diameter “a”
     Out of specification → Replace the piston pin.

Piston pin outside diameter
15.991–16.000 mm (0.6296–0.6299 in)
Limit
15.970 mm (0.6287 in)



3. Measure:
   - Piston pin bore diameter “b”
     Out of specification → Replace the piston.

Piston pin bore inside diameter
16.002–16.013 mm (0.6300–0.6304 in)
Limit
16.043 mm (0.6316 in)



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

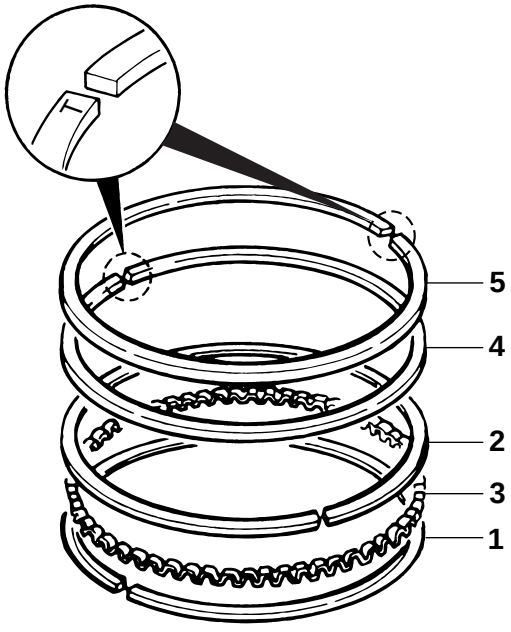
Piston-pin-to-piston-pin-bore clearance =
Piston pin bore diameter “b” -
Piston pin outside diameter “a”

Piston-pin-to-piston-pin-bore clearance
0.002–0.022 mm
Limit
0.073 mm

EAS24450
INSTALLING THE PISTON AND CYLINDER

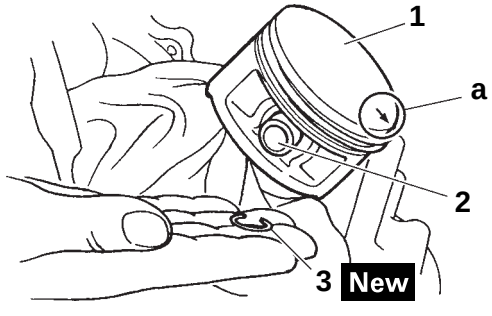
1. Install:
   - Lower oil ring rail “1”
   - Oil ring expander “2”
   - Upper oil ring rail “3”
   - 2nd ring “4”
   - Top ring “5”

NOTE:
Be sure to install the piston rings so that the “T” marks or numbers face up.



2. Install:
   - Piston “1”
   - Piston pin “2”
   - Piston pin clips “3” New

NOTE:
- Apply engine oil the piston pin.
- Make sure the arrow mark “a” on the piston points towards the exhaust side of the cylinder.
- Before installing the piston pin clip, cover the crankcase opening with a clean rag to prevent the clip from falling into the crankcase.

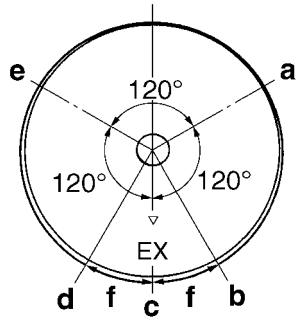


3. Install:
   - O-ring New
   - Cylinder gasket New
   - Dowel pins
4. Lubricate:
   - Piston
   - Piston rings
   - Cylinder

(with the recommended lubricant)

Recommended lubricant
Engine oil

5. Offset:
   - Piston ring end gaps



a. Top ring
b. Upper oil ring rail
c. Spacer
d. Lower oil ring rail
e. 2nd ring
f. 20mm

6. Install:
   - Cylinder

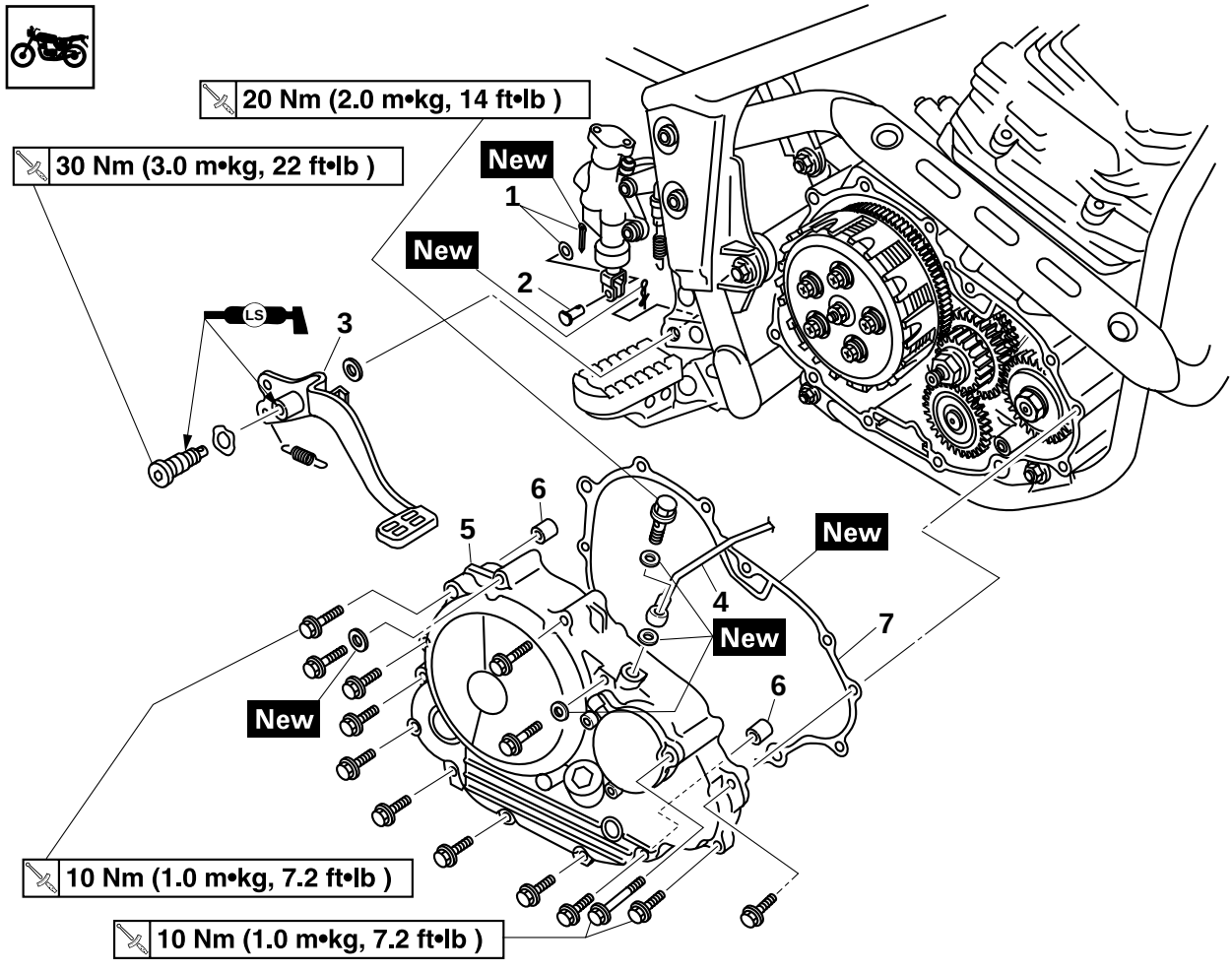
Cylinder bolt
10 Nm (1.0 m•kg, 7.2 ft•lb)

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

EAS25060

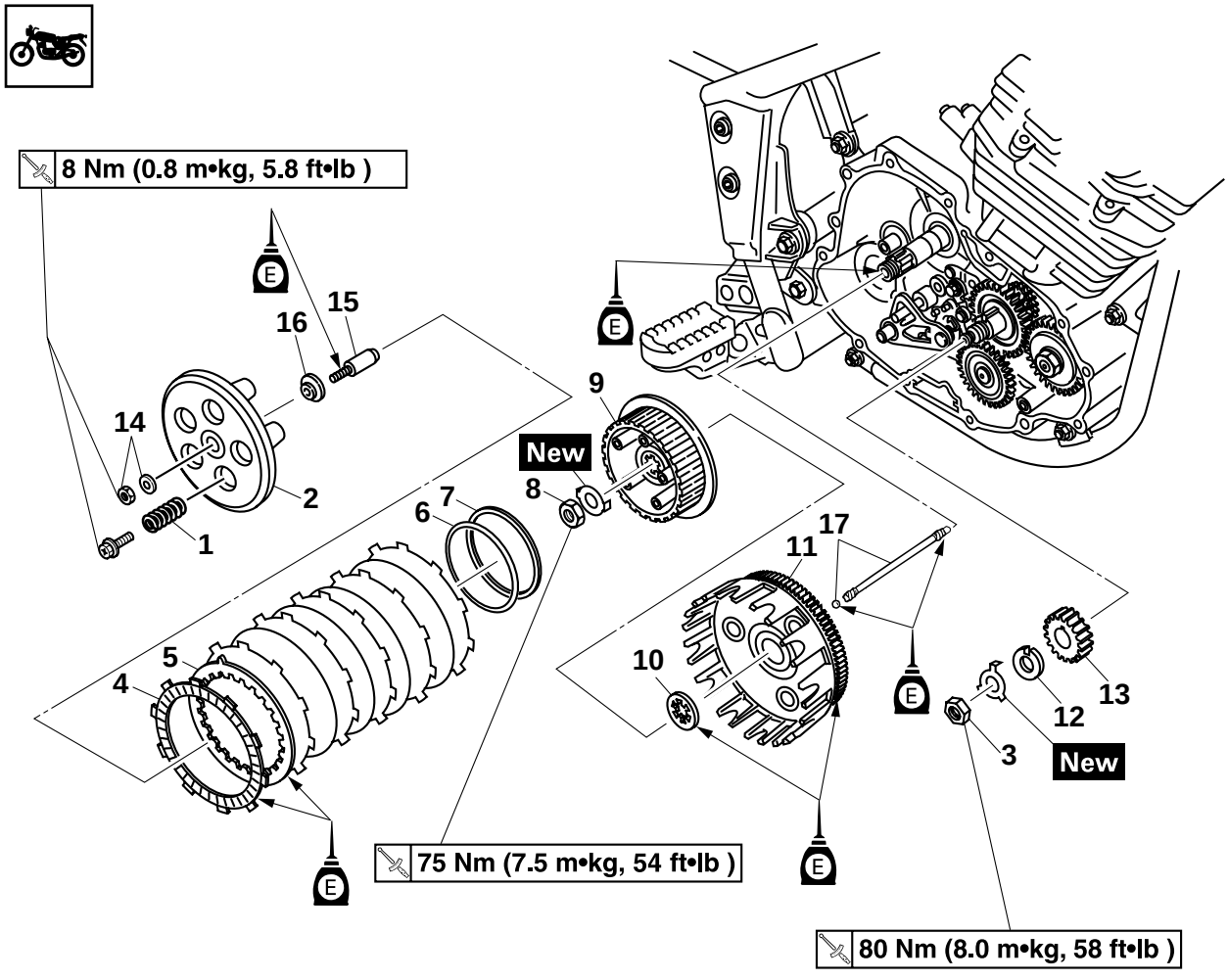
CLUTCH

Removing the clutch cover



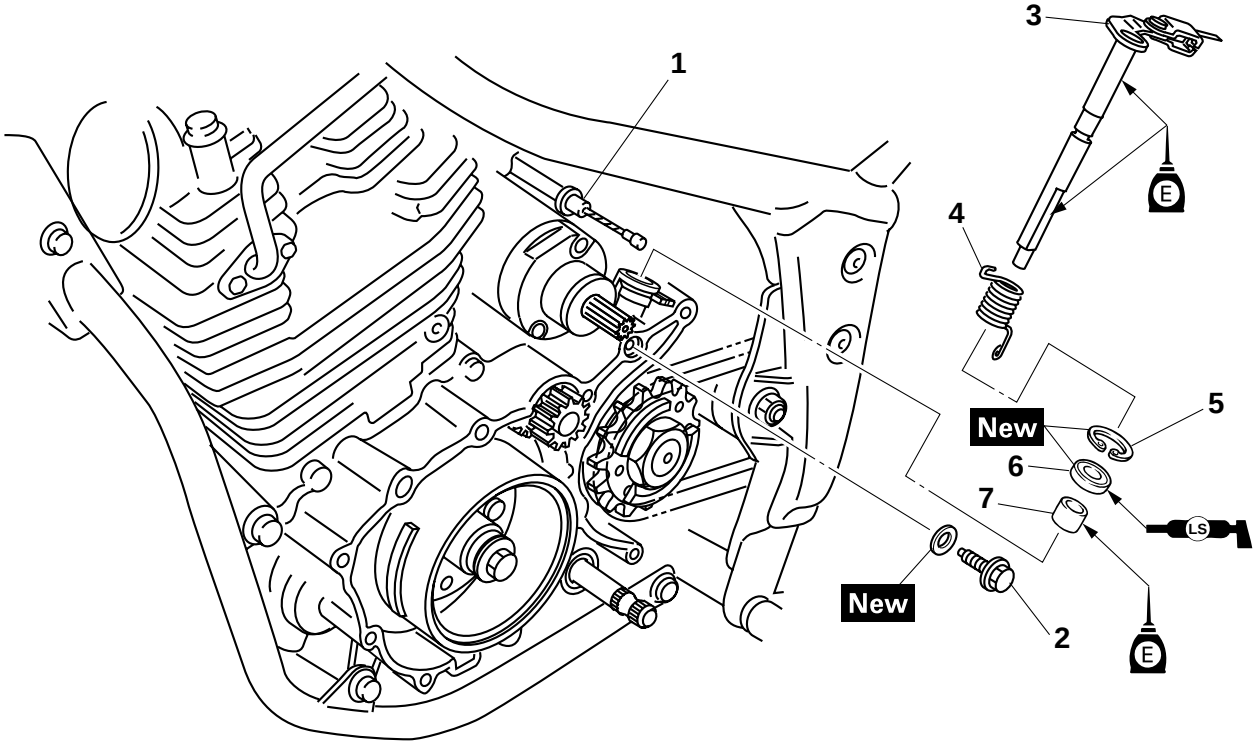
Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Refer to "CHANGING THE ENGINE OIL" on page 3-10.
1	Cotter pin/Washer	1/1	
2	Clevis pin	1	
3	Brake pedal	1	
4	Oil delivery pipe	1	
5	Right crankcase cover	1	
6	Dowel pin	2	
7	Gasket	1	
			For installation, reverse the removal procedure.

Removing the clutch



Order	Job/Parts to remove	Q'ty	Remarks
1	Clutch spring	5	
2	Pressure plate	1	
3	Primary drive gear nut	1	
4	Friction plate	6	
5	Clutch plate	5	
6	Cushion spring	1	
7	Seat plate	1	
8	Clutch boss nut	1	
9	Clutch boss	1	
10	Thrust washer	1	
11	Clutch housing	1	
12	Claw washer	1	
13	Primary driven gear	1	
14	Locknut/Washer	1/1	
15	Push rod1	1	
16	Push plate	1	
17	Push rod 2/Ball	1/1	
			For installation, reverse the removal procedure.

Removing the push lever shaft

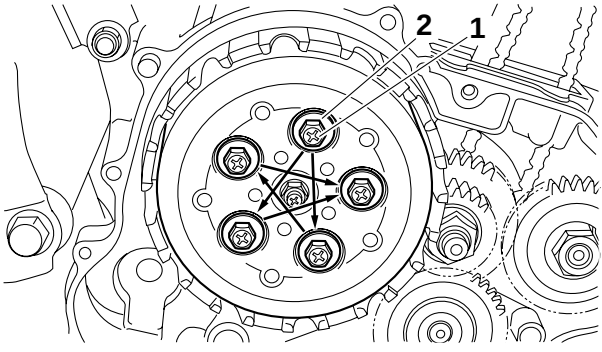


Order	Job/Parts to remove	Q'ty	Remarks
	Shift pedal		Refer to "ENGINE REMOVAL" on page 5-1.
	Left crankcase cover		
	Clutch assembly		
1	Clutch cable	1	
2	Bolt	1	
3	Push lever shaft	1	
4	Torsion spring	1	
5	Circlip	1	
6	Oil seal	1	
7	Bearing	1	
			For installation, reverse the removal procedure.

EAS25070
REMOVING THE CLUTCH

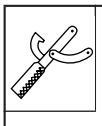
1. Remove:
   - Bolt “1”
   - Clutch spring “2”

NOTE:
Loosen the bolts in stages and in a crisscross pattern.

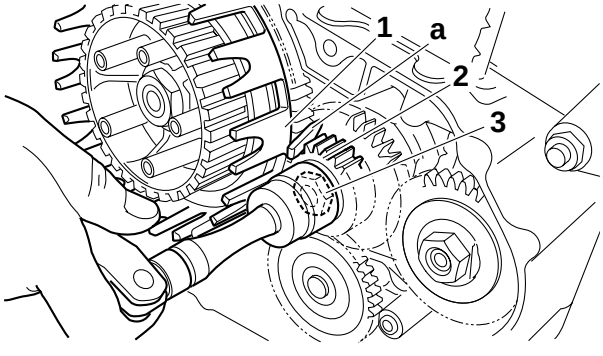


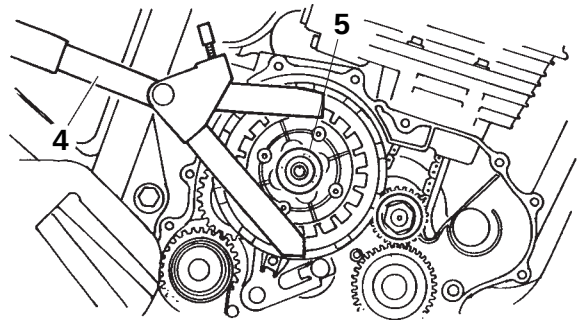
2. Straighten the lock washer tab.
3. Loosen:
   - Primary drive gear nut
   - Clutch boss nut

NOTE:
- Place the aluminum plate “a” between clutch housing “1” and primary drive gear “2”, and then loosen the primary drive gear nut “3”.
- While holding the clutch boss; with the universal clutch holder “4”, loosen the clutch boss nut “5”.

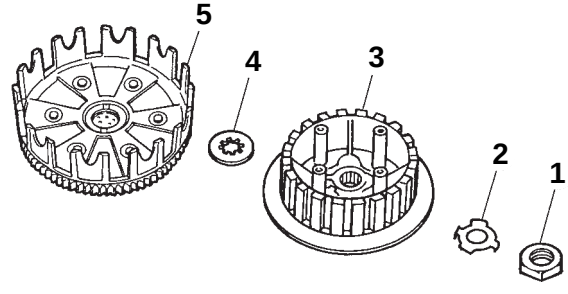


Universal clutch holder
90890-04086
YM-91042

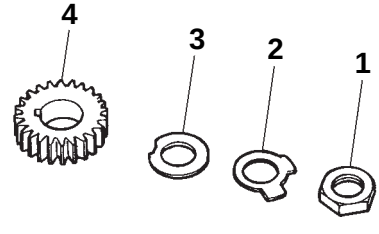




4. Remove:
   - Clutch boss nut “1”
   - Lock washer “2”
   - Clutch boss “3”
   - Thrust washer “4”
   - Clutch housing “5”



5. Remove:
   - Primary drive gear nut “1”
   - Lock washer “2”
   - Claw washer “3”
   - Primary drive gear “4”



EAS25100
CHECKING THE FRICTION PLATES

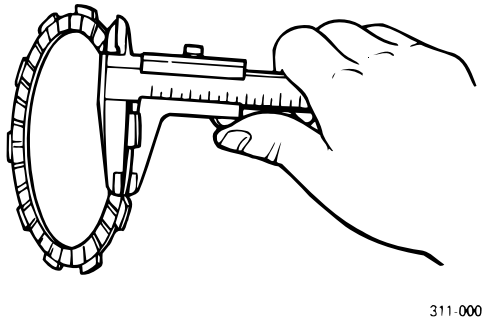
The following procedure applies to all of the friction plates.

1. Check:
   - Friction plate
     Damage/wear → Replace the friction plate.
2. Measure:
   - Friction plate thickness

Out of specification → Replace the friction plate.

NOTE:
Measure the friction plate at four places.

Friction plate thickness
2.70–2.90 mm (0.106–0.114 in)
Wear limit
2.60 mm (0.1024 in)

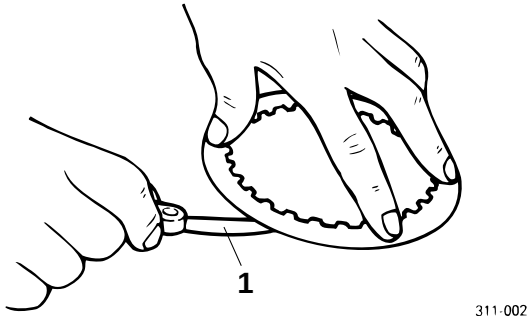


EAS25110
CHECKING THE CLUTCH PLATES

The following procedure applies to all of the clutch plates.

1. Check:
   - Clutch plate
     Damage → Replace the clutch plate.
2. Measure:
   - Clutch plate warpage
     (with a surface plate and thickness gauge "1")
     Out of specification → Replace the clutch plate.

Warpage limit
0.20 mm (0.0079 in)

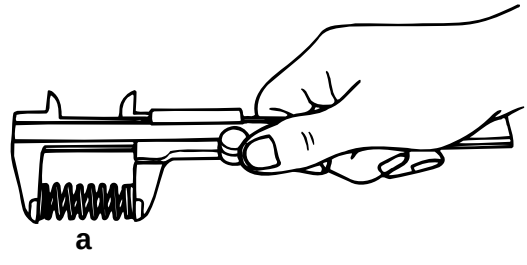


EAS25140
CHECKING THE CLUTCH SPRINGS

The following procedure applies to all of the clutch springs.

1. Check:
   - Clutch spring
     Damage → Replace the clutch spring.
2. Measure:
   - Clutch spring free length "a"
     Out of specification → Replace the clutch spring.

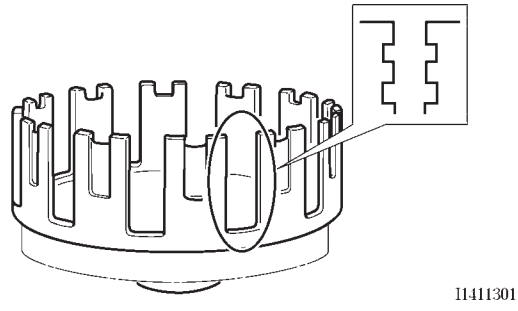
Clutch spring free length
40.10 mm (1.58 in)
Minimum length
38.10 mm (1.50 in)



EAS25150
CHECKING THE CLUTCH HOUSING

1. Check:
   - Clutch housing dogs "1"
     Damage/pitting/wear → Deburr the clutch housing dogs or replace the clutch housing.

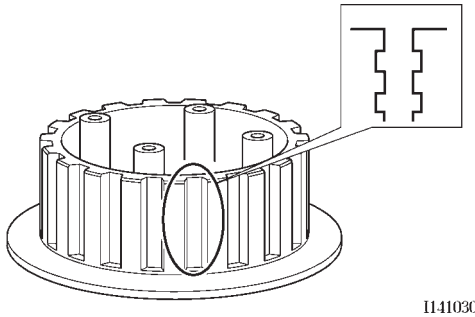
NOTE:
Pitting on the clutch housing dogs will cause erratic clutch operation.



EAS25160
CHECKING THE CLUTCH BOSS

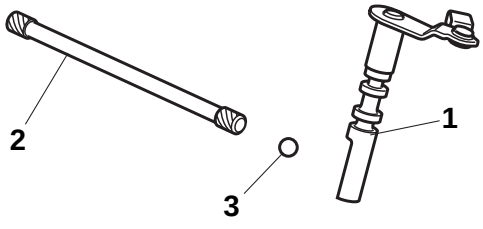
1. Check:
   - Clutch boss splines
     Damage/pitting/wear → Replace the clutch boss.

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



EAS25170
CHECKING THE PRESSURE PLATE
1. Check:
   - Pressure plate
     Cracks/damage → Replace.

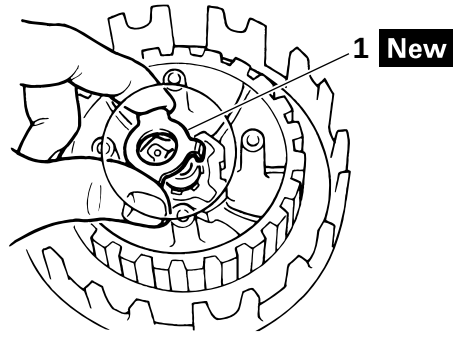
EAS25190
CHECKING THE CLUTCH PUSH RODS
1. Check:
   - Push lever shaft “1”
   - Push rod 2 “2”
   - Ball “3”
     Cracks/damage/wear → Replace the defective part(s).



EAS25200
CHECKING THE PRIMARY DRIVE GEAR
1. Check:
   - Primary drive gear
     Damage/wear → Replace the primary drive and primary driven gears as a set.
     Excessive noise during operation → Replace the primary drive and primary driven gears as a set.
2. Check:
   - Primary-drive-gear-to-primary-driven-gear free play
     Free play exists → Replace the primary drive and primary driven gears as a set.

EAS25260
INSTALLING THE CLUTCH
1. Install:
   - Primary drive gear
   - Claw washer
   - Lock washer New
   - Primary drive gear nut
2. Install:
   - Clutch housing
   - Thrust washer
   - Clutch boss
   - Lock washer “1”
   - Clutch boss nut

NOTE:
Make sure the teeth on the lock washer are correctly aligned with the grooves on the clutch boss.

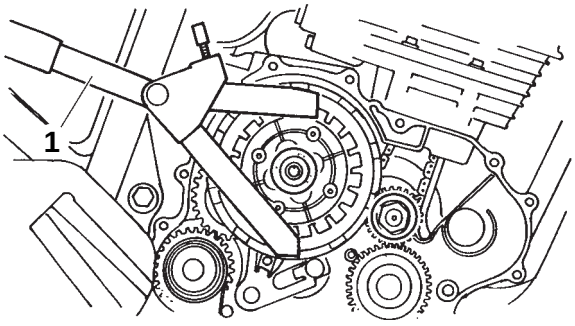


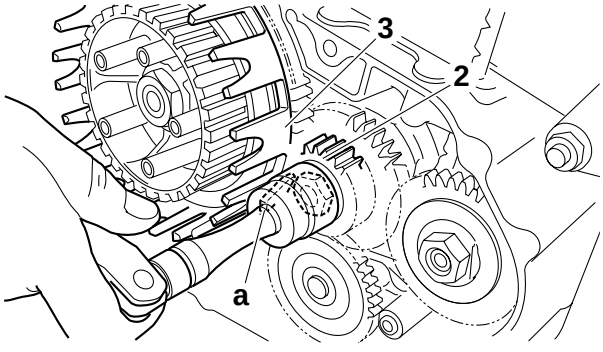
3. Tighten:
   - Clutch boss nut
   - Primary drive gear nut

Clutch boss nut
75 Nm (7.5 m•kg, 54 ft•lb)
Primary drive gear nut
80 Nm (8.0 m•kg, 58 ft•lb)

NOTE:
- While holding the clutch boss with the universal clutch holder “1”, tighten the clutch boss nut.
- Place the aluminum plate “a” between primary drive gear “2” and clutch housing “3”, and then tighten the primary drive gear nut.

Universal clutch holder
90890-04086
YM-91042



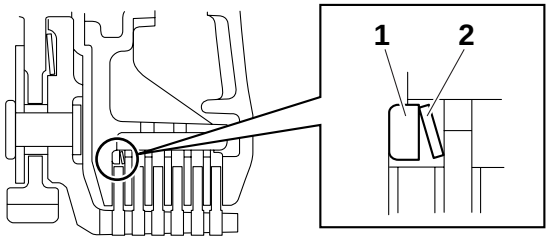


4. Bend the lock washer tab along a flat side of the nut.
5. Lubricate:
   - Friction plates
   - Clutch plates
   (with the recommended lubricant)

	Recommended lubricant **Engine oil**

6. Install:
   - Seat plate
   - Cushion spring
   - Friction plates (6 piece)
   - Clutch plates (5 piece)

NOTE:
- Install the seat plate "1" and cushion spring "2" as shown.
- First, install a friction plate and then alternate between a clutch plate and a friction plate.



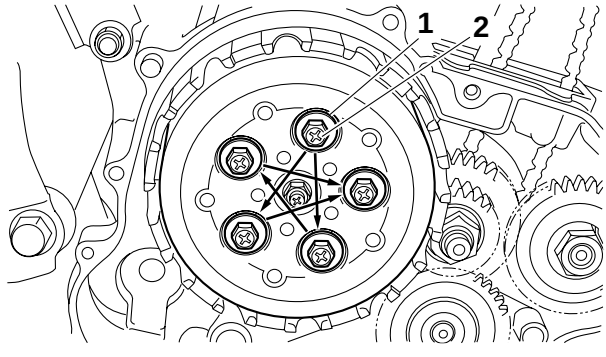
7. Install:
   - Bearing
   - Oil seal New
   - Circlip New
   - Torsion spring
   - Push lever shaft
   - Bolt
   - Clutch cable

NOTE:
After installing the clutch cable, bend the push lever shaft tab along a flat side of the nut.

8. Install:
   - Push rod 2
   - Ball
   - Push rod 1
   - Push plate
   - Washer
   - Washer
   - Locknut
   - Pressure plate
   - Clutch spring "1"
   - Bolt "2"

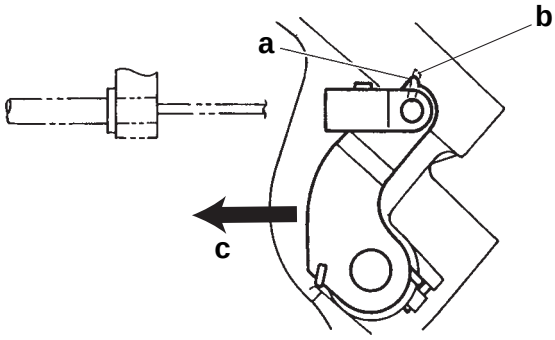
	Locknut **8 Nm (0.8 m•kg, 5.8 ft•lb)** **Clutch spring bolt** **8 Nm (0.8 m•kg, 5.8 ft•lb)**

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



9. Check:
   - Push lever position
   Push lever mark "a" and crankcase mark "b" not aligned → Correct.

NOTE:
Push the push lever in direction "c" and make sure the marks are aligned.



10. Adjust:
- Push lever position

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

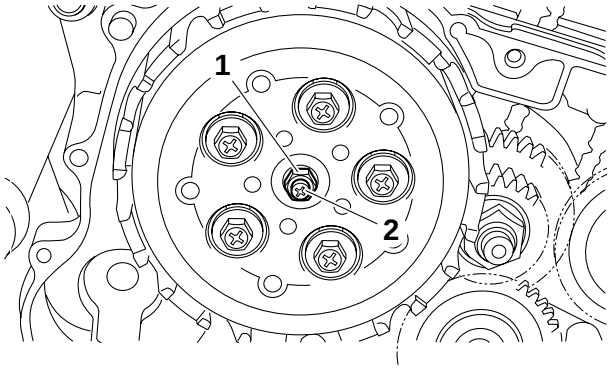
a. Loosen the locknut “1”.
b. Turn the adjusting screw “2” in or out until the marks are aligned.
c. Hold the adjusting screw to prevent it from moving and then tighten the locknut to specification.

ECA13820

CAUTION:

Do not overtighten the locknut since this will remove the free play between both push rods.

	Locknut **8 Nm (0.8 m•kg, 5.8 ft•lb)**



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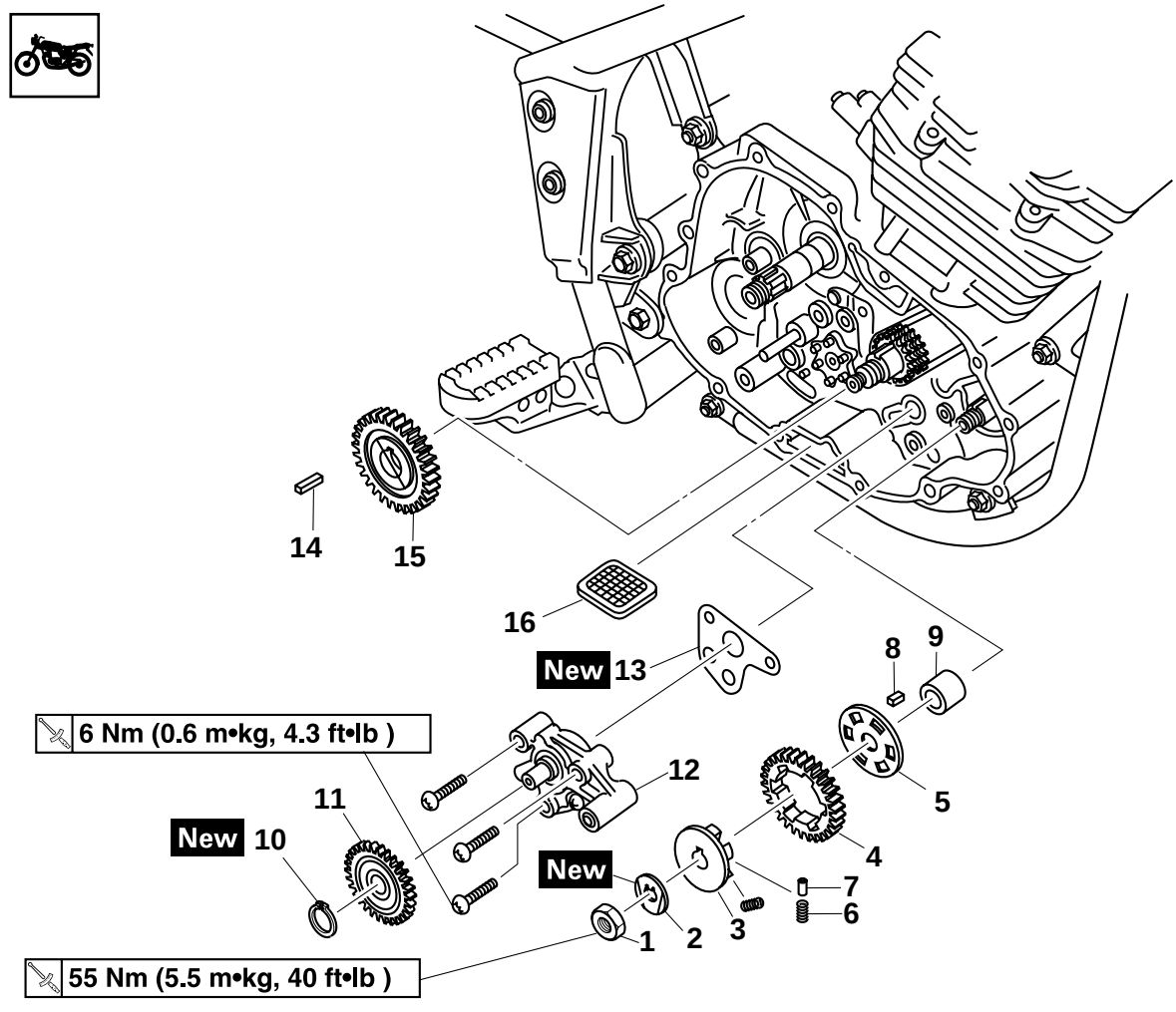
11. Check:
- Clutch cable free play
  Refer to “ADJUSTING THE CLUTCH CABLE FREE PLAY” on page 3-12.

	Clutch lever free play **10.0–15.0 mm (0.39–0.59 in)**

EAS24910

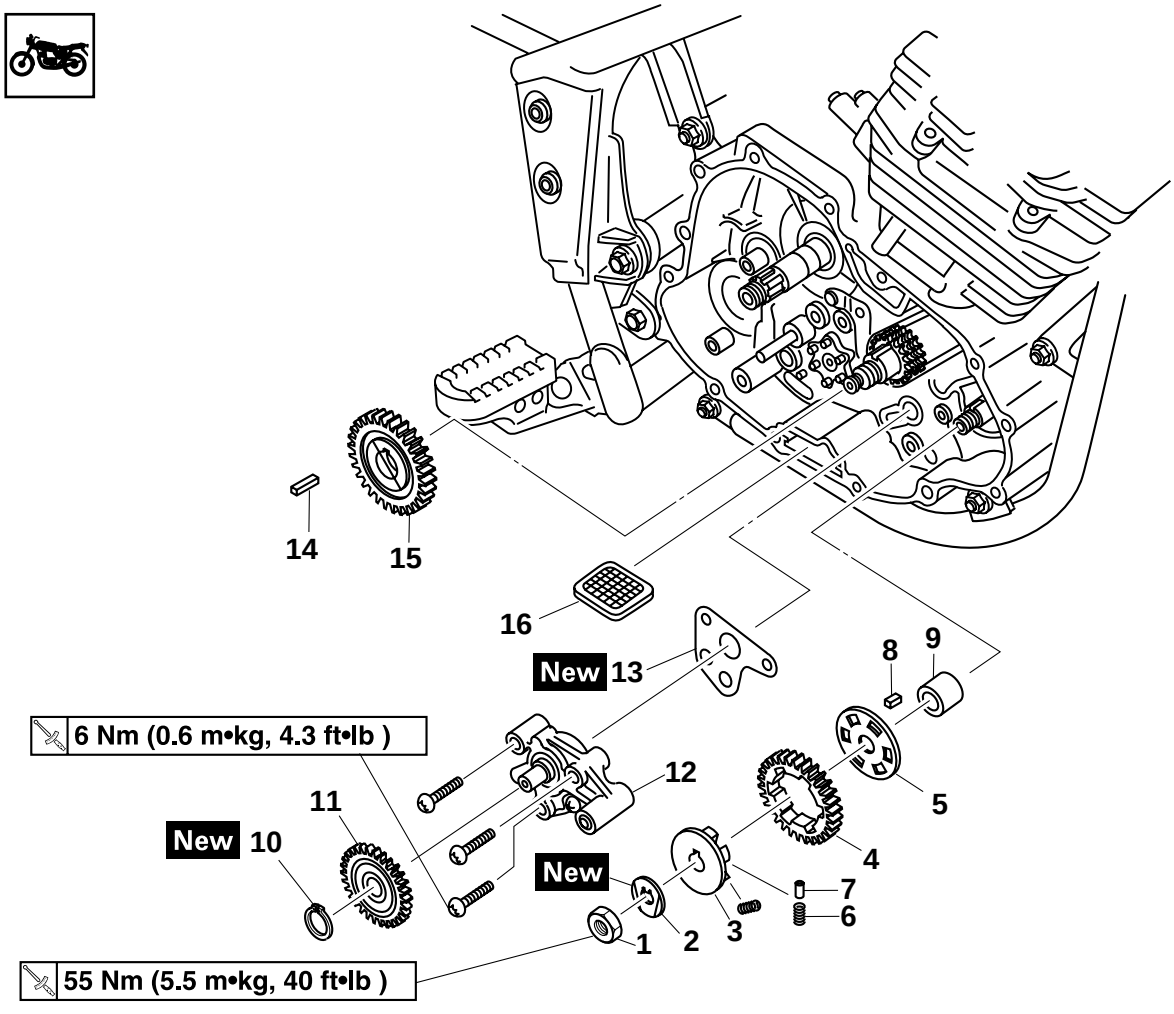
OIL PUMP AND BLANCER WEIGHT GEAR

Removing the oil pump and balancer weight gear



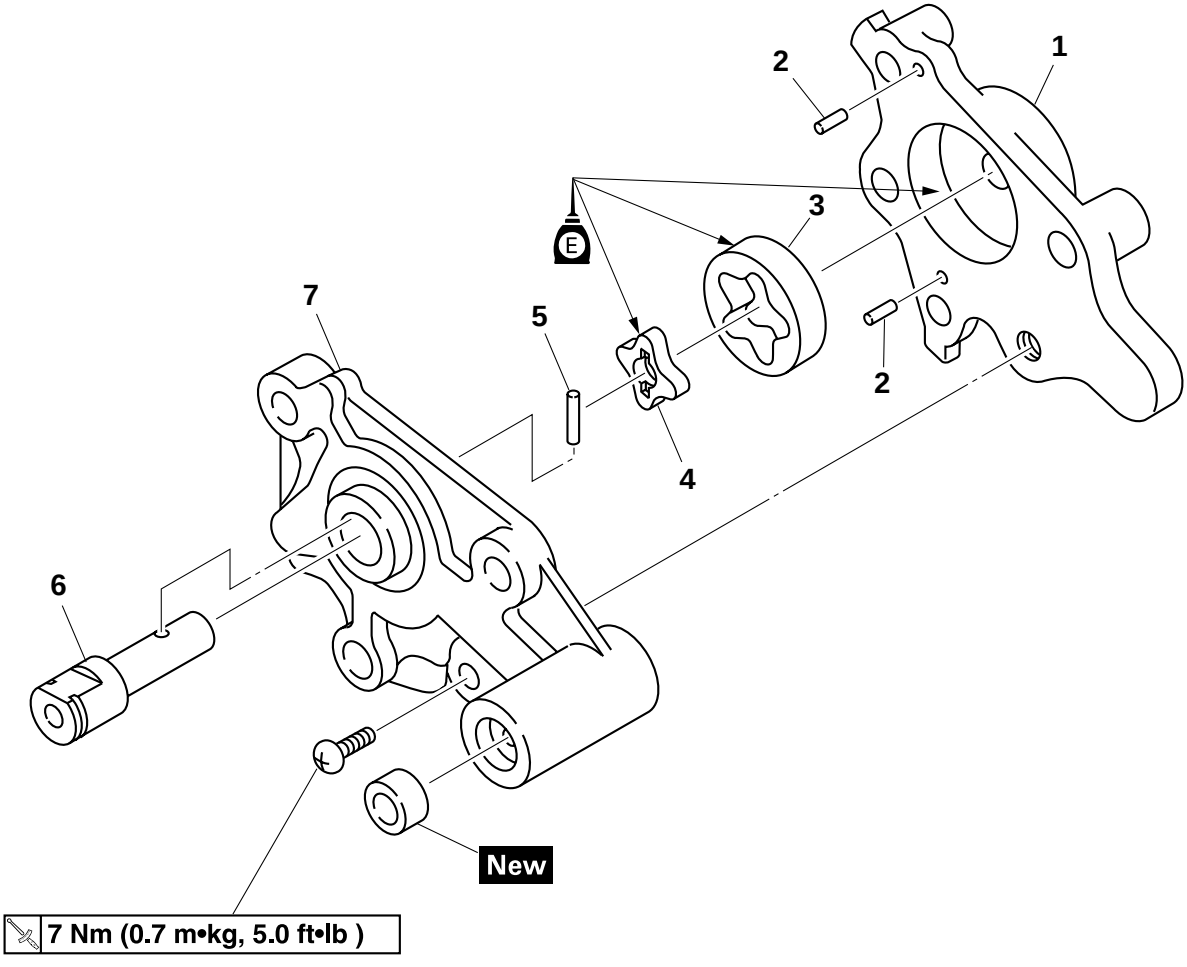
Order	Job/Parts to remove	Q'ty	Remarks
	Right crankcase cover		Refer to "CLUTCH" on page 5-30.
	Clutch		
	Primary drive gear		
1	Balancer weight gear nut	1	
2	Lock washer	1	
3	Buffer boss	1	
4	Balancer weight gear	1	
5	Absorber plate	1	
6	Compression spring	6	
7	Dowel pin	3	
8	Straight key	1	
9	Spacer	1	
10	Circlip	1	
11	Oil pump driven gear	1	
12	Oil pump assembly	1	
13	Gasket	1	
14	Straight key	1	
15	Balancer drive gear	1	
16	Oil strainer	1	

Removing the oil pump and balancer weight gear



Order	Job/Parts to remove	Q'ty	Remarks
			For installation, reverse the removal procedure.

Disassembling the oil pump



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil pump housing	1	
2	Dowel pin	2	
3	Outer rotor	1	
4	Inner rotor	1	
5	Dowel pin	1	
6	Shaft	1	
7	Oil pump cover	1	
			For assembly, reverse the disassembly procedure.

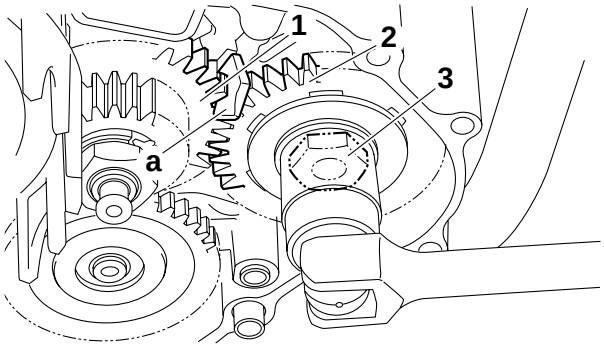
EAS4D601

REMOVING THE BALANCER WEIGHT GEAR AND OIL PUMP

1. Straighten the lock washer tab.
2. Remove:
   - Balancer weight gear nut
   - Lock washer
   - Balancer weight gear

NOTE:

Place the aluminum plate “a” between balancer drive gear “1” and balancer weight gear “2”, and then loosen the balancer weight gear nut “3”.



3. Remove:
   - Oil pump assembly

EAS24960

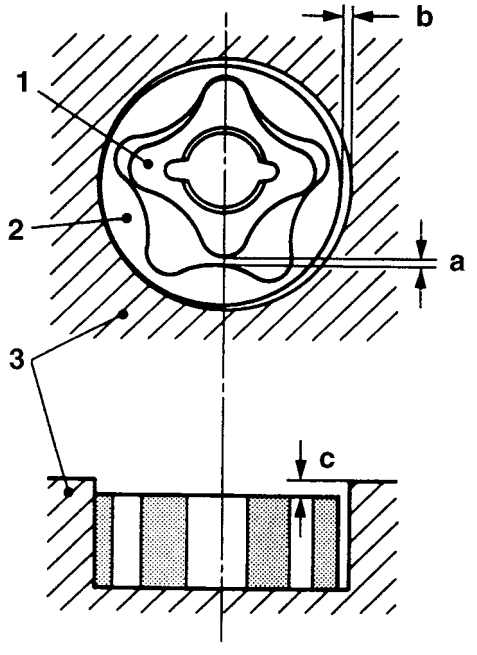
CHECKING THE OIL PUMP

1. Check:
   - Oil pump driven gear
   - Oil pump housing
   - Oil pump cover

   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”
   - Oil-pump-housing-to-inner-rotor-and-outer-rotor clearance “c”

   Out of specification → Replace the oil pump.

Inner-rotor-to-outer-rotor-tip clearance
0.150 mm (0.0059 in)
Limit
0.20 mm (0.0079 in)
Outer-rotor-to-oil-pump-housing clearance
0.010–0.034 mm (0.0004–0.0013 in)
Limit
0.050 mm (0.0020 in)
Oil-pump-housing-to-inner-and-outer-rotor clearance
0.04–0.09 mm (0.0016–0.0035 in)
Limit
0.15 mm (0.0059 in)



1. Inner rotor
2. Outer rotor
3. Oil pump housing

3. Check:
   - Oil pump operation

   Rough movement → Repeat steps (1) and (2) or replace the defective part(s).

EAS4D602

CHECKING THE BALANCER WEIGHT GEAR

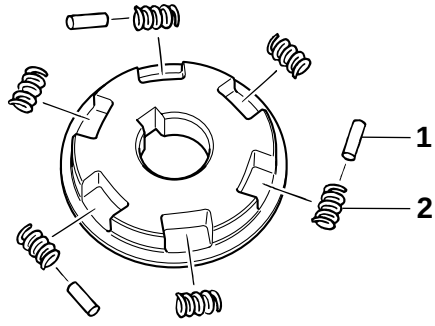
1. Check:
   - Balancer weight gear
   - Buffer boss
   - Compression spring
   - Dowel pin

   Cracks/damage/wear → Replace.

EAS4D603
ASSENBLING THE BALANCER DRIVE GEAR

1. Assemble:
   - Dowel pin “1”
   - Compression spring “2”

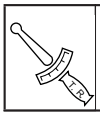
NOTE:
Install the dowel pins and compression springs alternately as shown as.



2. Assemble:
   - Buffer boss

EAS25020
INSTALLING THE OIL PUMP

1. Install:
   - Gasket New
   - Oil pump

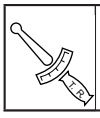
	**Oil pump bolt** **6 Nm (0.6 m•kg, 4.3 ft•lb)**

ECA13890
CAUTION:
After tightening the bolts, make sure the oil pump turns smoothly.

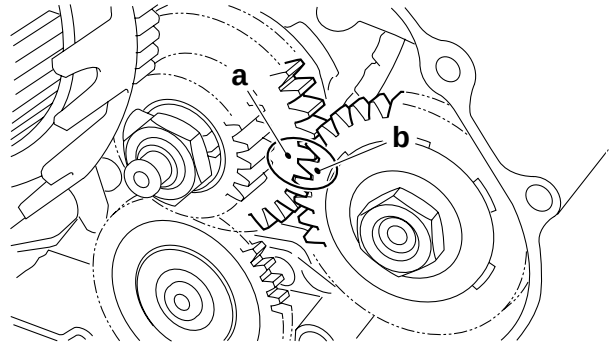
NOTE:
Align the arrow mark on the oil pump with the arrow mark on the crankcase.

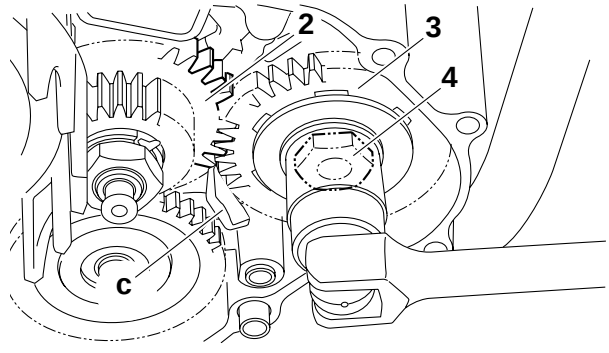
EAS4D604
INSTALLING THE BALANCER WEIGHT GEAR

1. Remove:
   - Balancer weight gear
   - Lock washer New
   - Balancer weight gear nut

	**Balancer weight gear nut** **55 Nm (5.5 m•kg, 40 ft•lb)**

NOTE:
- Align the punch mark “a” in the balancer drive gear with the punch mark “b” in the balancer weightn gear.
- Place the aluminum plate “c” between balancer drive gear “2” and balancer weight gear “3”, and then tighten the balancer weight gear nut “4”.



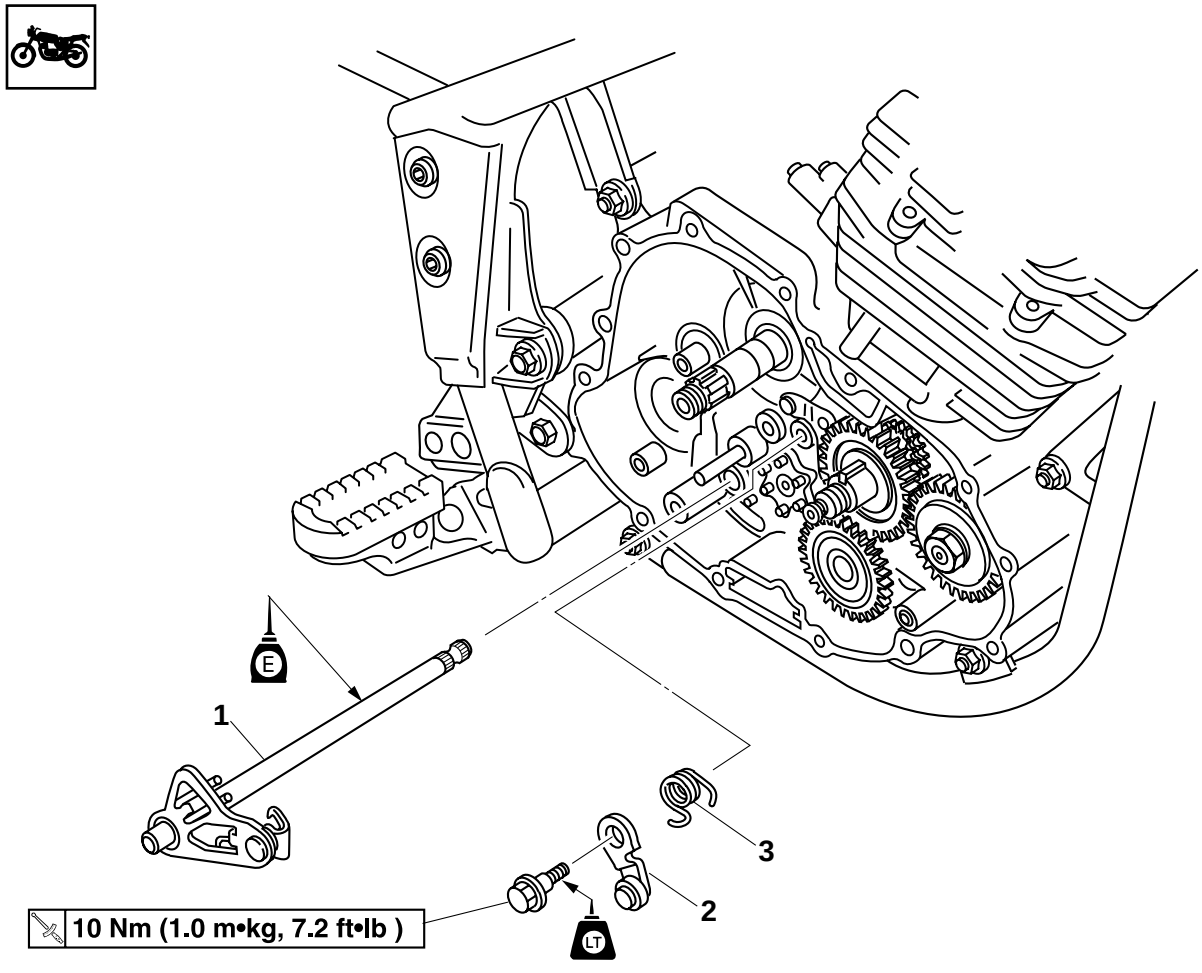


2. Bend the lock washer tab along a flat side of the nut.

EAS25410

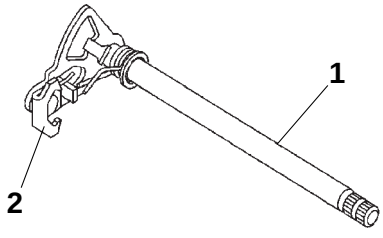
SHIFT SHAFT

Removing the shift shaft and stopper lever



Order	Job/Parts to remove	Q'ty	Remarks
	Right crankcase cover		Refer to "CLUTCH" on page 5-30.
	Clutch		
1	Shift shaft assembly	1	
2	Stopper lever	1	
3	Torsion spring	1	
			For installation, reverse the removal procedure.

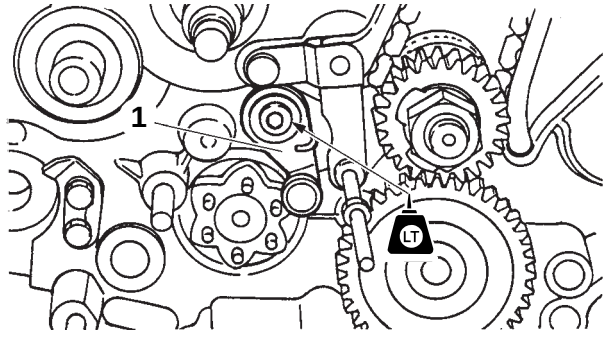
EAS25420
CHECKING THE SHIFT SHAFT
1. Check:
   - Shift shaft “1”
   - Shift lever “2”
     Bends/damage/wear → Replace.
   - Shift lever spring
     Damage/wear → Replace.



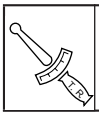
EAS25430
CHECKING THE STOPPER LEVER
1. Check:
   - Stopper lever
     Bends/damage → Replace.
     Roller turns roughly → Replace the stopper lever.

EAS25450
INSTALLING THE SHIFT SHAFT
1. Install:
   - Stopper lever “1”

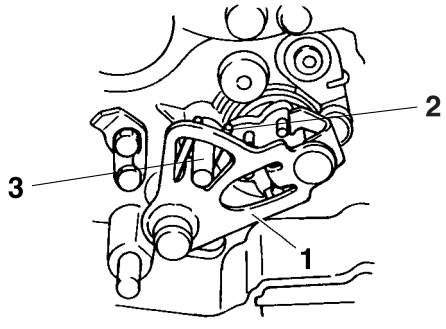
NOTE:
- Hook the ends of the stopper lever spring onto the stopper lever and the crankcase boss.
- Mesh the stopper lever with the shift drum segment assembly.



2. Tighten:
   - Stopper lever bolt

	**Stopper lever bolt** **10 Nm (1.0 m•kg, 7.2 ft•lb)**

3. Install:
   - Shift shaft “1”

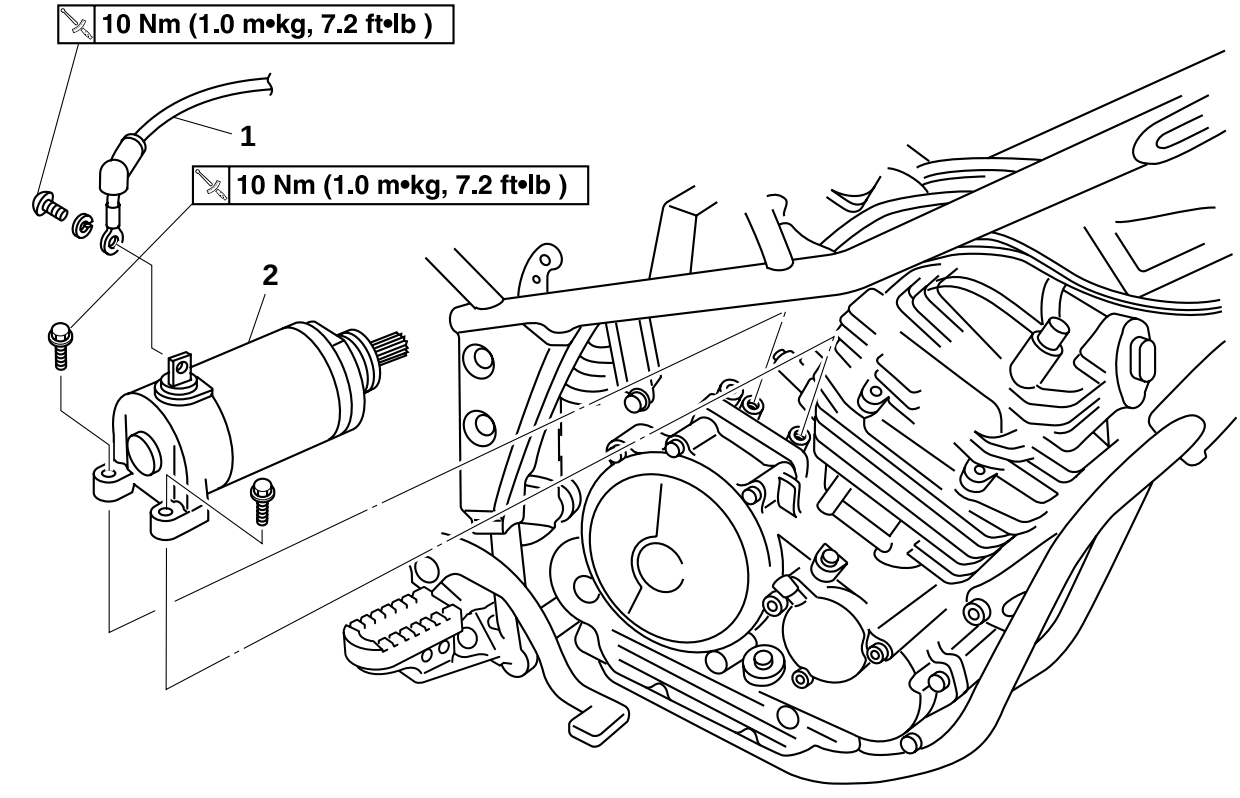


NOTE:
Install the shift shaft “1” by aligning the shift shaft spring “2” with the stopper “3”.

EAS24780

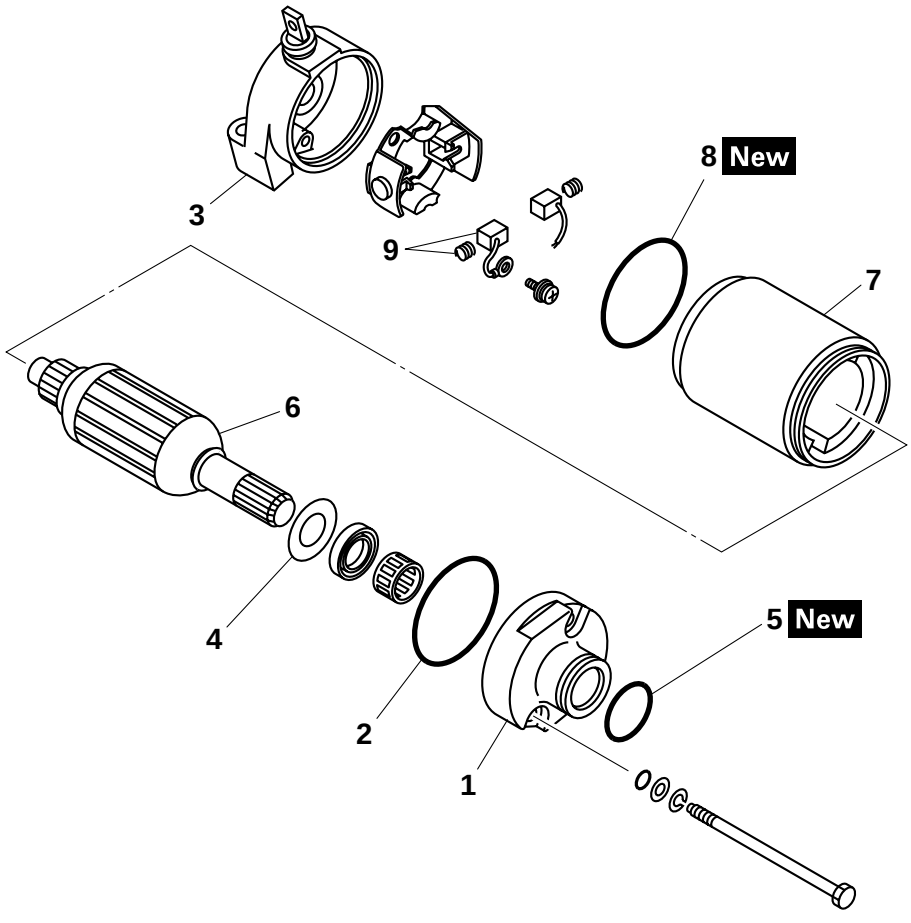
ELECTRIC STARTER

Removing the starter motor



Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank		Refer to "FUEL TANK" on page 6-1.
	Battery negative lead		Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-38.
	Carburetor		Refer to "CARBURETOR" on page 6-3.
1	Starter motor lead	1	
2	Starter motor assembly	1	
			For installation, reverse the removal procedure.

Disassembling the starter motor

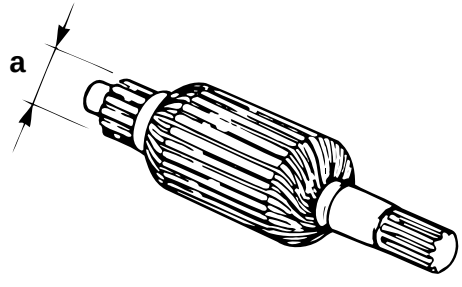


Order	Job/Parts to remove	Q'ty	Remarks
1	Front bracket	1	
2	O-ring	1	
3	Tang washer/Plate washer	1/1	
4	Rear bracket	1	
5	O-ring	1	
6	Armature coil	1	
7	Stator assembly	2	
8	O-ring	1	
9	Brush/brush spring	2/2	
			For assembly, reverse the disassembly procedure.

EAS24790
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.

Limit
21.0 mm (0.83 in)



3. Measure:
   - Mica undercut “a”
     Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.

Mica undercut (depth)
1.50 mm (0.06 in)

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

4. Measure:
   - Armature coil assembly resistances (commutator and insulation)
     Out of specification → Replace the starter motor.

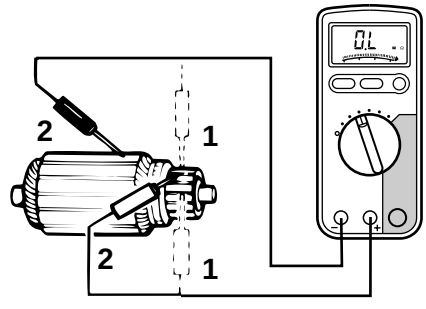
▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Measure the armature assembly resistances with the pocket tester.

Digital circuit tester
90890-03174
Model 88 Multimeter with tachometer
YU-A1927

Armature coil
Commutator resistance “1”
0.0126–0.0154 Ω at 20°C (68°F)
Insulation resistance “2”
Above 1 MΩ at 20°C (68°F)

b. If any resistance is out of specification, replace the starter motor.



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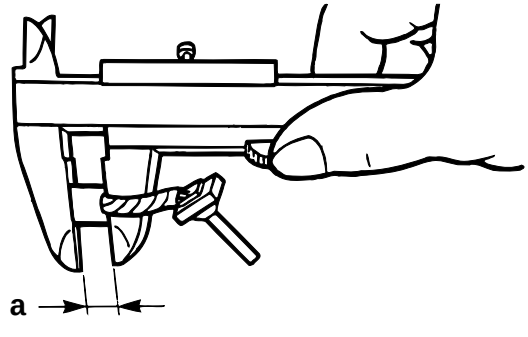
5. Measure:
   - Brush length “a”
     Out of specification → Replace the brushes as a set.

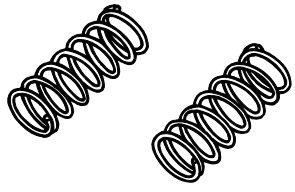
Limit
3.50 mm (0.14 in)



6. Measure:
   - Brush spring force
     Out of specification → Replace the brush

springs as a set.

Brush spring force
5.52–8.28 N (19.87–29.80 oz) (563–844 gf)

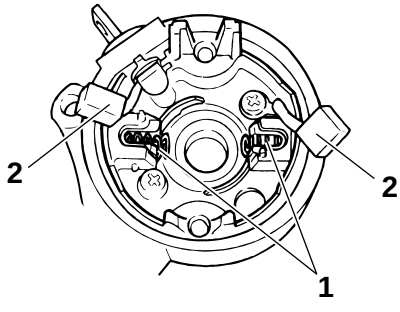


7. Check:
   - Bearing
   - Oil seal

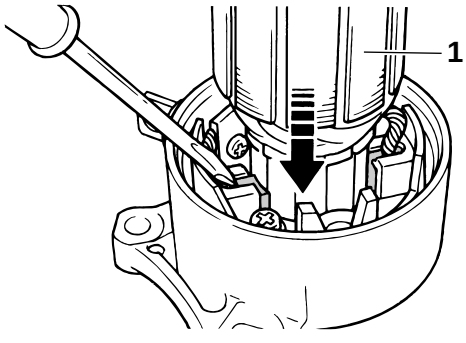
   Damage/wear → Replace the defective part(s).

EAS24800
ASSEMBLING THE STARTER MOTOR

1. Install:
   - Brush spring “1”
   - Brush “2”

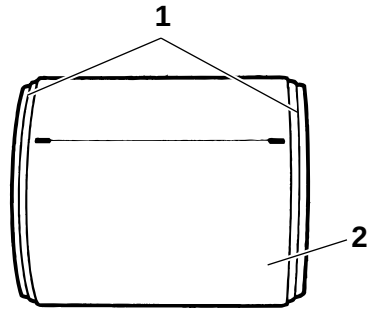


2. Install:
   - Armature coil “1”



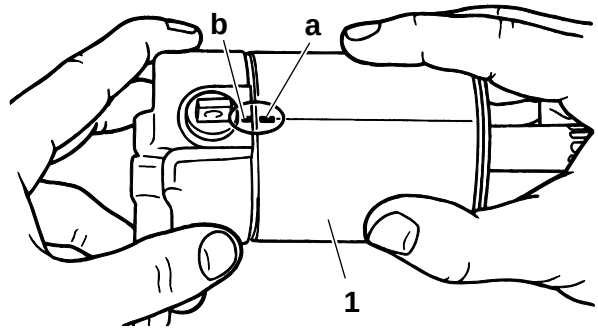
3. Install:
   - O-rings “1” New

   To stator assembly “2”.



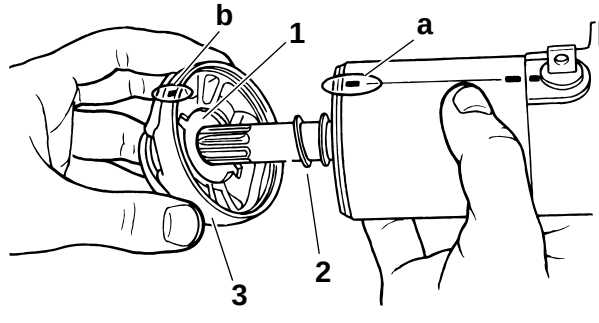
4. Install:
   - Stator assembly “1”

NOTE:
Align the match marks “a” on the starter assembly with the match marks “b” on the rear bracket.



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

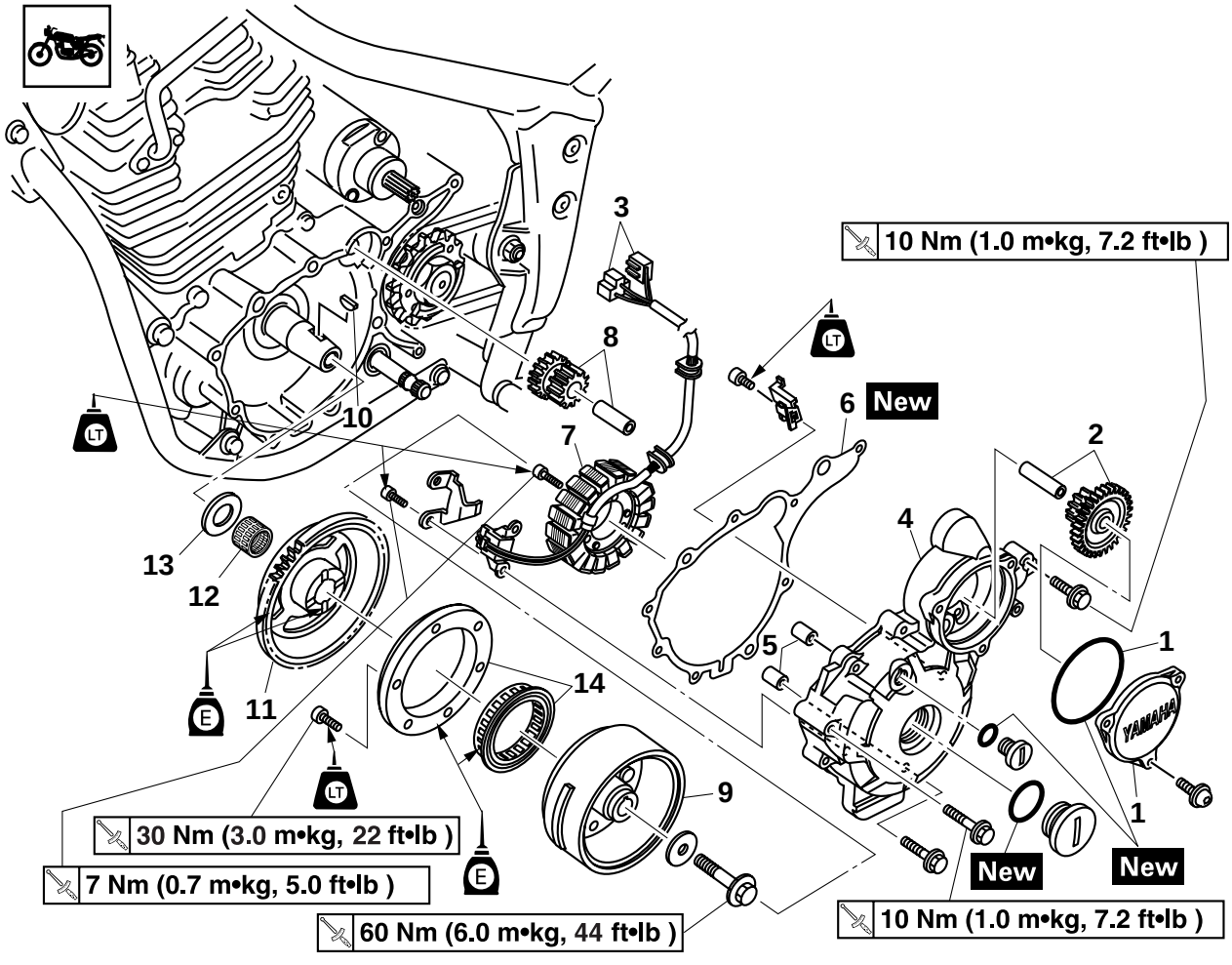
NOTE:
Align the match marks “a” on the starter assembly with the match marks “b” on the front bracket.



EAS24550

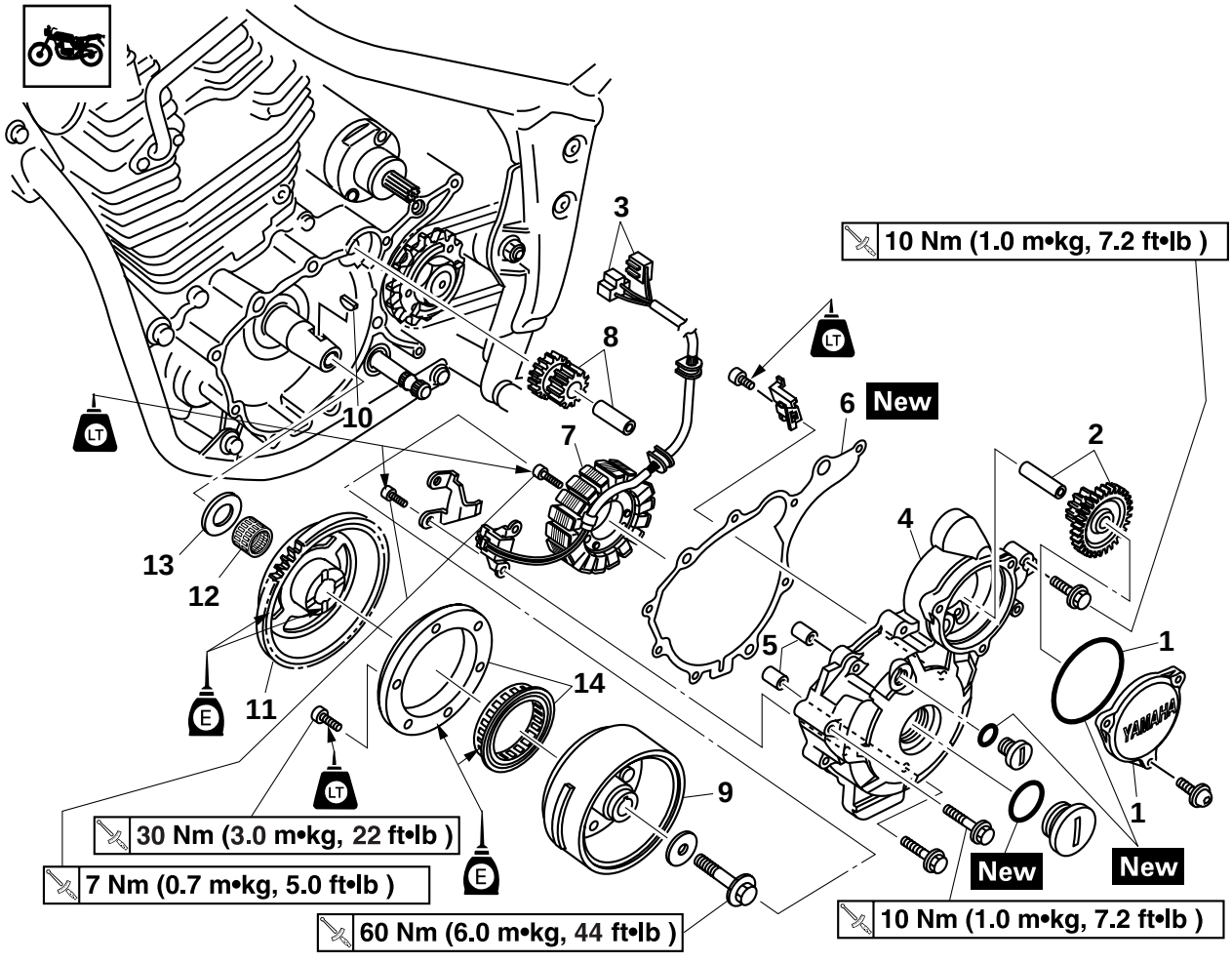
PICKUP COIL ROTOR AND STARTER CLUTCH

Removing the pickup coil rotor and starter clutch



Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-10.
	Shift pedal		Refer to "ENGINE REMOVAL" on page 5-1.
	Drive sprocket cover		
1	Starter idle gear cover/O-ring	1/1	
2	Starter idler gear 1/shaft	1/1	
3	Pickup coil rotor lead coupler	2	Disconnect.
4	Left crankcase cover	1	
5	Dowel pin	2	
6	Crank case cover gasket	1	
7	Stator coil assembly/pickup coil	1/1	
8	Starter idler gear 2/shaft	1/1	
9	Pickup coil rotor	1	
10	Woodruff key	1	
11	Starter wheel gear	1	
12	Bearing	1	
13	Washer	1	
14	Starter clutch	1	

Removing the pickup coil rotor and starter clutch



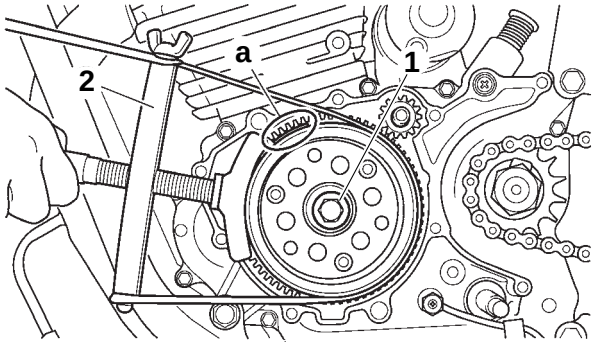
Order	Job/Parts to remove	Q'ty	Remarks
			For installation, reverse the removal procedure.

EAS24530
REMOVING THE PICKUPCOIL ROTOR

1. Remove:
   - Pickup coil rotor bolt “1”
   - Washer

NOTE:
- Loosen the pickup coil rotor bolt “1” while holding the rotor with a sheave holder “2”.
- Do not allow the sheave holder to touch the projection on the rotor “a”.

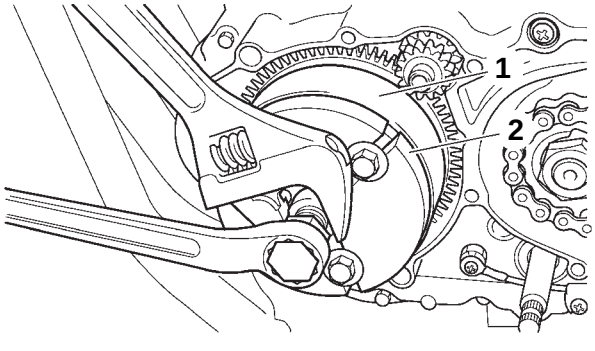
Sheave holder
90890-01701
Primary clutch holder
YS-01880-A



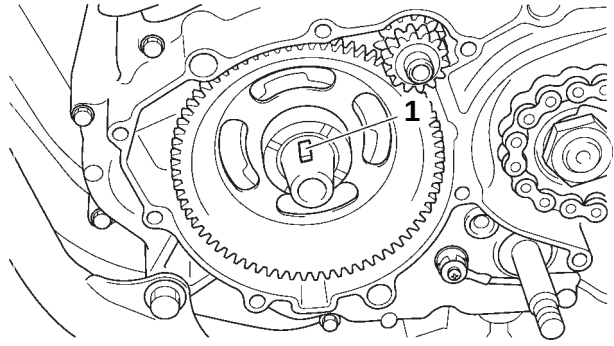
2. Remove:
   - Pickup coil rotor “1”

NOTE:
Remove the rotor using flywheel puller “2”.

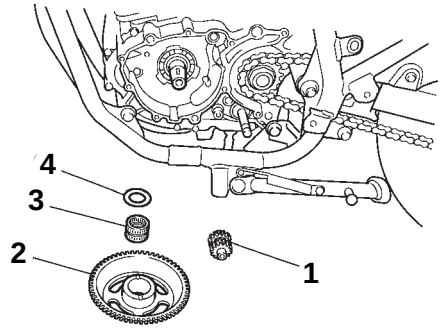
Flywheel puller
90890-01362
Heavy duty puller
YU-33270-B



3. Remove:
   - Woodruff key “1”

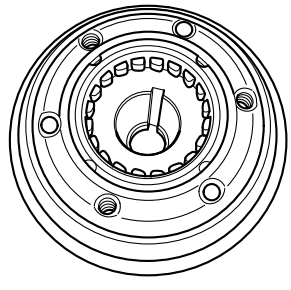


4. Remove:
   - Starter idle gear 2 “1”
   - Starter wheel gear “2”
   - Bearing “3”
   - Washer “4”

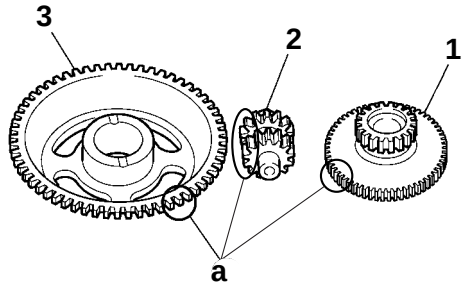


EAS24570
CHECKING THE STARTER CLUTCH

1. Check:
   - Starter clutch rollers
     Damage/wear → Replace the starter clutch.



2. Check:
   - Starter idle gear; “1”
   - Starter wheel gear; “2”
   - Starter clutch gear “3”
     Burrs/chips/roughness/wear → Replace the defective part(s).



3. Check:
   - Starter clutch gear's contacting surfaces
     Damage/pitting/wear → Replace the starter clutch gear.
4. Check:
   - Starter clutch operation

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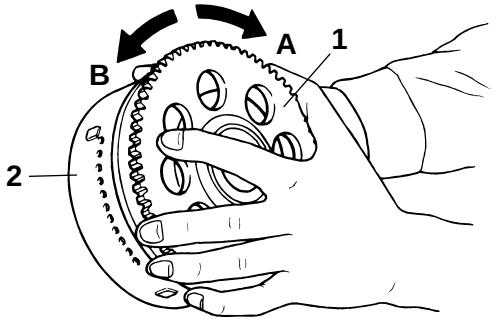
a. Install the starter wheel gear "1" onto the starter clutch "2" and hold the starter clutch.
b. When turning the starter wheel gear clockwise "A", the starter clutch and the starter wheel gear should engage, otherwise the starter clutch is faulty and must be replaced.
c. When turning the starter wheel gear counterclockwise "B", it should turn freely, otherwise the starter clutch is faulty and must be replaced.



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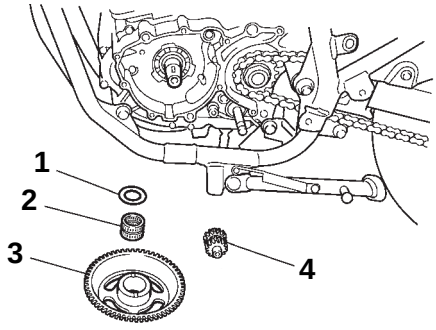
5. Check:
   - Shaft
     Damage/fatigue/wear → Replace the defective part(s).

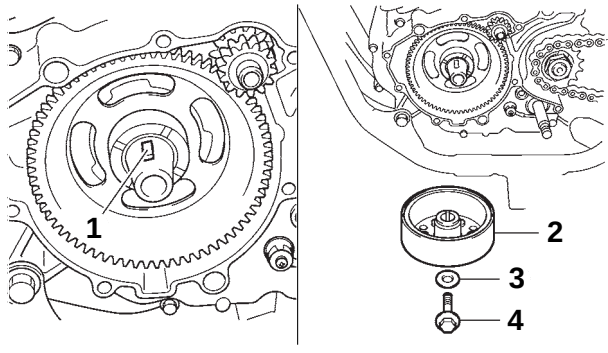
EAS24540
INSTALLING THE PICKUP COIL ROTOR

1. Install:
   - Washer "1"
   - Bearing "2"
   - Starter wheel gear "3"
   - Starter idle gear 2 "4"

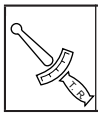


2. Install:
   - Woodruff key "1"
   - Pickup coil rotor "2"
   - Washer "3"
   - Pickup coil rotor bolt "4"

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

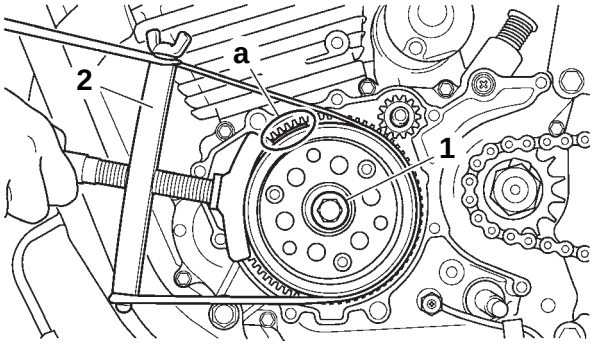


3. Tighten:
   - Pickup coil rotor bolt "1"

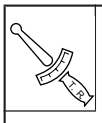
	**Pickup coil rotor bolt** **60 Nm (6.0 m•kg, 44 ft•lb)**

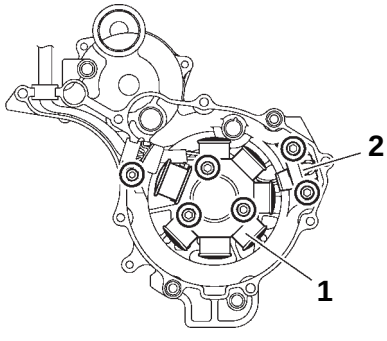
NOTE:
- Tighten the pickup coil rotor bolt "1" while holding the rotor with a sheave holder "2".
- Do not allow the sheave holder to touch the projection on the rotor "a".

	**Sheave holder** **90890-01701** **Primary clutch holder** **YS-01880-A**



4. Install:
   - Stater coil “1”
   - Pickup coil “2”

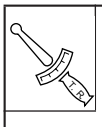
	**Stater coil bolt** **7 Nm (0.7 m•kg, 5.1 ft•lb)** **LOCTITE®** **Pickup coil bolt** **7 Nm (0.7 m•kg, 5.1 ft•lb)** **LOCTITE®**

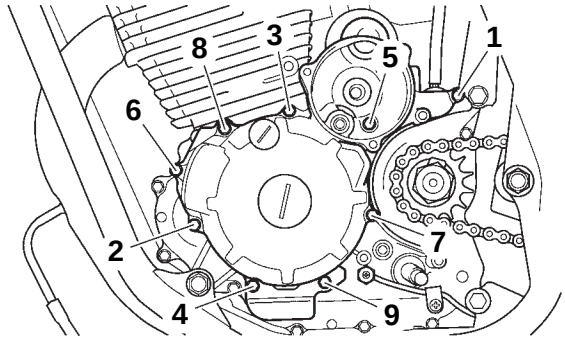


5. Install:
   - Dowel pin
   - Crankcase cover gasket New
6. Install:
   - Left crankcase cover

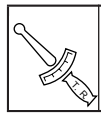
NOTE:

Tighten the bolts in stages and in a crisscross pattern as shown.

	**Crank case cover bolt** **M6×30mm : “1”—“5”** **10 Nm (1.0 m•kg, 7.2 ft•lb)** **M6×45mm : “6”** **10 Nm (1.0 m•kg, 7.2 ft•lb)** **M6×40mm : “7”—“9”** **10 Nm (1.0 m•kg, 7.2 ft•lb)**



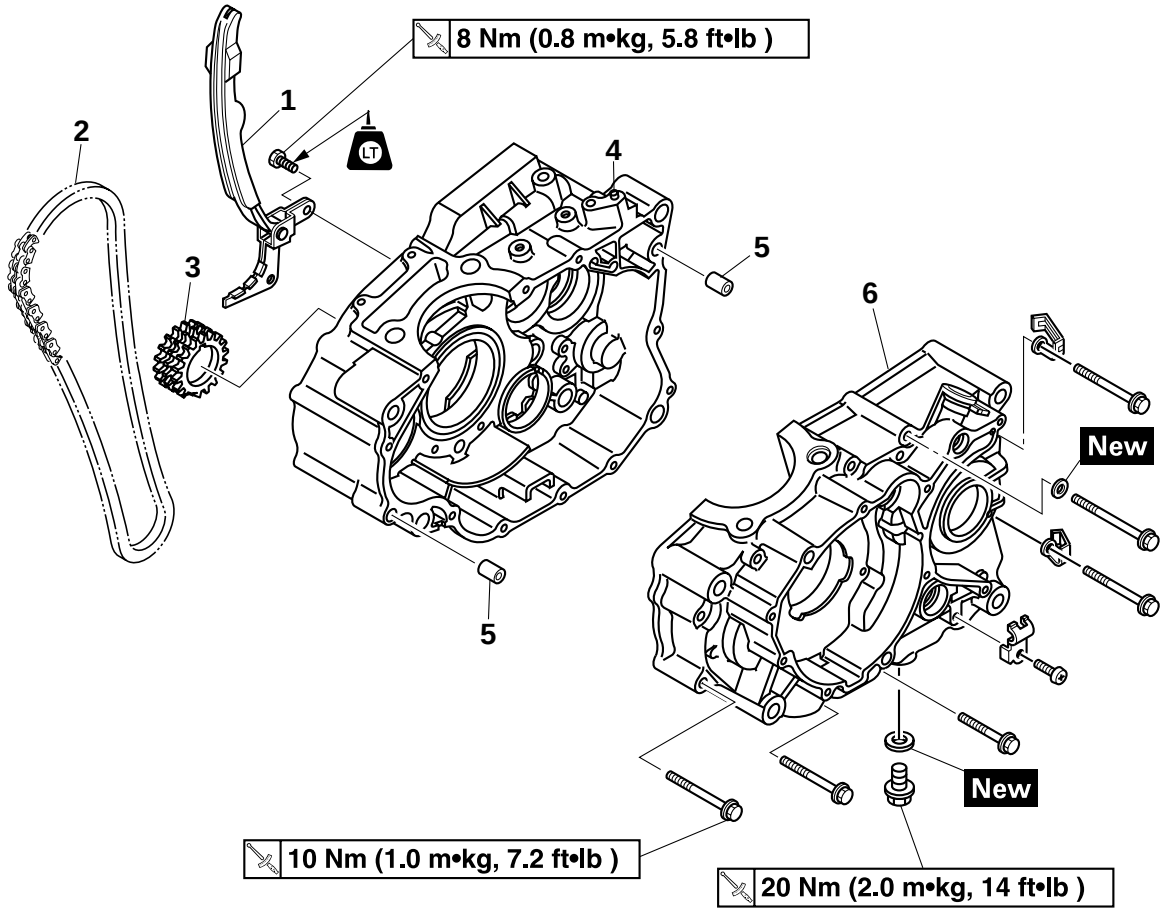
7. Install:
   - Starter idle gear 1
   - Shaft
8. Install:
   - O-ring New
   - Starter idle gear cover

	**Starter idle gear cover bolt** **8 Nm (0.8 m•kg, 5.8 ft•lb)**

EAS25540

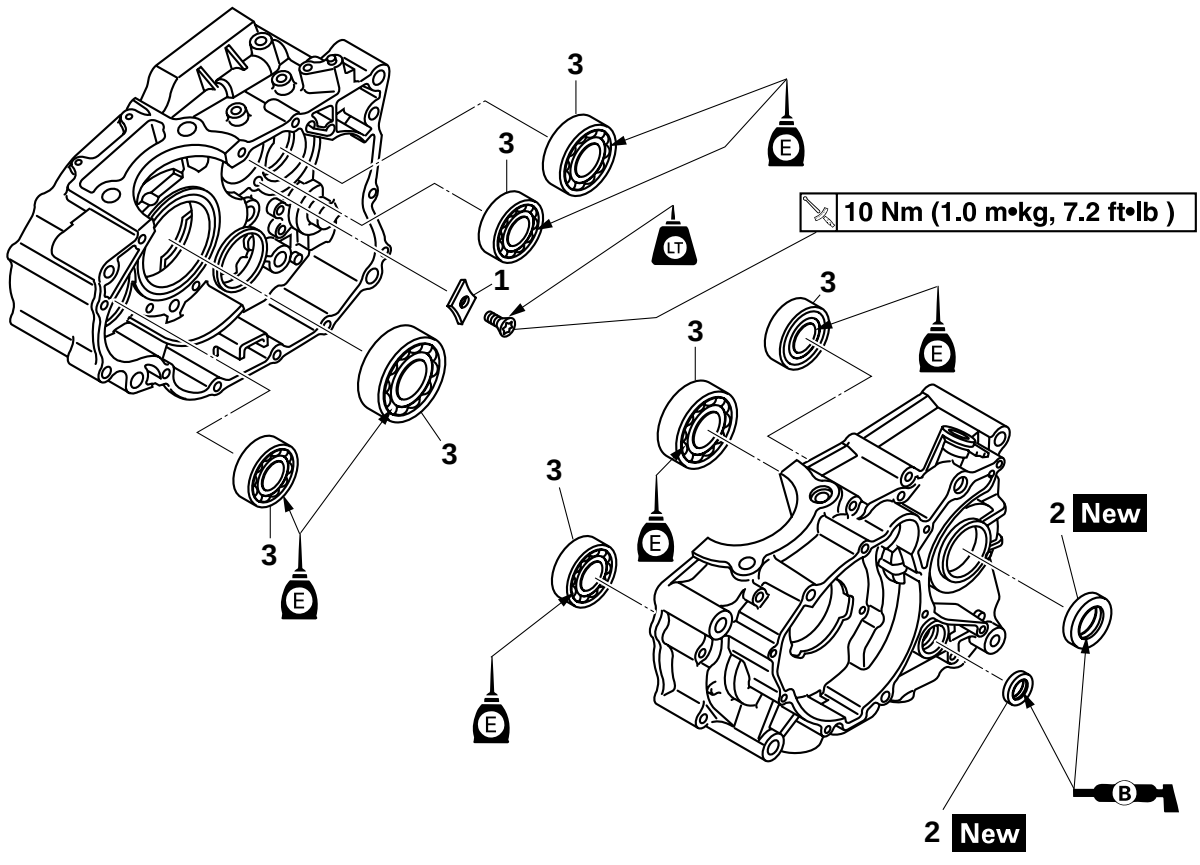
CRANKCASE

Separating the crankcase



Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-1.
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-5.
	Cylinder		Refer to "CYLINDER AND PISTON" on page 5-25.
	Clutch		Refer to "CLUTCH" on page 5-30.
	Oil pump		Refer to "OIL PUMP AND BLANCER WEIGHT GEAR" on page 5-38.
	Balancer weight gear		
	Shift shaft		Refer to "SHIFT SHAFT" on page 5-43.
	Pickup coil rotor		Refer to "PICKUP COIL ROTOR AND STARTER CLUTCH" on page 5-49.
1	Timing chain guide (intake side)	1	
2	Timing chain	1	
3	Crankshaft sprocket	1	
4	Right crankcase	1	
5	Dowel pin	2	
6	Left crankcase	1	
			For installation, reverse the removal procedure.

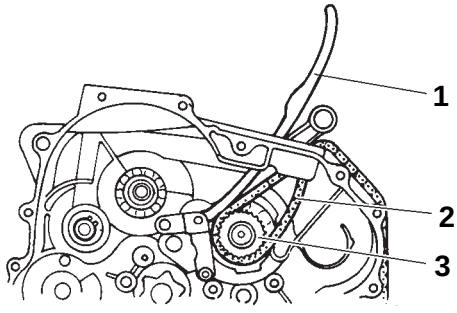
Removing the bearing



Order	Job/Parts to remove	Q'ty	Remarks
	Crankshaft assembly		Refer to "CRANKSHAFT ASSEMBLY" on page 5-58.
	Main axle assembly/drive axle assembly		Refer to "TRANSMISSION" on page 5-62.
1	Bearing retainer	1	
2	Oil seal	2	
3	Bearing	7	
			For installation, reverse the removal procedure.

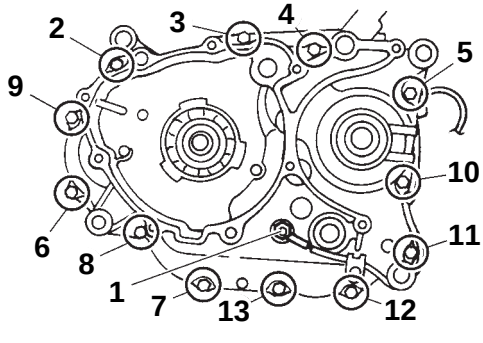
EAS25570
DISASSEMBLING THE CRANKCASE

1. Remove:
   - Timing chain guide (intake side) “1”
   - Timing chain “2”
   - Crankshaft sprocket “3”



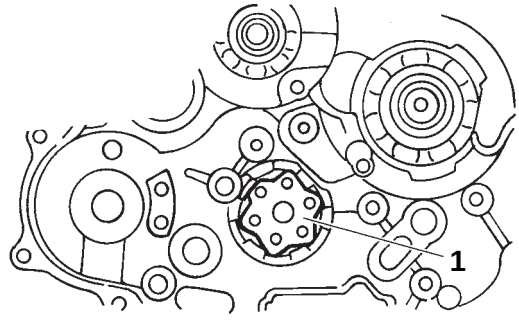
2. Remove:
   - Neutral switch “1”
   - Crankcase bolt M6×70mm : “2”—“4”
   - Copper washers
   - Crankcase bolt M6×60mm : “5”, “6”
   - Crankcase bolt M6×40mm : “7”—“9”
   - Crankcase bolt M6×40mm : “10”—“13”

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).



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

ECA13910
CAUTION:
- **First check that the shift drum segment’s teeth and the drive axle circlip are properly positioned, then remove the right crankcase.**
- **Do not damage the crankcase mating surfaces.**

EAS25580
CHECKING THE CRANKCASE

1. Thoroughly wash the crankcase halves in a mild solvent.
2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.
3. Check:
   - Crankcase
     Cracks/damage → Replace.
   - Oil delivery passages
     Obstruction → Blow out with compressed air.

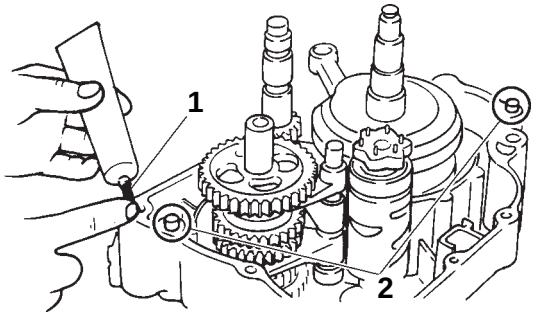
EAS25690
ASSEMBLING THE CRANKCASE

1. Apply:
   - Sealant “1”
     (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 “2”



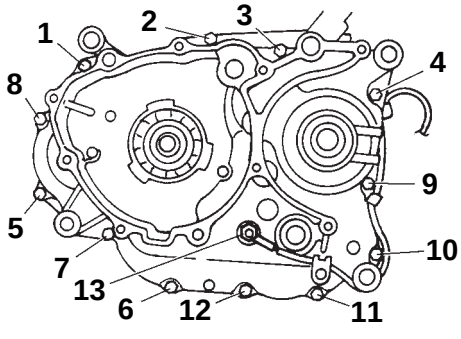
3. Install:
   - Right crankcase
     (onto the left crankcase)

NOTE:
Tap lightly on the right crankcase with a soft-face hammer.

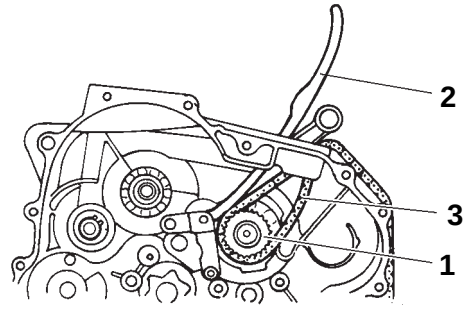
4. Install:
   - Crankcase bolt M6×70mm : "1"—"3"
   - Copper washers
     To "1"—"3".
   - Crankcase bolt M6×60mm : "4", "5"
   - Crankcase bolt M6×40mm : "6"—"8"
   - Crankcase bolt M6×40mm : "9"—"12"

	Crankcase bolts : "1"—"12" **10 Nm (1.0 m•kg, 7.2 ft•lb)**

NOTE:
Tighten each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern.



5. Install:
   - Neutral switch "13"
6. Install:
   - Crankshaft sprocket "1"
   - Timing chain guide (intake side) "2"
   - Timing chain "3"

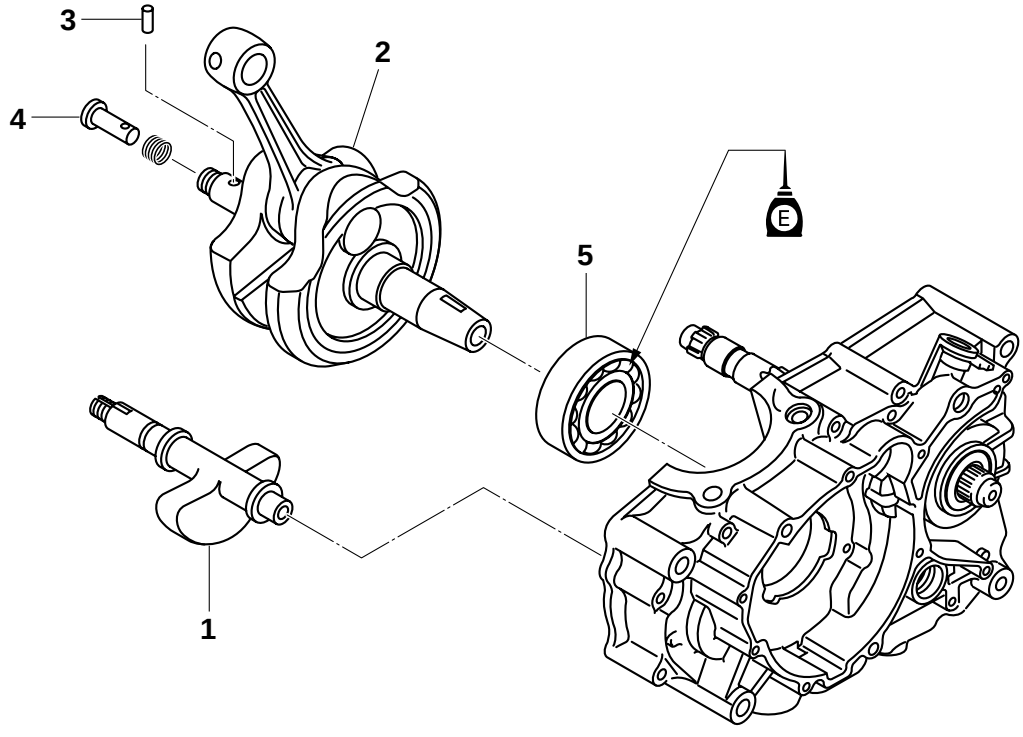


7. Apply:
   - Engine oil
     (onto the crankshaft pins bearings and oil delivery holes)
8. Check:
   - Crankshaft and transmission operation
     Rough movement → Repair.

EAS25970

CRANKSHAFT ASSEMBLY

Removing the crankshaft assembly

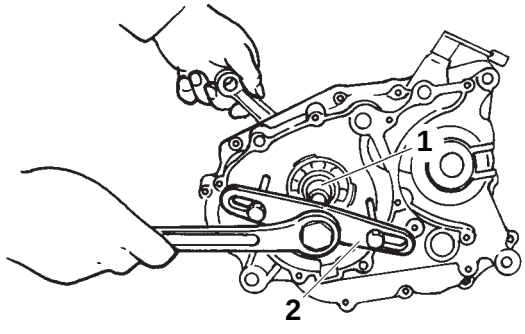


Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Refer to "CRANKCASE" on page 5-54.
1	Balancer weight	1	
2	Crankshaft assembly	1	
3	Dowel pin	1	
4	Plunger seal	1	
5	Bearing	1	
			For installation, reverse the removal procedure.

EAS25990
REMOVING THE CRANKSHAFT ASSEMBLY
1. Remove:
   - Balancer weight
   - Crankshaft assembly “1”

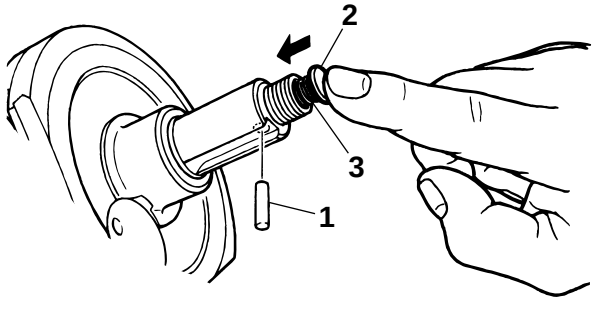
NOTE:
- Remove the crankshaft assembly with the crankcase separating tool “2”.
- Make sure the crankcase separating tool is centered over the crankshaft assembly.

Crankcase separating tool
90890-01135
Crankcase separator
YU-01135-B



EAS4D605
REMOVING THE PLUNGER SEAL
1. Remove:
   - Dowel pin “1”
   - Plunger seal “2”
   - Compression spring “3”

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

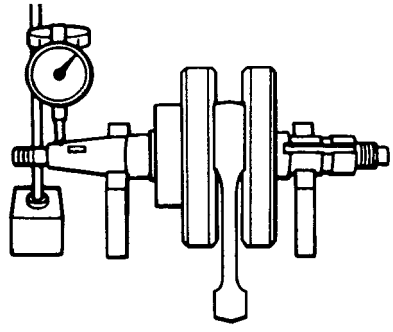


EAS26060
CHECKING THE CRANKSHAFT AND CONNECTING ROD
1. Measure:
   - Crankshaft runout

   Out of specification → Replace the crankshaft, bearing or both.

NOTE:
Turn the crankshaft slowly.

Runout limit C
0.030 mm (0.0012 in)



2. Measure:
   - Big end side clearance

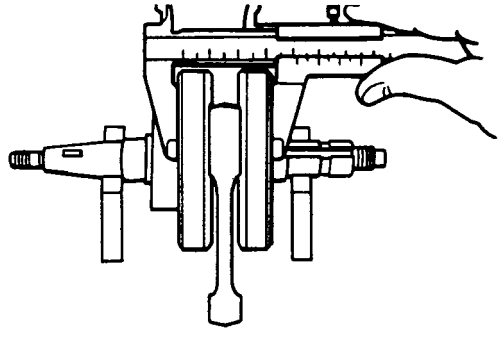
   Out of specification → Replace the big end bearing, crankshaft pin, or connecting rod.

Big end side clearance D
0.350–0.850 mm (0.0138–0.0335 in)

3. Measure:
   - Crankshaft width

   Out of specification → Replace the crankshaft.

Width A
69.25–69.30 mm (2.726–2.728 in)

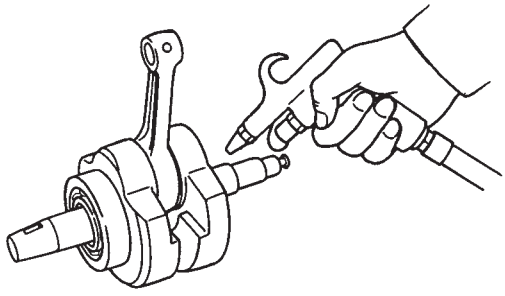


4. Check:
   - Crankshaft sprocket

   Damage/wear → Replace the crankshaft.
   - Bearing

   Cracks/damage/wear → Replace the crankshaft.
5. Check:
   - Crankshaft journal oil passage

Obstruction → Blow out with compressed air.

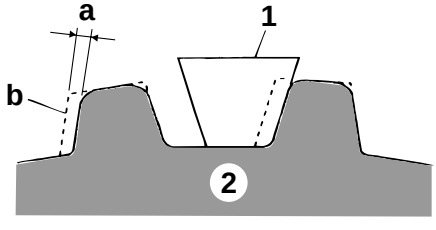


EAS4D606

CHECKING THE TIMING CHAIN, CRANKSHAFT SPROCKET AND TIMING CHAIN GUIDE

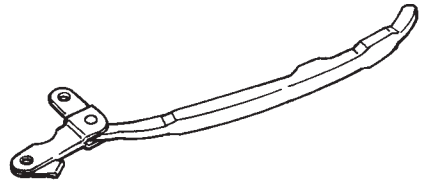
The following procedure applies to all of the camshaft sprockets and timing chain guides.

1. Check:
   - Timing chain
     Damage/stiffness → Replace the timing chain and camshaft sprocket and crankshaft sprocket as a set.
2. Check:
   - Crankshaft sprocket
     More than 1/4 tooth wear "a" → Replace the timing chain and camshaft sprocket and crankshaft sprocket as a set.



a. 1/4 tooth
b. Correct
1. Timing chain roller
2. Crankshaft sprocket

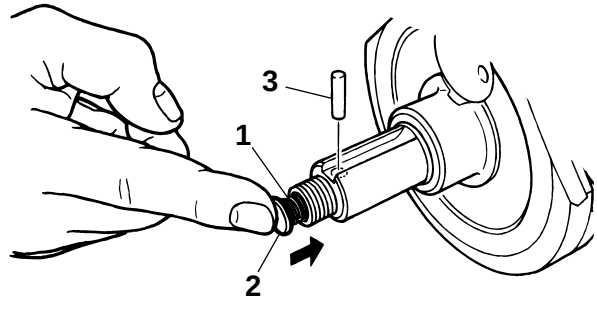
3. Check:
   - Timing chain guide (intake side)



EAS4D607

INSTALLING THE PLUNGER SEAL

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



EAS26210

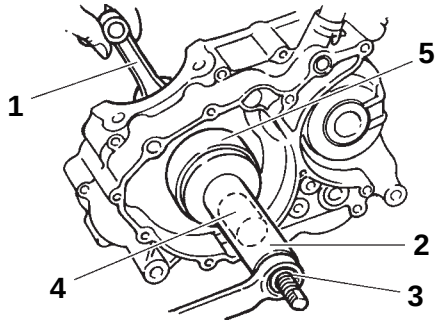
INSTALLING THE CRANKSHAFT ASSEMBLY

1. Install:
   - Crankshaft assembly "1"

NOTE:

Install the crankshaft assembly with the crankshaft installer pot "2", crankshaft installer bolt "3", adapter "4" and spacer "5".

Crankshaft installer pot
90890-01274
Installing pot
YU-90058
Crankshaft installer bolt
90890-01275
Bolt
YU-90060
Spacer
90890-01288
Adapter (M10)
90890-01383
Adapter #2
YU-90062



ECA13970

CAUTION:

To avoid scratching the crankshaft and to ease the installation procedure, lubricate the oil seal lips with lithium-soap-based grease and each bearing with engine oil.

NOTE:

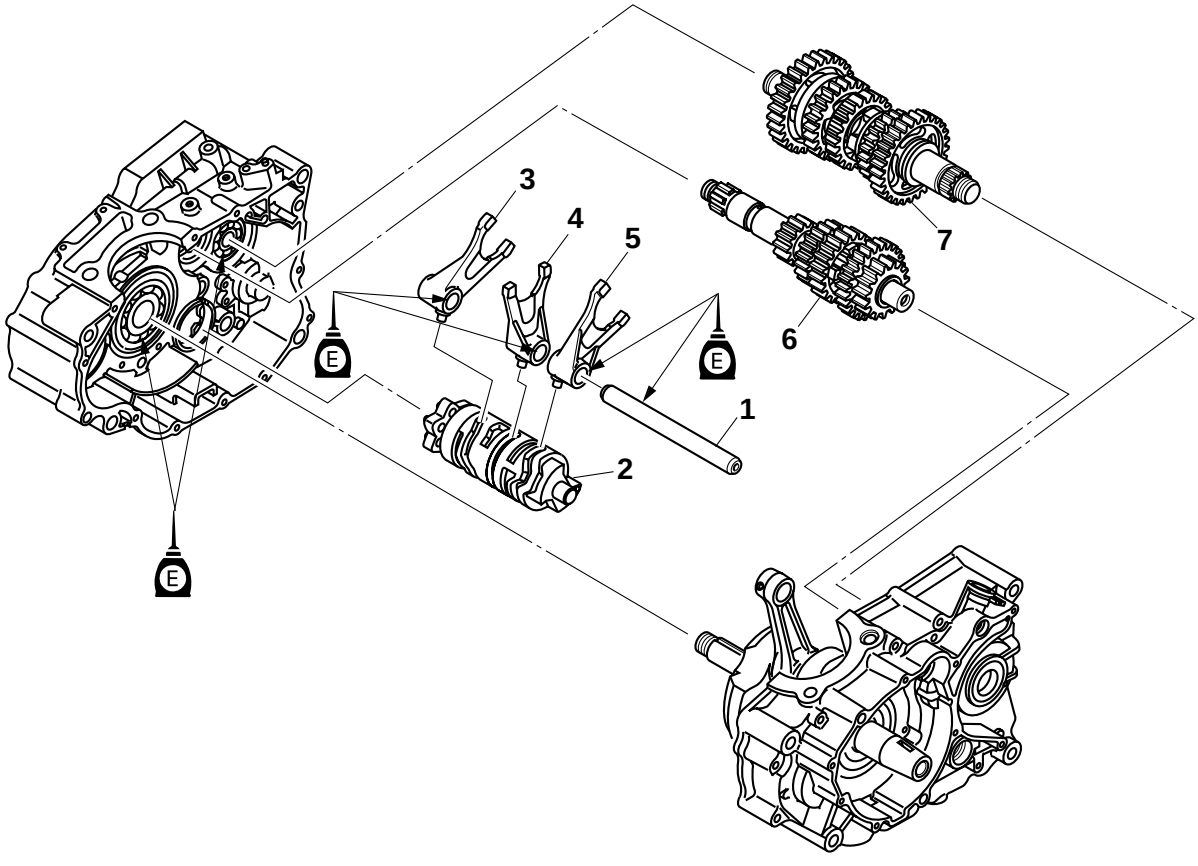
Hold the connecting rod at top dead center (TDC) with one hand while turning the nut of the crankshaft installer bolt with the other. Turn the crankshaft installer bolt until the crankshaft assembly bottoms against the bearing.

2. Install:
   - Balancer weight
     To the right crank case.

EAS26240

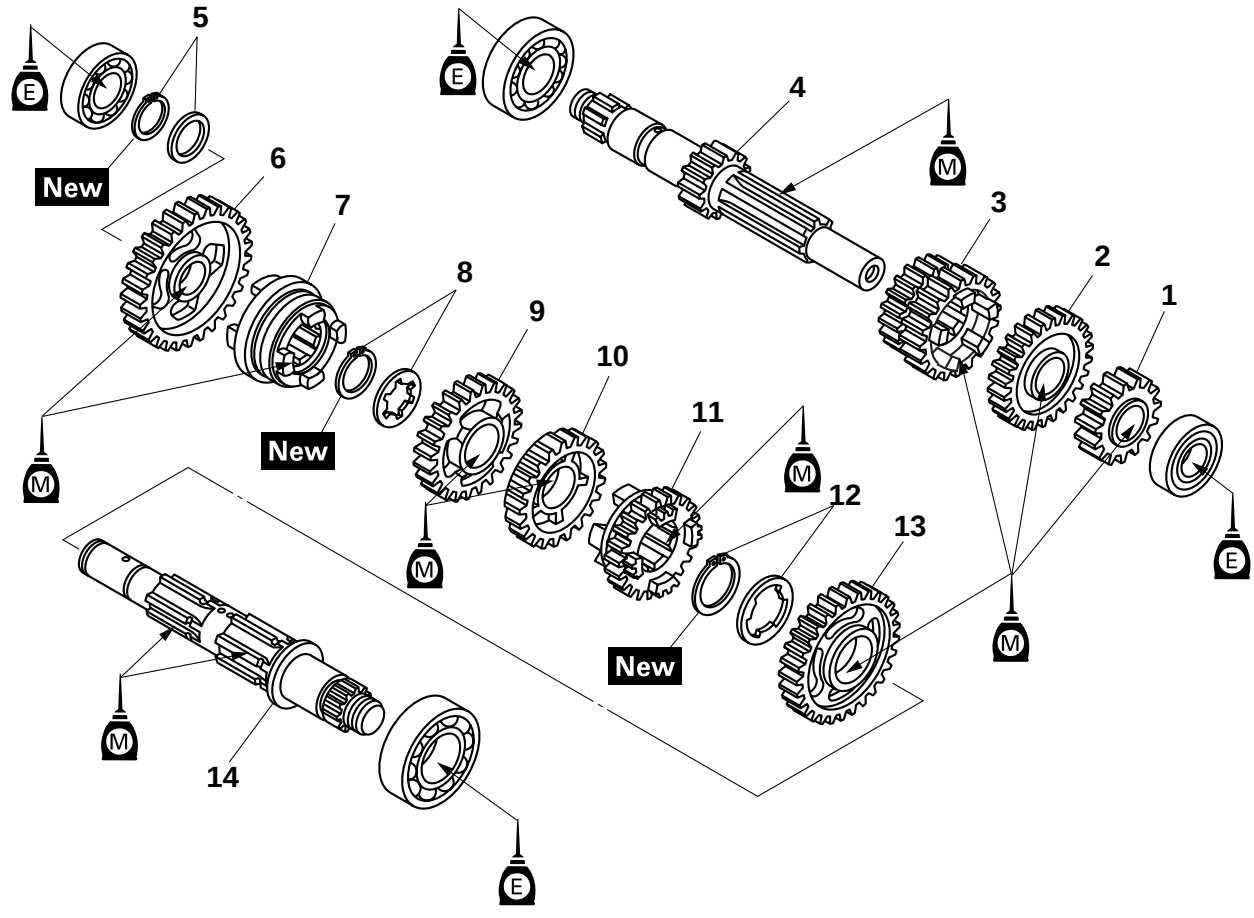
TRANSMISSION

Removing the transmission, shift drum assembly, and shift forks



Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Separate. Refer to "CRANKSHAFT ASSEMBLY" on page 5-58.
1	Shift fork guide bar	1	
2	Shift drum assembly	1	
3	Shift fork-3 (R)	1	
4	Shift fork-2 (C)	1	
5	Shift fork-1 (L)	1	
6	Main axle assembly	1	
7	Drive axle assembly	1	
			For installation, reverse the removal procedure.

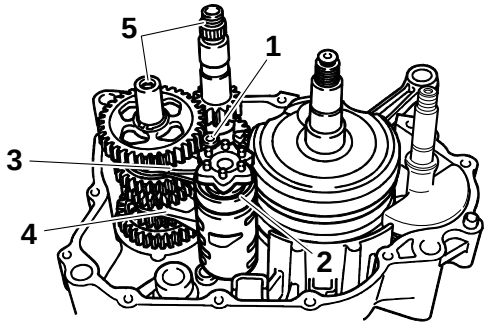
Disassembling the transmission



Order	Job/Parts to remove	Q'ty	Remarks
1	2nd pinion gear	1	
2	5th pinion gear	1	
3	3rd pinion gear	1	
4	Main axle	1	
5	Circlip/washer	1/1	
6	1st wheel gear	1	
7	Dog clutch	1	
8	Circlip/washer	1/1	
9	3rd wheel gear	1	
10	4th wheel gear	1	
11	5th wheel gear	1	
12	Circlip/washer	1/1	
13	2nd wheel gear	1	
14	Drive axle	1	
			For installation, reverse the removal procedure.

EAS26250
REMOVING THE TRANSMISSION

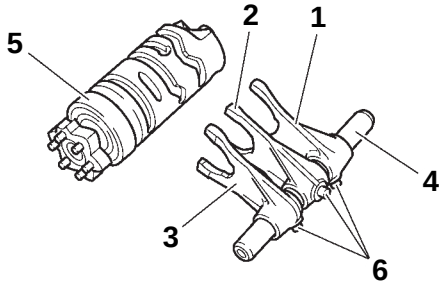
1. Remove:
   - Shift fork guide bar “1”
   - Shift drum assembly “2”
   - Shift fork 3 (R) “3”
   - Shift fork 2 (C)
   - Shift fork 1 (L) “4”
2. Remove:
   - Transmission “5”



EAS26260
CHECKING THE SHIFT FORKS

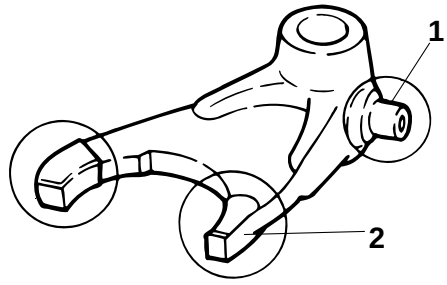
The following procedure applies to all of the shift forks.

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



1. Shift fork 3 (R)
2. Shift fork 2 (C)
3. Shift fork 3 (L)
4. Shift fork guide bar
5. Shift drum assembly
6. Shift fork cam follower

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

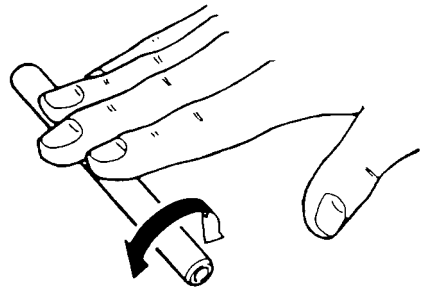


3. Check:
   - Shift fork guide bar
     Roll the shift fork guide bar on a flat surface.
     Bends → Replace.

EWA12840

WARNING

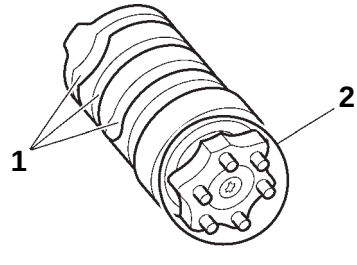
Do not attempt to straighten a bent shift fork guide bar.



319-010

EAS26270
CHECKING THE SHIFT DRUM ASSEMBLY

1. Check:
   - Shift drum groove “1”
     Damage/scratches/wear → Replace the shift drum assembly.
   - Shift drum segment “2”
     Damage/wear → Replace the shift drum assembly.
   - Shift drum bearing
     Damage/pitting → Replace the shift drum assembly.

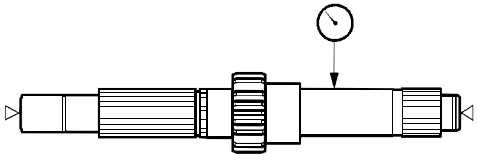


I1530101

EAS26290
CHECKING THE TRANSMISSION

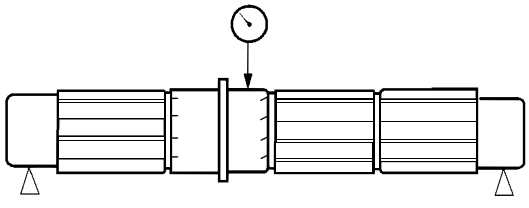
1. Measure:
   - Main axle runout
     (with a centering device and dial gauge)
     Out of specification → Replace the main axle.

Main axle runout limit
0.08 mm (0.0032 in)

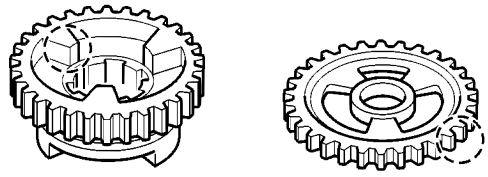


2. Measure:
   - Drive axle runout
     (with a centering device and dial gauge)
     Out of specification → Replace the drive axle.

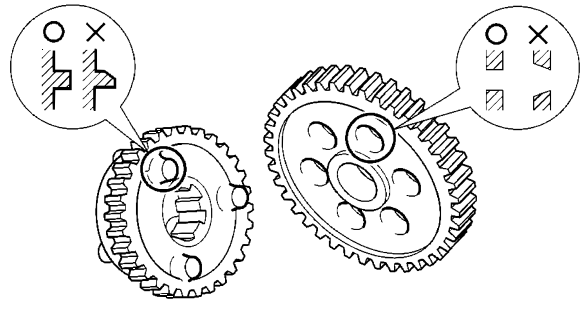
Drive axle runout limit
0.08 mm (0.0032 in)



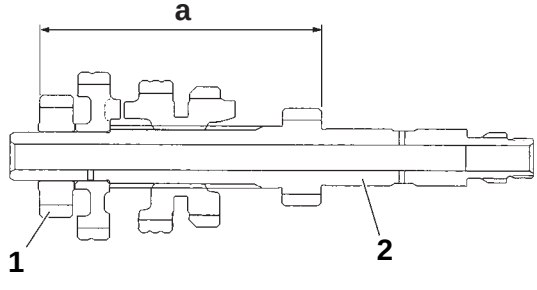
3. Check:
   - Transmission gears
     Blue discoloration/pitting/wear → Replace the defective gear(s).
   - Transmission gear dogs
     Cracks/damage/rounded edges → Replace the defective gear(s).



4. Check:
   - Transmission gear engagement
     (each pinion gear to its respective wheel gear)
     Incorrect → Reassemble the transmission axle assemblies.



NOTE:
When reassembling the main axle, press the 2nd pinion gear “1” onto it “2” as shown.



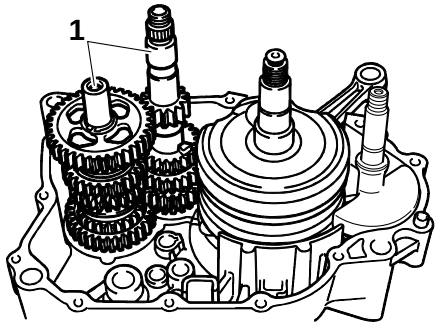
a. 102.2–102.4 mm

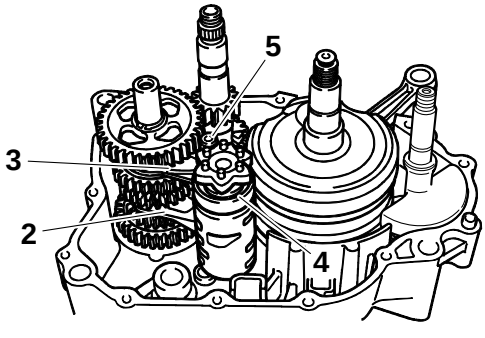
5. Check:
   - Transmission gear movement
     Rough movement → Replace the defective part(s).
6. Check:
   - Circlips
     Bends/damage/looseness → Replace.

EAS26330

INSTALLING THE SHIFT FORKS AND SHIFT DRUM ASSEMBLY

1. Install:
   - Transmission “1”
   - Shift fork 1 (L) “2”
   - Shift fork 2 (C)
   - Shift fork 3 (R) “3”
   - Shift drum assembly “4”
   - Shift fork guide bar “5”
   - Right crankcase

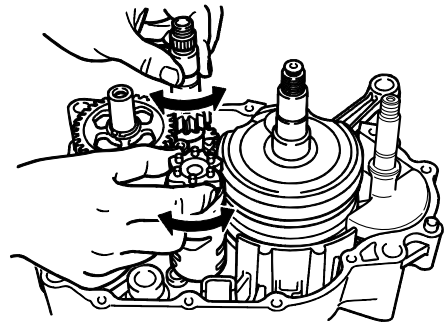




NOTE:

- The embossed marks “a” on the shift forks should face towards the left side of the engine and be in the following sequence: “L”, “C”, “R”.
- The grooved side of the shift fork guide bar should face towards the right side of the engine.

2. Check:
   - Shift cam operation
     Unsmoothy operation → Repair.



NOTE:

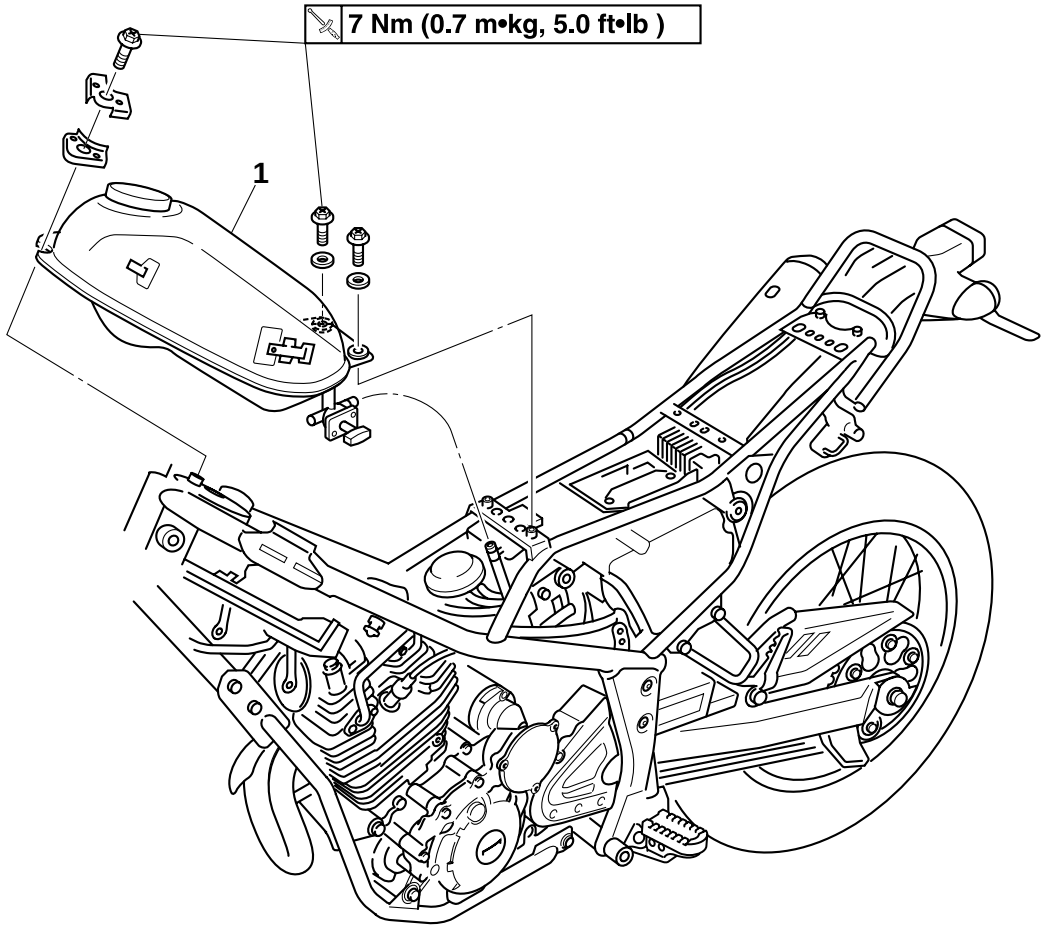
Check the transmission and shift forks for smooth operation by turning the shift cam with your hand.

FUEL SYSTEM

EAS26620

FUEL TANK

Removing the fuel tank

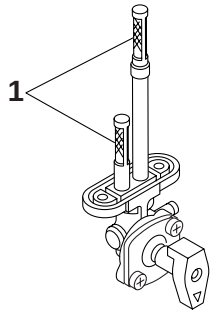


Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank side cover (left/right)		
1	Fuel tank	1	Check that the fuel cock lever is positioned to "OFF".
			For installation, reverse the removal procedure.

EAS26650

CHECKING THE FUEL COCK

1. Check:
   - Fuel cock
     Cracks/damage/wear → Replace.
2. Check:
   - Fuel cock strainer “1”
     Obstruction → clean.
     Blow out the jets with compressed air.
     Damage → Replace.

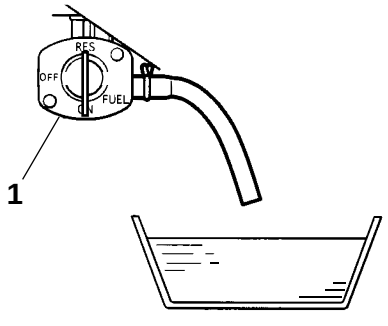


3. Check:
   - Fuel cock operation

NOTE:
After installing the fuel cock, check its operation.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Check that the fuel cock lever is positioned to “OFF”.
b. Place a container under the end of the fuel hose.
c. Check the fuel cock “1” operation.



Fuel flows.
Fuel cock is OK.
Fuel does not flow.
Replace the fuel cock.

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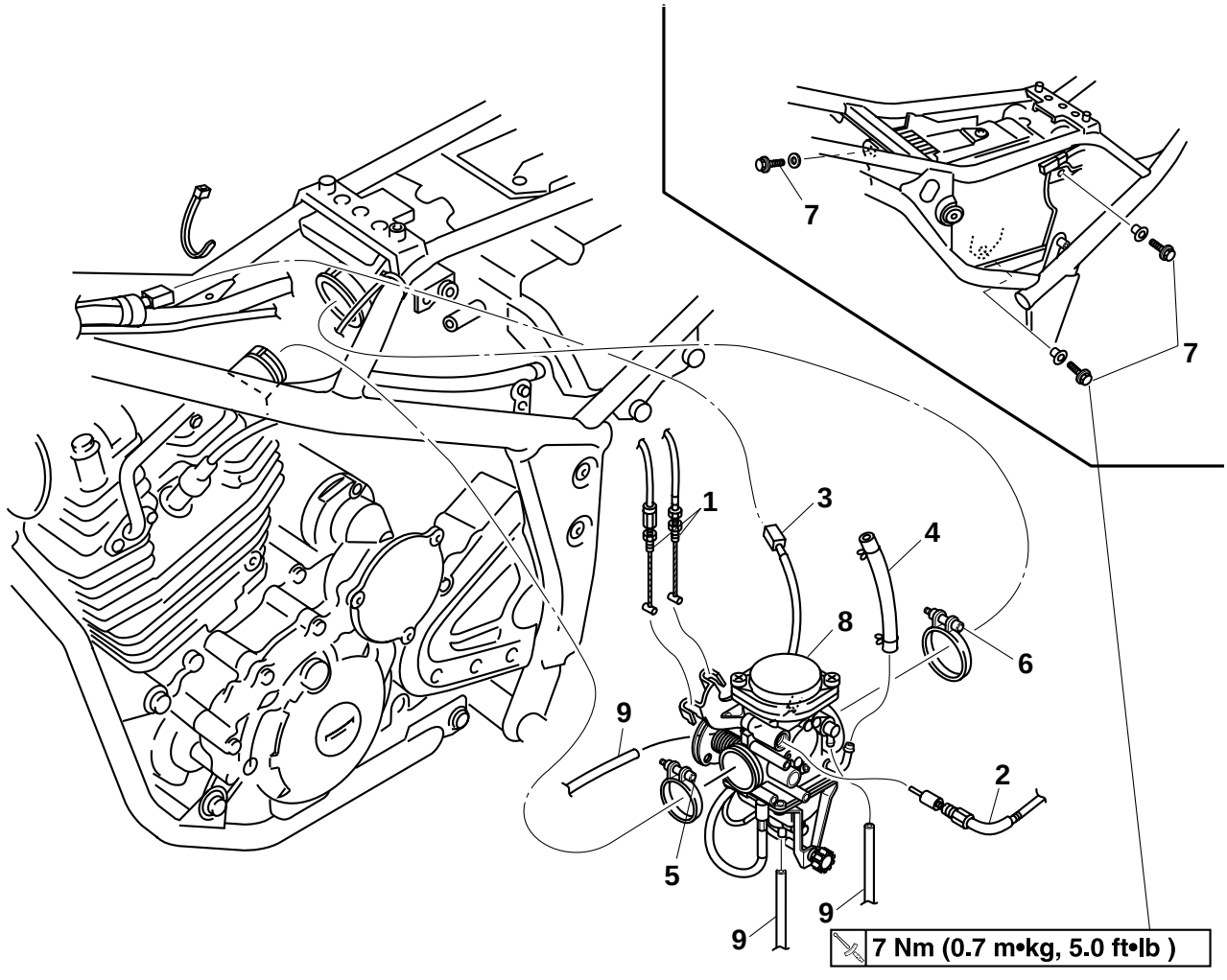
EAS26720

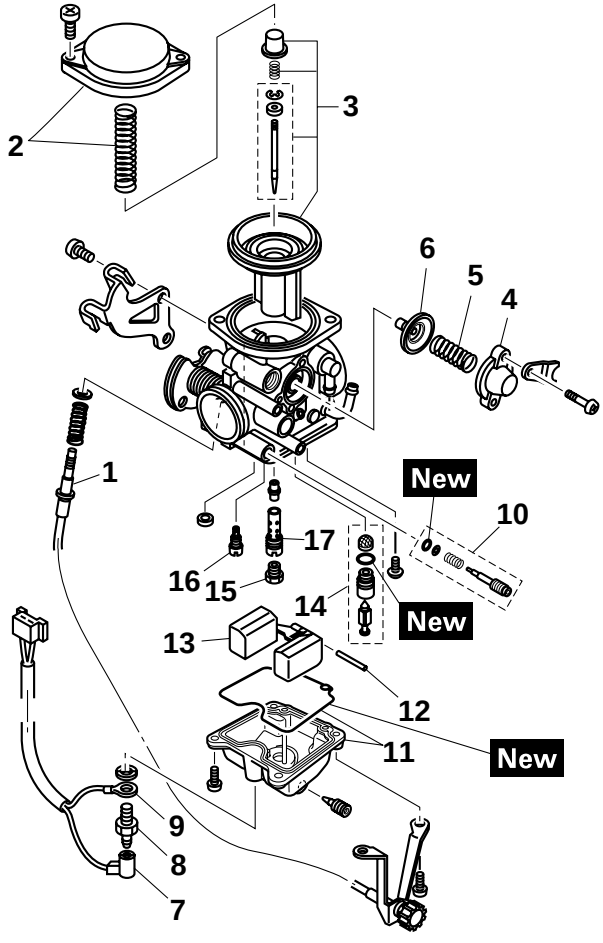
CARBURETOR

Removing the carburetor



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Side cover (left/right)		
	Fuel tank		Refer to "FUEL TANK" on page 6-1.
	Battery		
1	Throttle cable 1/throttle cable 2	1/1	
2	Starter plunger	1	
3	Carburetor warmer lead coupler	1	Disconnect.
4	Fuel hose	1	Disconnect.
5	Carburetor joint clamp screw	1	Loosen.
6	Air filter clamp screw	1	Loosen.
7	Air filter case bolt	3	Remove.
8	Carburetor assembly	1	
9	Air vent hose	3	
			For installation, reverse the removal procedure.

Disassembling the carburetor



Order	Job/Parts to remove	Q'ty	Remarks
1	Throttle stop screw	1	
2	Cover/Diaphram spring	1/1	
3	Diaphragm	1	
4	Cover	1	
5	Spring	1	
6	Coasting enricher diaphragm	1	
7	Carburetor warmer positive lead	1	
8	Carburetor warmer	1	
9	Carburetor warmer negative lead	1	
10	Pilot screw set	1	
11	Float chamber/Gasket	1/1	
12	Float pin	1	
13	Float	1	
14	Needle valve seat set	1	
15	Main jet	1	
16	Pilot jet	1	
17	Main nozzle	1	
			For assembly, reverse the disassembly procedure.

EAS26760
CHECKING THE CARBURETOR

1. Check:
   - Carburetor body
   - Float chamber
   Cracks/damage → Replace.
2. Check:
   - Fuel passages
   Obstruction → Clean.

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a. Wash the carburetor in a petroleum-based solvent. Do not use any caustic carburetor cleaning solution.
b. Blow out all of the passages and jets with compressed air.

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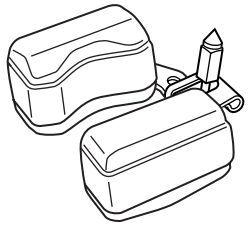
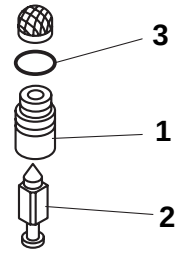
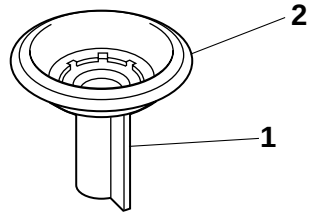
3. Check:
   - Float chamber body
   Dirt → Clean.
4. Check:
   - Float
   Damage → Replace.



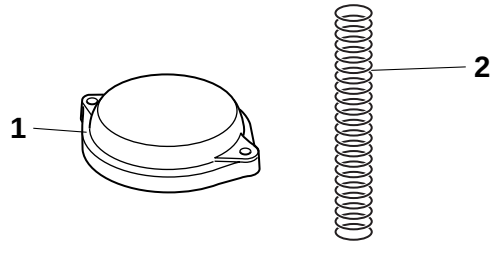
5. Check:
   - Needle valve seat “1”
   - Needle valve “2”
   Damage/obstruction/wear → Replace the needle valve, needle valve seat and O-ring as a set.
6. Check:
   - O-ring “3”
   Damage/wear → Replace the needle valve, needle valve seat and O-ring as a set.



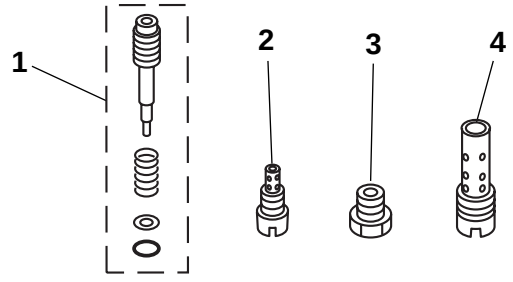
7. Check:
   - Piston valve “1”
   Damage/scratches/wear → Replace.
   - Piston valve diaphragm “2”
   Cracks/tears → Replace.



8. Check:
   - Cover “1”
   - Diaphram spring “2”
   Cracks/damage → Replace.

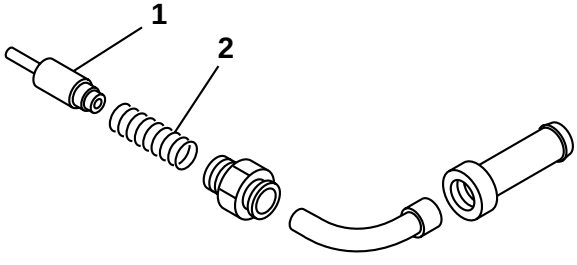


9. Check:
   - Pilot screw set “1”
   - Pilot jet “2”
   - Main jet “3”
   - Main nozzle “4”
   Bends/damage/wear → Replace.
   Obstruction → Clean.
   Blow out the jets with compressed air.



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

11. Check:
- Starter plunger “1”
- Starter plunger spring “2”
  Bends/cracks/damage → Replace.

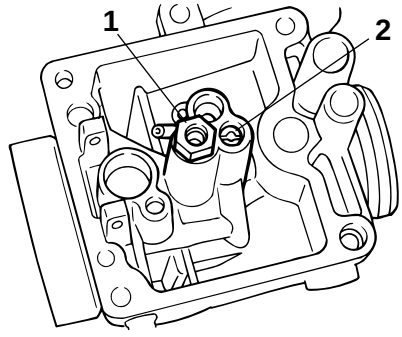


12. Check:
- Hose joints
  Cracks/damage → Replace.

13. Check:
- Vacuum hoses
- Fuel hoses
  Cracks/damage/wear → Replace.
  Obstruction → Clean.
  Blow out the hoses with compressed air.

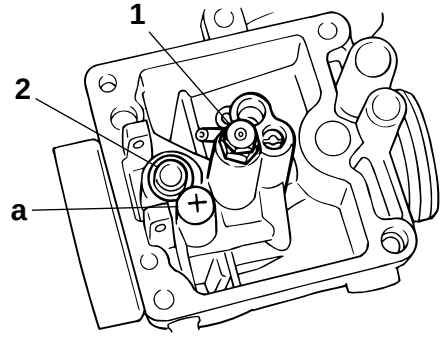
EAS26800
ASSEMBLING THE CARBURETOR
ECA14110
CAUTION:
- **Before assembling the carburetor, wash all of the parts in a petroleum-based solvent.**
- **Always use a new gasket.**

1. Install:
- Main nozzle “1”
- Pilot jet “2”



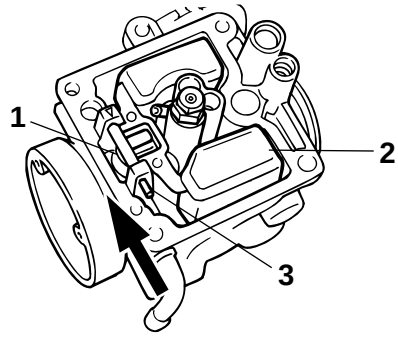
2. Install:
- Main jet “1”
- Needle valve seat “2”

NOTE:
Install the screw “a” securely.



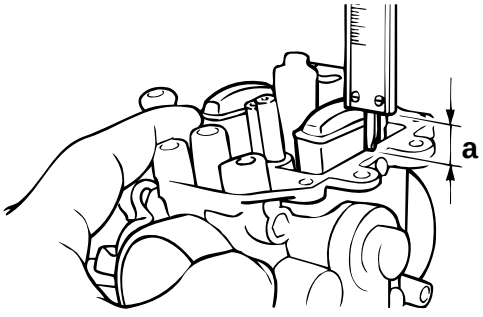
3. Install:
- Needle valve “1”
- Float “2”
- Float pin “3”

NOTE:
Install the float pin from the side opposite the arrow.

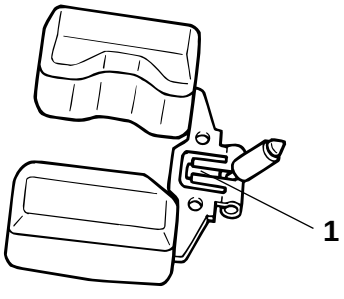


4. Check:
- Float height “a”
  Hold the carburetor in an upside down position. Measure the distance from the mating surface of the float chamber (gasket removed) to the top of the float.
  Out of specification → adjust.

Float height
10.5 mm (0.41 in)

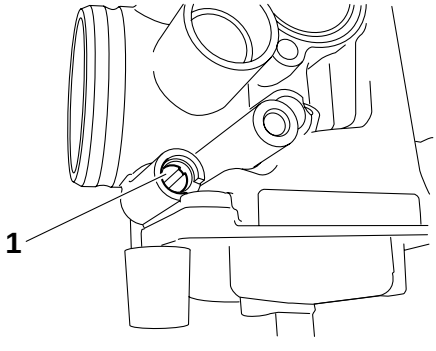


5. Adjust:
   - Float height
     Adjust the float height by bending the float tang “1” on the float.

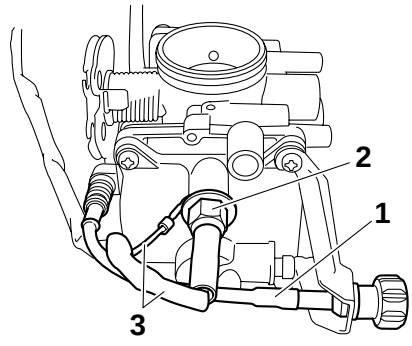


6. Install:
   - Pilot screw “1”

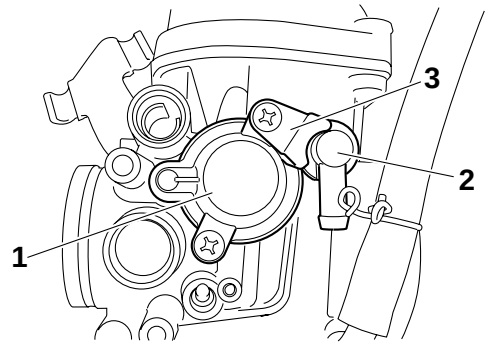
Pilot screw turns out
1-1/4



7. Install:
   - Float chamber gasket New
   - Float chamber
   - Throttle stop screw “1”
   - Carburetor warmer “2”
   - Carburetor warmer lead “3”



8. Install:
   - Coasting enricher diaphram
   - Cover “1”
   - Hoser “2”
   - Stopper “3”



EAS26890
INSTALLING THE CARBURETOR

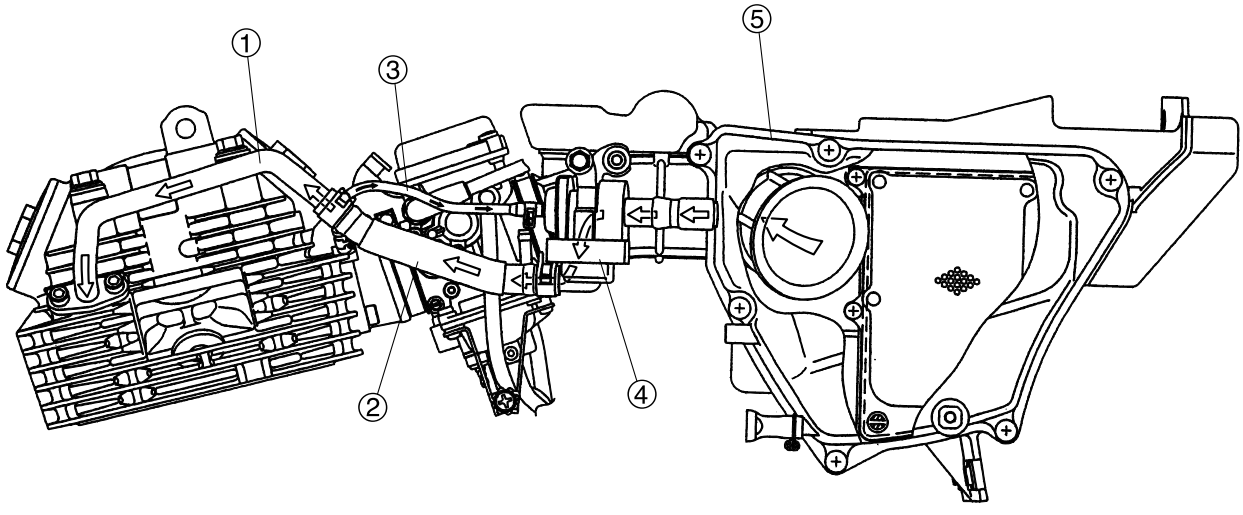
1. Adjust:
   - Engine idling speed
     Refer to “ADJUSTING THE ENGINE IDLING SPEED” on page 3-6.

Engine idling speed
1300–1500 r/min

2. Adjust:
   - Throttle cable free play
     Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” on page 3-7.

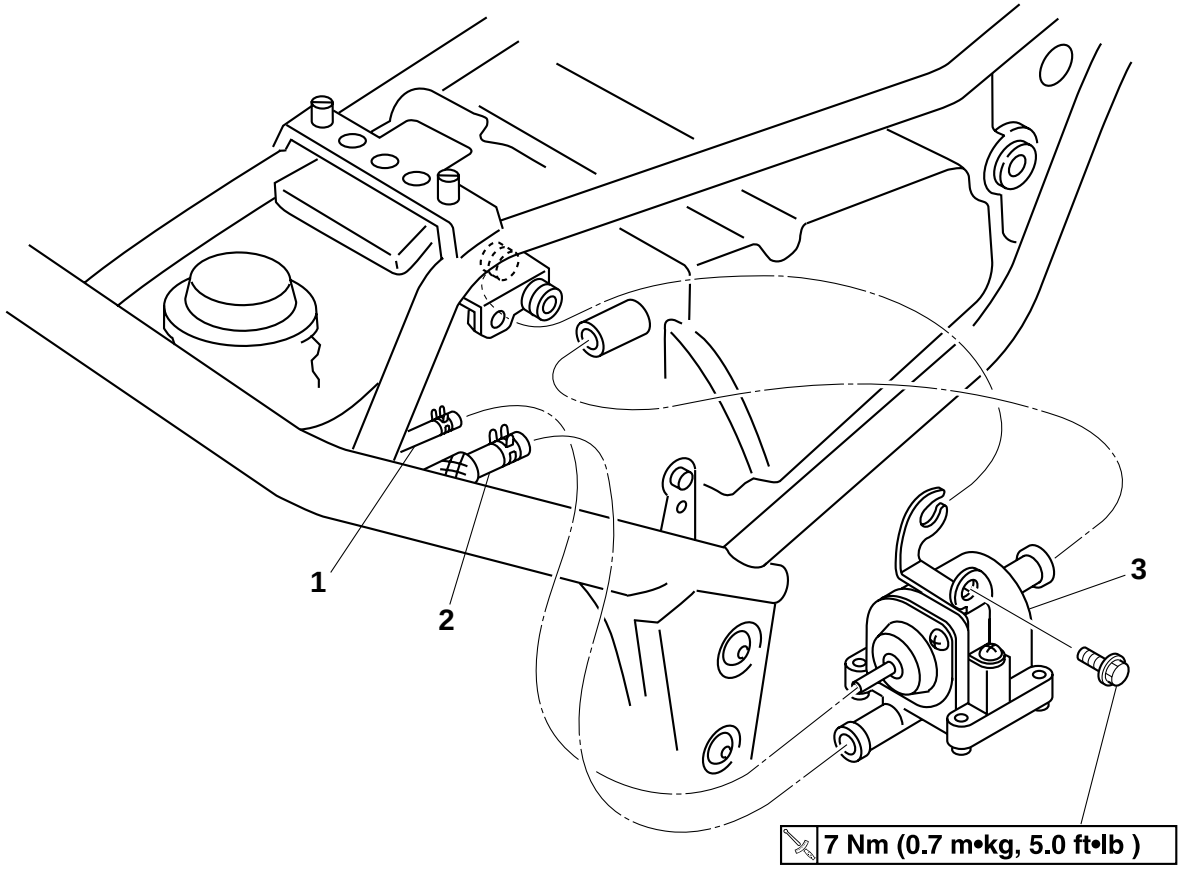
Throttle cable free play
3.0–5.0 mm (0.12–0.20 in)

EAS27040
AIR INDUCTION SYSTEM



1. Air induction system pipe
2. Air induction system hose (air cut-off valve — cylinder head)
3. Air induction system hose (carburetor joint — air cut-off valve)
4. Air cut-off valve
5. Air cleaner

Removing the air cut-off valve



Order	Job/Parts to remove	Q'ty	Remarks
1	Air induction system hose (air cut-off valve — cylinder head)	1	
2	Air induction system hose (carburetor joint — air cut-off valve)	1	
3	Air cut-off valve	1	
			For installation, reverse the removal procedure.

EAS27060

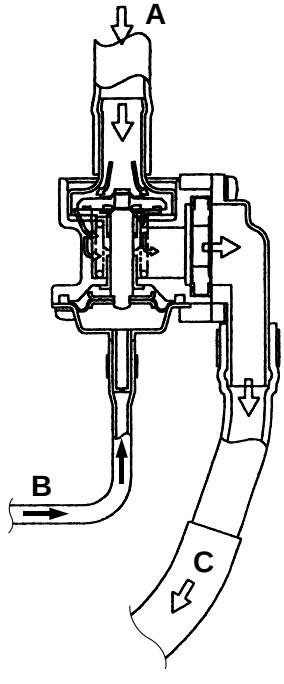
CHECKING THE AIR INDUCTION SYSTEM

Air induction

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.

Air cut-off valve

The air cut-off valve is controlled by the intake gas pressure. Ordinarily, the air cut-off valve opens to allow the air to flow during idle and closes to cut-off the flow when the vehicle is being driven.



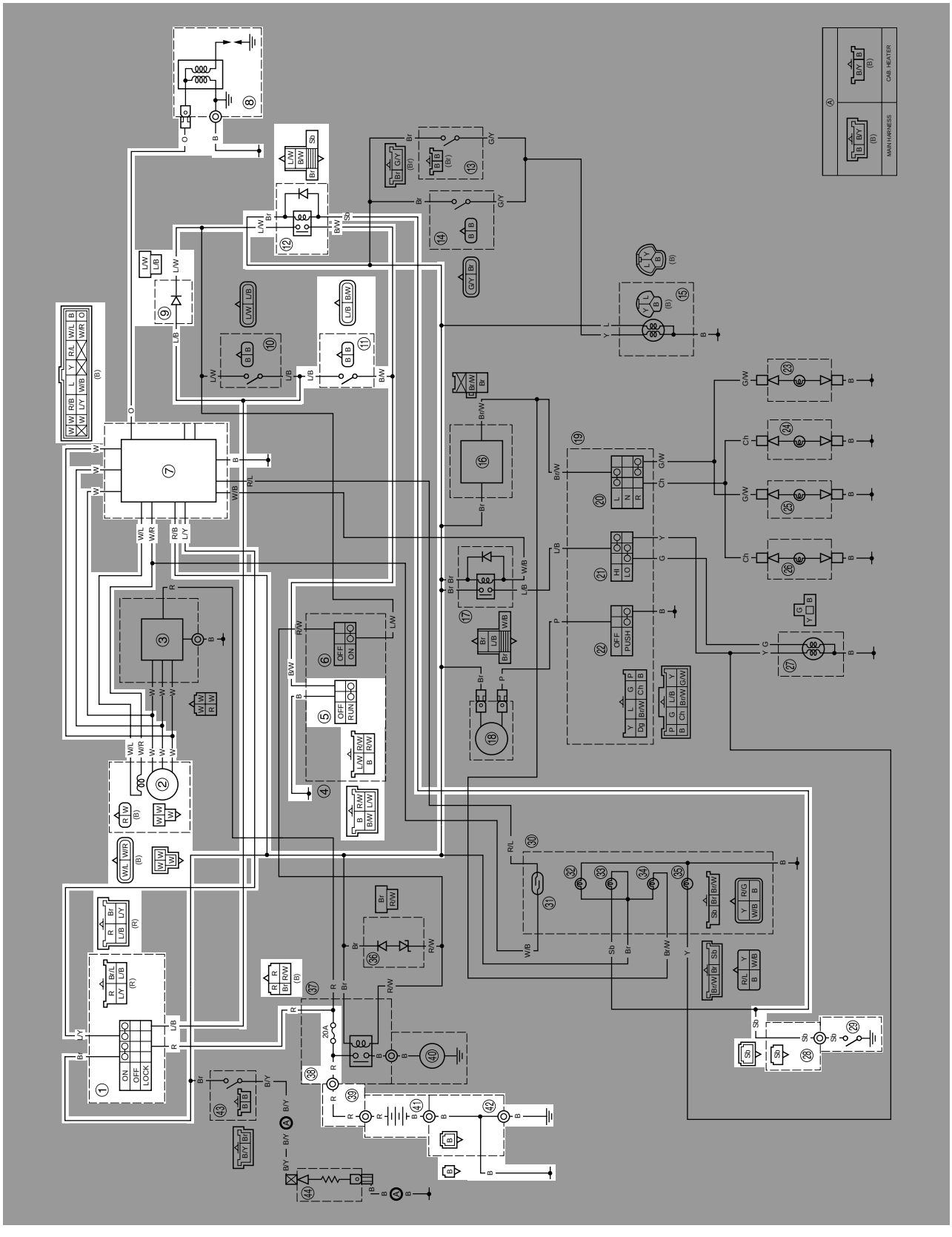
A. From the air filter
B. From the carburetor joint
C. To the cylinder head

1. Check:
   - Hoses
     Loose connections → Connect properly.
     Cracks/damage → Replace.
   - Pipes
     Cracks/damage → Replace.
2. Check:
   - Air cut-off valve
     Cracks/damage → Replace.

ELECTRICAL SYSTEM

EAS27090
IGNITION SYSTEM

EAS27100
CIRCUIT DIAGRAM



1. Main switch
2. Pickup coil rotor
5. Engine stop switch
7. CDI unit
8. Ignition coil
9. Diode
11. Sidestand switch
12. Starting circuit cut-off relay
28. Neutral switch lead
29. Neutral switch
38. Main fuse
39. Battery positive lead
41. Battery
42. Battery negative lead

EAS27130

TROUBLESHOOTING

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

NOTE:

Before troubleshooting, remove the following part(s):

1. Seat
2. Side cover (left/right)
3. Fuel tank side cover (left/right)
4. Fuel tank
5. Tool box (left/right)

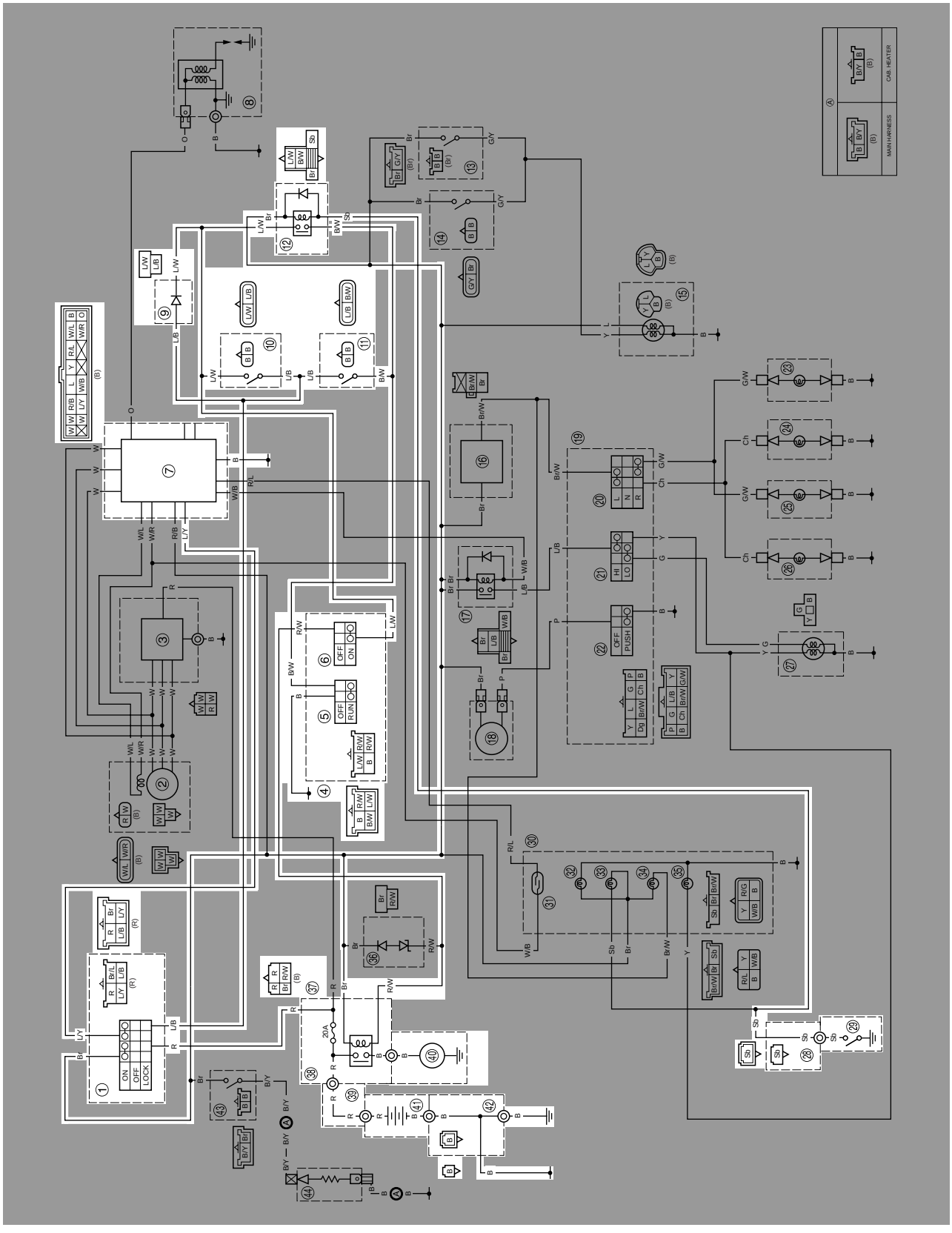
1. Check the fuse. Refer to “CHECKING THE FUSE” on page 7-37.	NG→	Replace the fuse.
OK↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” on page 7-38.	NG→	● Clean the battery terminals. ● Recharge or replace the battery.
OK↓		
3. Check the spark plug. Refer to “CHECKING THE SPARK PLUG” on page 3-8.	NG→	Re-gap or replace the spark plug.
OK↓		
4. Check the spark plug cap. Refer to “CHECKING THE SPARK PLUG CAP” on page 7-43.	NG→	Replace the spark plug cap.
OK↓		
5. Check the ignition coil. Refer to “CHECKING THE IGNITION COIL” on page 7-43.	NG→	Replace the ignition coil.
OK↓		
6. Check the pickup coil. Refer to “CHECKING THE PICKUP COIL” on page 7-44.	NG→	Replace the pickup coil.
OK↓		
7. Check the stator coil. Refer to “CHECKING THE STATOR COIL” on page 7-44.	NG→	Replace the stator assembly.
OK↓		
8. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 7-33.	NG→	Replace the main switch.
OK↓		
9. Check the engine stop switch. Refer to “CHECKING THE SWITCHES” on page 7-33.	NG→	Replace the right handlebar switch.
OK↓		

10. Check the neutral switch.
    Refer to “CHECKING THE SWITCHES” on page 7-33.
    NG→ Replace the neutral switch.
    OK↓
11. Check the sidestand switch.
    Refer to “CHECKING THE SWITCHES” on page 7-33.
    NG→ Replace the sidestand switch.
    OK↓
12. Check the starting circuit cut-off relay.
    Refer to “CHECKING THE RELAYS” on page 7-41.
    NG→ Replace the starting circuit cut-off relay.
    OK↓
13. Check the diode.
    Refer to “CHECKING THE DIODE” on page 7-42.
    NG→ Replace the diode.
    OK↓
14. Check the entire ignition system’s wiring.
    Refer to “CIRCUIT DIAGRAM” on page 7-1.
    NG→ Properly connect or repair the ignition system’s wiring
    OK↓

Replace the CDI unit.

EAS27160
ELECTRIC STARTING SYSTEM

EAS27170
CIRCUIT DIAGRAM



1. Main switch
5. Engine stop switch
6. Start switch
7. CDI unit
9. Diode
10. Clutch switch
11. Sidestand switch
12. Starting circuit cut-off relay
28. Neutral switch lead
29. Neutral switch
37. Starter relay
38. Main fuse
39. Battery positive lead
40. Starter motor
41. Battery
42. Battery negative lead

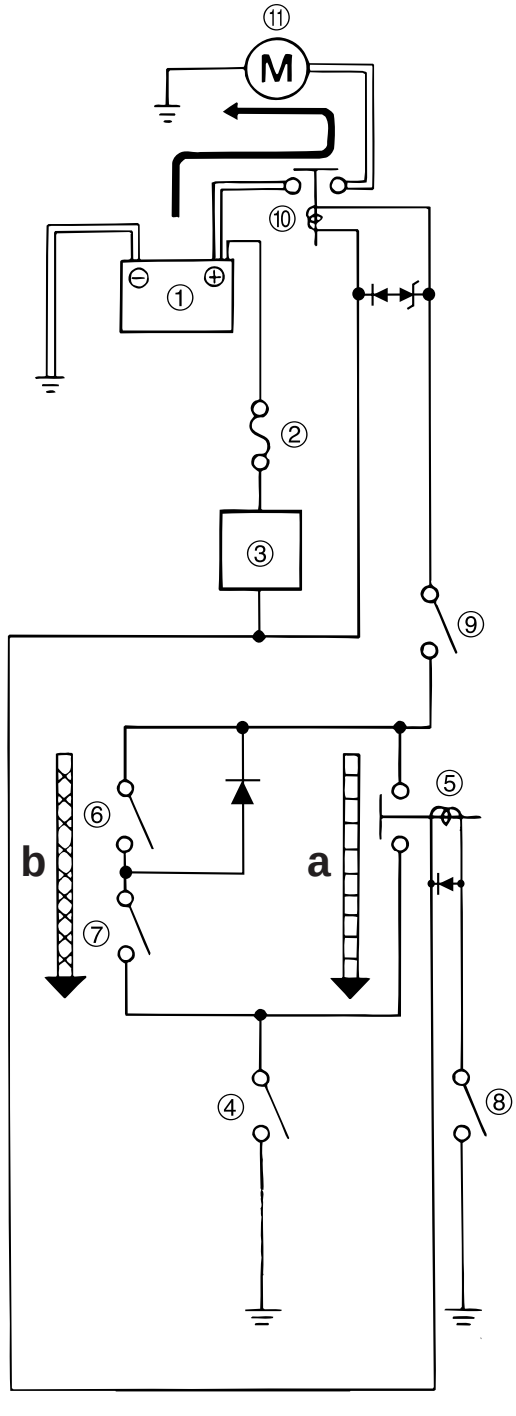
EAS27180

STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

If the engine stop switch is set to "○" 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 cut-off relay prevents the starter motor from operating when neither of these conditions has been met. In this instance, the starting circuit cut-off relay is open so current cannot reach the starter motor. When at least one of the above conditions has been met the starting circuit cut-off relay is closed and the engine can be started by pressing the starter switch.



a. WHEN THE TRANSMISSION IS IN NEUTRAL
b. WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED TO THE HANDLEBAR

1. Battery
2. Main fuse
3. Main switch
4. Engine stop switch
5. Starting circuit cut-off relay
6. Clutch switch
7. Sidestand switch
8. Neutral switch
9. Start switch
10. Starter relay
11. Starter motor

EAS27190

TROUBLESHOOTING

The starter motor fails to turn.

NOTE:

Before troubleshooting, remove the following part(s):

1. Seat
2. Side cover (left/right)
3. Fuel tank side cover (left/right)
4. Fuel tank
5. Tool box (left/right)

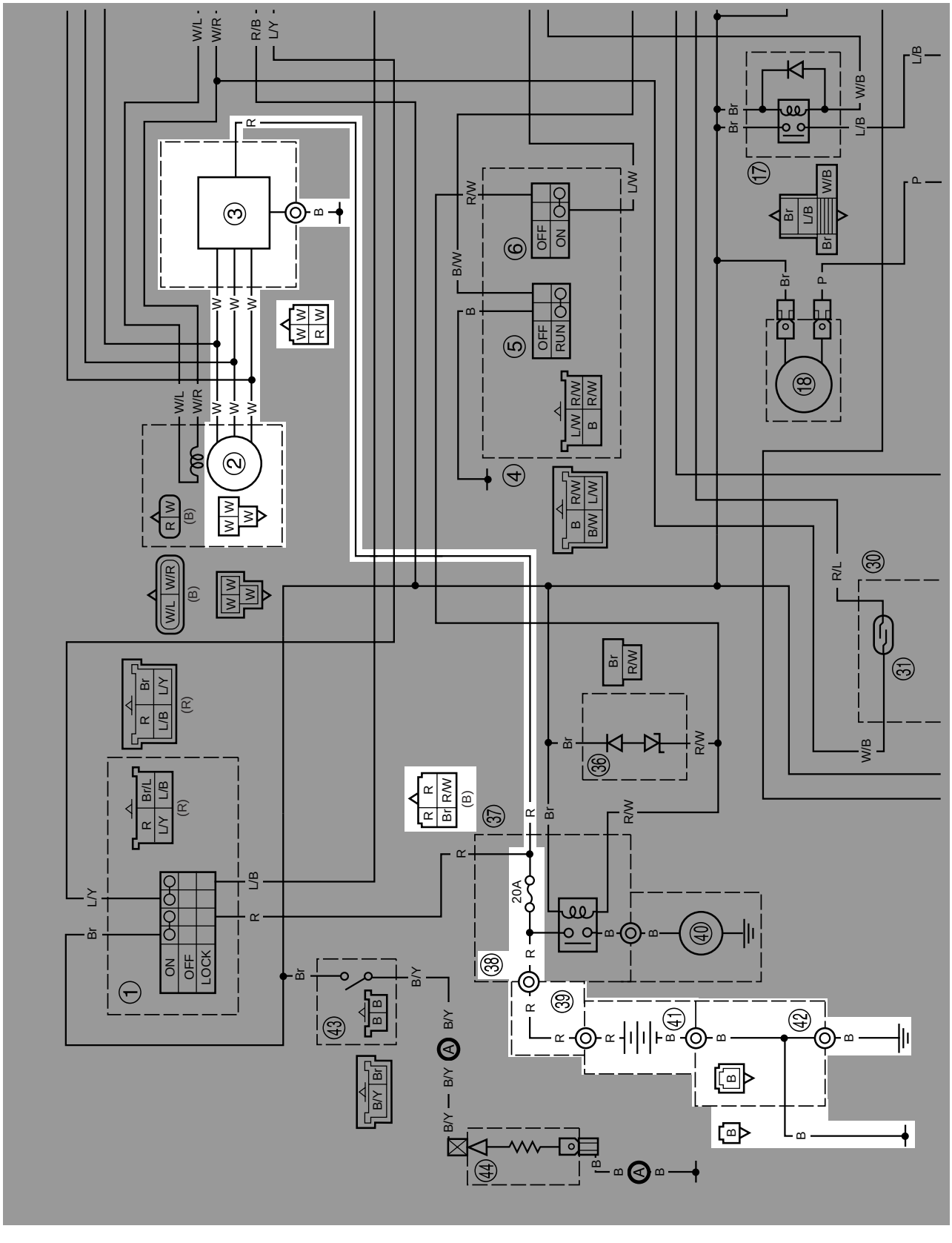
1. Check the fuse. Refer to “CHECKING THE FUSE” on page 7-37.	NG→	Replace the fuse.
OK↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” on page 7-38.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the starter motor. Refer to “CHECKING THE STARTER MOTOR” on page 5-47.	NG→	Repair or replace the starter motor.
OK↓		
4. Check the starting circuit cut-off relay. Refer to “CHECKING THE RELAYS” on page 7-41.	NG→	Replace the starting circuit cut-off relay.
OK↓		
5. Check the starter relay. Refer to “CHECKING THE RELAYS” on page 7-41.	NG→	Replace the starter relay.
OK↓		
6. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 7-33.	NG→	Replace the main switch.
OK↓		
7. Check the engine stop switch. Refer to “CHECKING THE SWITCHES” on page 7-33.	NG→	Replace the right handlebar switch.
OK↓		
8. Check the neutral switch. Refer to “CHECKING THE SWITCHES” on page 7-33.	NG→	Replace the neutral switch.
OK↓		
9. Check the sidestand switch. Refer to “CHECKING THE SWITCHES” on page 7-33.	NG→	Replace the sidestand switch.
OK↓		

10. Check the clutch switch.
    Refer to “CHECKING THE SWITCHES” on page 7-33.
    NG→ Replace the clutch switch.
    OK↓
11. Check the start switch.
    Refer to “CHECKING THE SWITCHES” on page 7-33.
    NG→ Replace the right handlebar switch.
    OK↓
12. Check the entire starting system’s wiring.
    Refer to “CIRCUIT DIAGRAM” on page 7-5.
    NG→ Properly connect or repair the starting system’s wiring
    OK↓

The starting system circuit is OK.

EAS27200
CHARGING SYSTEM

EAS27210
CIRCUIT DIAGRAM



2. Pickup coil rotor
3. Rectifier/regulator
38. Main fuse
39. Battery positive lead
41. Battery
42. Battery negative lead

EAS27220

TROUBLESHOOTING

The battery is not being charged.

NOTE:

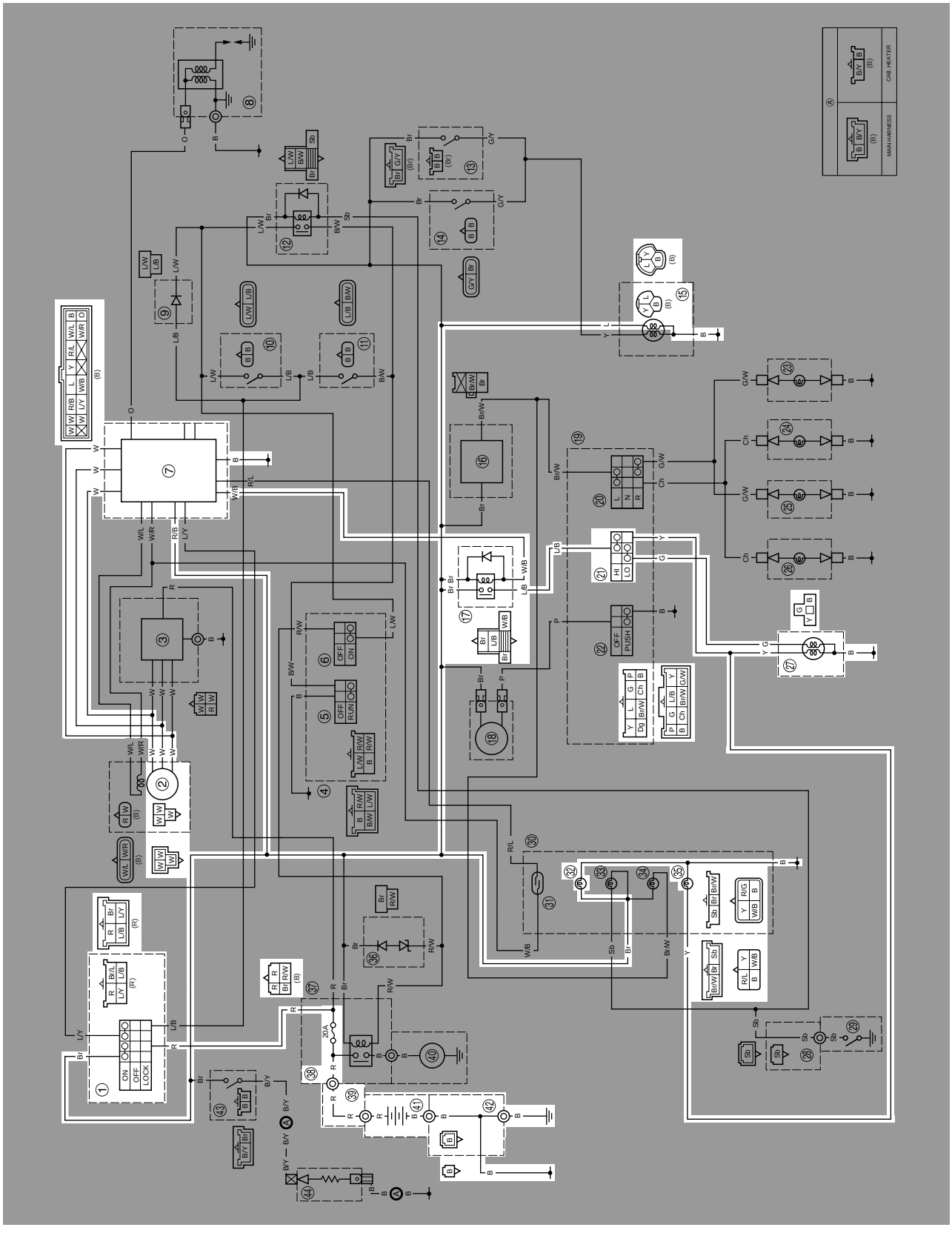
Before troubleshooting, remove the following part(s):

1. Seat
2. Side cover (right)

1. Check the fuse. Refer to "CHECKING THE FUSE" on page 7-37.	NG→	Replace the fuse.
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-38.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the stator coil. Refer to "CHECKING THE STATOR COIL" on page 7-44.	NG→	Replace the stator assembly.
OK↓		
4. Check the rectifier/regulator. Refer to "CHECKING THE RECTIFIER/REGULATOR" on page 7-45.	NG→	Replace the rectifier/regulator.
OK↓		
5. Check the entire charging system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-11.	NG→	Properly connect or repair the charging system's wiring.
OK↓		
This circuit is OK.		

EAS27240
LIGHTING SYSTEM

EAS27250
CIRCUIT DIAGRAM



1. Main switch
2. Pickup coil rotor
7. CDI unit
15. Tail/brake light
17. Headlight relay
21. Dimmer switch
27. Headlight
32. Meter light
35. High beam indicator light
38. Main fuse
39. Battery positive lead
41. Battery
42. Battery negative lead

EAS27260

TROUBLESHOOTING

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

NOTE:

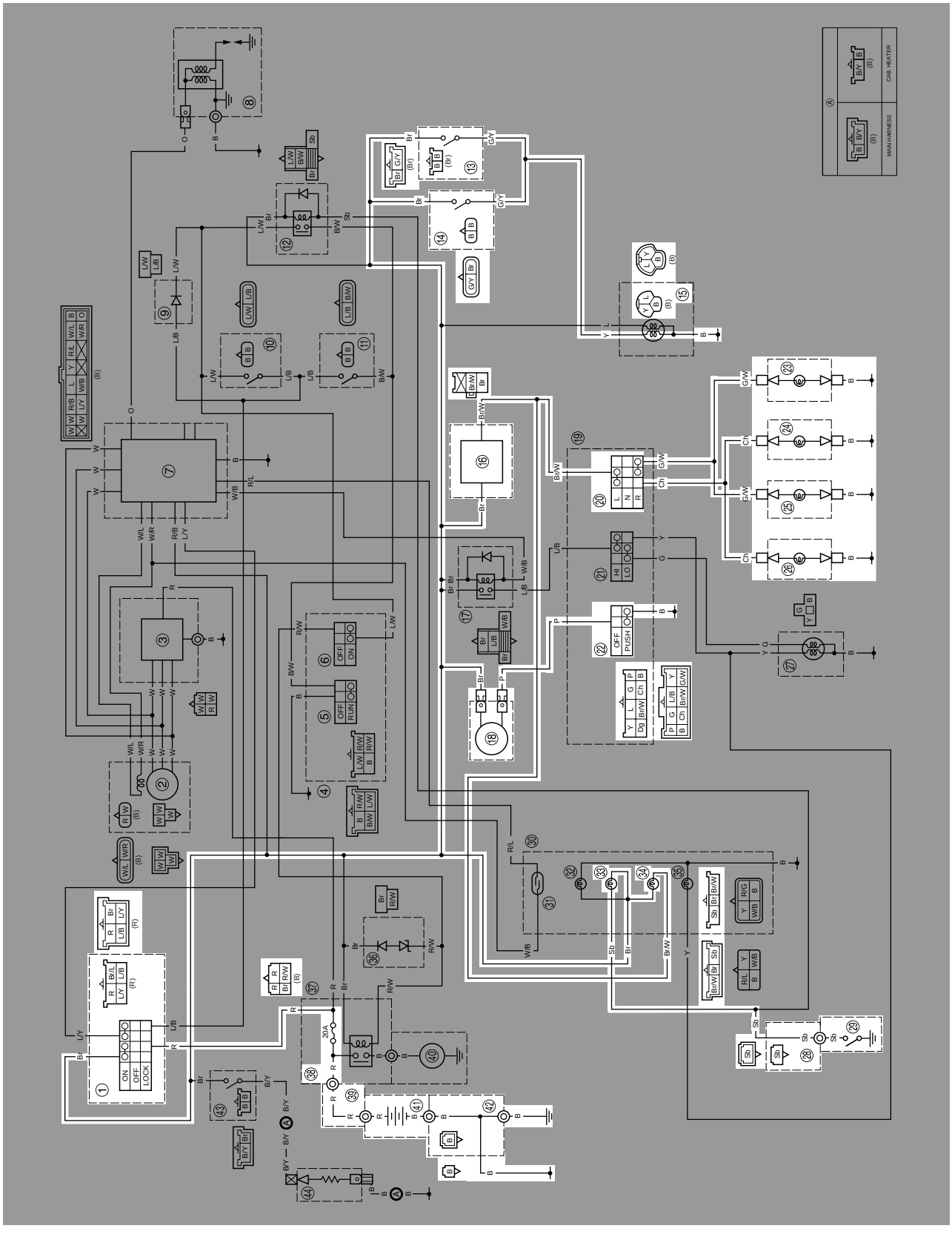
Before troubleshooting, remove the following part(s):

1. Seat
2. Side cover (left/right)
3. Fuel tank side cover (left/right)
4. Fuel tank
5. Tool box (left/right)
6. Headlight unit

1. Check the each bulbs and bulb sockets condition. Refer to “CHECKING THE BULBS AND BULB SOCKETS” on page 7-36.	NG→	Replace the bulb(s) and bulb socket(s).
OK↓		
2. Check the fuse. Refer to “CHECKING THE FUSE” on page 7-37.	NG→	Replace the fuse.
OK↓		
3. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” on page 7-38.	NG→	● Clean the battery terminals. ● Recharge or replace the battery.
OK↓		
4. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 7-33.	NG→	Replace the main switch.
OK↓		
5. Check the dimmer switch. Refer to “CHECKING THE SWITCHES” on page 7-33.	NG→	The dimmer switch is faulty. Replace the left handlebar switch.
OK↓		
6. Check the headlight relay. Refer to “CHECKING THE RELAYS” on page 7-41.	NG→	Replace the headlight relay.
OK↓		
7. Check the entire lighting system’s wiring. Refer to “CIRCUIT DIAGRAM” on page 7-15.	NG→	Properly connect or repair the lighting system’s wiring.
OK↓		
This circuit is OK.		

EAS27270
SIGNALING SYSTEM

EAS27280
CIRCUIT DIAGRAM



1. Main switch
13. Rear brake light switch
14. Front brake light switch
15. Tail/brake light
16. Turn signal relay
18. Horn
20. Turn switch
22. Horn switch
23. Rear right turn signal light
24. Rear left turn signal light
25. Front right turn signal light
26. Front left turn signal light
28. Neutral switch lead
29. Neutral switch
33. Neutral indicator light
34. Turn signal indicator light
38. Main fuse
39. Battery positive lead
41. Battery
42. Battery negative lead

EAS27290

TROUBLESHOOTING

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

NOTE:

Before troubleshooting, remove the following part(s):

1. Seat
2. Side cover (left/right)
3. Fuel tank side cover (left/right)
4. Fuel tank
5. Tool box (left/right)

1. Check the fuse. Refer to “CHECKING THE FUSE” on page 7-37.	NG→	Replace the fuse.
OK↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” on page 7-38.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 7-33.	NG→	Replace the main switch.
OK↓		
4. Check the entire signaling system’s wiring. Refer to “CIRCUIT DIAGRAM” on page 7-19.	NG→	Properly connect or repair the signaling system’s wiring.
OK↓		
This circuit is OK.		

Check the signaling system

The horn fails to sound.

1. Check the horn switch. Refer to “CHECKING THE SWITCHES” on page 7-33.	NG→	Replace the left handlebar switch.
OK↓		
2. Check the horn. Refer to “CHECKING THE HORN” on page 7-45.	NG→	Replace the horn.
OK↓		
3. Check the entire signaling system’s wiring. Refer to “CIRCUIT DIAGRAM” on page 7-19.	NG→	Properly connect or repair the signaling system’s wiring.
OK↓		
This circuit is OK.		

The tail/brake light fails to come on.

1. Check the tail/brake light bulb and socket.
   Refer to “CHECKING THE BULBS AND BULB SOCKETS” on page 7-36.
   NG→ Replace the tail/brake light bulb, socket or both.
   OK↓
2. Check the brake light switch.
   Refer to “CHECKING THE SWITCHES” on page 7-33.
   NG→ Replace the brake light switch.
   OK↓
3. Check the entire signaling system’s wiring.
   Refer to “CIRCUIT DIAGRAM” on page 7-19.
   NG→ Properly connect or repair the signaling system’s wiring.
   OK↓

This circuit is OK.

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

1. Check the turn signal indicator light bulb and socket.
   Refer to “CHECKING THE BULBS AND BULB SOCKETS” on page 7-36.
   NG→ Replace the turn signal indicator light bulb, socket or both.
   OK↓
2. Check the turn signal switch.
   Refer to “CHECKING THE SWITCHES” on page 7-33.
   NG→ Replace the left handlebar switch.
   OK↓
3. Check the turn signal relay.
   Refer to “CHECKING THE RELAYS” on page 7-41.
   NG→ Replace the turn signal relay.
   OK↓
4. Check the entire signaling system’s wiring.
   Refer to “CIRCUIT DIAGRAM” on page 7-19.
   NG→ Properly connect or repair the signaling system’s wiring.
   OK↓

This circuit is OK.

The neutral indicator light fails to come.

1. Check the neutral indicator light bulb and socket.
   Refer to “CHECKING THE BULBS AND BULB SOCKETS” on page 7-36.

NG→ Replace the neutral indicator light bulb, socket or both.

OK↓

2. Check the neutral switch.
   Refer to “CHECKING THE SWITCHES” on page 7-33.

NG→ Replace the neutral switch.

OK↓

3. Check the entire signaling system’s wiring.
   Refer to “CIRCUIT DIAGRAM” on page 7-19.

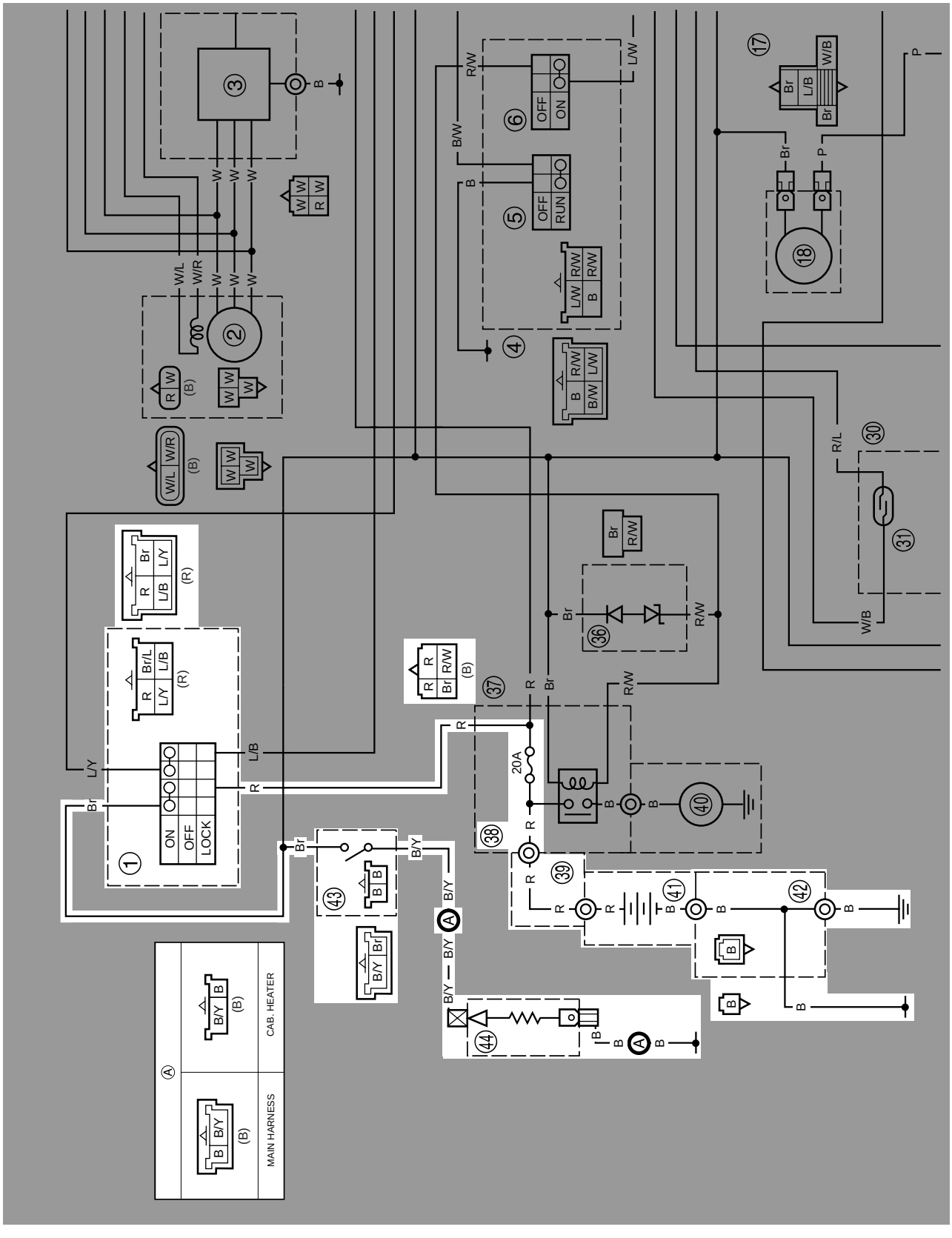
NG→ Properly connect or repair the signaling system’s wiring.

OK↓

This circuit is OK.

EAS27490
CARBURETOR HEATING SYSTEM

EAS27500
CIRCUIT DIAGRAM



1. Main switch
38. Main fuse
39. Battery positive lead
41. Battery
42. Battery negative lead
43. Thermo switch
44. Carburetor warmer

EAS27510

TROUBLESHOOTING

The carburetor heating system fails to operate.

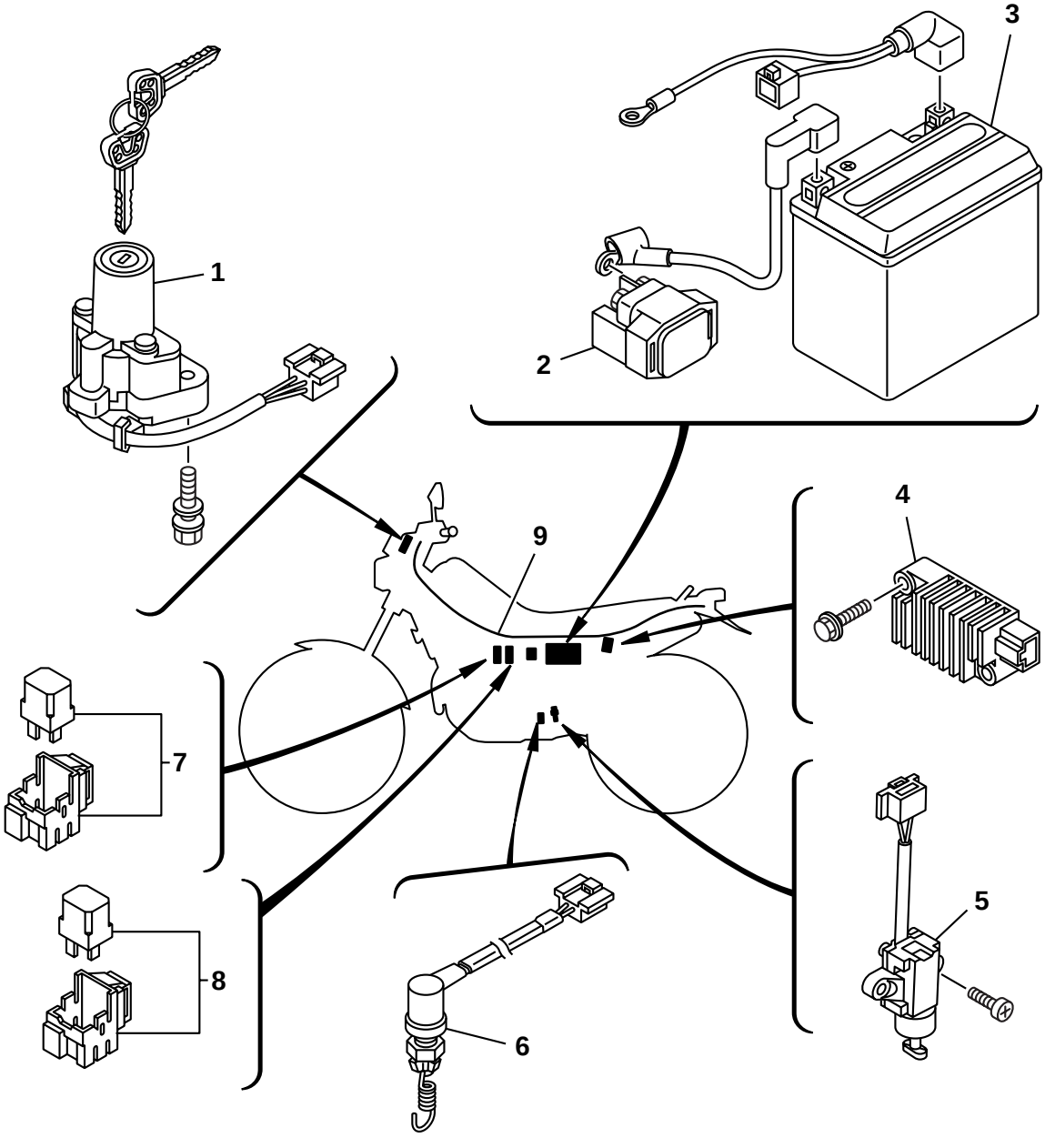
NOTE:

Before troubleshooting, remove the following part(s):

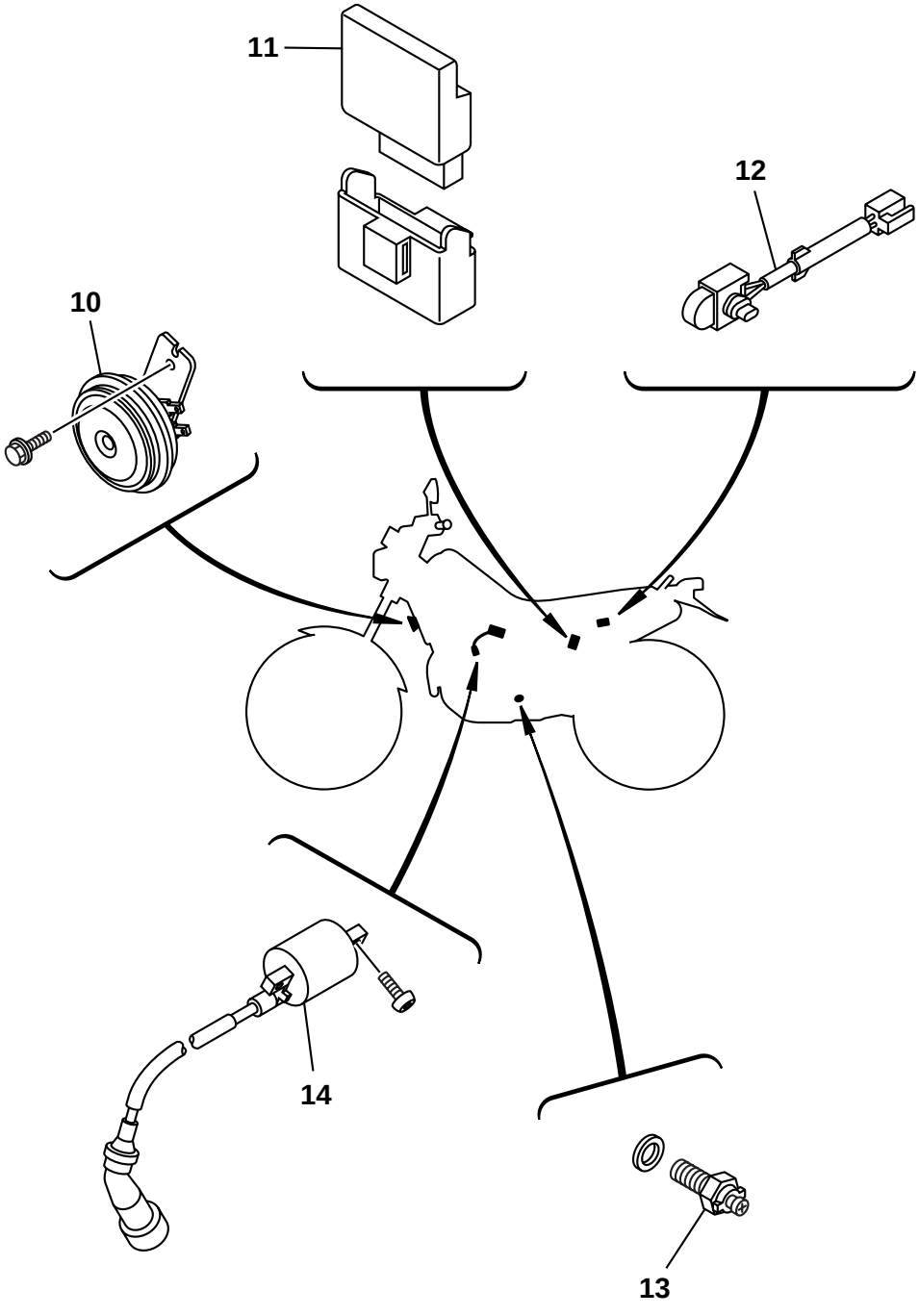
1. Seat
2. Side cover (left/right)
3. Fuel tank side cover (left/right)
4. Fuel tank
5. Tool box (left/right)
6. Battery
7. Carburetor

1. Check the fuse. Refer to “CHECKING THE FUSE” on page 7-37.	NG→	Replace the fuse.
OK↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” on page 7-38.	NG→	● Clean the battery terminals. ● Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 7-33.	NG→	Replace the main switch.
OK↓		
4. Check the thermo switch. Refer to “CHECKING THE THERMO SWITCH” on page 7-46.	NG→	Replace the thermo switch.
OK↓		
5. Check the carburetor warmer. Refer to “CHECKING THE CARBURETOR WARMER” on page 7-47.	NG→	Replace the carburetor warmer.
OK↓		
6. Check the entire carburetor heater system’s wiring. Refer to “CIRCUIT DIAGRAM” on page 7-25.	NG→	Properly connect or repair the carburetor heater system’s wiring.
OK↓		
This circuit is OK.		

EAS27970
ELECTRICAL COMPONENTS



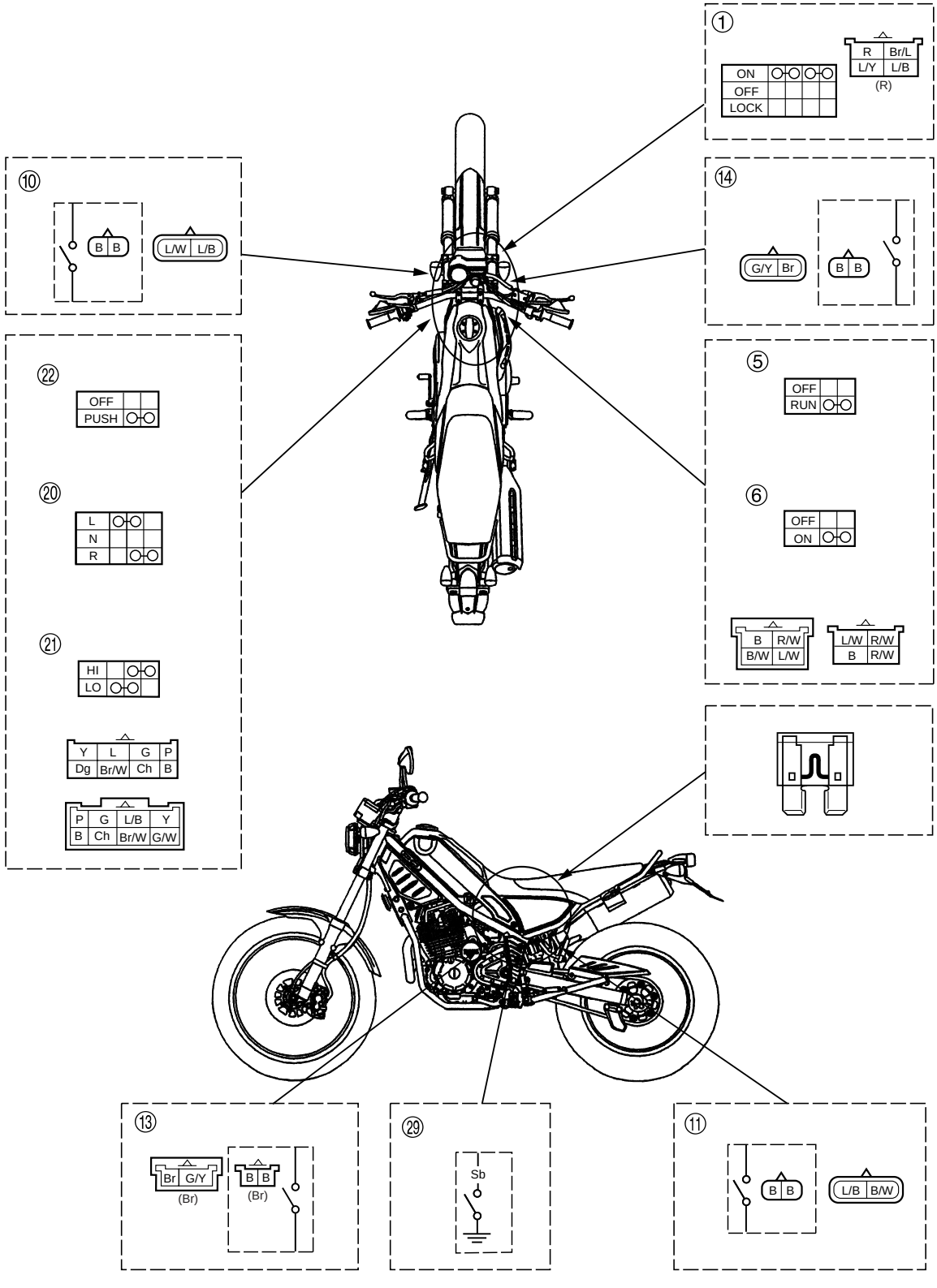
1. Main switch
2. Starter relay
3. Battery
4. Rectifier/regurator
5. Sidestand switch
6. Rear brake light switch
7. Starting circuit cut-off relay
8. Headlight relay
9. Wire harness


11
12
10
14
13

10. Horn
11. CDI unit
12. Thermo switch
13. Neutral switch
14. Ignition coil

EAS27980

CHECKING THE SWITCHES



1. Main switch
5. Engine stop switch
6. Start switch
10. Clutch switch
11. Sidestand switch
13. Rear brake light switch
14. Front brake light switch
20. Turn signal switch
21. Dimmer switch
22. Horn switch
29. Neutral switch

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.

ECA14370

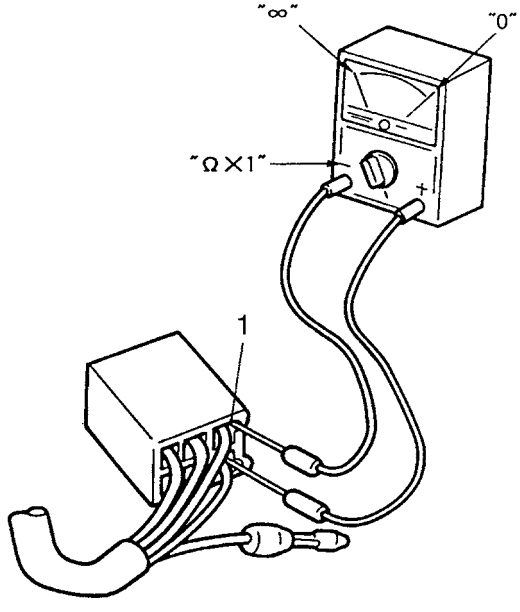
CAUTION:

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

Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

NOTE:

- Before checking for continuity, set the pocket tester to "0" and to the "Ω × 1" range.
- When checking for continuity, switch back and forth between the switch positions a few times.

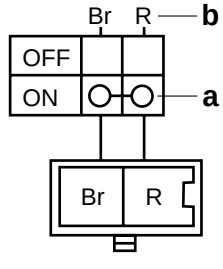


The terminal connections for switches (e.g., main switch, engine stop switch) are shown in an illustration similar to the one on the left.
The switch positions "a" are shown in the far left column and the switch lead colors "b" are shown in the top row in the switch illustration.

NOTE:

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

The example illustration on the left shows that:
There is continuity between black and black/white when the switch is set to "OFF".
There is continuity between red and brown when the switch is set to "ON".



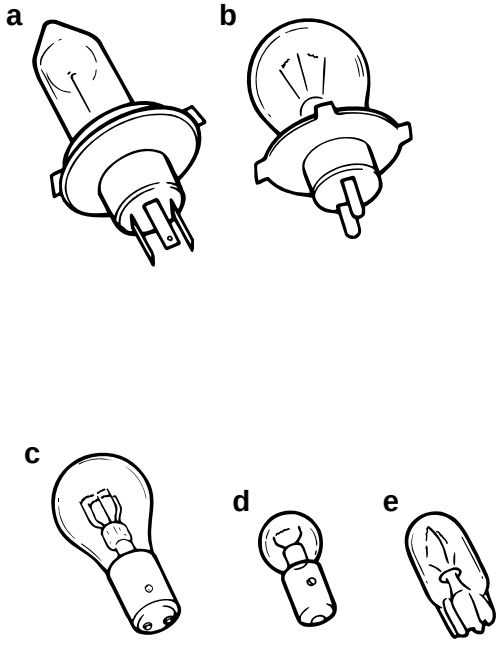
EAS27990
CHECKING THE BULBS AND BULB SOCKETS

Check each bulb and bulb socket for damage or wear, proper connections, and also for continuity between the terminals.
Damage/wear → Repair or replace the bulb, bulb socket or both.
Improperly connected → Properly connect.
No continuity → Repair or replace the bulb, bulb socket or both.

Types of bulbs

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

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



Checking the condition of the bulbs

The following procedure applies to all of the bulbs.

1. Remove:
   - Bulb

EWA13320
⚠ WARNING

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

ECA14380
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 it with a cloth moistened with alcohol or lacquer thinner.**

2. Check:
   - Bulb (for continuity)
     (with the pocket tester)
     No continuity → Replace.

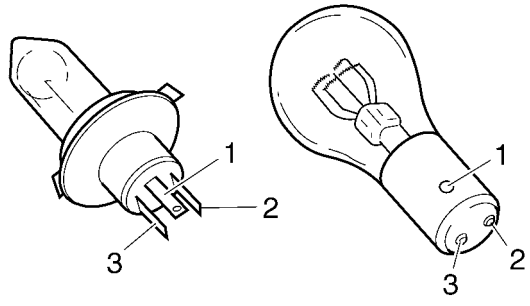
Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

NOTE:
Before checking for continuity, set the pocket tester to "0" and to the "Ω × 1" range.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Connect the positive tester probe to terminal "1" and the negative tester probe to terminal "2", and check the continuity.
b. Connect the positive tester probe to terminal "1" and the negative tester probe to terminal "3", and check the continuity.
c. If either of the readings indicate no continuity, replace the bulb.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲



Checking the condition of the bulb sockets
The following procedure applies to all of the bulb sockets.

1. Check:
   - Bulb socket (for continuity)
     (with the pocket tester)
     No continuity → Replace.

	Pocket tester **90890-03112** **Analog pocket tester** **YU-03112-C**

NOTE:
Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

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

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EAS28000
CHECKING THE FUSE
The following procedure applies to all of the fuse.

ECA13680
CAUTION:
To avoid a short circuit, always set the main switch to "OFF" when checking or replacing a fuse.

1. Remove:
   - Side cover (right)
     Refer to "GENERAL CHASSIS" on page 4-1.
2. Check:
   - Fuse

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

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

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

	Pocket tester **90890-03112** **Analog pocket tester** **YU-03112-C**

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

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3. Replace:
   - Blown fuse

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

Fuses	Amperage rating	Q'ty
Main	20 A	1
Reserve	20 A	1

EWA13310
WARNING
Never use a fuse with an amperage rating other than that specified. Improvising or using a fuse with the wrong amperage rating may cause extensive damage to the electrical system, cause the lighting and ignition systems to malfunction and could possibly cause a fire.

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4. Install:
   - Side cover (right)
     Refer to "GENERAL CHASSIS" on page 4-1.

EAS28030
CHECKING AND CHARGING THE BATTERY

EWA13290
⚠ 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.**

ECA13660
CAUTION:

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

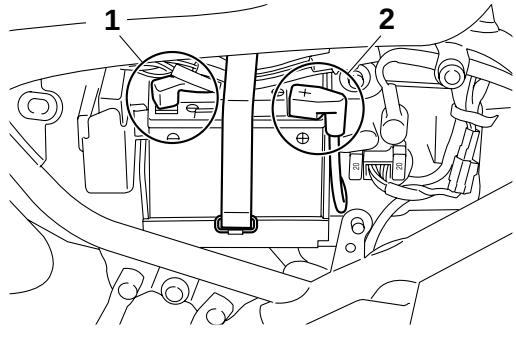
NOTE:

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

1. Remove:
   - Side cover (right)
     Refer to “GENERAL CHASSIS” on page 4-1.
   - Battery band
2. Disconnect:
   - Battery leads
     (from the battery terminals)

ECA13640
CAUTION:

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



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

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Connect a pocket tester to the battery terminals.

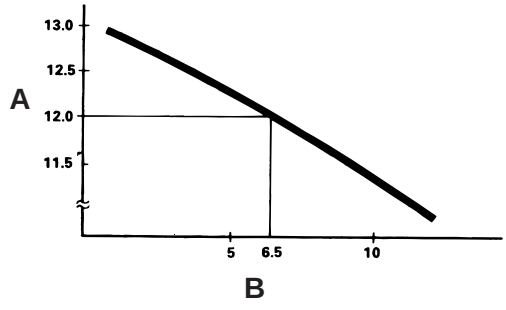
- Positive tester probe → positive battery terminal
- Negative tester probe → negative battery terminal

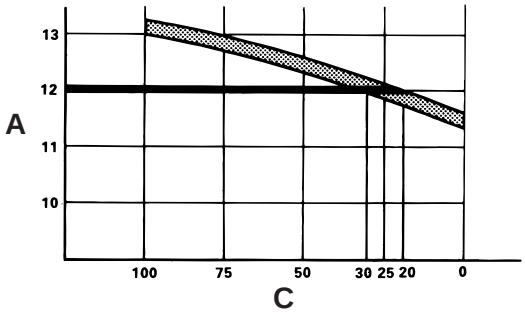
NOTE:

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

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

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





A. Open-circuit voltage (V)
B. Charging time (hours)
C. Charge of the battery (%)

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

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

EWA13300

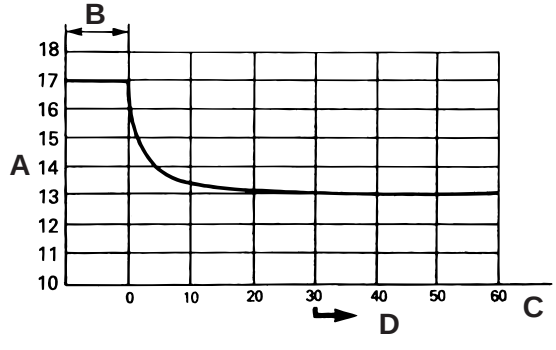
⚠ WARNING

Do not quick charge a battery.

ECA13670

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 vehicle. (If charging has to be done with the battery mounted on the vehicle, 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.**



A. Open-circuit voltage (V)
B. Charge
C. Minites
D. Check the open-circuit voltage.

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Charging method using a variable-current (voltage) charger

a. Measure the open-circuit voltage prior to charging.

NOTE:

Voltage should be measured 30 minutes after

the machine is stopped.

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

NOTE:

Set the charging voltage at 16–17 V.If the setting is lower, charging will be insufficient. If too high, the battery will be over-charged.

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

NOTE:

If the current is lower than the standard charging current written on the battery, set the charging voltage adjust dial at 20–24 V and monitor the amperage for 3–5 minutes to check the battery.

- Reach the standard charging current
  Battery is good.
- Does not reach the standard charging current
  Replace the battery.

d. Adjust the voltage so that the current is at the standard charging level.
e. Set the time according to the charging time suitable for the open-circuit voltage.
   Refer to “Battery condition checking steps”.
f. If charging requires more than 5 hours, it is advisable to check the charging current after a lapse of 5 hours. If there is any change in the amperage, readjust the voltage to obtain the standard charging current.
g. Measure the battery open-circuit voltage after leaving the battery unused for more than 30 minutes.

12.8 V or more --- Charging is complete.
12.7 V or less --- Recharging is required.
Under 12.0 V --- Replace the battery.

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Charging method using a constant voltage charger

a. Measure the open-circuit voltage prior to charging.

NOTE:

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

b. Connect a charger and AMP meter to the battery and start charging.
c. Make sure that the current is higher than the standard charging current written on the battery.

NOTE:

If the current is lower than the standard charging current written on the battery, This type of battery charger cannot charge the MF battery. A variable voltage charger is recommended.

d. Charge the battery until the battery’s charging voltage is 15 V.

NOTE:

Set the charging time at 20 hours (maximum).

e. Measure the battery open-circuit voltage after leaving the battery unused for more than 30 minutes.

12.8 V or more --- Charging is complete.
12.7 V or less --- Recharging is required.
Under 12.0 V --- Replace the battery.

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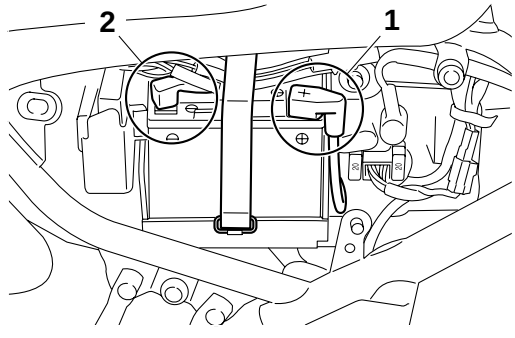
6. Install:
   - Battery
7. Connect:
   - Battery leads
     (to the battery terminals)

ECA13630

CAUTION:

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



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

Recommended lubricant
Dielectric grease

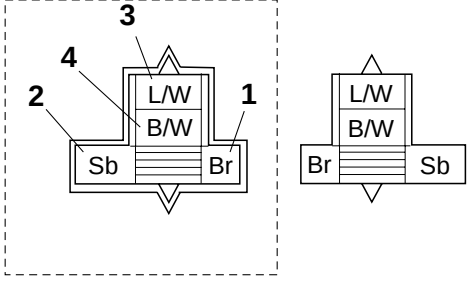
10. Install:
- Battery band
- Side cover (right)
  Refer to “GENERAL CHASSIS” on page 4-1.

EAS28040
CHECKING THE RELAYS
Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, replace the relay.

Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

1. Disconnect the relay from the wire harness.
2. Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the relay terminal as shown.
   Check the relay operation.
   Out of specification → Replace.

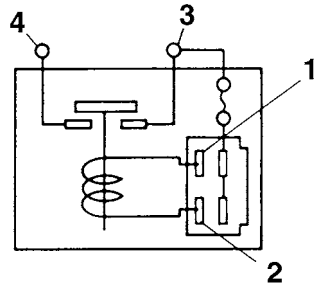
Starting circuit cut-off relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Result
Continuity/No continuity
(Between “3” to “4”)

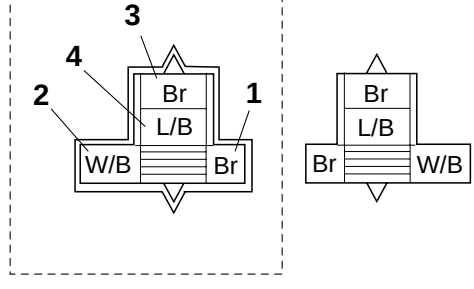
Starter relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Result
Continuity/No continuity
(Between “3” to “4”)

Headlight relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Result
Continuity/No continuity
(Between “3” to “4”)

EAS4D608
CHECKING THE TURN SIGNAL RELAY
1. Check:
- Turn signal relay input voltage
  Out of specification → The wiring circuit from the main switch to the turn signal relay coupler is faulty and must be repaired.

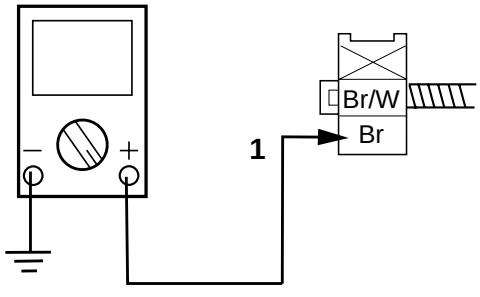
Turn signal relay input voltage
DC 12 V

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Connect the pocket tester (DC 20 V) to the turn signal relay terminal as shown.

Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe
  brown “1”
- Negative tester probe
  ground



b. Turn the main switch to “ON”.
c. Measure the turn signal relay input voltage.

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2. Check:
   - Turn signal relay output voltage
     Out of specification → Replace.

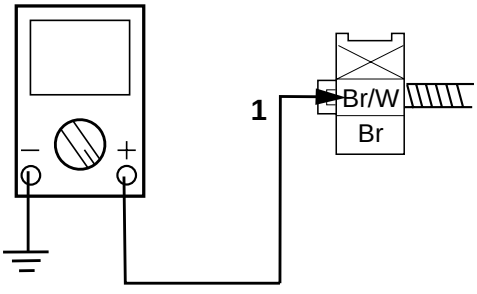
Turn signal relay input voltage
DC 12 V

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Connect the pocket tester (DC 20 V) to the turn signal/hazard relay terminal as shown.

Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Negative tester probe
  brown/white “1”
- Positive tester probe
  ground



b. Turn the main switch to “ON”.
c. Measure the turn signal relay output voltage.

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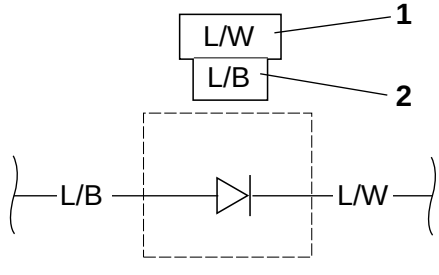
EAS28050
CHECKING THE DIODE

1. Check:
   - Diode
     Out of specification → Replace.

Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

Continuity
Positive tester probe → blue/white “1”
Negative tester probe → blue/black “2”
No continuity
Positive tester probe → blue/black “2”
Negative tester probe → blue/white* “1”



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a. Disconnect the diode from the wire harness.
b. Connect the pocket tester ($\Omega \times 1$) to the diode coupler as shown.
c. Check the diode for continuity.

d. Check the diode for no continuity.

NOTE:
When you switch the positive and negative tester probes, the readings in the above chart will be reversed.

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EAS28060
CHECKING THE SPARK PLUG CAP

1. Check:
   - Spark plug cap resistance
     Out of specification → Replace.

Resistance
10.0 kΩ

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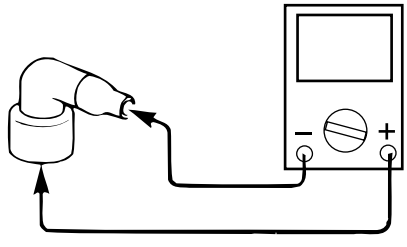
a. Remove the spark plug cap from the spark plug lead.
b. Connect the pocket tester (Ω × 1k) to the spark plug cap as shown.

Pocket tester
90890-03112
Analog pocket tester
YU-03112-C



c. Measure the spark plug cap resistance.

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EAS28090
CHECKING THE IGNITION COIL

1. Check:
   - Primary coil resistance
     Out of specification → Replace.

Primary coil resistance
0.18–0.28 Ω

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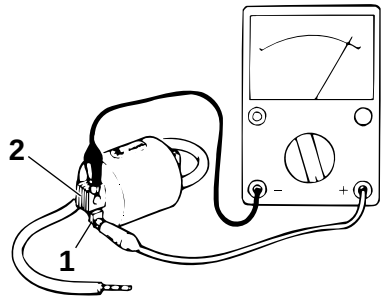
a. Disconnect the ignition coil connectors from the ignition coil terminals.
b. Connect the pocket tester (Ω × 1) to the ignition coil as shown.

Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe
  Orange “1”
- Negative tester probe
  Ignition coil base “2”



c. Measure the primary coil resistance.

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2. Check:
   - Secondary coil resistance
     Out of specification → Replace.

Secondary coil resistance
6.30–9.50 kΩ

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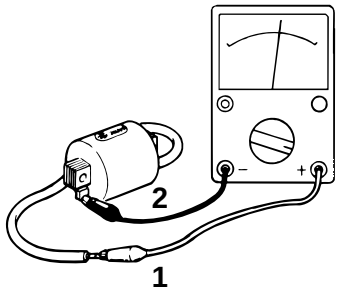
a. Disconnect the spark plug cap from the ignition coil.
b. Connect the pocket tester (Ω × 1k) to the ignition coil as shown.

Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Negative tester probe
  High tension code “1”
- Positive tester probe
  Orange “2”



c. Measure the secondary coil resistance.

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3. Check:
   - Ignition spark gap
     Out of specification → Replace.

	Minimum ignition spark gap **6 mm (0.24 in)**

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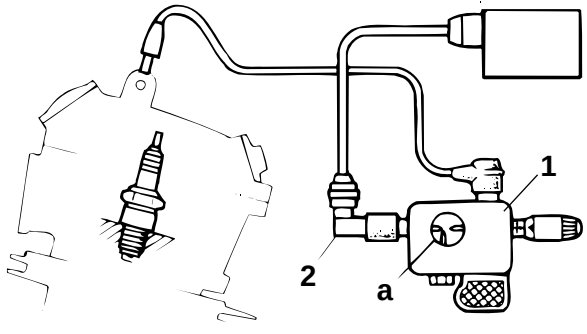
a. Disconnect the spark plug cap from the spark plug.



1. Ignition checker/opama pet-4000 spark checker
2. Spark plug cap

b. Connect the ignition checker/opama pet-4000 spark checker "2" as shown.

	Ignition checker **90890-06754** **Opama pet-4000 spark checker** **YM-34487**

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

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EAS28110
CHECKING THE PICKUP COIL

1. Disconnect:
   - Pickup coil coupler
     (from the wire harness)
2. Check:
   - Pickup coil resistance
     Out of specification → Replace.

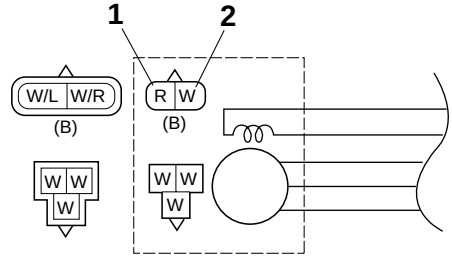
	Pickup coil resistance **248.0–372.0 Ω**

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Connect the pocket tester (Ω × 100) to the pickup coil terminal as shown.

	Pocket tester **90890-03112** **Analog pocket tester** **YU-03112-C**

• Positive tester probe Red "1" • Negative tester probe White "2"



b. Measure the pickup coil resistance.

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EAS28150
CHECKING THE STATOR COIL

1. Disconnect:
   - Stator coil coupler
     (from the wire harness)
2. Check:
   - Stator coil resistance
     Out of specification → Replace the stator coil.

Stator coil resistance
0.56–0.84 Ω

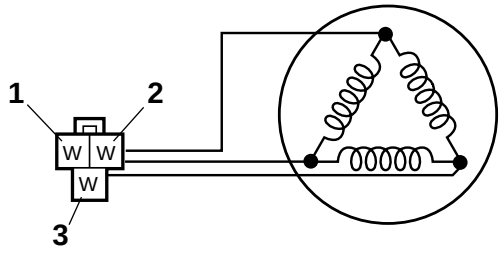
a. Connect the pocket tester (Ω × 1) to the stator coil coupler as shown.

Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe
  White “1”
- Negative tester probe
  White “2”

- Positive tester probe
  White “1”
- Negative tester probe
  White “3”

- Positive tester probe
  White “2”
- Negative tester probe
  White “3”



b. Measure the stator coil resistance.

EAS28170
CHECKING THE RECTIFIER/REGULATOR

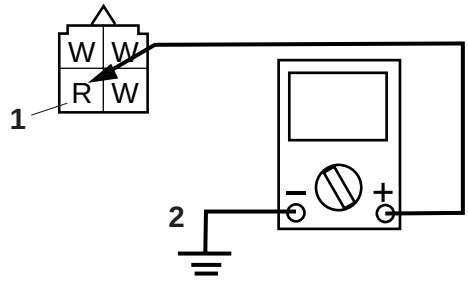
1. Check:
   - Rectifier/regulator output voltage
     Out of specification → Replace the rectifier/regulator.

Rectifier/regulator output voltage
14 V at 5000 r/min

a. Set the engine tachometer to the ignition coil of cylinder #1.
b. Connect the pocket tester (AC 20 V) to the rectifier/regulator coupler as shown.

Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe
  red “1”
- Negative tester probe
  ground “2”



c. Start the engine and let it run at approximately 5000 r/min.
d. Measure the charging voltage.

EAS28180
CHECKING THE HORN

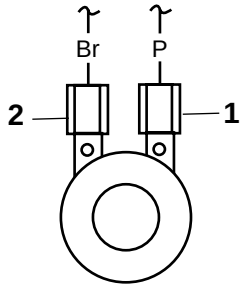
1. Check:
   - Horn resistance
     Out of specification → Replace.

Horn resistance
1.01–1.11 Ω at 20°C (68°F)

a. Disconnect the horn leads from the horn terminals.
b. Connect the pocket tester (Ω × 1) to the horn terminals.

Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe
  Horn terminal “1”
- Negative tester probe
  Horn terminal “2”



c. Measure the horn resistance.

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2. Check:
   - Horn sound
     Faulty sound → Adjust or replace.

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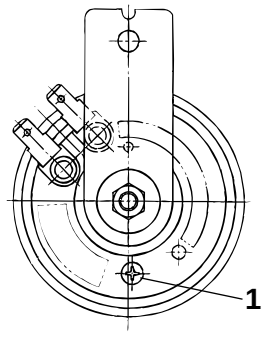
a. Connect a battery (12 V) to the horn.
b. Turn the adjusting screw “1” until the specified horn sound is obtained.



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EAS28270

CHECKING THE THERMO SWITCH

1. Remove:
   - Thermo switch
     (from the thermostat housing)

EWA13830

⚠ WARNING

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

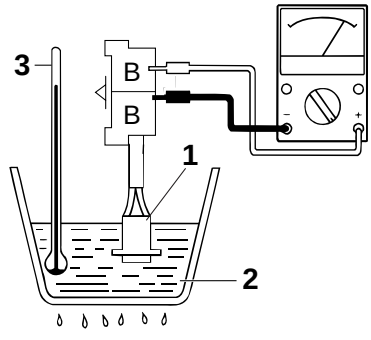
2. Check:
   - Thermo switch continuity
     Out of specification → Replace the thermo switch.

Test step	Coolant temperature	Continuity
1	Less than 16±3°C (60.8±5.4°F)	YES
2	More than 16±3°C (60.8±5.4°F)	NO
3	More than 11±3°C (51.8±5.4°F)	NO
4	Less than 11±3°C (51.8±5.4°F)	YES

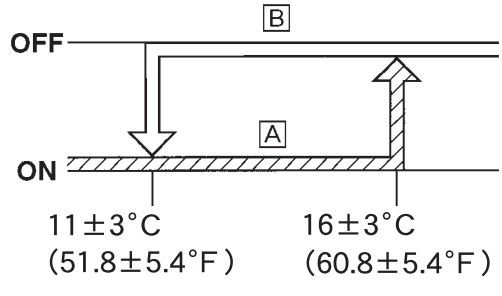
Step 1 and 2: Heating phase
Step 3 and 4: Cooling phase

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Connect the pocket tester (Ω × 1) to the thermo switch “1” coupler as shown.
b. Immerse the thermo switch in a container filled with coolant “2”.
c. Place a thermometer “3” in the coolant.



d. Slowly heat the coolant, then let it cool down to the specified temperature.



A. Heating phase
B. Cooling phase

e. Check the thermo switch for continuity.

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3. Install:
   - Thermo switch

EAS28310

CHECKING THE CARBURETOR WARMER

1. Check:
   - Carburetor warmer resistance
     Out of specification → Replace.

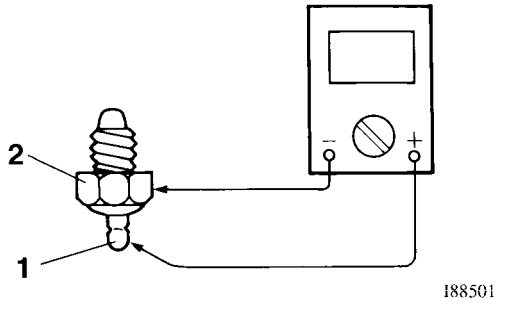
Resistance
4.7–9.5 Ω

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Remove the carburetor warmer leads from the carburetor.
b. Connect the pocket tester (Ω × 1) to the carburetor warmer as shown.

Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe
  Carburetor warmer terminal “1”
- Negative tester probe
  Carburetor warmer body “2”



c. Measure the carburetor warmer resistance.

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TROUBLESHOOTING

EAS28450
TROUBLESHOOTING

EAS28460
GENERAL INFORMATION
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.

EAS28470
STARTING FAILURES
Engine
1. Cylinder(s) and cylinder head(s)
   - Loose spark plug
   - Loose cylinder head or cylinder
   - Damaged cylinder head gasket
   - Damaged cylinder gasket
   - Worn or damaged cylinder
   - Incorrect valve clearance
   - Improperly sealed valve
   - Incorrect valve-to-valve-seat contact
   - Incorrect valve timing
   - Faulty valve spring
   - Seized valve
2. Piston(s) and piston ring(s)
   - Improperly installed piston ring
   - Damaged, worn or fatigued piston ring
   - Seized piston ring
   - Seized or damaged piston
3. Air filter
   - Improperly installed air filter
   - Clogged air filter element
4. Crankcase and crankshaft
   - Improperly assembled crankcase
   - Seized crankshaft

Fuel system
1. Fuel tank
   - Empty fuel tank
   - Clogged fuel filter
   - Clogged fuel strainer
   - Clogged fuel tank drain hose
   - Clogged rollover valve
   - Clogged rollover valve hose
   - Deteriorated or contaminated fuel
2. Fuel pump
   - Faulty fuel pump
   - Faulty fuel pump relay
3. Fuel cock
   - Clogged or damaged fuel hose
4. Carburetor(s)
   - Deteriorated or contaminated fuel
   - Clogged pilot jet
   - Clogged pilot air passage
   - Sucked-in air
   - Damaged float
   - Worn needle valve
   - Improperly installed needle valve seat
   - Incorrect fuel level
   - Improperly installed pilot jet
   - Clogged starter jet
   - Faulty starter plunger
   - Improperly adjusted starter cable

Electrical system
1. Battery
   - Discharged battery
   - Faulty battery
2. Fuse(s)
   - Blown, damaged or incorrect fuse
   - Improperly installed fuse
3. Spark plug(s)
   - Incorrect spark plug gap
   - Incorrect spark plug heat range
   - Fouled spark plug
   - Worn or damaged electrode
   - Worn or damaged insulator
   - Faulty spark plug cap
4. Ignition coil(s)
   - Cracked or broken ignition coil body
   - Broken or shorted primary or secondary coils
   - Faulty spark plug lead
5. Ignition system
   - Faulty ignitor unit
   - Faulty pickup coil
   - Broken generator rotor woodruff key
6. Switches and wiring
   - Faulty main switch
   - Faulty engine stop switch
   - Broken or shorted wiring
   - Faulty neutral switch
   - Faulty start switch
   - Faulty sidestand switch
   - Faulty clutch switch
   - Improperly grounded circuit
   - Loose connections
7. Starting system
   - Faulty starter motor

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

EAS28490

INCORRECT ENGINE IDLING SPEED

Engine

1. Cylinder(s) and cylinder head(s)
   - Incorrect valve clearance
   - Damaged valve train components
2. Air filter
   - Clogged air filter element

Fuel system

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

Electrical system

1. Battery
   - Discharged battery
   - Faulty battery
2. Spark plug(s)
   - Incorrect spark plug gap
   - Incorrect spark plug heat range
   - Fouled spark plug
   - Worn or damaged electrode
   - Worn or damaged insulator
   - Faulty spark plug cap
3. Ignition coil(s)
   - Broken or shorted primary or secondary coils
   - Faulty spark plug lead
   - Cracked or broken ignition coil
4. Ignition system
   - Faulty ignitor unit
   - Faulty pickup coil
   - Broken generator rotor woodruff key

EAS28510

POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to “STARTING FAILURES” on page 8-1.

Engine

1. Air filter
   - Clogged air filter element

Fuel system

1. Carburetor(s)
   - Faulty diaphragm
   - Incorrect fuel level
   - Loose or clogged main jet
2. Fuel pump
   - Faulty fuel pump

EAS28530

FAULTY GEAR SHIFTING

Shifting is difficult

Refer to “Clutch drags”.

EAS28540

SHIFT PEDAL DOES NOT MOVE

Shift shaft

- Improperly adjusted shift rod
- Bent shift shaft

Shift drum and shift forks

- Foreign object in a shift drum groove
- Seized shift fork
- Bent shift fork guide bar

Transmission

- Seized transmission gear
- Foreign object between transmission gears
- Improperly assembled transmission

EAS28550

JUMPS OUT OF GEAR

Shift shaft

- Incorrect shift pedal position
- Improperly returned stopper lever

Shift forks

- Worn shift fork

Shift drum

- Incorrect axial play
- Worn shift drum groove

Transmission

- Worn gear dog

EAS28560

FAULTY CLUTCH

Clutch slips

1. Clutch
   - Improperly assembled clutch
   - Improperly adjusted clutch cable
   - Loose or fatigued clutch spring
   - Worn friction plate
   - Worn clutch plate
2. Engine oil
   - Incorrect oil level
   - Incorrect oil viscosity (low)
   - Deteriorated oil

Clutch drags

1. Clutch
   - Unevenly tensioned clutch springs
   - Warped pressure plate
   - Bent clutch plate
   - Swollen friction plate
   - Bent clutch push rod
   - Broken clutch boss
   - Burnt primary driven gear bushing
   - Match marks not aligned
2. Engine oil
   - Incorrect oil level
   - Incorrect oil viscosity (high)
   - Deteriorated oil

EAS28590

OVERHEATING

Engine

1. Cylinder head(s) and piston(s)
   - Heavy carbon buildup
2. Engine oil
   - Incorrect oil level
   - Incorrect oil viscosity
   - Inferior oil quality

Fuel system

1. Carburetor(s)
   - Incorrect main jet setting
   - Incorrect fuel level
   - Damaged or loose carburetor joint
2. Air filter
   - Clogged air filter element

Chassis

1. Brake(s)
   - Dragging brake

Electrical system

1. Spark plug(s)
   - Incorrect spark plug gap
   - Incorrect spark plug heat range
2. Ignition system
   - Faulty ignitor unit

EAS28620

POOR BRAKING PERFORMANCE

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

EAS28660

FAULTY FRONT FORK LEGS

Leaking oil

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

Malfunction

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

EAS28670

UNSTABLE HANDLING

1. Handlebar
   - Bent or improperly installed handlebar
2. Steering head components
   - Improperly installed upper bracket
   - Improperly installed lower bracket (improperly tightened ring nut)
   - Bent steering stem
   - Damaged ball bearing or bearing race
3. Front fork leg(s)
   - Uneven oil levels (both front fork legs)
   - Unevenly tensioned fork spring (both front fork legs)
   - Broken fork spring
   - Bent or damaged inner tube
   - Bent or damaged outer tube
4. Swingarm
   - Worn bearing or bushing
   - Bent or damaged swingarm
5. Rear shock absorber assembly(-ies)
   - Faulty rear shock absorber spring
   - Leaking oil or gas
6. Tire(s)
   - Uneven tire pressures (front and rear)
   - Incorrect tire pressure
   - Uneven tire wear

7. Wheel(s)
   - Incorrect wheel balance
   - Deformed cast wheel
   - Damaged wheel bearing
   - Bent or loose wheel axle
   - Excessive wheel runout
8. Frame
   - Bent frame
   - Damaged steering head pipe
   - Improperly installed bearing race

EAS28710

FAULTY LIGHTING OR SIGNALING SYSTEM

Headlight does not come on
- Wrong headlight bulb
- Too many electrical accessories
- Hard charging
- Incorrect connection
- Improperly grounded circuit
- Poor contacts (main or light switch)
- Burnt-out headlight bulb

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

Tail/brake light does not come on
- Wrong tail/brake light bulb
- Too many electrical accessories
- Incorrect connection
- Burnt-out tail/brake light bulb

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

Turn signal does not come on
- Faulty turn signal switch
- Faulty turn signal relay
- Burnt-out turn signal bulb
- Incorrect connection
- Damaged or faulty wire harness
- Improperly grounded circuit
- Faulty battery
- Blown, damaged or incorrect fuse

Turn signal blinks slowly
- Faulty turn signal relay
- Faulty main switch
- Faulty turn signal switch
- Incorrect turn signal bulb

Turn signal remains lit
- Faulty turn signal relay
- Burnt-out turn signal bulb

Turn signal blinks quickly
- Incorrect turn signal bulb
- Faulty turn signal relay
- Burnt-out turn signal bulb

Horn does not sound
- Improperly adjusted horn
- Damaged or faulty horn
- Faulty main switch
- Faulty horn switch
- Faulty battery
- Blown, damaged or incorrect fuse
- Faulty wire harness

EAS28740
WIRING DIAGRAM

XG250 2005
1. Main switch
2. Pickup coil rotor
3. Rectifier/regulator
4. Right handlebar switch
5. Engine stop switch
6. Start switch
7. CDI unit
8. Ignition coil
9. Diode
10. Clutch switch
11. Sidestand switch
12. Starting circuit cut-off relay
13. Rear brake switch
14. Front brake switch
15. Tail/brake light
16. Turn signal relay
17. Headlight relay
18. Horn
19. Left handlebar switch
20. Turn signal switch
21. Dimmer switch
22. Horn switch
23. Rear right turn signal light
24. Rear left turn signal light
25. Front right turn signal light
26. Front left turn signal light
27. Headlight
28. Neutral switch lead
29. Neutral switch
30. Meter
31. Speedometer
32. Meter light
33. Neutral indicator light
34. Turn signal indicator light
35. High beam indicator light
36. Diode (relay unit)
37. Starter relay
38. Main fuse
39. Battery positive lead
40. Starter motor
41. Battery
42. Battery negative lead
43. Thermo switch
44. Carburetor warmer

EAS28750
COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
O	Orange
P	Pink
R	Red
Sb	Sky blue
W	White
Y	Yellow
B/G	Black/Green
B/L	Black/Blue
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
Br/G	Brown/Green
Br/L	Brown/Blue
Br/R	Brown/Red
Br/W	Brown/White
G/B	Green/Black
G/R	Green/Red
G/W	Green/White
G/Y	Green/Yellow
Gy/G	Gray/Green
Gy/R	Gray/Red
L/B	Blue/Black
L/R	Blue/Red
L/W	Blue/White
L/Y	Blue/Yellow
O/B	Orange/Black
P/W	Pink/White
R/B	Red/Black
R/G	Red/Green
R/L	Red/Blue
R/W	Red/White
R/Y	Red/Yellow
Sb/W	Sky blue/White
W/B	White/Black
W/R	White/Red
W/Y	White/Yellow
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red

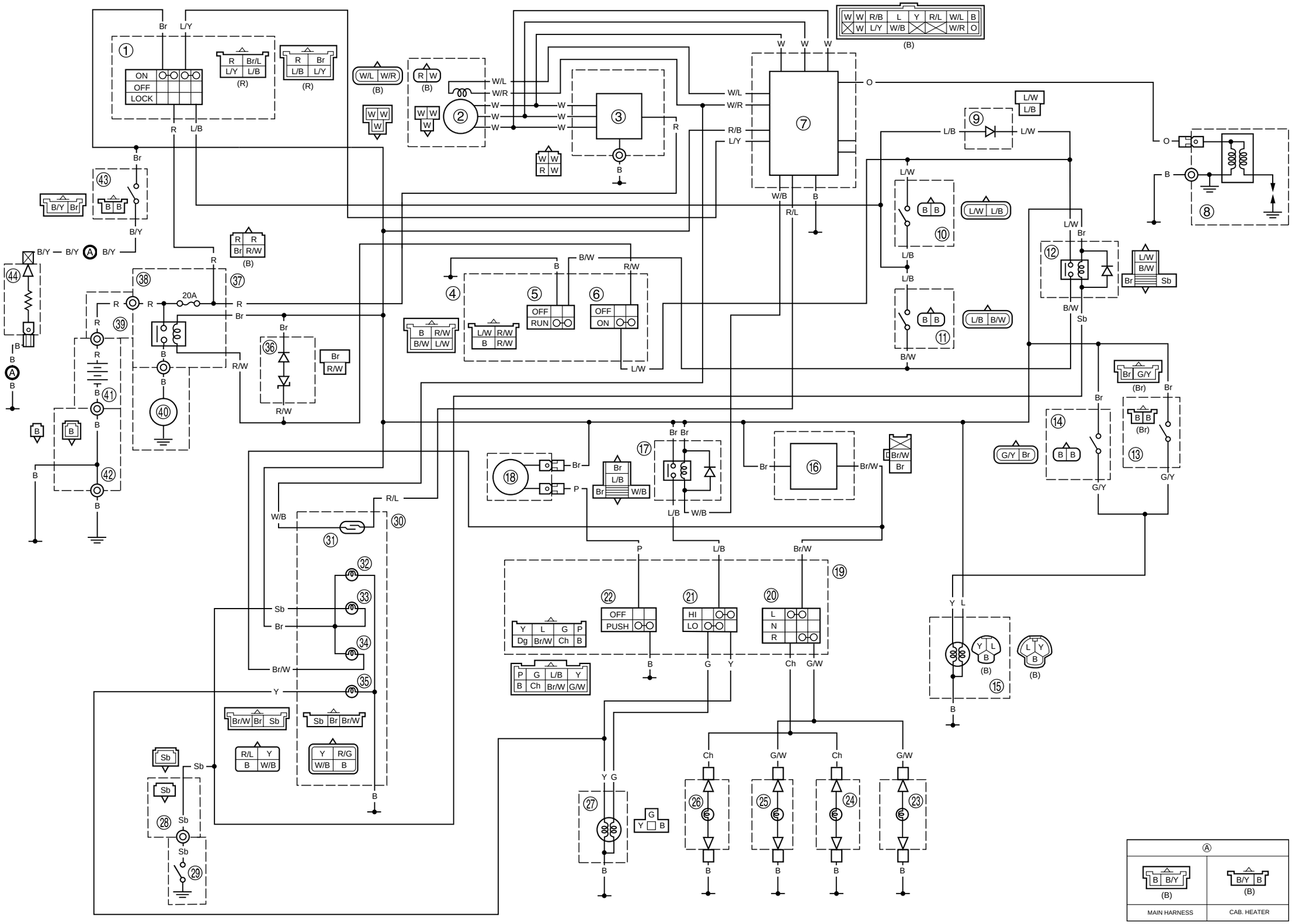
XG250 2005
WIRING DIAGRAM

XG250 2005
SCHÉMA DE CÂBLAGE

XG250 2005
SCHALTPLAN

SCHEMA ELETTRICO
XG250 2005

DIAGRAMA ELÉCTRICO DE LA
XG250 2005



XG250 2005
WIRING DIAGRAM

XG250 2005
SCHÉMA DE CÂBLAGE

XG250 2005
SCHALTPLAN

SCHEMA ELETTRICO
XG250 2005

DIAGRAMA ELÉCTRICO DE LA
XG250 2005