



GRIZZLY 300 ***2012***

Service Manual



LIT-11616-25-16

YFM30GB
SERVICE MANUAL
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IMPORTANT

This manual was produced by the Yamaha Motor Company 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, so it is assumed that anyone who uses this book to perform maintenance and repairs on Yamaha machine has a basic understanding of the mechanical ideas and the procedures of machine repair. Repairs attempted by anyone without this knowledge are likely to render the machine unsafe and unfit for use.




Yamaha Motor Company, Ltd. is continually striving to improve all 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.

TIP

Designs and specifications are subject to change without notice.

IMPORTANT INFORMATION

Particularly important information is distinguished in this manual by the following notations:

	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
	A WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	A NOTICE indicates special precautions that must be taken to avoid damage to the vehicle or other property.
TIP	A TIP provides key information to make procedures easier or clearer.

*Product and specifications are subject to change without notice.

HOW TO USE THIS MANUAL

MANUAL ORGANIZATION

This manual consists of chapters for the main categories of subjects. (See “symbols”)

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

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

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

EXPLODED DIAGRAMS

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

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

②

①

③

⑧

FRONT AND REAR WHEELS CHAS

REAR WHEELS

④

⑤

⑥

⑦

Order	Job/Part	Qty	Remarks
Removing the rear wheels			
			Remove the parts in the order listed. Place the machine on a level surface.
			⚠ Warning Securely support the machine so there is no danger of it falling over.
			The following procedure applies to both of the rear wheels.
1	Rear wheel	2	Refer to "INSTALLING THE REAR WHEELS"
2	Rubber cap	2	
3	Collar pin	2	Refer to "INSTALLING THE WHEEL HUBS"
4	Axle nut	2	
5	Shaft connector	2	

6-3

FRONT AND REAR WHEELS CHAS

CHECKING THE WHEELS

The following procedure applies to both of the front and rear wheels.

1. Check:
 - wheel
2. Measure:
 - wheel runout

Over the specified limit → Replace the wheel or check the wheel bearing play (3).

Wheel runout limit:
 Radial ②: 2.0 mm (0.08 in)
 Lateral ③: 2.0 mm (0.08 in)

3. Check:
 - wheel balance
 - Out of balance → Adjust

⚠ Warning

After replacing the tire, ride conservatively to allow the tire to be properly seated in the rim. Failure to do so may cause an accident resulting in machine damage and possible operator injury.









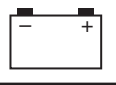
















CHECKING THE WHEEL HUBS

The following procedure applies to both of the front and rear wheel hubs.

1. Check:
 - wheel hub ①
 - Cracks/damage → Replace.
 - spline (wheel hubs) ②
 - Wear/damage → Replace the wheel hub.

① Front
② Rear

6-4

① GEN INFO 	② SPEC 	
③ CHK ADJ 	④ ENG 	
⑤ COOL 	⑥ CARB 	
⑦ DRIV 	⑧ CHAS 	
⑨ ELEC 	⑩ TRBL SHTG ? 	
⑪ 	⑫ 	
⑬ 	⑭ 	
⑮ 	⑯ 	
⑰ 	⑱ 	
⑲ 	⑳ 	㉑ 
㉒ 	㉓ 	㉔ 
㉕ 	㉖ New	

SYMBOLS

The following symbols are not relevant to every machine.

Symbols ① to ⑩ indicate the subject of each chapter.

- ① General information
- ② Specifications
- ③ Periodic checks and adjustments
- ④ Engine
- ⑤ Cooling system
- ⑥ Carburetor
- ⑦ Drive train
- ⑧ Chassis
- ⑨ Electrical
- ⑩ Troubleshooting

Symbols ⑪ to ⑱ indicate the following

- ⑪ Serviceable with engine mounted
- ⑫ Filling fluid
- ⑬ Lubricant
- ⑭ Special tool
- ⑮ Torque
- ⑯ Wear limit, clearance
- ⑰ Engine speed
- ⑱ Electrical data (Ω , V, A)











Symbols ⑲ to ㉔ in the exploded diagrams indicate the types of lubricants and lubrication points.

- ⑲ Apply engine oil
- ⑳ Apply gear oil
- ㉑ Apply molybdenum disulfide oil
- ㉒ Apply wheel bearing grease
- ㉓ Apply lithium-soap-based grease
- ㉔ Apply molybdenum disulfide grease

Symbols ㉕ to ㉖ in the exploded diagrams indicate where to apply a locking agent ㉕ and when to install a new part ㉖.

- ㉕ Apply the locking agent (LOCTITE®)
- ㉖ Replace

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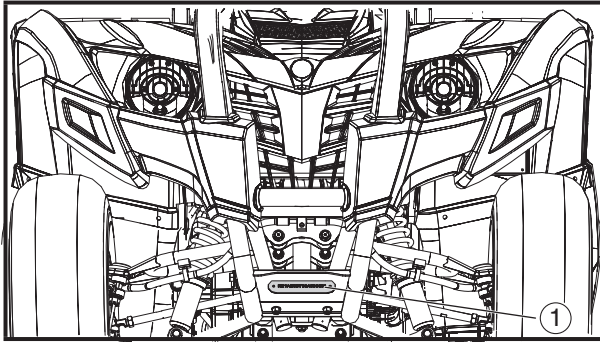
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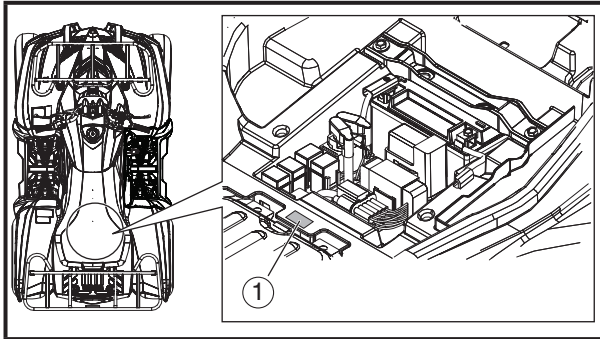


GENERAL INFORMATION

MACHINE IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER

The vehicle identification number is ① stamped into the front side of the frame.



MODEL LABEL

The model label ① is affixed to the air filter case cover. This information will be needed to order spare parts.



**IMPORTANT INFORMATION
PREPARATION FOR REMOVAL AND
DISASSEMBLY**

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

REPLACEMENT PARTS

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

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, lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.

① Oil seal

NOTICE

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



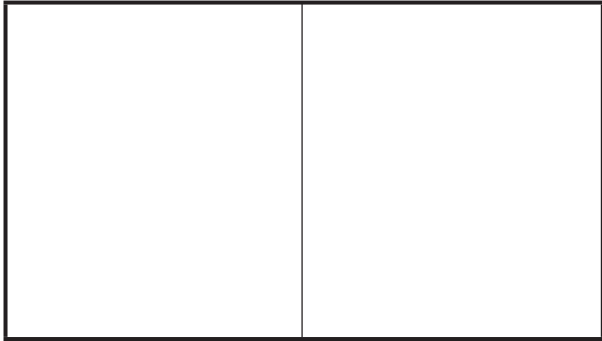
① Bearing



CIRCLIPS

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

④ Shaft



CHECKING THE CONNECTIONS

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.

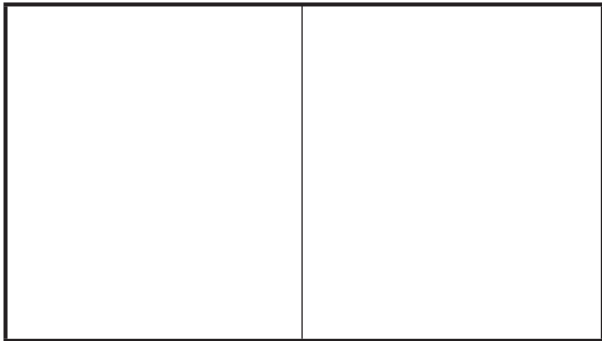
3. Check:

- all connections

Loose connection → Connect properly.

TIP

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

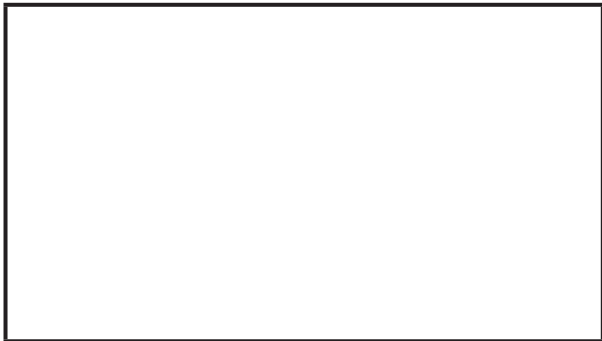


4. Connect:

- lead
- coupler
- connector

TIP

Make sure all connections are tight.



5. Check:

- continuity (with the pocket tester)



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

TIP

- 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; this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools may differ by shape and part number from country to country. In such a case, two types are provided.

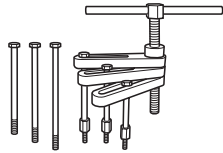
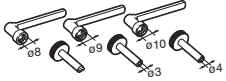
When placing an order, refer to the list provided below to avoid any mistakes.

For US and CAN

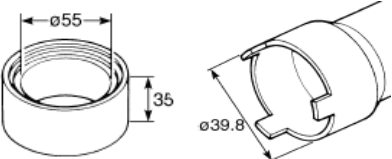
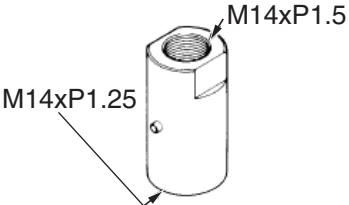
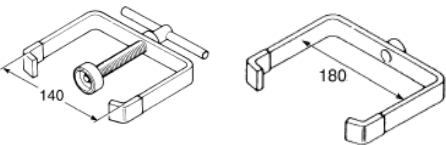
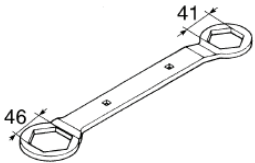
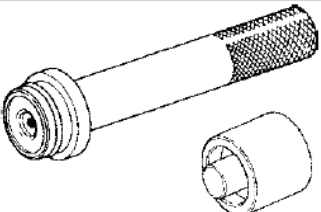
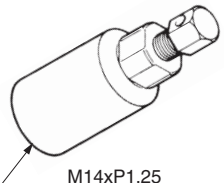
P/N. YM-, YU-, YS-, YK-, ACC-

Except for US and CAN

P/N. 90890

Tool No.	Tool name/Function	Illustration	
Bolt 90890-04158 YM-04158 Weight 90890-01084 YU-01083-3	Slide hammer bolt (M5)/weight This tool is used to remove the rocker arm shaft.		
90890-04152 YU-A9642	Crankcase separating tool Crankcase separator This tool is used to separate the crankcase.		
90890-01235 YU-01235	Rotor holding tool This tool is needed to hold the starter puller when removing/installing the starter puller bolt or camshaft sprocket bolts.		
90890-01268 YU-01268	Ring nut wrench Spanner wrench This tool is used to adjusting the front shock absorbers.		
90890-01304 YU-01304	Piston pin puller This tool is used to remove the piston pin.		
90890-01311 YM-A5970	Tappet adjusting tool (3 mm) Six piece tappet set These tools are necessary for adjusting the valve clearance.		

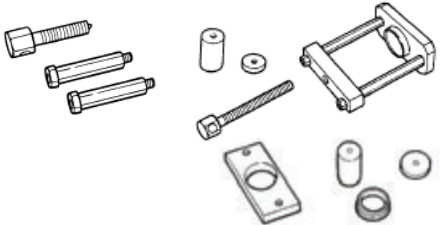



Tool No.	Tool name/Function	Illustration
Pot 90890-01274 Bolt 90890-01275	Crankshaft installer pot Crankshaft installer bolt These tools are used to install the crankshaft.	
YU-90050	Crankshaft installer set These tools are used to install the crankshaft.	
90890-01288 90890-04164 YM-04164	Spacer These tools are used to install the crankshaft.	
90890-04163 YM-04163	Adapter(M14xP1.5/M14 x P1.25) This tool is used to install the drive shaft.	
90890-01337 YM-33285 90890-01464 YM-33285-6	Clutch spring holder Universal clutch compressor holder Clutch spring holder arm Compressor holder adapter These tool are used for removing or installing the clutch.	
90890-01348 YM-01348	Locknut wrench This tool is needed when removing or installing the clutch nut.	
90890-04058 YM-04058-1 90890-04078 YM-33221	Middle driven shaft bearing driver Mechanical seal installer These tools are used to install the water pump seal.	
90890-01404 YM-01404	Flywheel puller These tools are needed to remove the rotor.	



Tool No.	Tool name/Function	Illustration	
Set 90890-03081 YU-33223 Adapter 90890-04082 YU-33223-3	Compression gauge set Adapter This tool is needed to measure the engine compression.		
90890-03113 YU-8036-B	Engine tachometer This tool is needed for observing engine rpm.		
90890-03112 YU-03112-C	Pocket tester Analog pocket tester This instrument is needed for checking the electrical system.		
90890-03141 YU-03141	Timing light Inductive clamp timing light This tool is necessary for checking ignition timing.		
Compressor 90890-04019 YM-04019	Valve spring compressor This tool is needed to remove and install the valve assemblies.		
90890-01243 YM-01253-1	Valve spring compressor attachment Valve spring compressor adapter (26 mm) This tool is needed to remove and install the valve assemblies.		
90890-04086 YM-91042	Universal clutch holder This tool is needed to hold the clutch carrier when removing or installing the carrier nut.		
90890-04064 YM-04064-A	Valve guide remover (ø6) Valve guide remover (6.0 mm) This tool is needed to remove and install the valve guides.		



Tool No.	Tool name/Function	Illustration
90890-01312 YM-01312-A	Fuel level gauge This gauge is used to measure the fuel level in the float chamber.	
90890-01325 YU-24460-01	Radiator cap tester This tool is used to check the cooling system.	
90890-01325 YU-24460-01	Adapter This tool is used to check the cooling system.	
90890-01701 YS-01880-A	Sheave holder Primary clutch holder This tool is needed to hold the AC magneto rotor when loosen or tighten the AC magneto rotor nut.	
90890-03079 YM-34483	Thickness gauge Narrow gauge set This tool is used to measure the valve clearance and spark plug gap.	
90890-01474 YM-01474 90890-01480 YM-01480 90890-01514 YM-01514	Ball joint remover Ball joint remover attachment set Ball joint remover short shaft set These tools are used for removing and installing the ball joints.	
90890-01498 YM-37134	Axle nut wrench This tool is used for removing and installing the rear axle nut.	90890-01498 



SPECIFICATIONS

GENERAL SPECIFICATIONS

Item	Standard
Model code	1SC1
Dimensions	
Overall length	1895 mm (74.6 in)
Overall width	1069 mm (42.1 in)
Overall height	1124 mm (44.3 in)
Seat height	794 mm (31.3 in)
Wheelbase	1199 mm (47.2 in)
Minimum ground clearance	137 mm (5.4 in)
Minimum turning radius	3150 mm (124 in)
Basic weight	
With oil and full fuel tank	232 kg (511 lb)
Engine	
Engine type	Liquid cooled 4-stroke, SOHC
Cylinder arrangement	Vertical single cylinder
Displacement	287 cm ³ (17.51 cu.in)
Bore x stroke	75.0 x 65.0 mm (29.5 x 2.56 in)
Compression ratio	8.6 : 1
Standard compression pressure (at sea level)	1,200 kPa (12.0 kg/cm ² , 174.0 psi)
Starting system	Electric starter
Lubrication system	Wet sump
Oil type or grade	
Engine oil	<p>YAMALUBE, SAE10W-30, SAE10W-40, SAE20W-40, SAE20W-50 or SAE5W-30</p> <p>API service SG type or higher, JASO standard MA</p>
Transfer gear oil	SAE 90 API GL-5 Hypoid gear oil
Final gear oil	SAE 80 API GL-4 Hypoid gear oil
Oil capacity	
Engine oil	
Periodic oil change	1.20 L (1.27 US qt, 1.06 Imp.qt)
Total amount	1.40 L (1.48 US qt, 1.23 Imp.qt)
Transfer gear oil	
Periodic oil change	1.20 L (1.27 US qt, 1.06 Imp.qt)
Total amount	1.30 L (1.37 US qt, 1.14 Imp.qt)



Item	Standard
Final gear oil Total amount Radiator capacity (including all routes)	0.15 L (0.16 US qt, 0.13 Imp.qt) 0.94 L (0.99 US qt, 0.83 Imp.qt)
Air filter	Wet type element
Fuel Type Fuel tank capacity Fuel reserve amount	Unleaded gasoline only 10.7 L (2.35 Imp gal, 2.83 US gal) 3.0 L (0.66 Imp gal, 0.79 US gal)
Carburetor Type/quantity Manufacturer	CVK 32 / 1 KTW
Spark plug Type/manufacturer Spark plug gap	NGK/CR8E 0.7 - 0.8 mm (0.028 - 0.031 in)
Clutch type	Dry, centrifugal automatic
Transmission Primary reduction system Secondary reduction system Transmission type Operation Reverse gear Low range High range Transfer gear	V-belt Shaft drive V-belt automatic Right hand operation 47/17 × 31/26 × 32/18 × 19/17 (6.54) 44/17 × 32/18 × 19/17 (5.14) 44/17 × 26/23 × 19/17 (3.27) 36/10
Chassis Frame type Caster angle Camber angle Kingpin angle Trail Tread (STD) front rear Toe-in (with tires touching the ground))	Steel tube frame 8.1° 2° 8.8° 39.8 mm (1.57 in) 805 mm (31.69 in) 825 mm (32.48 in) 15 mm (0.59 in)
Tire Type Size front rear Manufacturer front rear Type front rear	Tubeless AT22 x 7-10 AT22 x 10-9 MAXXIS MAXXIS M919 M920

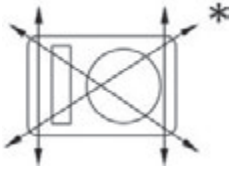
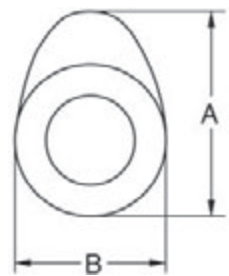
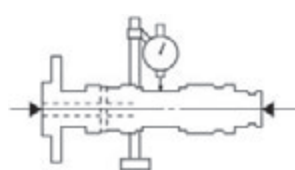


Item	Standard
<p>Tire pressure (cold tire) Maximum load* Off-road riding</p> <p style="text-align: right;">front rear</p> <p>*Load in total weight of rider and accessories</p>	<p>155.0 kg (342 lb) 27 ~ 30 kPa (0.27 ~ 0.30 kgf/cm², 4.0 ~ 4.4 psi) 22 ~ 25 kPa (0.22 ~ 0.25 kgf/cm², 3.2 ~ 3.6 psi)</p>
<p>Brake</p> <p>Front brake</p> <p style="text-align: right;">type operation</p> <p>Rear brake</p> <p style="text-align: right;">type operation</p>	<p>Dual disc brake Right hand operation Single disc brake Left hand and right foot operation</p>
<p>Suspension</p> <p>Front suspension Rear suspension</p>	<p>Double wishbone / Independent Swingarm</p>
<p>Shock absorber</p> <p>Front shock absorber Rear shock absorber</p>	<p>Coil spring/oil damper Coil spring/oil damper</p>
<p>Wheel travel</p> <p>Front wheel travel Rear wheel travel</p>	<p>151 mm (5.9 in) 141 mm (5.6 in)</p>
<p>Electrical</p> <p>Ignition system Generator system Battery type Battery capacity</p>	<p>DC-CDI AC magneto GTX12-BS 12 V 10.0 Ah</p>
<p>Headlight type</p>	<p>Halogen bulb</p>
<p>Bulb wattage x quantity:</p> <p>Headlight Tail/brake light Indicator lights</p> <p style="padding-left: 20px;">Neutral Reverse Coolant temperature</p>	<p>12 V, 35/35 W × 2 12 V, 5.0/21.0 W × 1 12 V, 1.7 W × 1 12 V, 1.7 W × 1 12 V, 1.7 W × 1</p>

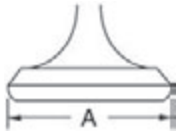
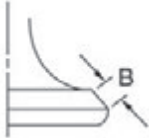


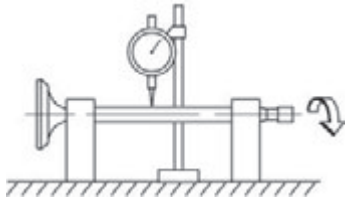


EBS01002

ENGINE SPECIFICATIONS

Item	Standard	Limit
<p>Cylinder head Volume Warp limit *</p> 	<p>20.30 ~ 21.30 cm³ (1.24 ~ 1.30 cu.in) ----</p>	<p>---- 0.05 mm (0.0020 in)</p>
<p>Cylinder Bore size</p>	<p>74.995 ~ 75.015 mm (2.9526 ~ 2.9533 in)</p>	<p>75.100 mm (2.9567 in)</p>
<p>Camshaft Drive method Camshaft lobe dimensions</p> 	<p>Chain drive (Right)</p>	
<p>Intake</p>	<p>“A” 34.780 ~ 34.980 mm (1.3693 ~ 1.3701 in) “B” 29.000 ~ 29.100 mm (1.1417 ~ 1.1457in)</p>	<p>34.680 mm (1.4484 in) 28.900 mm (1.1378 in)</p>
<p>Exhaust</p>	<p>“A” 34.640 ~ 34.840 mm (1.3638 ~ 1.3655 in) “B” 29.000 ~ 29.100 mm (1.1417 ~ 1.1457in)</p>	<p>34.540 mm (1.3598 in) 28.900 mm (1.1484 in)</p>
<p>Camshaft runout limit</p> 	<p>----</p>	<p>0.03 mm (0.0012 in)</p>
<p>Timing chain Timing chain type Timing chain adjustment method</p>	<p>92RH2010-100M Automatic</p>	<p>---- ----</p>
<p>Rocker arm/rocker arm shaft Rocker arm inside diameter Rocker arm shaft outside diameter Rocker-arm-to-rocker-arm-shaft clearance</p>	<p>11.982 ~ 12.000 mm (0.4717 ~ 0.4724 in) 11.966 ~ 11.984 mm (0.4711 ~ 0.4718 in) -0.002 ~ 0.034 mm (0.00008 ~ 0.0013 in)</p>	<p>12.018 mm (0.4731 in) 11.925 mm (0.4695 in) ----</p>



Item	Standard	Limit
Valve, valve seat, valve guide		
Valve clearance (cold) IN	0.08 ~ 0.12 mm (0.0031 ~ 0.0047 in)	----
EX	0.13 ~ 0.17 mm (0.0051 ~ 0.0067 in)	----
Valve dimensions		
		
Head Diameter	Face Width	Seat Width
		
		Margin Thickness
"A" head diameter IN	25.40 ~ 25.60 mm (1.0000 ~ 1.0079 in)	----
EX	21.90 ~ 22.10 mm (0.8622 ~ 0.8701 in)	----
"B" face width IN	1.20 mm (0.0472 in)	----
EX	1.20 mm (0.0472 in)	----
"C" seat width IN	0.50 ~ 0.90 mm (0.0197 ~ 0.0354 in)	1.2 mm (0.05 in)
EX	0.50 ~ 0.90 mm (0.0197 ~ 0.0354 in)	1.2 mm (0.05 in)
"D" margin thickness IN	0.50 ~ 0.90 mm (0.0197 ~ 0.0354 in)	----
EX	0.80 ~ 1.20 mm (0.0315 ~ 0.0472 in)	----
Stem outside diameter IN	4.975 ~ 4.990 mm (0.1959 ~ 0.1965 in)	4.900 mm (0.193 in)
EX	4.950 ~ 4.975 mm (0.1949 ~ 0.1959 in)	4.900 mm (0.193 in)
Guide inside diameter IN	5.000 ~ 5.012 mm (0.1969 ~ 0.1973 in)	5.030 mm (0.198 in)
EX	5.000 ~ 5.012 mm (0.1969 ~ 0.1973 in)	5.030 mm (0.198 in)
Stem-to-guide clearance IN	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.080 mm (0.003 in)
EX	0.025 ~ 0.062 mm (0.0010 ~ 0.0024 in)	0.100 mm (0.004 in)
Valve stem runout	----	0.01 mm (0.0004 in)
Valve seat width IN	3.30 ~ 3.50 mm (0.1299 ~ 0.1378 in)	4.0 mm (0.16 in)
EX	3.30 ~ 3.50 mm (0.1299 ~ 0.1378 in)	4.0 mm (0.16 in)
		




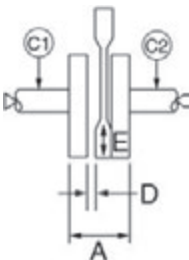
ENGINE SPECIFICATIONS

SPEC



Item	Standard	Limit
Valve spring		
Inner spring		
Free length	IN 38.70 mm (1.52 in)	35.20 mm (1.38 in)
	EX 38.70 mm (1.52 in)	35.20 mm (1.38 in)
Installed length (valve closed)	IN 31.80 mm (1.25 in)	----
	EX 31.80 mm (1.25 in)	----
Spring rate K1	IN 7.15 N/mm (0.73 kg/mm, 40.84 lb/in)	----
K2	IN 9.54 N/mm (0.97 kg/mm, 54.38 lb/in)	----
K1	EX 7.15 N/mm (0.73 kg/mm, 40.84 lb/in)	----
K2	EX 9.54 N/mm (0.97 kg/mm, 54.38 lb/in)	----
Compressed spring force (installed)	IN 41.49 ~ 57.19 N (4.23~ 5.83 kg, 9.32 ~ 12.85 lb)	----
	EX 41.49 ~ 57.19 N (4.23~ 5.83 kg, 9.32 ~ 12.85 lb)	----
Tilt limit *	IN ----	2.5°/1.60 mm (2.5°/0.063 in)
	EX ----	2.5°/1.60 mm (2.5°/0.063 in)
Direction of winding (top view)	IN Counter clockwise	----
	EX Counter clockwise	----
Outer spring		
Free length	IN 40.40 mm (1.59 in)	36.90 mm (1.45 in)
	EX 40.40 mm (1.59 in)	36.90 mm (1.45 in)
Installed length (valve closed)	IN 32.00 mm (1.26 in)	----
	EX 32.00 mm (1.26 in)	----
Spring rate K1	IN 15.79 N/mm (1.61 kg/mm, 90.07 lb/in)	----
Spring rate K2	IN 20.30 N/mm (2.07 kg/mm, 115.81 lb/in)	----
Spring rate K1	EX 15.79 N/mm (1.61 kg/mm, 90.07 lb/in)	----
Spring rate K2	EX 20.30 N/mm (2.07 kg/mm, 115.81 lb/in)	----
Compressed spring force (installed)	IN 73.97 ~ 103.40 N (7.54 ~ 10.54 kg, 16.63 ~ 23.243 lb)	----
	EX 73.97 ~ 103.40 N (7.54 ~ 10.54 kg, 16.63 ~ 23.243 lb)	----



Item	Standard	Limit
Piston rings		
Top ring		
		
Type	Barrel	----
Dimensions (B × T)	1.00 × 2.61 mm (0.039 × 0.103 in)	----
End gap (installed)	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)	0.50 mm (0.020 in)
Side clearance	0.015 ~ 0.050 mm (0.0005 ~ 0.0019 in)	0.09 mm (0.0035 in)
2nd ring		
		
Type	Taper	----
Dimensions (B × T)	1.00 × 2.80 mm (0.039 × 0.110 in)	----
End gap (installed)	0.30 ~ 0.45 mm (0.012 ~ 0.018 in)	0.65 mm (0.026 in)
Side clearance	0.015 ~ 0.050 mm (0.0005 ~ 0.0019 in)	0.09 mm (0.0035 in)
Oil ring		
		
Dimensions (B × T)	2.00 × 2.50 mm (0.079 × 0.098 in)	----
End gap (installed)	0.20 ~ 0.70 mm (0.008 ~ 0.028 in)	----
Crankshaft		
		
Crank width "A"	56.00 ~ 56.05 mm (2.205 ~ 2.207 in)	----
Runout limit C1	----	0.03 mm (0.0012 in)
C2	----	0.03 mm (0.0012 in)
Big end side clearance "D"	0.100 ~ 0.400 mm (0.0039 ~ 0.0157 in)	0.60 mm (0.0236 in)
Big end radial clearance "E"	0.005 ~ 0.008 mm (0.0002 ~ 0.0003 in)	----

ENGINE SPECIFICATIONS

SPEC



Item	Standard	Limit
Balancer Balancer drive method	Gear	----
Transmission Main axle runout limit	----	0.06 mm (0.0024 in)
Drive axle runout limit	----	0.06 mm (0.0024 in)
Main axle assembly width	102.2 ~ 102.4 mm (4.02 ~ 4.03 in)	----
Shifter Shifter type	Shift drum and guide bar	----
Max. shift fork guide bar bending	----	0.05 mm (0.002 in)
Air filter oil grade	Foam air filter oil or equivalent oil	----

ENGINE SPECIFICATIONS

SPEC



Item	Standard	Limit
Carburetor		
I. D. mark	1SC1 00	----
Main jet (M.J)	#138	----
Main air jet (M.A.J)	#70	----
Jet needle (J.N)	NPPC	----
Needle jet (N.J)	ø3.8	----
Pilot air jet 1 (P.A.J.1)	#100	----
Pilot outlet (P.O)	ø0.8x3	----
Pilot jet (P.J)	#35	----
Bypass 1 (B.P.1)	ø4.8	----
Valve seat size (V.S)	ø2.4	----
Starter jet 1 (G.S.1)	#95	----
Float height (F.H)	17.0 mm (0.67 in)	----
Oil filter type	Wire mesh	----
Oil pump		
Oil pump type	Trochoid	----
Inner-rotor-to-outer-rotor-tip clearance	0.15 mm (0.0059 in)	0.20 mm (0.0078 in)
Outer-rotor-to-oil-pump-housing clearance	0.150 ~ 0.200 mm (0.0059 ~ 0.0078 in)	0.25 mm (0.0098 in)



CHASSIS SPECIFICATIONS

Item	Standard	Limit
Front suspension		
Shock absorber travel	75.0 mm (2.95 in)	----
Fork spring free length	281.0 mm (11.06 in)	----
Spring rate (K ₁)	1.8 kg/mm	----
(K ₂)	3.0 kg/mm	----
Optional spring	No	----
Rear suspension		
Shock absorber travel	100.0mm (3.94 in)	----
Spring free length	295.0 mm (11.61 in)	----
Spring rate (K ₁)	2.85 kg/mm	----
Optional spring	No	----
Front wheel		
Type	Panel wheel	----
Rim size	10 x 5.5AT	----
Rim material	Steel	----
Rim runout limit radial	----	2.0 mm (0.08 in)
lateral	----	2.0 mm (0.08 in)
Rear wheel		
Type	Panel wheel	----
Rim size	9 x 8AT	----
Rim material	Steel	----
Rim runout limit radial	----	2.0 mm (0.08 in)
lateral	----	2.0 mm (0.08 in)
Front disc brake		
Type	Dual disc brake	----
Disc outside diameter x thickness	175.0 mm x 3.5 mm (6.89 in x 0.14 in)	3.00 mm (0.12 in)
Brake disk maximum deflection		0.15 mm (0.006 in)
Pad thickness inner	4.7 mm (0.19 in)	1.0 mm (0.04 in)
Pad thickness outer	4.7 mm (0.19 in)	1.0 mm (0.04 in)
Master cylinder inside diameter	12.70 mm (0.50 in)	----
Caliper cylinder inside diameter	30.23 mm (1.19 in)	----
Brake fluid type	DOT 4	----

CHASSIS SPECIFICATIONS

SPEC



Item	Standard	Limit
Rear disc brake		
Type	Single cylinder	----
Disc outside diameter × thickness	220.0 mm × 4.0 mm (8.66 in × 0.16 in)	3.00 mm (0.12 in)
Brake disk maximum deflection		0.15 mm (0.006 in)
Pad thickness inner	4.8 mm (0.19 in)	1.00 mm (0.04 in)
Pad thickness outer	4.8 mm (0.19 in)	1.00 mm (0.08 in)
Master cylinder inside diameter	12.70 mm (0.50 in)	----
Caliper cylinder inside diameter	30.23 mm (1.19 in)	----
Brake fluid type	DOT 4	----
Brake lever pedal		
Brake lever free play	front	0 mm (0 in)
	rear	4.0 ~ 7.0 mm (0.16 ~ 0.28 in)
Brake pedal position		47 ~ 57 mm (1.85 ~ 2.24 in)
Parking brake cable end length		48 ~ 52 mm (1.89 ~ 2.05 in)
Throttle lever free play		5.0 ~ 10.0 mm (0.20 ~ 0.39 in)
Speed limiter length		Less than 12 mm (0.47 in)



EBS01004

ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
Voltage	12 V	----
Ignition system		
Ignition timing (B.T.D.C.)	10.0°/1,700 r/min	----
Advanced timing (B.T.D.C.)	27°/4,000 r/min	----
Advancer type	Electrical (digital)	----
C.D.I.		
Magneto model/manufacturer	31120-RFS-0000/SHIHLIN	----
Pickup coil resistance/color	96 ~ 144 Ω at 20 °C (68 °F)/ Blue – Green	----
C.D.I. unit model/manufacturer	C0410-MAA0-0000/SHIHLIN	----
Ignition coil		
Model/manufacturer	C0510-MAA0-0000/SHIHLIN	----
Minimum spark gap	6 mm (0.24 in)	----
Primary winding resistance	0.19 ~ 0.23 Ω at 20 °C (68 °F)	----
Secondary winding resistance	2.79 ~ 3.41 k Ω at 20 °C (68 °F)	----
Spark plug cap		
Type	Resin	----
Resistance	5 k Ω	----
Charging system		
Type	A.C. magneto	----
Model/manufacturer	31120-RFS-0000/SHIHLIN	----
Nominal output	14 V 375 W at 5,000 r/min	----
Charging coil resistance/color	0.19~ 0.29 Ω at 20 °C (68 °F)/ Yellow – Yellow	----
Rectifier/regulator		
Regulator type	Shunt type	----
No-load regulated voltage (DC)	14.1 ~ 14.9 V	----
Model/manufacturer	C1600-MAA0-0001/E-YANG	----
Capacity (DC)	20 A	----



Item	Standard	Limit
Electric starter system		
Type	Constant mesh	----
Starter motor		
Model/manufacture	31200-RFS-0000/SHIHLIN	----
Output	0.60 kW	----
Armature coil resistance	0.018 ~ 0.028 Ω at 20 °C (68 °F)	----
Brush overall length	12.7 mm (0.50 in)	8.2 mm (0.32 in)
Spring force	7.2 ~ 8.5 N (734 ~ 866 gf, 25.89~30.56 oz)	----
Commutator diameter	28 mm (1.10 in)	27 mm (1.06 in)
Mica undercut	0.75 mm (0.03 in)	----
Starter relay		
Model/manufacture	C585A-MAA0-0000/E-YANG	----
Model/manufacture	150 A	----
Coil winding resistance	3.2 ~ 4.8 Ω at 20 °C (68 °F)	----
Headlight relay		
Headlight relay		
Model/manufacture	C8500-MAA0-0000/KOSO	
Coil resistance	80.0 Ω ~ 100.0 Ω	
Circuit breakers		
Type	Fuse	----
Amperage for individual circuit		
Main fuse	30A \times 1	----
Ignition fuse	10A \times 1	
Signal fuse	10A \times 1	
Head fuse	10A \times 1	
Fan motor fuse	10A \times 1	



EBS01005

TIGHTENING TORQUES
ENGINE TIGHTENING TORQUES

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m•kg	ft•lb	
Reed valve comp.	Bolt	M6	2	12	1.2	8.7	
Air pipe	Bolt	M6	2	12	1.2	8.7	
Cylinder head cover	Bolt	M6	4	12	1.2	8.7	
Cylinder head	Nut	M10	4	38	3.8	27.4	
Cylinder head side cover	Bolt	M6	3	12	1.2	8.7	
Camshaft sprocket washer	Bolt	M6	2	12	1.2	8.7	
Spark plug	—	M10	1	12	1.2	8.9	
Therm unit	—	M10	1	11	1.1	8.0	
Timing chain tensioner	Bolt	M6	2	12	1.2	8.7	
Cylinder head (timing chain side)	Bolt	M6	2	12	1.2	8.7	
Carburetor joint	Bolt	M6	2	12	1.2	8.7	
Cylinder head (Carb. joint)	Stud bolt	M6	2	12	1.2	8.7	
Cylinder head (exhaust pipe)	Stud bolt	M8	2	27	2.7	19.5	
Clearance adjusting locknut	Nut	M5	4	9	0.9	6.5	
Rocker arm shaft plate	Bolt	M6	1	12	1.2	8.7	
Cylinder stud bolt 1	Stud bolt	M10	2	12	1.2	8.7	
Cylinder stud bolt 2	Stud bolt	M10	2	12	1.2	8.7	
Water pump cover	Bolt	M6	4	12	1.2	8.7	
Water pump impeller	Bolt	M7	1	12	1.2	8.7	
Engine oil drain bolt	Bolt	M30	1	15	1.5	10.8	
Crankcase cover(R)	Bolt	M6	10	12	1.2	8.7	
Stator assy	Bolt	M6	3	12	1.2	8.7	
C.D.I. magneto rotor	Nut	M14	1	55	5.5	40.0	
Pulse	Bolt	M5	2	5	0.5	3.6	
One-way clutch	Bolt	M6	3	12	1.2	8.7	
Crankcase cover(L)	Bolt	M6	9	12	1.2	8.7	
Sheave primary fixed	Bolt	M14	1	55	5.5	40.0	
Clutch housing	Bolt	M14	1	55	5.5	40.0	
Sheave secondary fixed	Nut	M36	1	95	9.5	68.7	
Mission case	Bolt	M8	9	28	2.8	20.3	
Transmission oil drain bolt	Bolt	M12	1	40	4.0	30.0	
Mission box rear cover	Bolt	M6	4	12	1.2	8.7	
Mission box	Bolt	M8	6	28	2.8	20.3	
Mission shaft drum fixing	Bolt	M14	1	40	4.0	30.0	
Mission box front cover	Bolt	M6	4	9	0.9	6.5	
Mission box oil drain bolt	Bolt	M8	1	14	1.4	10.7	

TIGHTENING TORQUES

SPEC




Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m•kg	ft•lb	
Starter motor	Bolt	M6	1	12	1.2	8.7	
Oil pump	Bolt	M3	2	1.5	0.2	1.1	
Crankcase L and R	Bolt	M6	2	12	1.2	8.7	
Crankcase L	Bolt	M6	7	10	1.0	7.2	
Change switch	Bolt	M6	2	12	1.2	8.7	
Air clean case	Bolt	M6	4	8	0.8	5.8	
Muffler	Bolt	M8	2	25	2.5	18.1	
Exhaust pipe	Nut	M8	2	25	2.5	18.1	

TIP

*1: Apply oil to the bearing surface of (upper) cylinder head bolt.
Further, apply molybdenum disulfide grease to thread part.



CHASSIS TIGHTENING TORQUES

Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m•kg	ft•lb	
Engine bracket (front) and frame	M10	60	6.0	43.4	
Engine bracket (front) and engine	M12	60	6.0	43.4	
Engine and frame	M12	60	6.0	43.4	
Select lever assembly and frame	M8	25	2.5	18.1	
Shift tie-rod and select lever assembly	M8	25	2.5	18.1	
Shift tie-rod and engine	M8	25	2.5	18.1	
Swingarm pivot shaft and frame	M22	75	7.5	54.2	
Rear shock absorber and frame	M10	38	3.8	27.5	
Rear shock absorber and swingarm	M10	38	3.8	27.5	
Final gear case and swingarm	M10	35	3.5	25.3	
Final gear case and rear axle housing	M10	35	3.5	25.3	
Front arm and frame	M10	35	3.5	25.3	
Front shock absorber and frame	M10	35	3.5	25.3	
Front shock absorber and lower front arm	M10	35	3.5	25.3	
Steering stem and frame	M14	55	5.5	39.8	
Steering stem bushing and frame	M8	25	2.5	18.1	Use a lock washer.
Steering stem and handlebar holder	M8	25	2.5	18.1	
Steering stem and tie-rod ball joint	M10	35	3.5	25.3	
Steering knuckle and tie-rod ball joint	M10	35	3.5	25.3	
Tie-rod locknut	M10	35	3.5	25.3	
Steering knuckle and front arm (upper and lower)	M12	45	4.5	32.5	
Steering knuckle and brake caliper	M8	28	2.8	20.3	
Front wheel and wheel hub	M10	45	4.5	32.5	
Front brake disc and wheel hub	M10	35	3.5	25.3	
Steering knuckle and wheel hub	M14	80	8.0	57.9	
Rear axle and rear axle nut	M33	170	17.0	123.0	
Rear brake disc and disc bracket	M10	35	3.5	25.3	
Rear brake caliper and brake caliper bracket	M8	28	2.8	20.3	
Parking brake case and caliper	M8	25	2.5	18.1	
Parking brake adjusting bolt and locknut	M8	16	1.6	11.6	
Rear axle and wheel hub	M14	135	13.5	97.6	
Rear wheel and wheel hub	M10	55	5.5	40.0	
Throttle lever and housing	M5	8	0.8	5.8	
Master cylinder and parking brake lever	M6	13	1.3	9.4	
Rear brake lever and handle bar	M6	13	1.3	9.4	

TIGHTENING TORQUES

SPEC



Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m•kg	ft•lb	
brake hose union bolt	M10	28	2.8	20.3	
Bleed screw	M6	7	0.7	5.1	
Rear brake master cylinder and brake pedal bracket	M8	25	2.5	18.1	
Brake pedal bracket and frame	M8	25	2.5	18.1	
Brake master cylinder cup and frame	M6	8	0.8	5.8	
Fuel tank and fuel cock	M16	16	1.6	11.6	
Fuel tank and frame	M6	13	1.3	9.4	
Seat stay and frame	M6	13	1.3	9.4	
Front fender holder and frame	M8	25	2.5	18.1	
Front fender and frame	M6	8	0.8	5.8	
Rear fender and frame	M6	8	0.8	5.8	
Footrest bracket and frame	M8	25	2.5	18.1	
Footrest board and footrest bracket	M6	8	0.8	5.8	
Front bumper and frame	M8	25	2.5	18.1	
Front carrier and frame	M8	25	2.5	18.1	
Front carrier and front bumper	M8	25	2.5	18.1	
Rear carrier and frame	M8	25	2.5	18.1	
Battery holding bracket	M6	8	0.8	5.8	
Air duct (front) and frame	M6	8	0.8	5.8	
Air duct (rear) and frame	M6	8	0.8	5.8	

HOW TO USE THE CONVERSION TABLE/ GENERAL TIGHTENING TORQUE SPECIFICATIONS

SPEC



EBS00022

HOW TO USE THE CONVERSION TABLE

All specification data in this manual are listed in SI and METRIC UNITS.

Use this table to convert METRIC unit data to IMPERIAL unit data.

Ex.

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

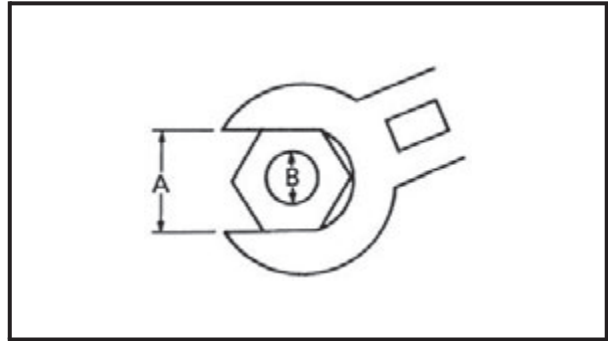
CONVERSION TABLE

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

EBS00023

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



EBS00024

LUBRICATION POINTS AND LUBRICANT TYPES

ENGINE

Lubrication point	Lubricant
Oil seal lips	
O-rings	
Bearings	
Cylinder head bolts (bearing surface of bolts)	
Cylinder head bolts (thread part)	
Cylinder body surface	
Crankshaft journals	
Connecting rod small end and big end	
Piston pin	
Piston surface	
Boss periphery	
Valve stems (intake and exhaust)	
Valve stem ends (intake and exhaust)	
Rocker arm shafts (intake and exhaust)	
Camshaft	
Valve rocker arms	
Oil pump rotors (inner and outer) and oil pump housing and shaft	
Starter idle gears 1	
Starter idle gears 2	
Starter wheel gear	
Push rods	
Clutch housing (primary driven gear)	
Push lever shaft	
Push rod ball	
Drive axle	
Main axle	
Transmission gears (inside and end)	
Shift fork guide bar	
Shift drum	
Shift shaft	

LUBRICATION POINTS AND LUBRICANT TYPES

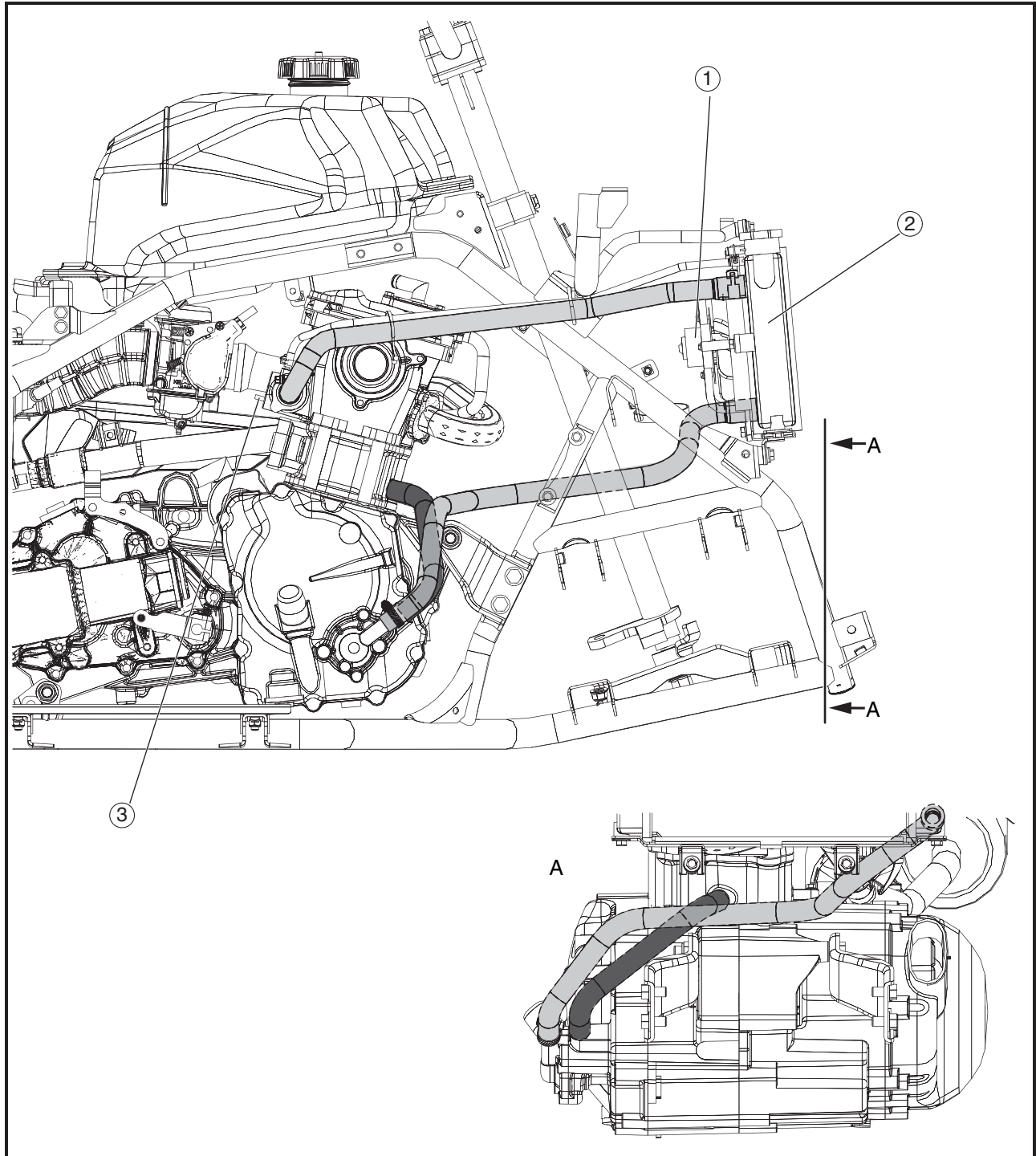
SPEC



Lubrication point	Lubricant
Crankcase mating surfaces	Sealant (Three Bond No.1215 [®]) Yamaha bond No.1215
AC magneto lead grommet (AC magneto cover)	Sealant (Three Bond No.1215 [®]) Yamaha bond No.1215

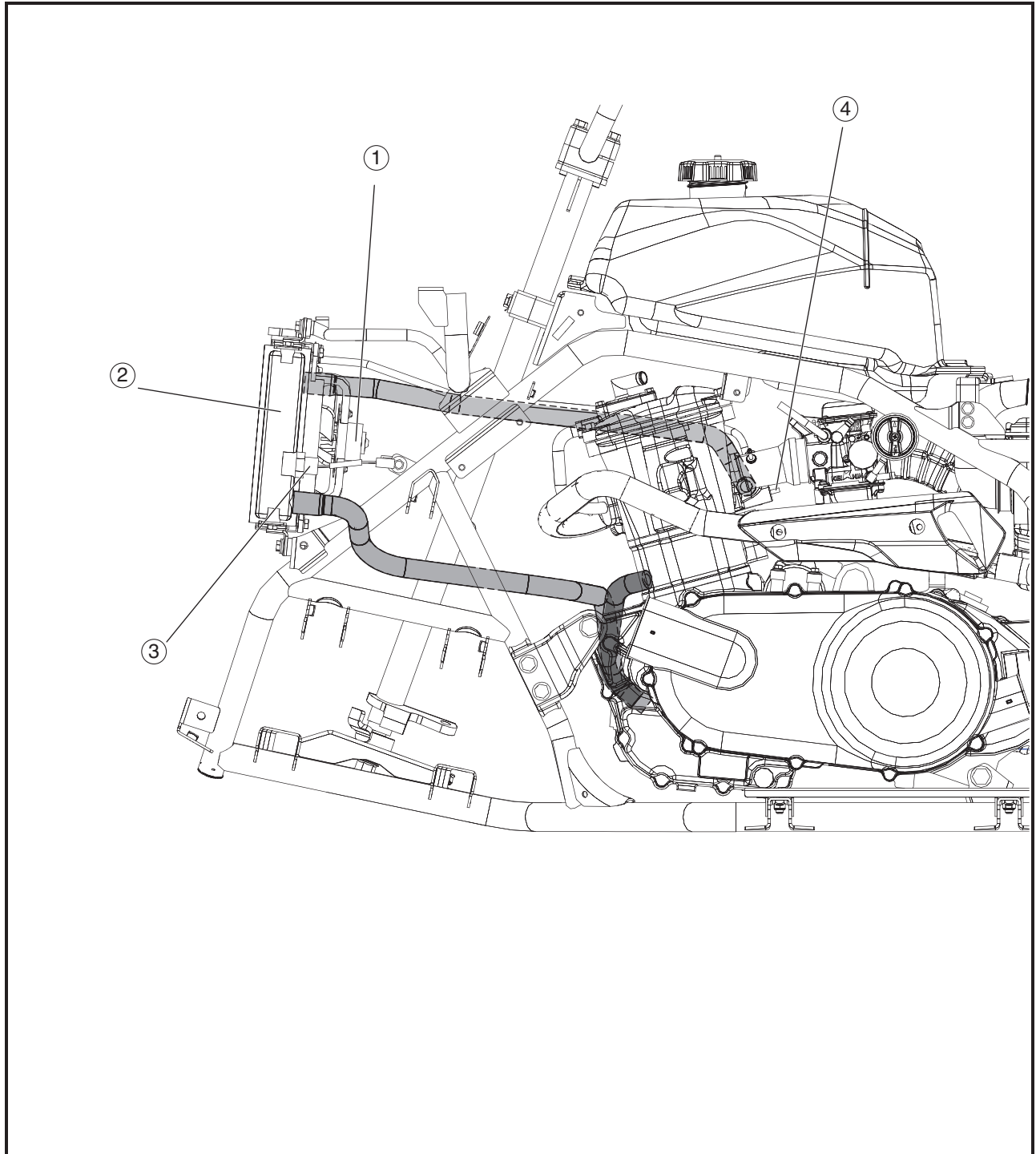
COOLANT FLOW DIAGRAMS

- ① Fan motor
- ② Radiator
- ③ Thermostat





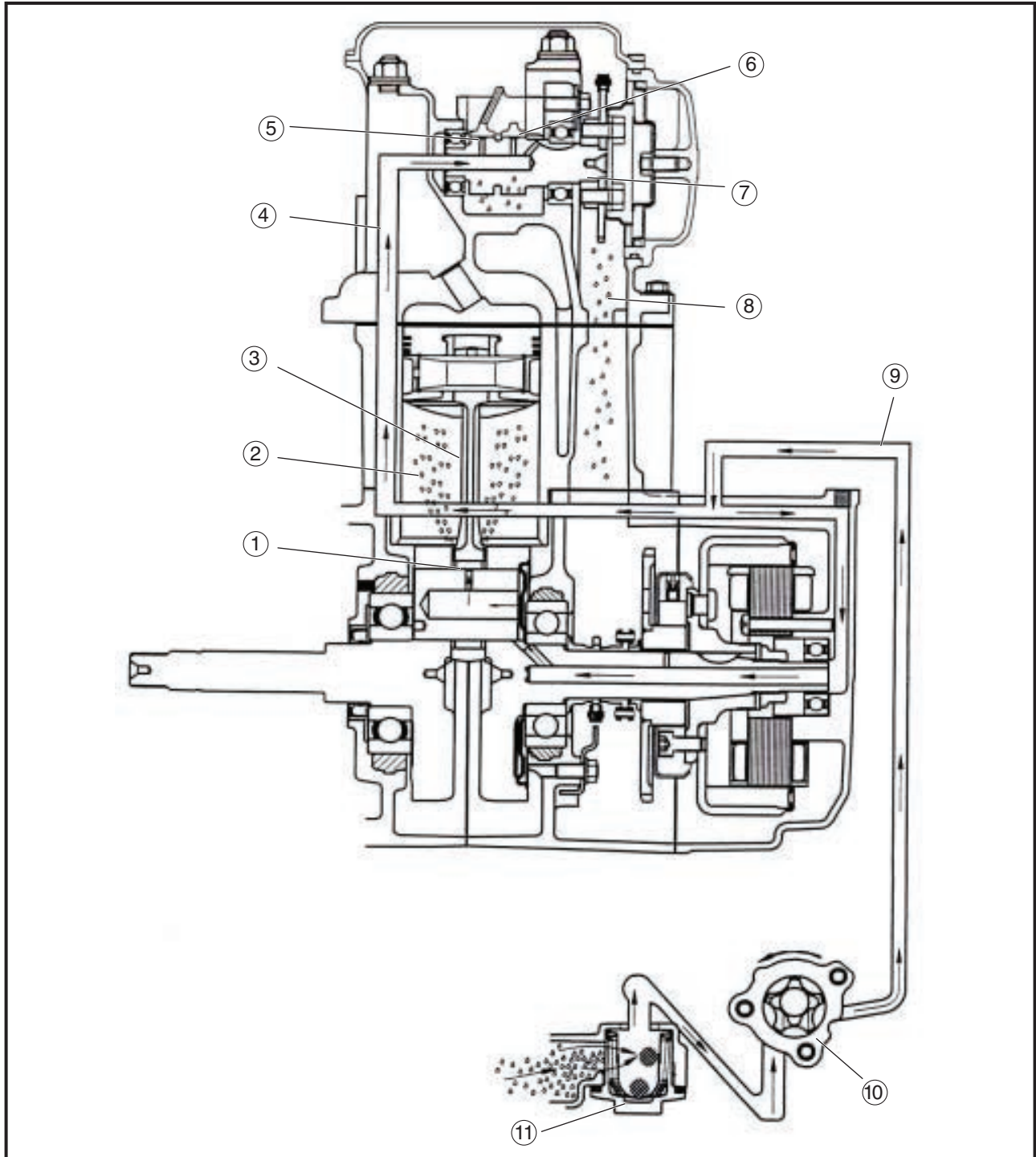
- ① Fan motor
- ② Radiator
- ③ Thermo switch
- ④ Thermostat





OIL FLOW DIAGRAMS

- ① Press-In Lubrication
- ② Spray Lubrication
- ③ Con-Rod
- ④ Oil Route
- ⑤ Press-In Lubrication
- ⑥ Valve Rocker Arm
- ⑦ Cam Shaft
- ⑧ Spray Lubrication
- ⑨ Oil Route
- ⑩ Oil Pump
- ⑪ Oil Strainer

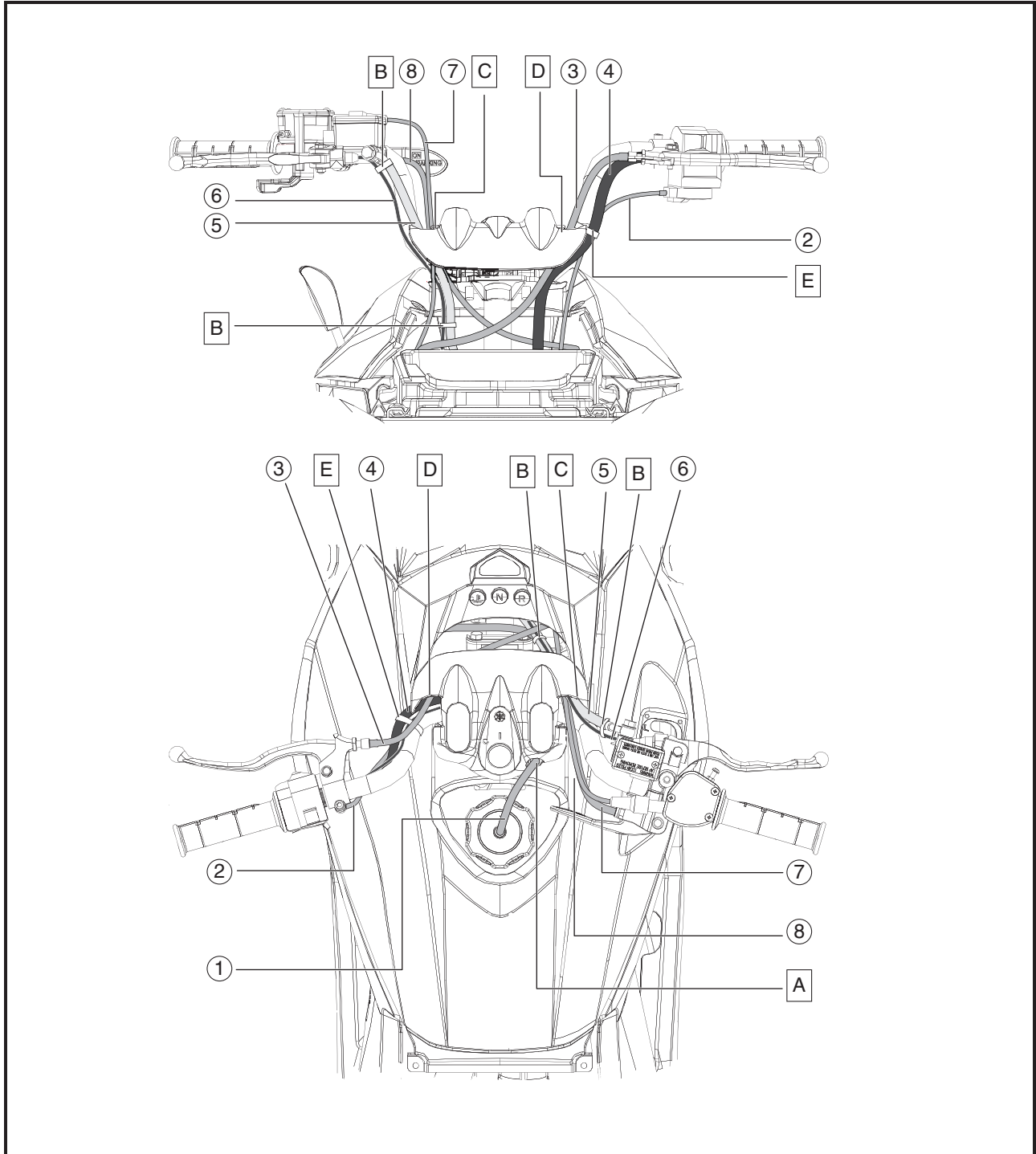




CABLE ROUTING

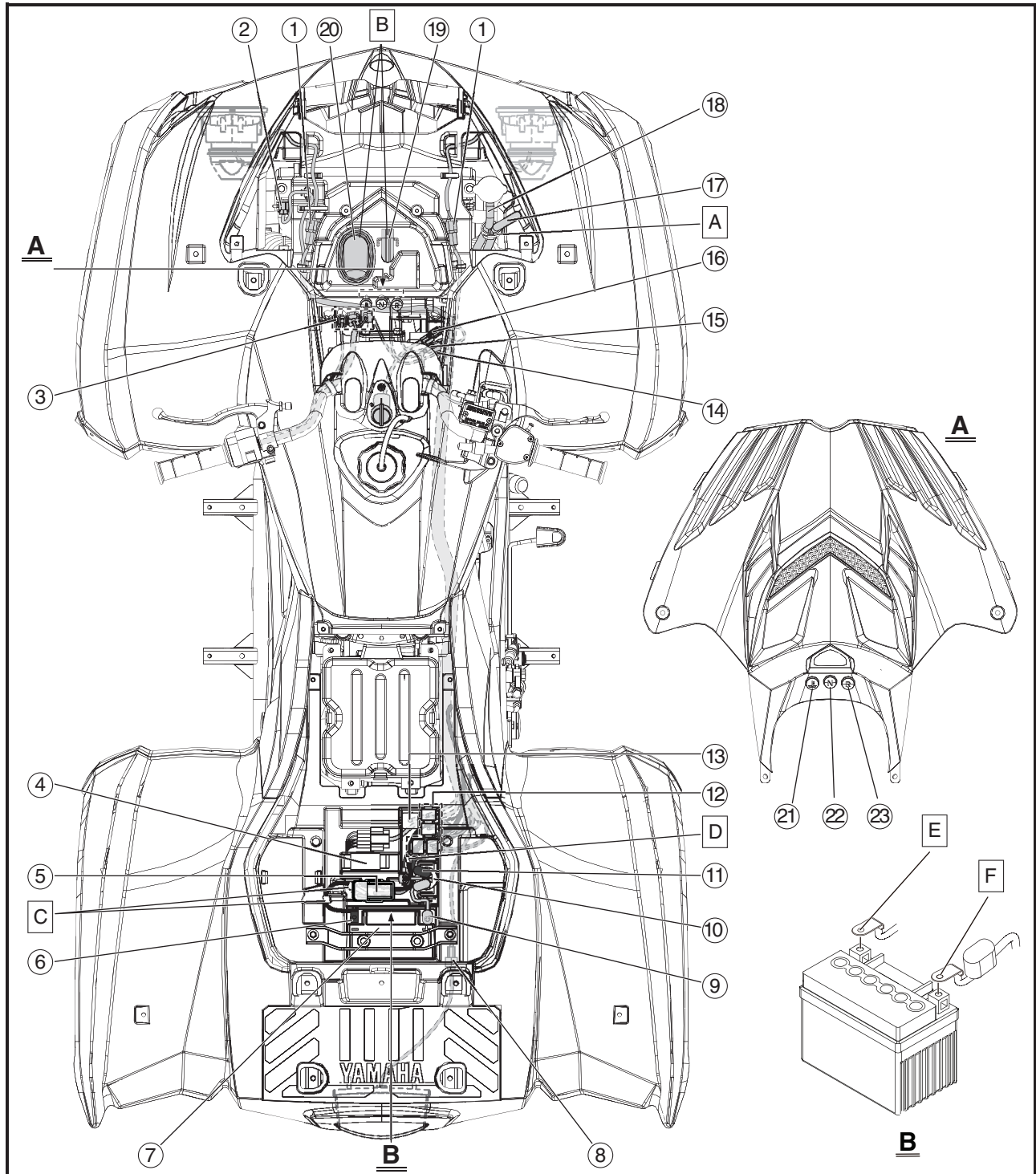
- ① Fuel tank breather hose
- ② Choke cable
- ③ Rear brake cable
- ④ Handlebar switch lead
- ⑤ Front brake hose
- ⑥ Front brake switch lead
- ⑦ Parking brake cable
- ⑧ Throttle cable

- A Insert the fuel tank breather hose into the hole in the handlebar cover.
- B Fasten the front brake switch lead and front brake hose with plastic bands.
- C Route the front brake hose, parking brake cable and throttle cable through the guide of the handlebar protector.
- D Route the rear brake cable through the guide of the handlebar protector.
- E Fasten the handlebar switch lead and choke cable with a plastic band.



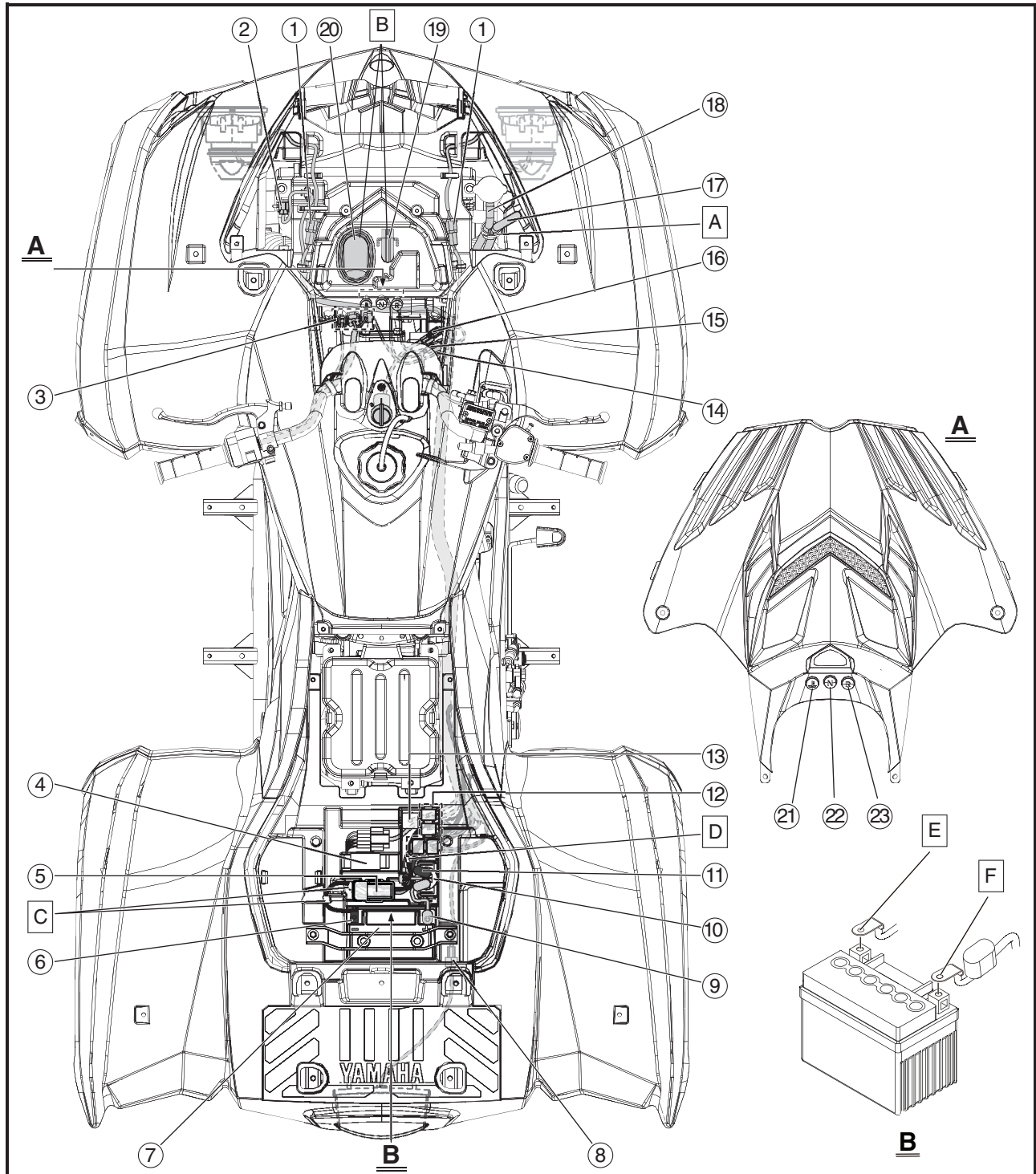


- | | | |
|-----------------------------|--------------------------------|-------------------------------------|
| ① Headlight couplers | ⑨ Positive battery lead | ⑰ Coolant reservoir breather hose |
| ② Thermo switch coupler | ⑩ Start relay | ⑱ Reserve rubber tube |
| ③ Handlebar switch couplers | ⑪ Starter motor lead | ⑲ A.I.C.V. inlet tube |
| ④ Shift controller | ⑫ Fuse boxes | ⑳ C.V.T. inlet tube |
| ⑤ CDI unit | ⑬ Head relay | ㉑ Coolant temperature warning light |
| ⑥ Negative battery lead | ⑭ Indicator light terminals | ㉒ Neutral indicator light |
| ⑦ Battery | ⑮ Front brake switch terminals | ㉓ Reverse indicator light |
| ⑧ Taillight lead coupler | ⑯ Main switch coupler | |





- A** Fasten the coolant reservoir breather hose and reserve rubber tube with a plastic band, then route the coolant reservoir breather hose through the front fender.
- B** Route the A.I.C.V. inlet tube and C.V.T. inlet tube through the hole in the front fender.
- C** Fasten the negative battery lead with plastic bands.
- D** Fasten the start relay lead and shift controller lead on the wire harness and the negative battery lead with plastic bands.
- E** Connect the negative battery lead to the battery so that the lead is routed to the side of the battery.
- F** Connect the positive battery lead to the battery so that the lead contacts the battery case.

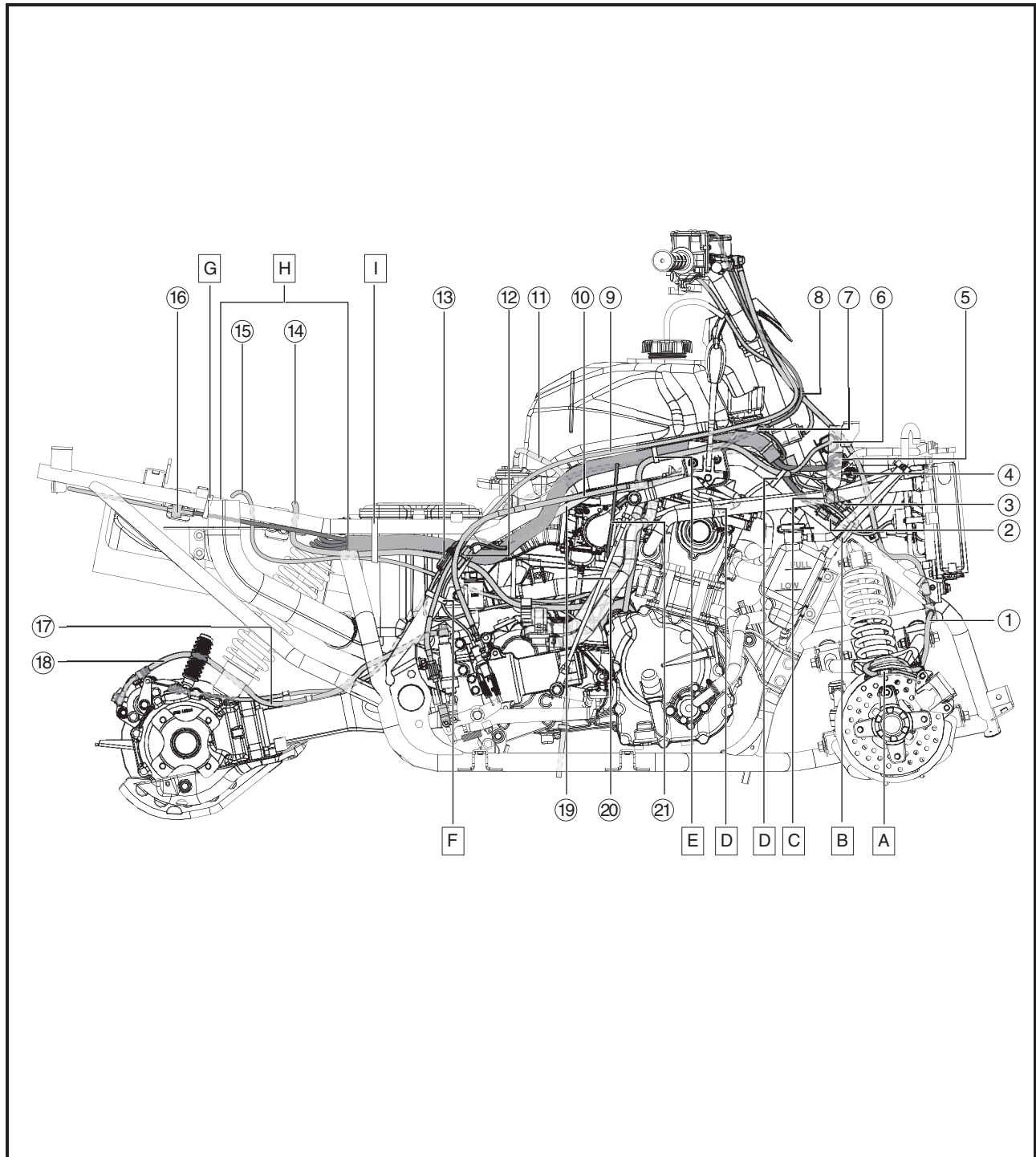




- | | | |
|----------------------------------------------|------------------------------|--------------------------|
| ① Front brake hose | ⑧ Throttle cable | ⑮ Negative battery lead |
| ② Fan motor coupler | ⑨ Rear brake cable | ⑯ Taillight lead coupler |
| ③ Heater control switch coupler | ⑩ Select lever control cable | ⑰ Parking brake cable |
| ④ Generator & wire harness coupler | ⑪ Carburetor air vent hose | ⑱ Rear brake hose |
| ⑤ Rectifier/regulator & wire harness coupler | ⑫ Rear brake switch coupler | ⑲ Blow by tube |
| ⑥ Generator & rectifier/regulator coupler | ⑬ Change switch terminals | ⑳ Fuel overflow hose |
| ⑦ Earth lead on wire harness | ⑭ Starter motor lead | ㉑ Thermostat terminal |

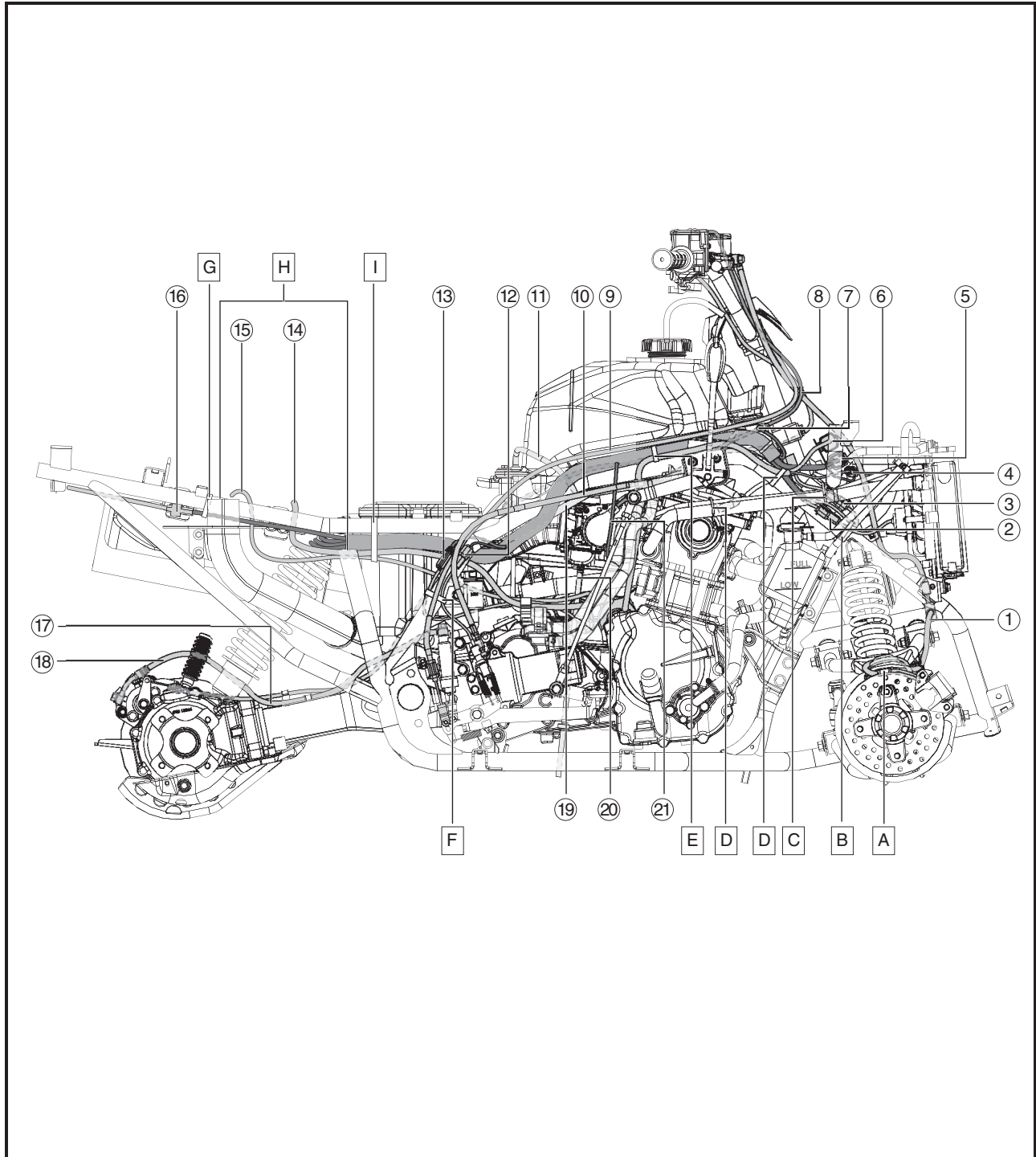
A Route the front brake hose through the guides on the upper front arms.

B Fasten the fan motor lead and the heater control switch lead on the wire harness with plastic bands.





- C Route the radiator outlet hose and coolant reservoir breather hose through the guides on the frame.
- D Fasten the generator lead and heater control switch lead on the wire harness with plastic bands.
- E Fasten the generator lead and wire harness with plastic bands.
- F Fasten the front brake switch lead and change switch lead with plastic bands.
- G Fasten the taillight lead on the wire harness with plastic bands.
- H Pass these leads through rear fender.
- I Fasten the starter motor lead, negative battery lead and wire harness with plastic bands.



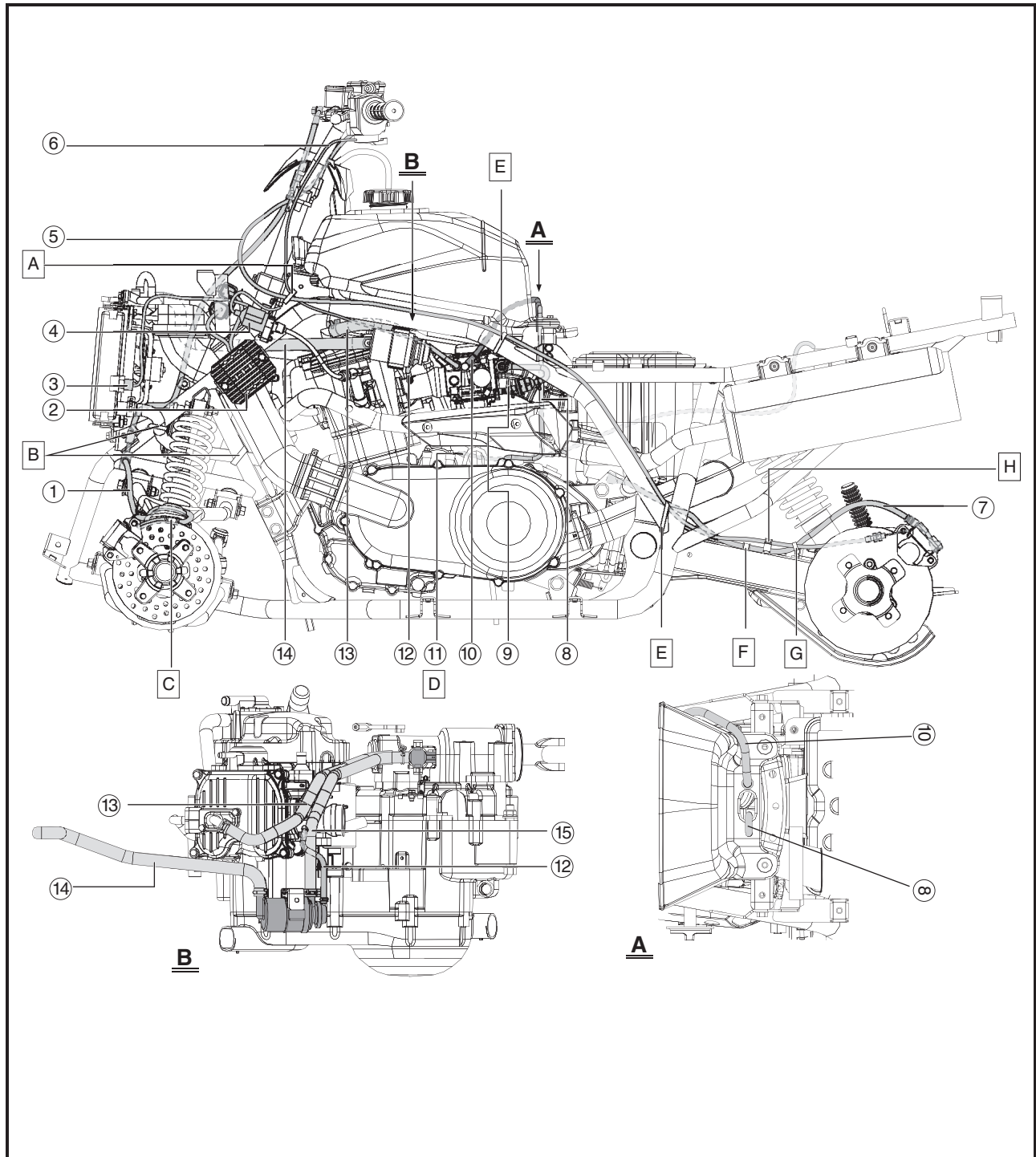


- | | | |
|-------------------------|------------------------------------|----------------------------|
| ① Front brake hose | ⑥ Choke cable | ⑪ Negative battery lead |
| ② Rectifier/regulator | ⑦ Rear brake hose | ⑫ A.I.C.V. rubber tube |
| ③ Thermo switch coupler | ⑧ Transfer gear case breather hose | ⑬ A.I.C.V. outlet tube |
| ④ Ignition coil | ⑨ Fuel tube | ⑭ A.I.C.V. inlet tube |
| ⑤ Parking brake cable | ⑩ Carburetor air vent hose | ⑮ A.I.C.V. connecting tube |

A Route the choke cable and parking brake cable through the guides on the frame.

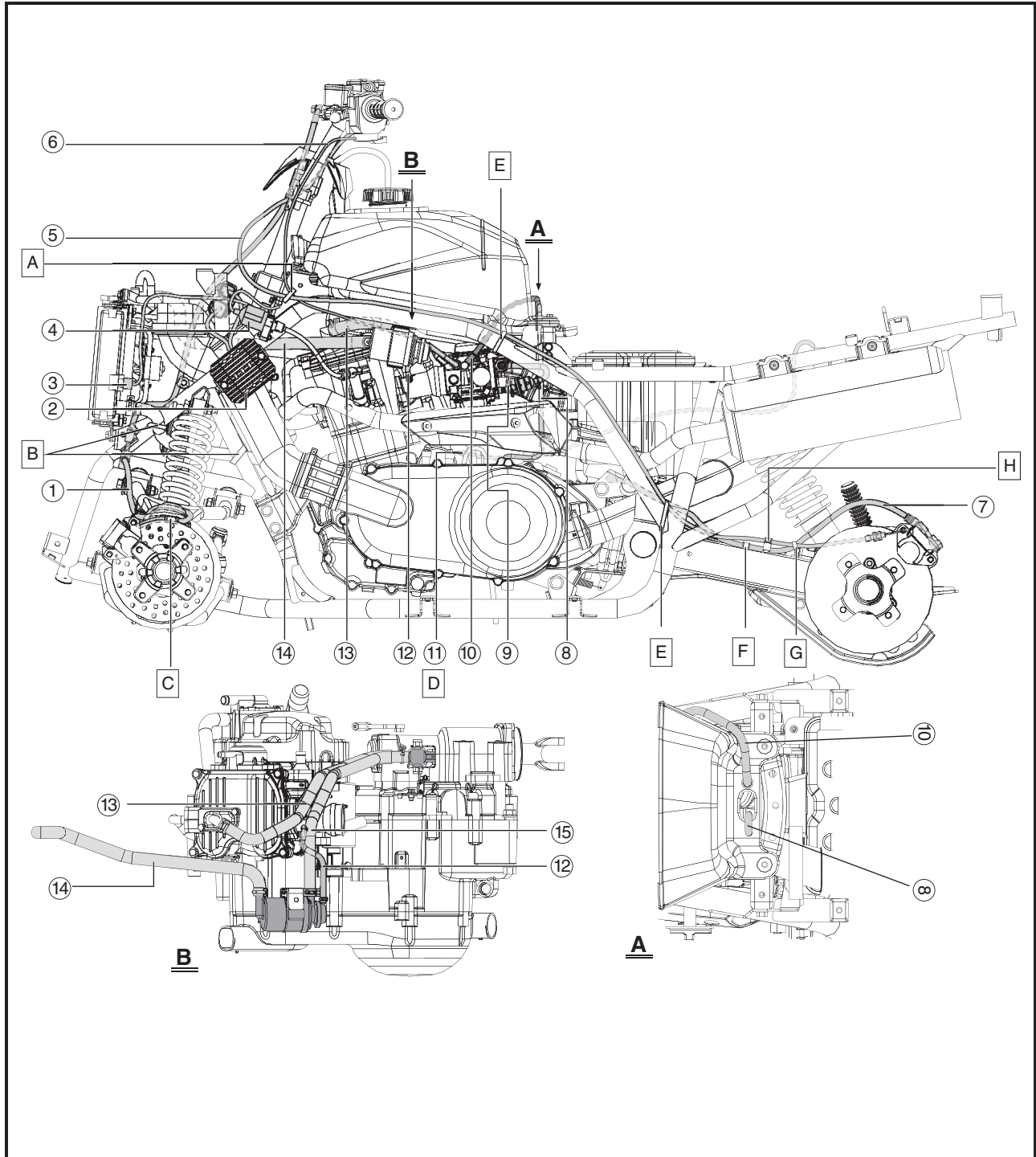
B Fasten the radiator inlet hose with plastic bands.

C Route the front brake hose through the guides on the upper front arms.





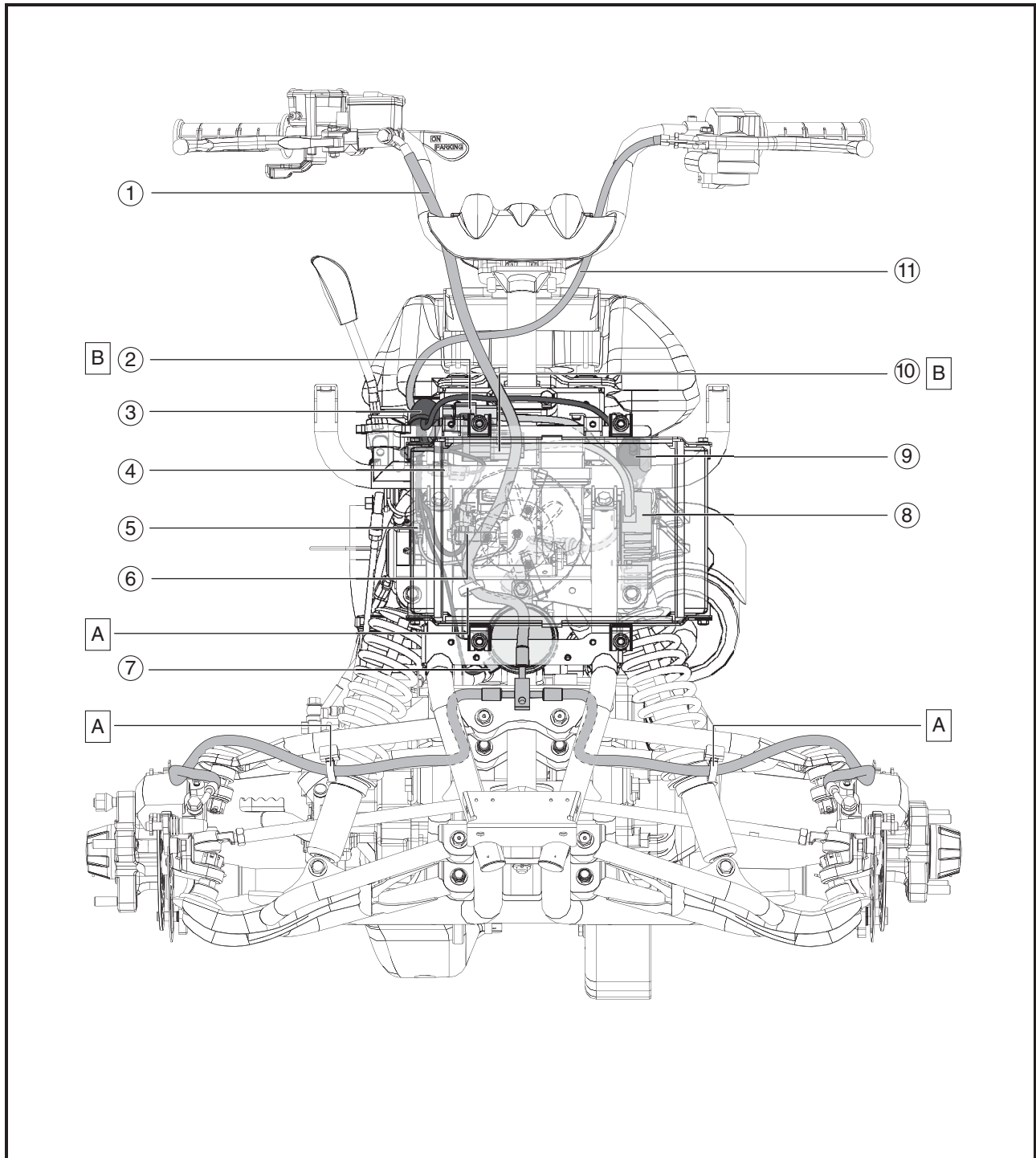
- D Fixed the negative battery lead on engine by a bolt of the starter motor.
- E Fasten the parking brake cable with plastic bands.
- F Route the rear brake hose through the guide on the swingarm.
- G Fasten the rear brake hose and parking brake cable with plastic bands
- H Route the parking brake cable through the guide on the swingarm.





- ① Front brake hose
- ② Generator & rectifier/regulator coupler
- ③ Wire harness
- ④ Generator & wire harness coupler
- ⑤ Fan motor coupler
- ⑥ Heater control switch coupler
- ⑦ Horn switch terminals
- ⑧ Rectifier/regulator
- ⑨ Ignition coil
- ⑩ Rectifier/regulator & wire harness coupler
- ⑪ Rear brake cable

- A Route the Front brake hose through the guides on the frame and upper front arms.
- B Insert the couplers on the bracket of the front fender holder.



PERIODIC CHECKS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended checks and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable machine operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to machines already in service as well as to new machines that are being prepared for sale. All service technicians should be familiar with this entire chapter.

PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

TIP

- For ATVs not equipped with an odometer or an hour meter, follow the month maintenance intervals.
- For ATVs equipped with an odometer or an hour meter, follow the km (mi) or hours maintenance intervals. However, keep in mind that if the ATV isn't used for a long period of time, the month maintenance intervals should be followed.
- 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	Whichever comes first ⇒	INITIAL			EVERY		
				month	1	3	6	6	12
				km (mi)	320 (200)	1300 (800)	2500 (1600)	2500 (1600)	5000 (3200)
				hours	20	80	160	160	320
1	* Fuel line	• Check fuel hoses for cracks or other damage, and replace if necessary.			√	√	√		
2	Spark plug	• Check condition and clean, regap, or replace if necessary.	√	√	√	√	√		
3	* Valves	• Check valve clearance and adjust if necessary.	√		√	√	√		
4	* Carburetor	• Check starter (choke) operation and correct if necessary. • Check engine idling speed and adjust if necessary.		√	√	√	√		
5	* Crankcase breather system	• Check breather hose for cracks or other damage, and replace if necessary.			√	√	√		
6	* Exhaust system	• Check for leakage and replace gasket(s) if necessary. • Check for looseness and tighten all screw clamps and joints if necessary.			√	√	√		
7	Spark arrester	• Clean.			√	√	√		

GENERAL MAINTENANCE AND LUBRICATION CHART

**CHK
ADJ**



GENERAL MAINTENANCE AND LUBRICATION CHART

NO.	ITEM	CHECK OR MAINTENANCE JOB	Whichever comes first →	INITIAL			EVERY		
				month	1	3	6	6	12
				km (mi)	320 (200)	1300 (800)	2500 (1600)	2500 (1600)	5000 (3200)
hours	20	80	160	160	320				
1	Air filter element	• Clean and replace if necessary.		Every 20–40 hours (more often in wet or dusty areas)					
2	* Front brake	• Check operation and correct if necessary. • Check fluid level and ATV for fluid leakage, and correct if necessary. • Replace brake pads.		√	√	√	√	√	
3	* Rear brake	• Check operation and correct if necessary. • Check brake lever free play, and adjust if necessary. • Check fluid level and ATV for fluid leakage, and correct if necessary. • Replace brake pads.		√	√	√	√	√	
4	* Parking brake	• Check operation and correct if necessary.		√	√	√	√	√	
5	* Brake hoses	• Check for cracks or other damage, and replace if necessary. • Replace.			√	√	√	√	
6	* Wheels	• Check runout and for damage, and replace if necessary.		√		√	√	√	
7	* Tires	• Check tread depth and for damage, and replace if necessary. • Check air pressure and balance, and correct if necessary.		√		√	√	√	
8	* Wheel hub bearings	• Check for looseness or damage, and replace if necessary.		√		√	√	√	
9	* V-belt	• Check for wear, cracks or other damage, and replace if necessary.		√		√	√	√	
10	* Chassis fasteners	• Make sure that all nuts, bolts, and screws are properly tightened.		√	√	√	√	√	
11	* Shock absorber assemblies	• Check operation and correct if necessary. • Check for oil leakage and replace if necessary.				√	√	√	
12	* Stabilizer bushes	• Check for cracks or other damage, and replace if necessary.				√	√	√	
13	* Steering shaft	• Lubricate with lithium-soap-based grease.				√	√	√	
14	* Steering system	• Check operation and repair or replace if damaged. • Check toe-in and adjust if necessary.		√	√	√	√	√	
15	* Engine mount	• Check for cracks or other damage, and replace if necessary.				√	√	√	
16	* Axle boot	• Check for cracks or other damage, and replace if necessary.		√	√	√	√	√	
17	Engine oil	• Change. • Check ATV for oil leakage, and correct if necessary.		√		√	√	√	
18	* Engine oil strainer	• Clean.		√		√		√	
19	Final transmission oil	• Change. • Check ATV for oil leakage, and correct if necessary.		√				√	
20	Final gear oil	• Change. • Check ATV for oil leakage, and correct if necessary.		√		√	√		
21	Cooling system	• Check coolant level and ATV for coolant leakage, and correct if necessary. • Replace coolant.		√	√	√	√	√	
22	* Moving parts and cables	• Lubricate.			√	√	√	√	
23	* Drive select lever safety system cable	• Check operation and adjust or replace if necessary.				√	√	√	

3

GENERAL MAINTENANCE AND LUBRICATION CHART



NO.	ITEM	CHECK OR MAINTENANCE JOB	Whichever comes first ⇒	INITIAL			EVERY		
				month	1	3	6	6	12
				km (mi)	320 (200)	1300 (800)	2500 (1600)	2500 (1600)	5000 (3200)
				hours	20	80	160	160	320
24	* Throttle lever housing and cable	<ul style="list-style-type: none"> • Check operation and correct if necessary. • Check throttle cable free play and adjust if necessary. • Lubricate throttle lever housing and cable. 		√	√	√	√	√	
25	* Front and rear brake switches	<ul style="list-style-type: none"> • Check operation and correct if necessary. 		√	√	√	√	√	
26	* Lights and switches	<ul style="list-style-type: none"> • Check operation and correct if necessary. • Adjust headlight beams. 		√	√	√	√	√	

TIP

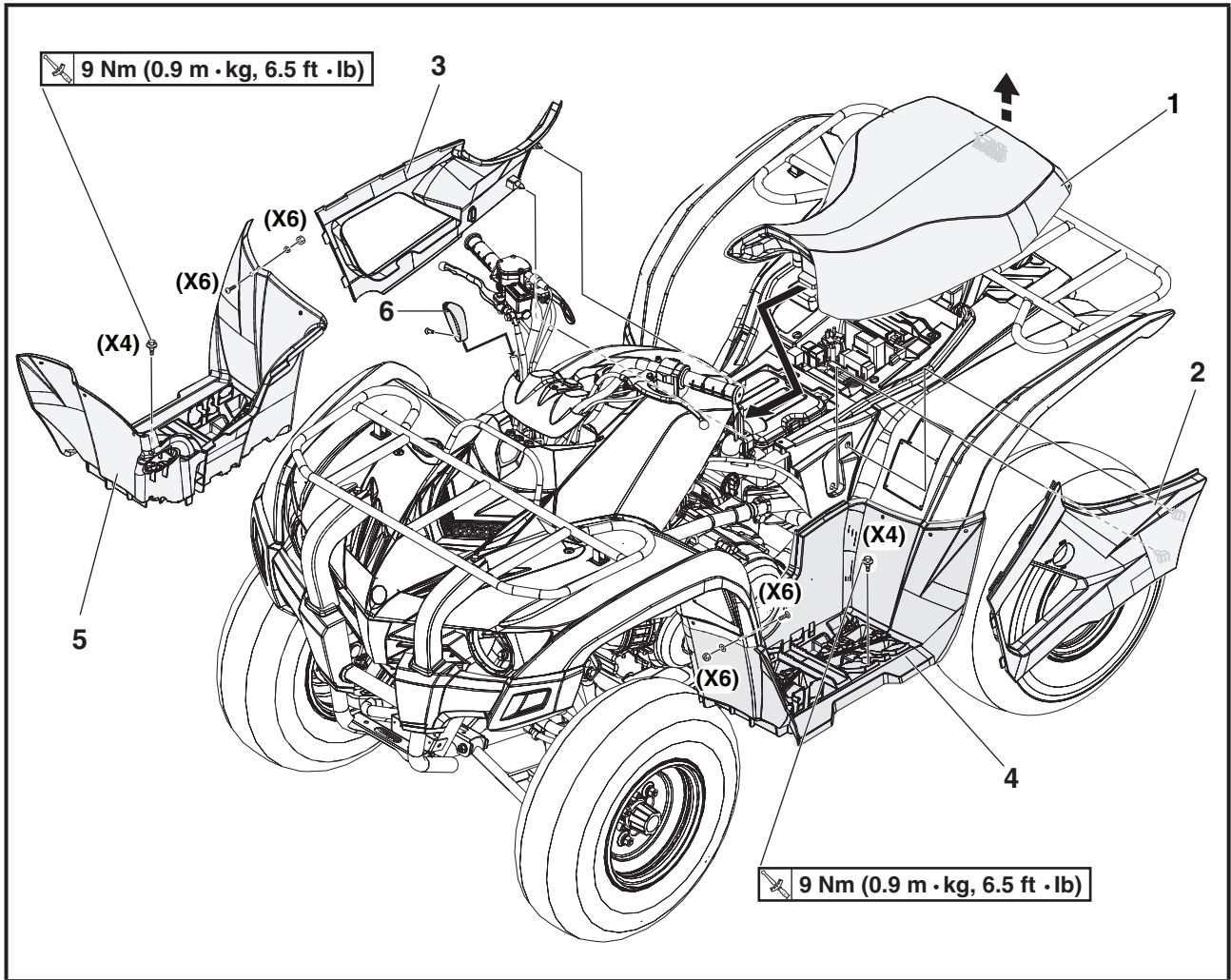
- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.
- Hydraulic brake service
 - Regularly check and, if necessary, correct the brake fluid level.
 - Every two years replace the internal components of the brake master cylinders and calipers, and change the brake fluid.
 - Replace the brake hoses every four years and if cracked or damaged.

WARNING

Indicates a potential hazard that could result in serious injury or death.

EBS00033

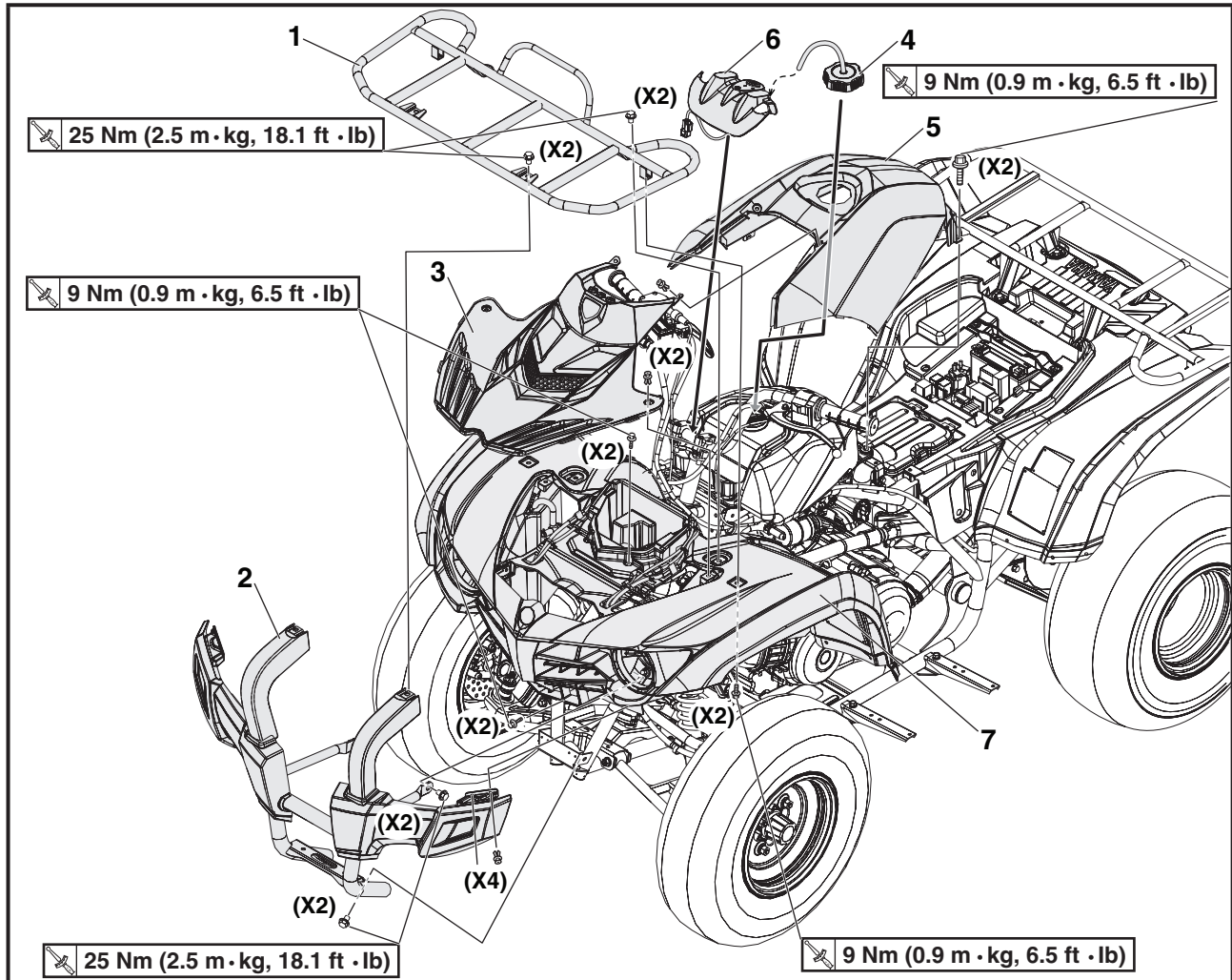
SEAT, FENDERS AND FUEL TANK
SEAT, SIDE COVERS AND FOOTREST BOARDS



Order	Job/Part	Q'ty	Remarks
	Removing the seat, side covers and footrest boards		Remove the parts in the order listed.
1	Seat	1	TIP _____ Pull back the seat lock lever, then pull up on the rear of the seat.
2	Left side cover	1	
3	Right side cover	1	
4	Left footrest board	1	
5	Right footrest board	1	
6	Handle plastics	1	
			For installation, reverse the removal procedure.



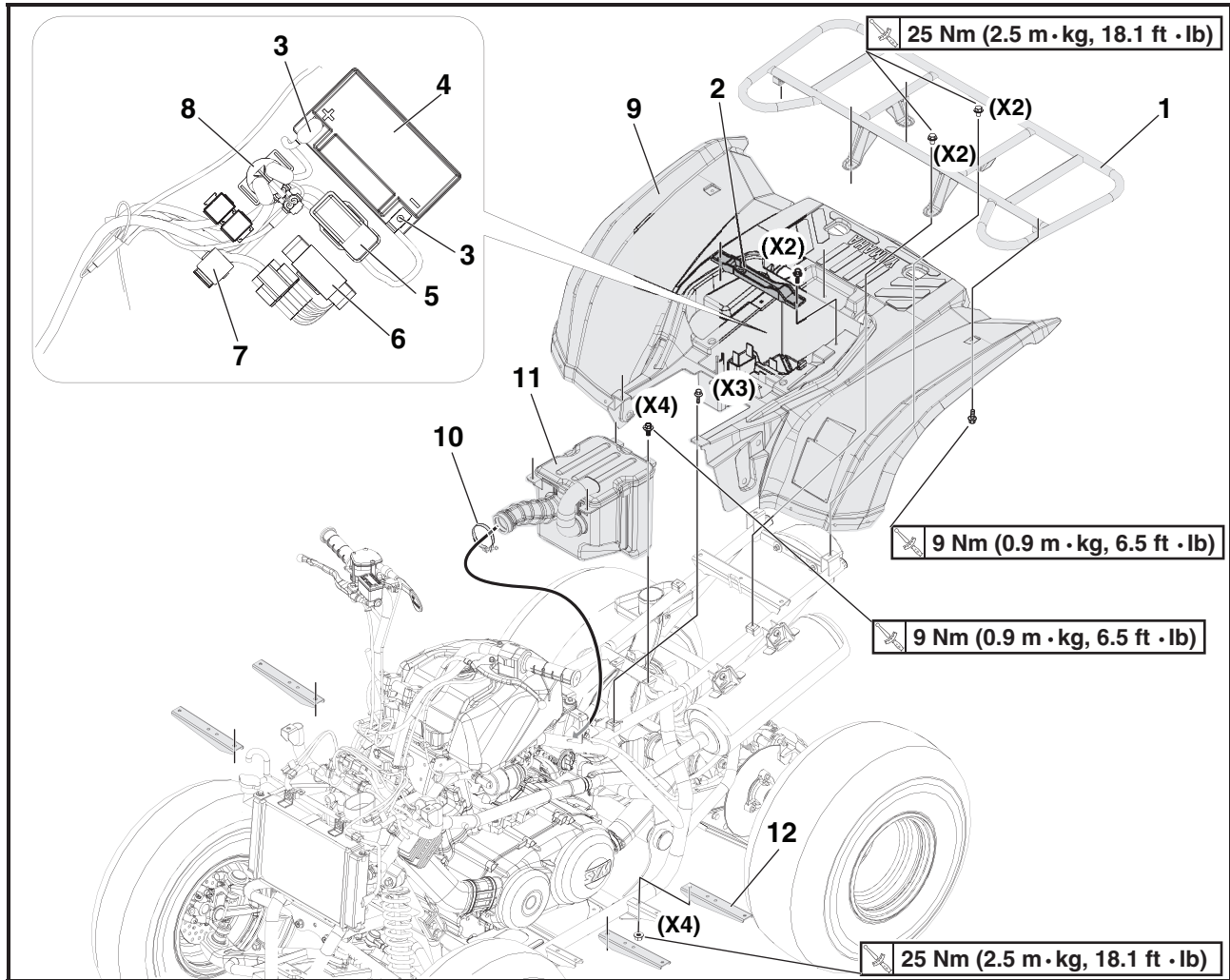
FRONT CARRIER, FRONT BUMPER AND FRONT FENDER



Order	Job/Part	Q'ty	Remarks
	Removing the front carrier, front bumper and front fender		Remove the parts in the order listed.
	Seat, side covers and footrest boards		Refer to "SEAT, SIDE COVERS AND FOOTREST BOARDS".
1	Front carrier	1	
2	Front bumper	1	
3	Front fender panel	1	
4	Fuel tank cap	1	Remove the fuel tank cover and install fuel tank cap.
5	Fuel tank cover	1	
6	Handlebar cover	1	Disconnect the main switch coupler.
7	Front fender	1	Disconnect the headlight couplers and thermo switch coupler.
			For installation, reverse the removal procedure.



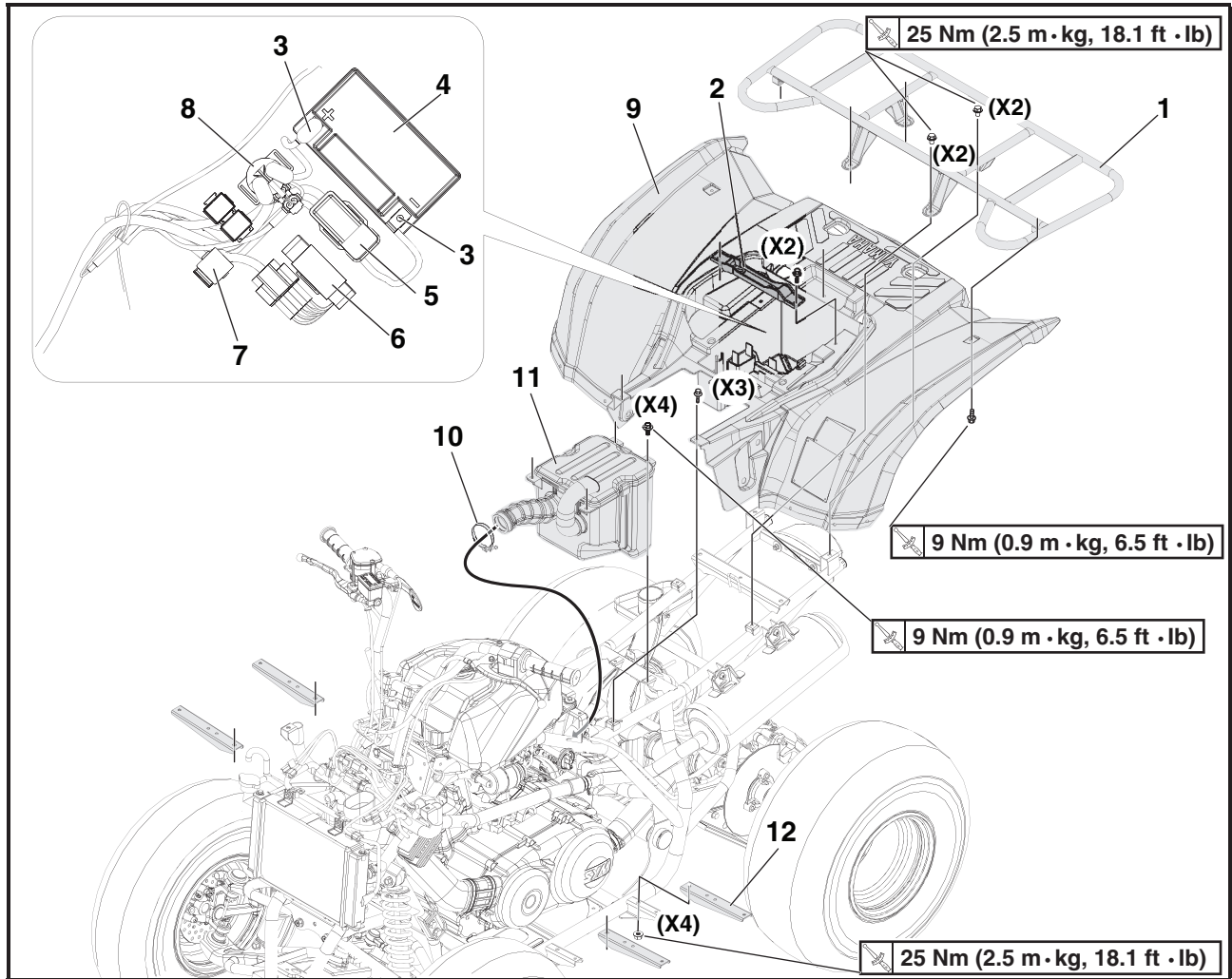
REAR FENDER AND AIR FILLTER CASE



Order	Job/Part	Q'ty	Remarks
	Removing the rear fender and air filter case		Remove the parts in the order listed.
	Seat, side covers and footrest boards		Refer to "SEAT, SIDE COVERS AND FOOTREST BOARDS".
1	Rear carrier	1	<div style="background-color: #cccccc; padding: 2px;">NOTICE</div> First disconnect the negative lead, then disconnect the positive lead.
2	Battery band	1	
3	Battery lead	2	
4	Battery	1	Disconnect.
5	CDI unit	1	
6	Shift gear control unit	1	
7	Relay	1	
8	Start relay	1	
9	Rear fender	1	Disconnect.

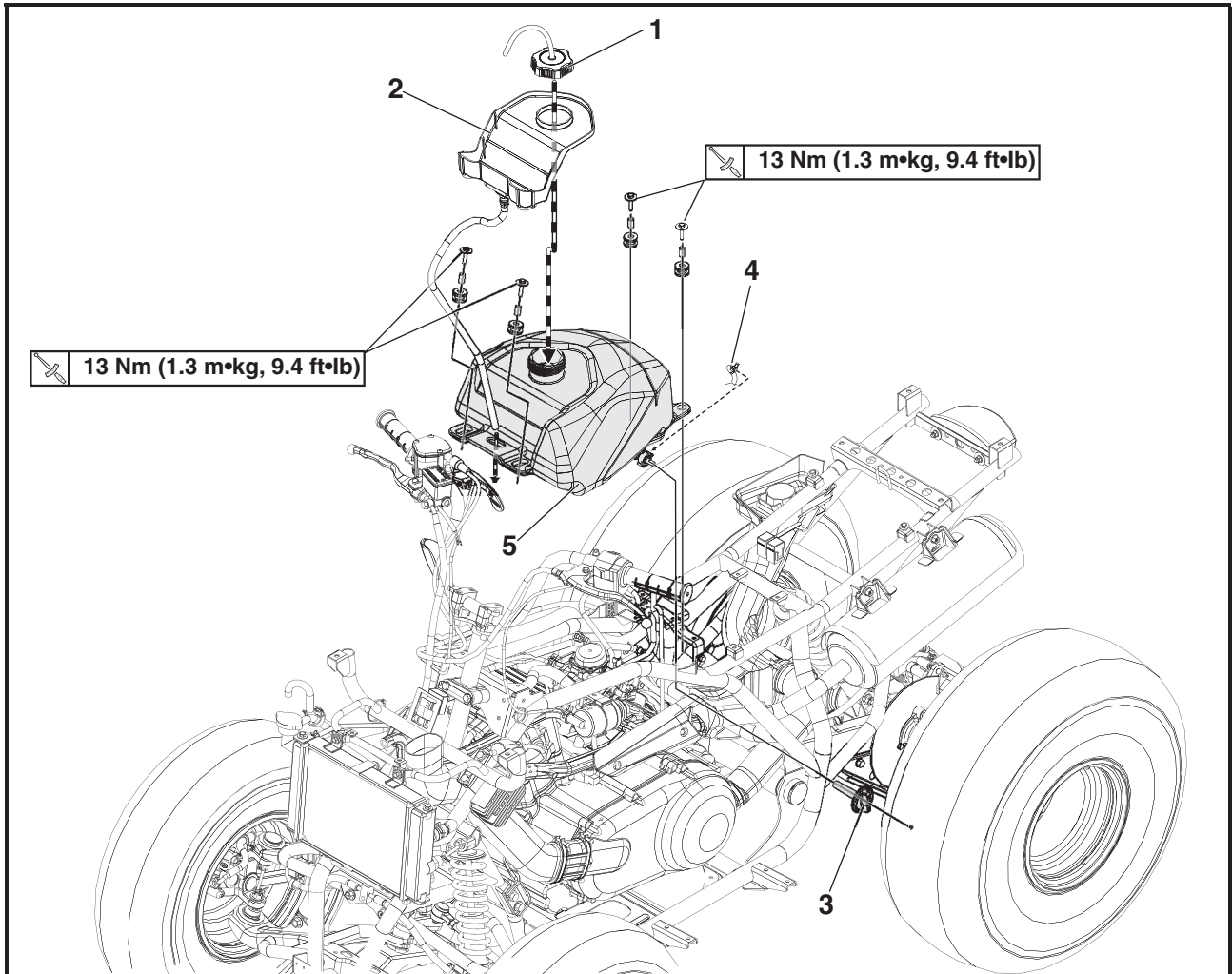


REAR FENDER AND AIR FILLTER CASE



Order	Job/Part	Q'ty	Remarks
10	Clamp	1	Loosen.
11	Air filter case	1	
12	Footrest bar	4	
			For installation, reverse the removal procedure.

FUEL TANK



Order	Job/Part	Q'ty	Remarks
	Removing the fuel tank Seat/front fender		Remove the parts in the order listed. Refer to "SEAT, FENDERS AND FUEL TANK".
1	Fuel tank cap	1	Remove the fuel tank shield and install fuel tank cap.
2	Fuel tank shield	1	
3	Fuel hose (fuel cock side)	1	TIP _____ Before disconnecting the fuel hose, turn the fuel cock to "OFF".
4	Fuel tank	1	TIP _____ When installing the fuel tank, pass the fuel tank breather hose through the hole in the handlebar protector. _____ For installation, reverse the removal procedure.



ENGINE

ADJUSTING THE VALVE CLEARANCE

The following procedure applies to all of the valves.

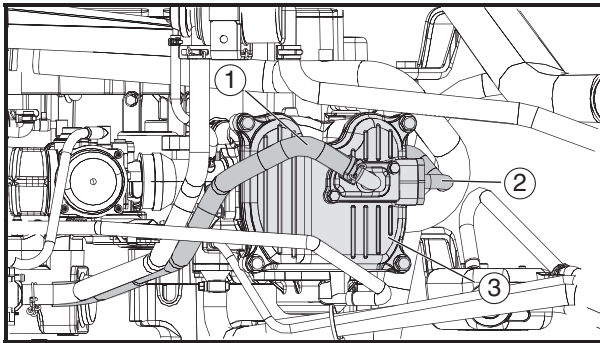
TIP

- 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 the Top Dead Center (TDC) on the compression stroke.

1. Remove:

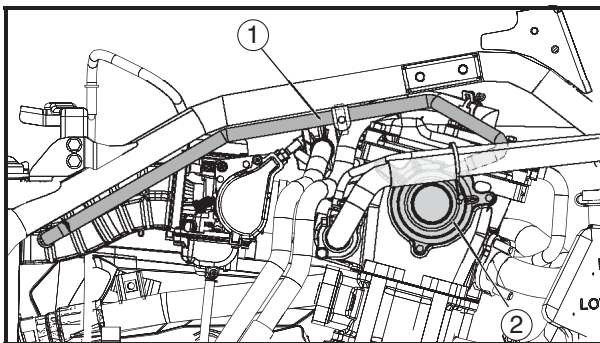
- seat
- front fender
- fuel tank

Refer to “SEAT, FENDERS AND FUEL TANK”.



2. Remove:

- A.I.C.V. outlet tube ①
- air pipe ②
- cylinder head cover ③



3. Remove:

- breather tube ①
- cylinder head side cover ②

4. Measure:

- valve clearance
- Out of specification → Adjust.

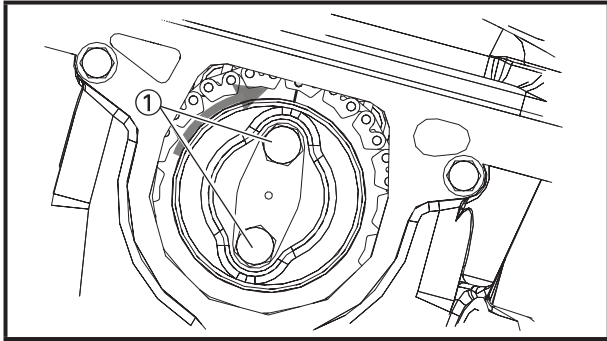
Valve clearance (cold)

Intake valve

0.08 ~ 0.12 mm
(0.0031 ~ 0.0047 in)

Exhaust valve

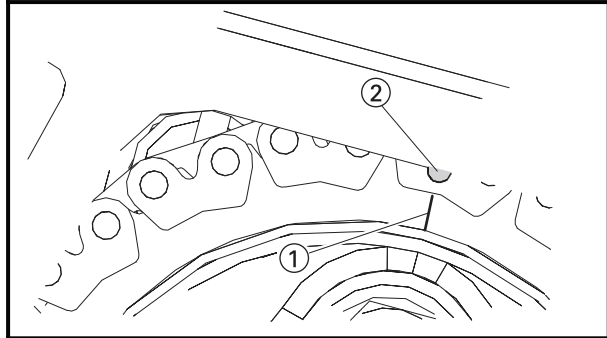
0.13 ~ 0.17 mm
(0.0051 ~ 0.0067 in)



a. Turn camshaft bolt ① in clockwise direction.

TIP

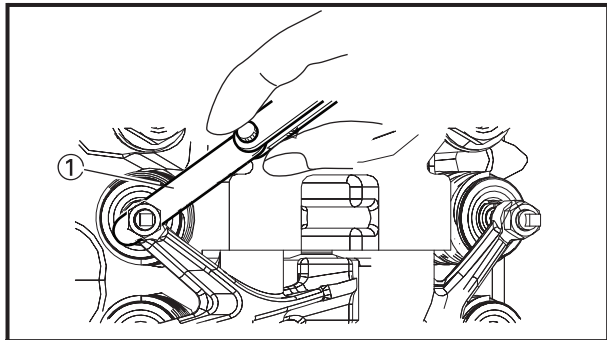
- Do not turn the bolt in Counterclockwise direction to prevent from camshaft bolt looseness.



b. Align the “I” mark ① on the camshaft sprocket with the stationary pointer ② on the cylinder head. When the “I” mark is aligned with the stationary pointer, the piston is at the Top Dead Center (TDC) on the compression stroke.

TIP

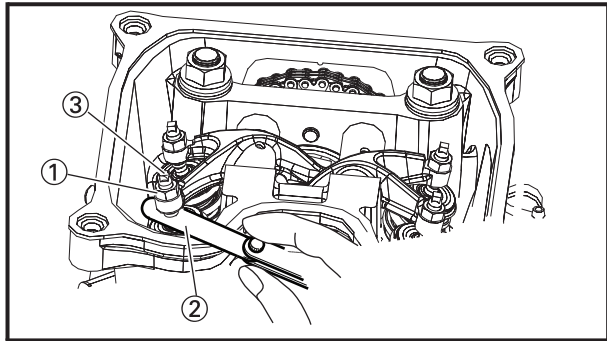
- When the piston is at the Top Dead Center (TDC) on the compression stroke, there should be clearance between the valve stem tips and their respective adjusting screws.



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

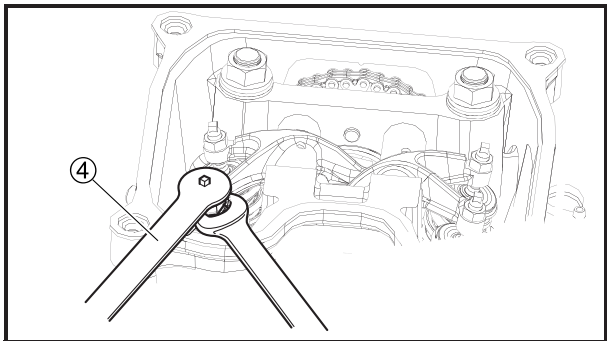


Thickness gauge
90890-03079
Narrow gauge set
YM-34483



5. Adjust:
• valve clearance

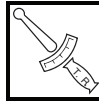
- Loosen the locknut ①.
- Insert a thickness gauge ② between the adjuster end and the valve end.
- Turn the adjuster ③ clockwise or counterclockwise with the tappet adjusting tool ④ until the proper clearance is obtained.



Tappet adjusting tool
90890-01311
YM-A5970



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



Locknut:
9 Nm (0.9 m • kg, 6.5 ft • lb)

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

6. Install:
- cylinder head side cover



Cylinder head side cover bolt:
12 Nm (1.2 m • kg, 8.7 ft • lb)

- breather tube
- cylinder head cover



Cylinder head cover bolt:
12 Nm (1.2 m • kg, 8.7 ft • lb)

- air pipe

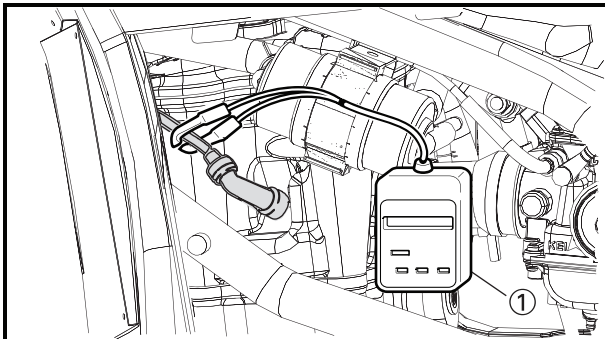


Cylinder head cover bolt:
12 Nm (1.2 m • kg, 8.7 ft • lb)

- A.I.C.V outlet tube

ADJUSTING THE ENGINE IDLING SPEED

1. Remove:
 - seat
 - left side cover and right side cover
Refer to "SEAT AND FENDERS".
2. Start the engine and let it warm up for several minutes.
3. Attach:
 - digital tachometer ①
(to the spark plug lead)



Inductive self-powered tachometer
P/N. YU-8036-B
Engine tachometer
P/N. 90890-03113

ADJUSTING THE ENGINE IDLING SPEED/ ADJUSTING THE THROTTLE LEVER FREE PLAY

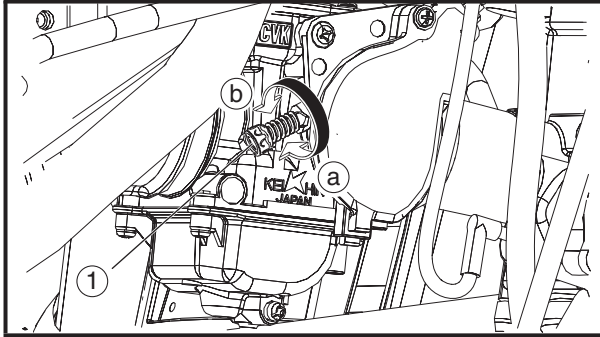
**CHK
ADJ**



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



Engine idling speed
1,600 ~ 1,800 r/min



5. Adjust:
 - engine idling speed
- a. Turn the throttle stop screw (1) in direction (a) or (b) until the specified idling speed is obtained.

Direction (a)	Idling speed becomes higher.
Direction (b)	Idling speed becomes lower.

6. Detach:
 - digital tachometer
7. Adjust:
 - throttle lever free play
 - Refer to “ADJUSTING THE THROTTLE LEVER FREE PLAY”.

Throttle lever free play
5 ~ 10 mm (0.20 ~ 0.39 in)

8. Install:
 - left side cover and right side cover
 - seat
 - Refer to “SEAT AND FENDERS”.

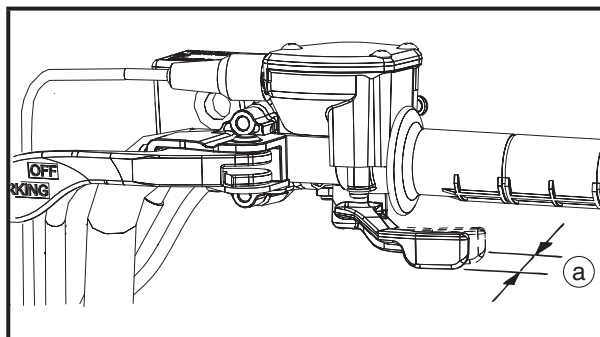
ADJUSTING THE THROTTLE LEVER FREE PLAY

TIP

Engine idling speed should be adjusted properly before adjusting the throttle lever free play.

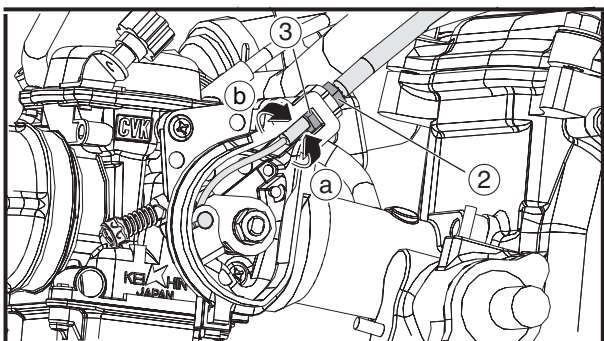
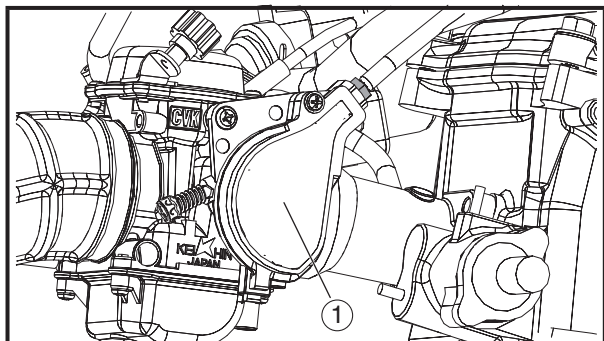
1. Measure:
 - throttle lever free play (a)
 - Out of specification → Adjust.

Throttle lever free play
5 ~ 10 mm (0.20 ~ 0.39 in)





2. Remove:
 - seat
 - right side cover
 Refer to “SEAT AND FENDERS”.
3. Adjust:
 - throttle lever free play



First step:

- a. Remove the throttle cover ①.
- b. Loosen the locknut ② on the carburetor side.
- c. Turn the adjusting nut ③ in direction ① or ② until the correct free play is obtained.

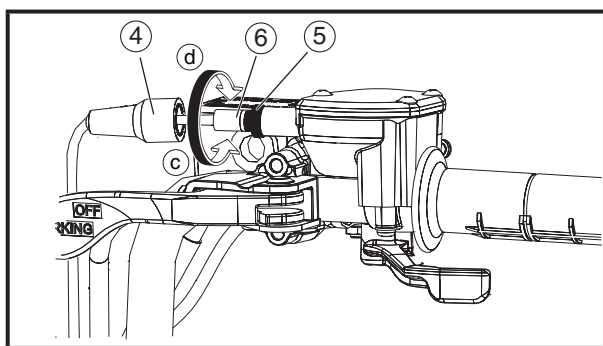
Direction ①	Free play is increased.
Direction ②	Free play is decreased.

- d. Tighten the locknut.
- e. Install the throttle cover

TIP

If the free play cannot be adjusted here, adjust it at the throttle lever side of the cable.

4. Install:
 - right side cover
 - seat
 Refer to “SEAT AND FENDERS”.



Second step:

- f. Slide back the rubber cover ④.
- g. Loosen the locknut ⑤.
- h. Turn the adjusting bolt ⑥ in direction ③ or ④ until the correct free play is obtained.

Direction ③	Free play is increased.
Direction ④	Free play is decreased.

- i. Tighten the locknut.
- j. Slide the rubber cover to its original position.

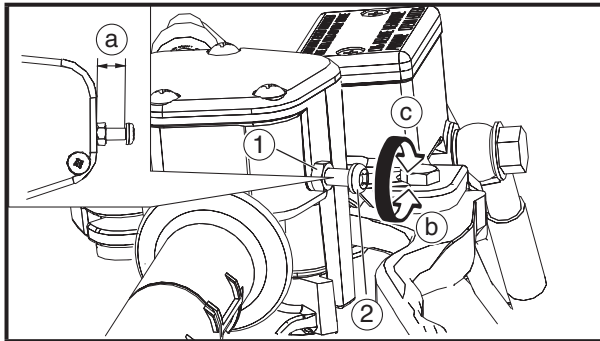
⚠ WARNING

After adjusting the free play, turn the handlebar to the right and left to make sure that the engine idling speed does not increase.



ADJUSTING THE SPEED LIMITER

The speed limiter keeps the carburetor throttle from becoming fully-opened even when the throttle lever is applied to the maximum position. Screwing in the adjusting screw stops the engine speed from increasing.



1. Measure:
 - Speed limiter length (a)
 - Out of specification → Adjust.

	Speed limiter length Less than 12 mm (0.47 in)
--	-----------------------------------------------------------------

2. Adjust:
 - speed limiter length

- a. Loosen the locknut (1).
- b. Turn the adjusting screw (2) in or out until the specified speed limiter length is obtained.

Direction (b)	Speed limiter length is decreased.
Direction (c)	Speed limiter length is increased.

- c. Tighten the locknut.

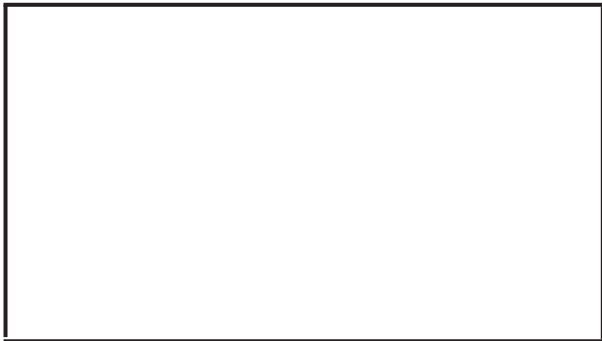
⚠ WARNING

- Particularly for a beginner rider, the speed limiter should be screwed in completely. Screw it out little by little as their riding technique improves. Never remove the speed limiter for a beginning rider.
- For proper throttle lever operation do not turn out the adjusting screw more than 12 mm (0.47 in). Also, always adjust the throttle lever free play to 5 ~ 10 mm (0.20 ~ 0.39 in).

CHECKING THE SPARK PLUG

1. Remove:
 - seat
 - left side cover
 Refer to “SEAT AND FENDERS”.
2. Disconnect:
 - spark plug cap
3. Remove:
 - spark plug
4. Check:
 - spark plug type
 Incorrect → Change.

**Standard spark plug
NGK/CR8E**



5. Check:
 - electrode ①
Wear/damage → Replace.
 - insulator ②
Abnormal color → Replace.
Normal color is a medium-to-light tan color.
6. Clean:
 - spark plug
(with a spark plug cleaner or wire brush)
7. Measure:
 - spark plug gap (a)
Use a wire gauge or thickness gauge.
Out of specification → Regap.

**Spark plug gap
0.7 ~ 0.8 mm (0.028 ~ 0.031 in)**

8. Install:
 - spark plug

**Spark plug
12.0 Nm (1.20 m·kgf, 8.9 ft · lbf)**

TIP

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

9. Install:
 - spark plug cap
10. Install:
 - left side cover and right side cover
 - seat
 Refer to “SEAT AND FENDERS”.



CHECKING THE IGNITION TIMING

TIP

Engine idling speed and throttle cable free play should be adjusted properly before checking the ignition timing.

1. Attach:
 - digital tachometer

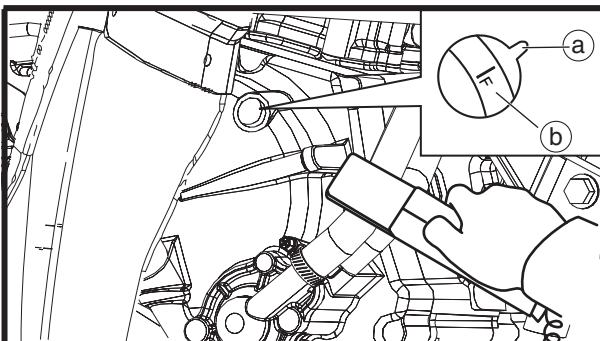
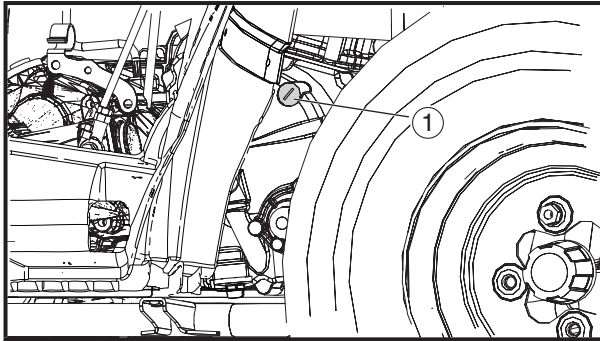


Digital tachometer
90890-06760, YU-39951-B

- timing light
(to spark plug lead)



Timing light
90890-03141
Inductive clamp timing light
YU-03141



2. Check:
 - ignition timing

- a. Warm up the engine and keep it at the specified speed.



Engine speed
1,600 ~ 1,800 r/min

- b. Remove the timing mark accessing screw (1).
- c. Visually check the stationary pointer (a) to verify it is within the required firing range (b) indicated on the AC magneto rotor.
Incorrect firing range → Check the pickup coil assembly.
- d. Install the timing mark accessing screw.

3. Detach:
 - timing light
 - digital tachometer



MEASURING THE COMPRESSION PRESSURE

The following procedure applies to the cylinder.

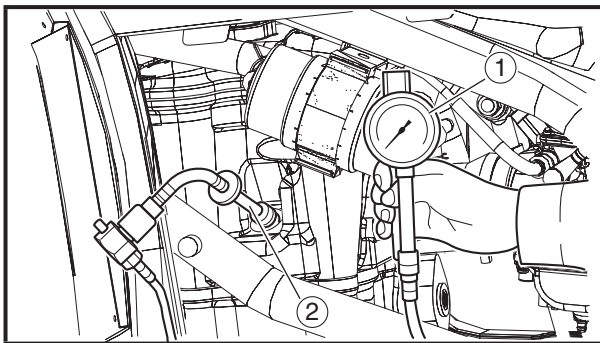
TIP

Insufficient compression pressure will result in a loss of performance.

1. Remove:
 - seat
 - left side cover and right side cover
Refer to “SEAT AND FENDERS”.
2. Measure:
 - Valve clearance
Out of specification → Adjust.
Refer to “ADJUSTING THE VALVE CLEARANCE”
3. Start the engine, warm it up for several minutes, and then turn it off.
4. Disconnect:
 - Spark plug cap
5. Remove:
 - Spark plug

NOTICE

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



6. Install:
 - Compression gauge ①
 - Extension ②



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

7. Measure:

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

	Compression pressure (standard) 1,200 kPa/720 r/min (12.2 kgf/cm ² , 174 psi/720 r/min)
	Compression pressure (maximum) 1,400 kPa/720 r/min (14.3 kgf/cm ² , 203 psi/720 r/min)
	Compression pressure (minimum) 1000 kPa/720 r/min (10.2 kgf/cm ² , 145 psi/720 r/min)

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

⚠ 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.



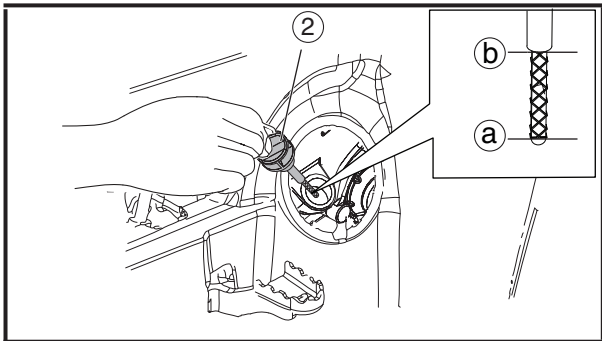
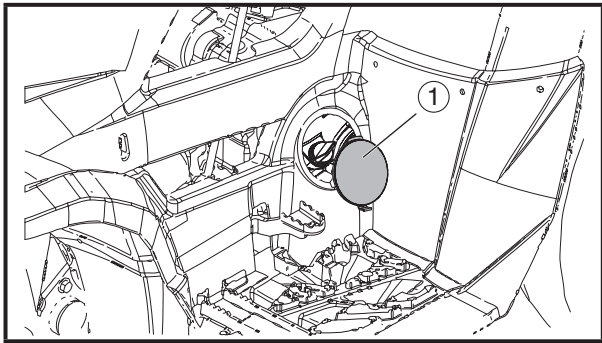
8. Install:
- Spark plug

<p>Spark plug 12.0 Nm (1.20 m·kgf, 8.9 ft · lbf)</p>

9. Connect:
- Spark plug cap
10. Install:
- left side cover and right side cover
 - seat
- Refer to “SEAT AND FENDERS”.

CHECKING THE ENGINE OIL LEVEL

1. Place the machine on a level surface.
2. Start the engine, warm it up several minutes, and then turn it off.
3. Remove engine oil cap cover ① .



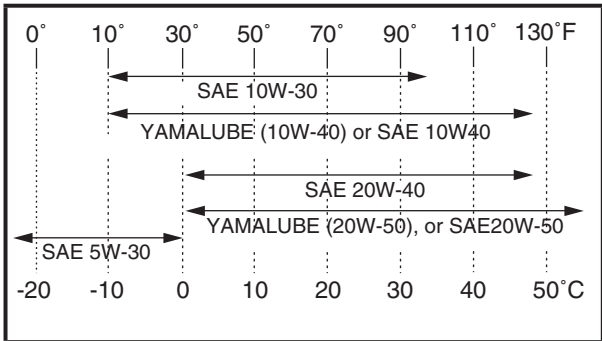
4. Check:
 - engine oil level

Oil level should be between the minimum level mark (a) and the maximum level mark (b).

Low oil level → Add oil to the proper level.

TIP

- Wait a few minutes until the oil settles before checking the oil level.
- Do not screw the dipstick ② in when checking the oil level.



Recommended engine oil type
YAMALUBE, SAE10W-30,
SAE10W-40, SAE20W-40,
SAE20W-50 or SAE5W-30

Recommended engine oil grade
API service SG type or higher,
JASO standard MA



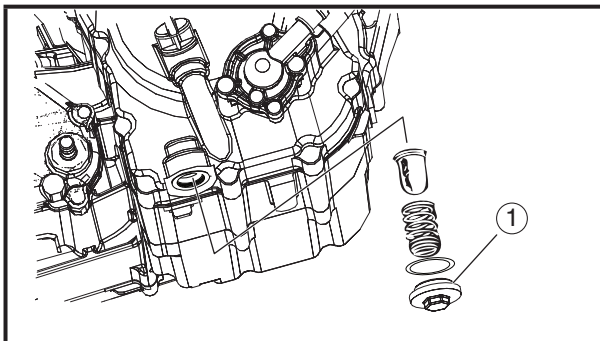
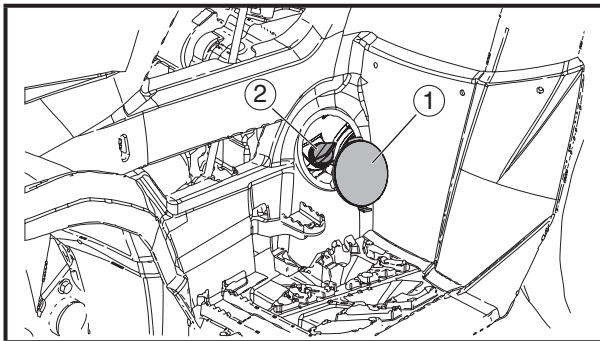
NOTICE

- Do not add any chemical additives. Engine oil also lubricates the clutch and additives could cause clutch slippage.
- Do not allow foreign material to enter the crankcase.

5. Start the engine, warm it up for several minutes, and then turn it off.
6. Check:
 - engine oil level
7. Install engine oil cap cover.

TIP

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



CHANGING THE ENGINE OIL

1. Place the machine on a level surface.
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Place a container under the engine oil drain bolt.
4. Remove:
 - engine oil cap cover (1)
 - dipstick (2)
5. Remove:
 - engine oil drain bolt (1)
(along with the O-ring, spring and oil filter screen)
6. Drain:
 - engine oil
(completely from the crankcase)
7. Check:
 - O-ring
Damage → Replace
8. Install:
 - engine oil drain bolt (1)
(along with the O-ring, spring and oil filter screen)

**Engine oil drain bolt
15 Nm (1.5 m·kgf, 10.8 ft · lbf)**



9. Fill:

- crankcase
(with the specified amount of the recommended engine oil)

	Quantity Periodic oil change 1.20 L (1.27 US qt, 1.06 Imp.qt)
-----------------------------------------------------------------------------------	------------------------------------------------------------------------------------------

10. Install:

- dipstick

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

12. Check:

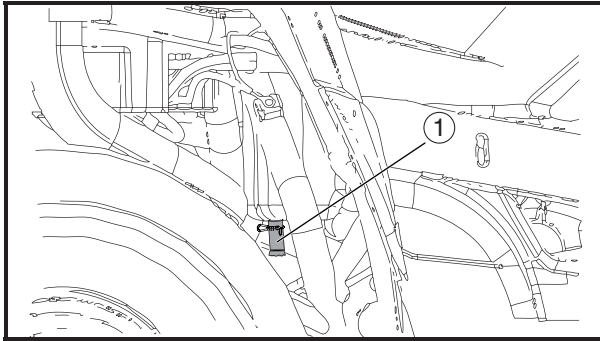
- engine
(for engine oil leaks)

13. Check:

- engine oil level
Refer to “CHECKING THE ENGINE OIL”

14. Install:

- engine oil cap cover

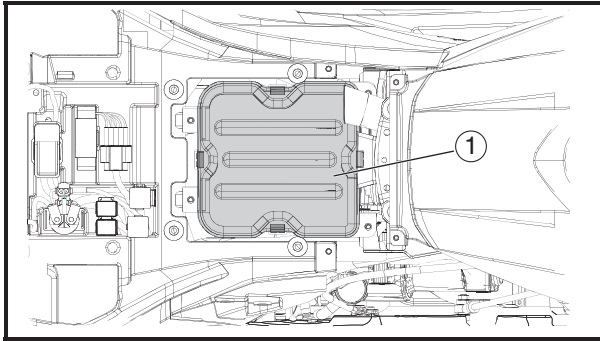


CLEANING THE AIR FILTER ELEMENT

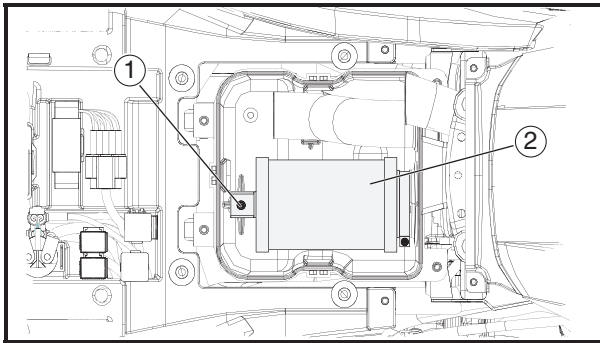
TIP

There is a check hose (1) at the bottom of the air filter case. If dust and/or water collects in this hose, clean the air filter element and air filter case.

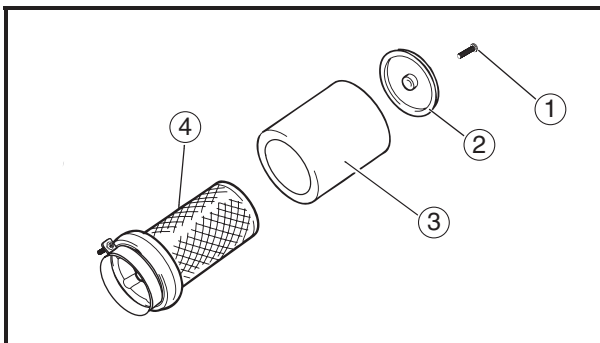
1. Remove:
 - seat
Refer to "SEAT, FENDERS AND FUEL TANK".



2. Remove:
 - air filter case cover (1)



3. Remove:
 - bolt (1)
 - air filter element assembly (2)

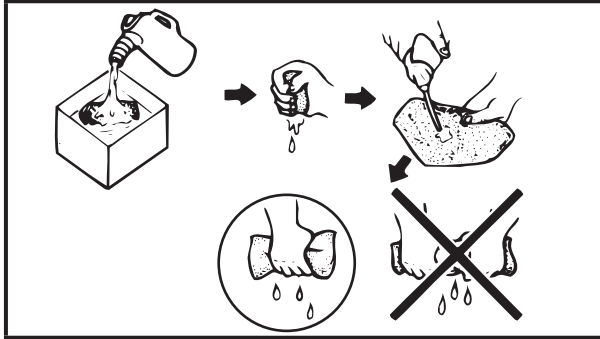


4. Remove:
 - bolt (1)
 - air filter element cap (2)
 - air filter element (3)
 - air filter element frame (4)



NOTICE

The engine should never be run without the air filter; excessive piston and/or cylinder wear may result.



5. Check:
 - air filter element
Damage → Replace.

6. Clean:
 - air filter element

- a. Wash the element gently, but thoroughly in solvent.

⚠ WARNING

Use a cleaning solvent which is designed to clean parts only. Never use gasoline or low flash point solvents as they may cause a fire or explosion.

- b. Squeeze the excess solvent out of the element and let it dry.

NOTICE

Do not twist or wring out the element. This could damage the foam material.

- c. Apply Yamaha foam air filter oil or other quality foam air filter oil.
- d. Squeeze out the excess oil.

TIP

The element should be wet but not dripping.

7. Install:
 - air filter element assembly
 - air filter element frame
 - air filter element
 - air filter element cap
 - bolt

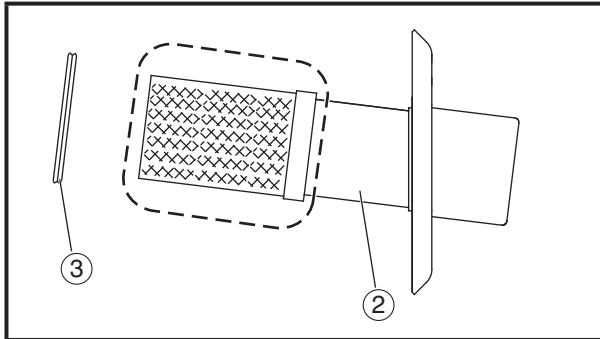
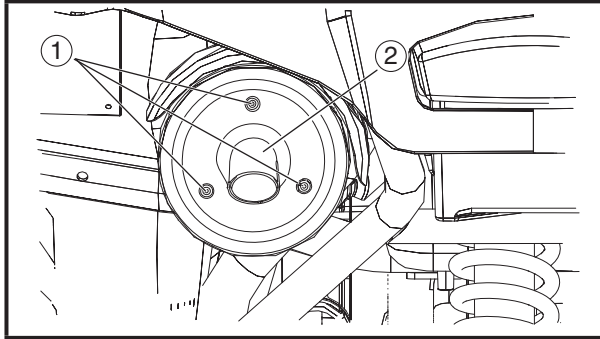
8. Install:
 - air filter element assembly
 - bolt

TIP

Make sure its sealing surface matches the sealing surface of the case so there is no air leak.



9. Install:
 - air filter case cover
10. Install:
 - seat
 Refer to "SEAT, FENDERS AND FUEL TANK".



CLEANING THE SPARK ARRESTER

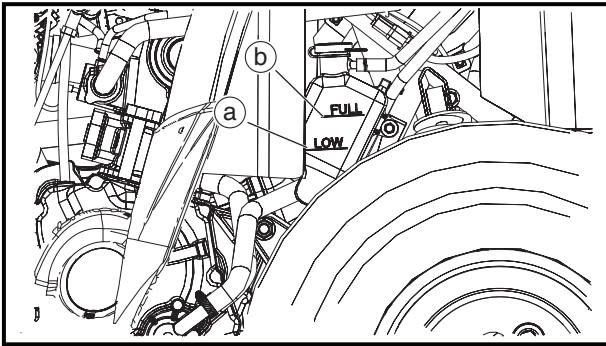
1. Clean:
 - Spark arrester

⚠ WARNING

- Select a well-ventilated area free of combustible materials.
- Always let the exhaust system cool before performing this operation.
- Do not start the engine when removing the tailpipe from the muffler.

- a. Remove the bolts (1).
- b. Remove the tailpipe (2) and gasket (3) from the muffler.
- c. Tap the tailpipe lightly with a soft-face hammer or suitable tool, then use a wire brush to remove any carbon deposits from the spark arrester portion of the tailpipe and the inner contact surfaces of the muffler.
- d. Insert the tailpipe and gasket into the muffler.
- e. Install the bolts and tighten it.

🔧 12 Nm (1.2 m·kgf, 8.7 ft·lbf)



CHECKING THE COOLANT LEVEL

1. Place the machine on a level surface.
2. Check:
 - Coolant level
The coolant level should be between the minimum level mark (a) and maximum level mark (b).
Below the minimum level mark → Add the recommended coolant to the proper level.

NOTICE

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

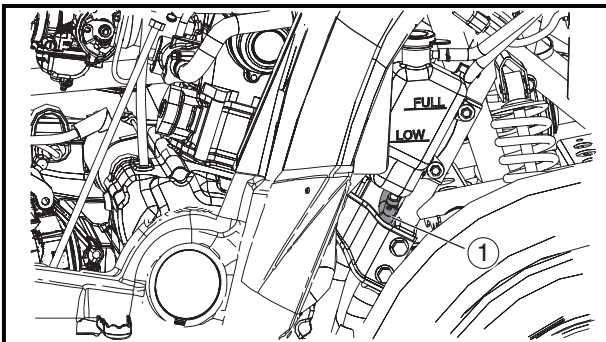
3. Start the engine, warm it up for several minutes, and then turn it off.
4. Check:
 - Coolant level

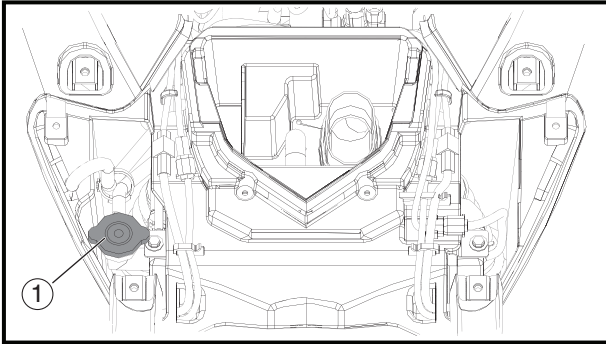
TIP

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

CHANGING THE COOLANT

1. Remove:
 - front carrier
 - front panel
Refer to “FRONT CARRIER, FRONT BUMPER AND FRONT FENDER”.
2. Disconnect:
 - coolant reservoir hose (1)
3. Drain:
 - Coolant
(from the coolant reservoir)
4. Connect:
 - coolant reservoir hose



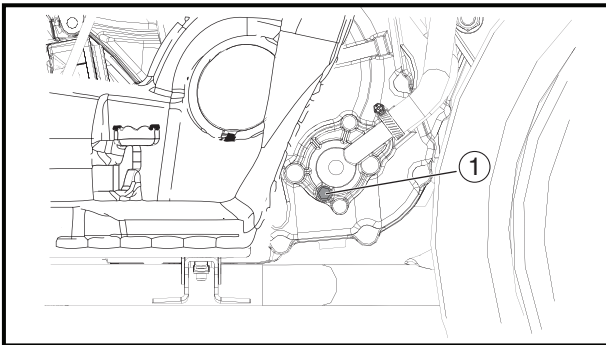


5. Remove:
- radiator cap ①

⚠ WARNING

A hot radiator is under pressure. Therefore, do not remove the radiator cap when the engine is hot. Scalding hot fluid and steam may be blown out, which could cause serious injury. When the engine has cooled, open the radiator cap as follows:

Place a thick rag or a towel over the radiator cap and slowly turn the radiator cap counterclockwise toward the detent to allow any residual pressure to escape. When the hissing sound has stopped, turn the radiator cap counterclockwise while pressing down on it and then remove it.



6. Remove:
- coolant drain bolt (water pump) ①
(along with the copper washer)

7. Drain:
- Coolant

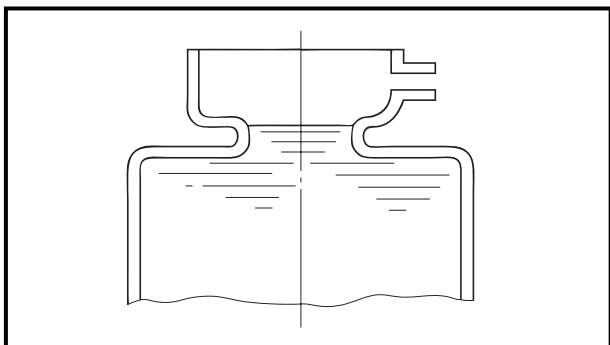


8. Check:
- copper washer ① **New**
 - coolant drain bolt ②
Damage → Replace.

9. Install:
- coolant drain bolt (water pump)



Coolant drain bolt:
12 Nm (1.2 m • kg, 8.7 ft • lb)



10.Fill:

- cooling system
(with the specified amount of the recommended coolant)



Recommended antifreeze
High-quality ethylene glycol antifreeze containing corrosion inhibitors for aluminum engines
Mixing ratio
1:1 (antifreeze:water)
Quantity
Total amount
0.94L
(0.83 Imp qt, 0.99 US qt)
Coolant reservoir capacity
0.25 L
(0.22 Imp qt, 0.26 US qt)

Handling notes for coolant

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

! WARNING

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

NOTICE

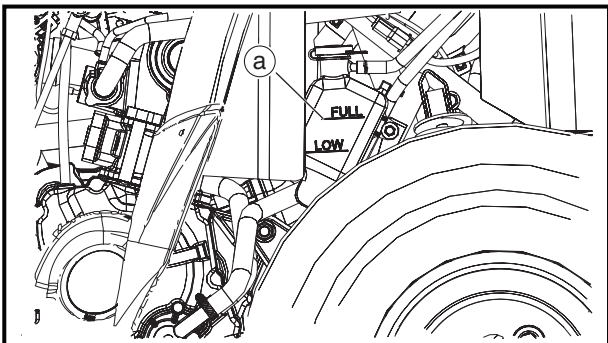
- Adding water instead of coolant lowers the antifreeze content of the coolant. If water is used instead of coolant, check, and if necessary, correct the antifreeze concentration of the coolant.
- Use only distilled water. However, soft water may be used if distilled water is not available.
- If coolant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

11.Install:

- radiator cap

CHANGING THE COOLANT/ CHECK THE COOLANT TEMPERATURE INDICATOR LIGHT

CHK
ADJ



12.Fill:

- coolant reservoir
(with the recommended coolant to the maximum level mark (a))

13.Install:

- coolant reservoir cap

14.Start the engine, warm it up for ten minutes, and then rev the engine five times.

15.Pour the recommended coolant into the radiator until it is full.

16.Stop the engine and allow it to cool. If the coolant level has dropped after the engine has cooled add sufficient coolant until it reaches the top of the radiator, and then install the radiator cap.

17.Start the engine, and then check for coolant leakage.

Cracks/wear/damage → Replace.

18.Inspect:

- coolant level

Refer to “CHECKING THE COOLANT LEVEL”.

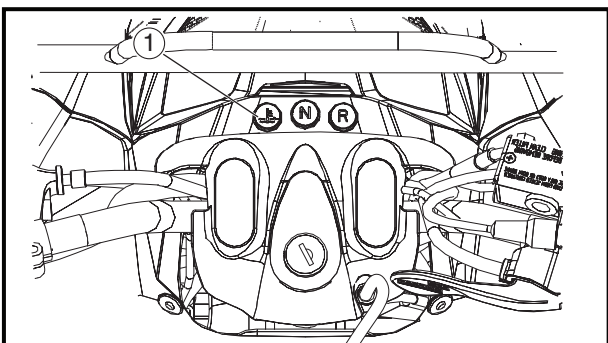
TIP

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

19.Install:

- front panel
- front carrier

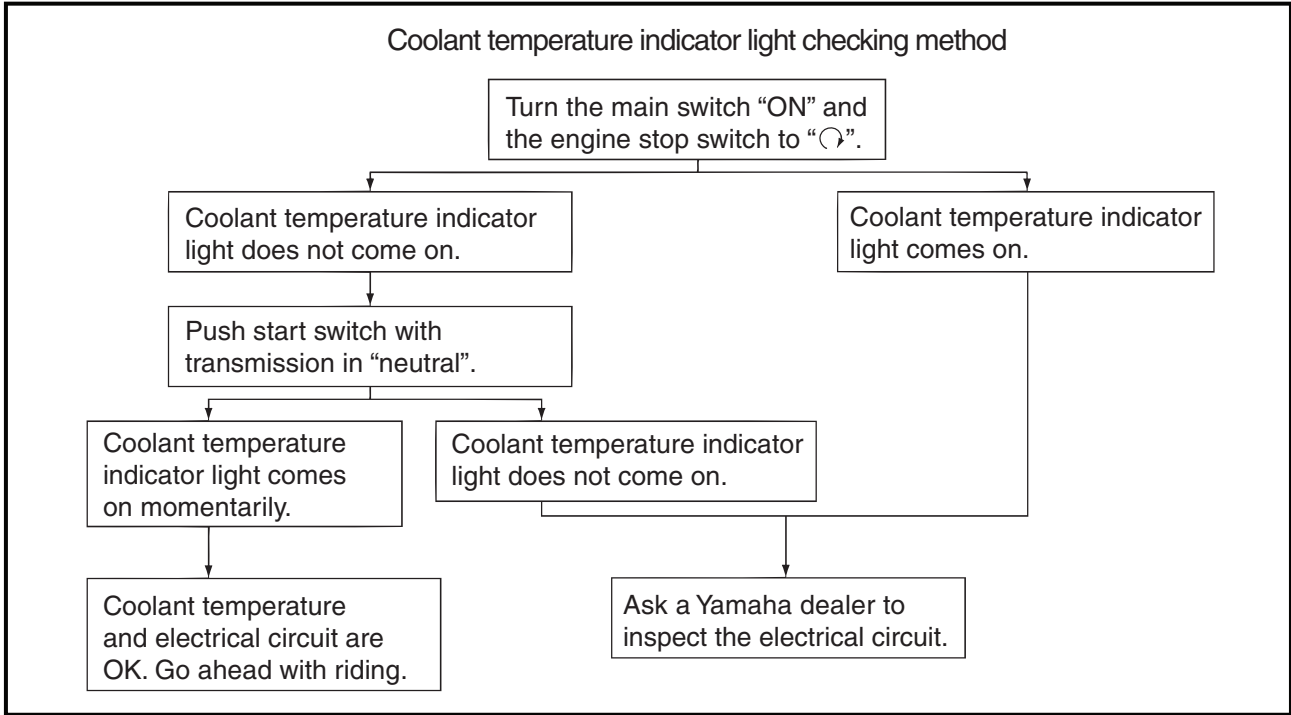
Refer to “FRONT CARRIER, FRONT BUMPER AND FRONT FENDER”.

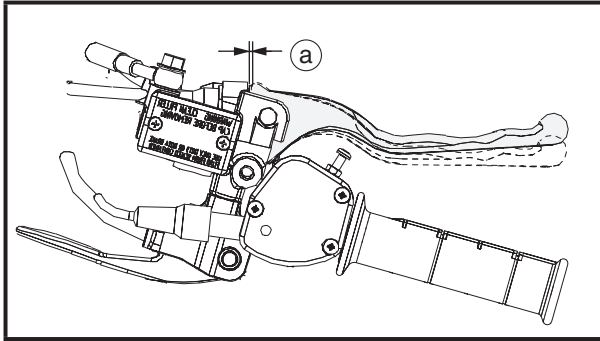


CHECK THE COOLANT TEMPERATURE INDICATOR LIGHT

1. Check:

- coolant indicator light (1)





CHASSIS

CHECKING THE FRONT BRAKE

1. Measure:

- brake lever free play (a)
Out of specification → Bleed the front brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM”.

Brake lever free play
(at the end of the brake lever)
0 mm (0 in)

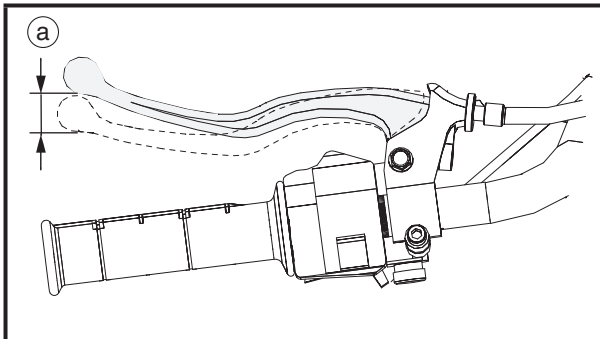
ADJUSTING THE REAR BRAKE LEVER

TIP

Before adjusting the rear brake lever, the rear brake linings should be checked.

NOTICE

Proper lever free play is essential to avoid excessive brake drag.



1. Measure:

- rear brake lever free play (a)
Out of specification → Adjust.



Front brake lever free play
4 –7 mm (0.16 –0.28 in)

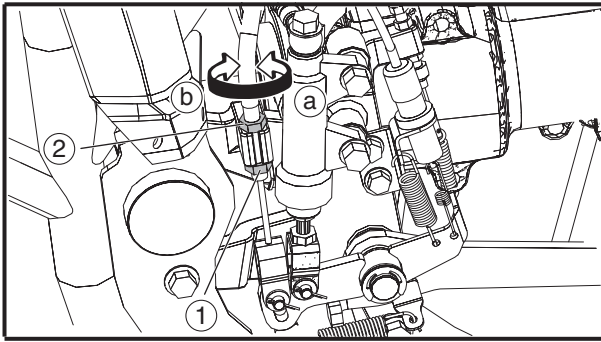
2. Remove:

- seat
- right side cover
- right footboard

Refer to “SEAT, SIDE COVERS AND FOOTREST BOARDS”.

ADJUSTING THE REAR BRAKE LEVER

CHK
ADJ



3. Adjust:
- rear brake lever free play



First step:

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

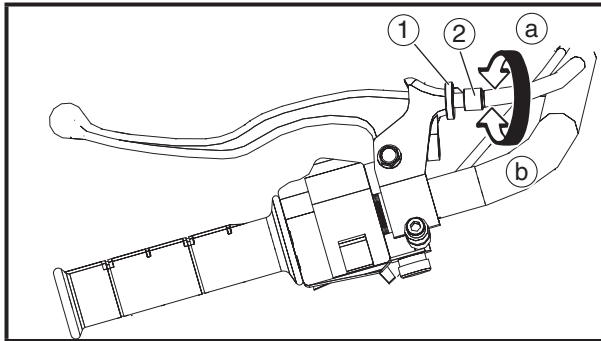
Direction (a)	Free play is increased.
---------------	-------------------------

Direction (b)	Free play is decreased.
---------------	-------------------------

- Tighten the locknuts.

TIP

If the free play cannot be adjusted here, adjust it at the throttle lever side of the cable.



Second step:

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

Direction (a)	Free play is increased.
---------------	-------------------------

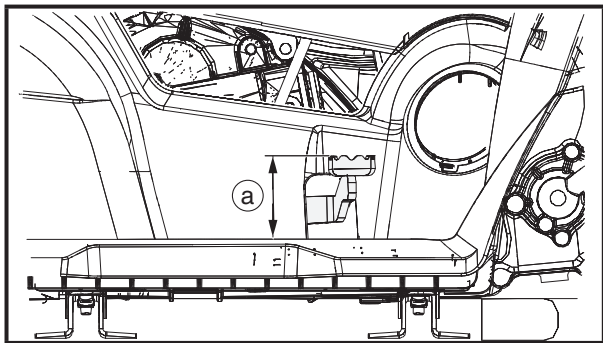
Direction (b)	Free play is decreased.
---------------	-------------------------

- Tighten the locknuts.



4. Install:
- right footboard
 - right side cover
 - seat

Refer to “SEAT, SIDE COVERS AND FOOTREST BOARDS”.



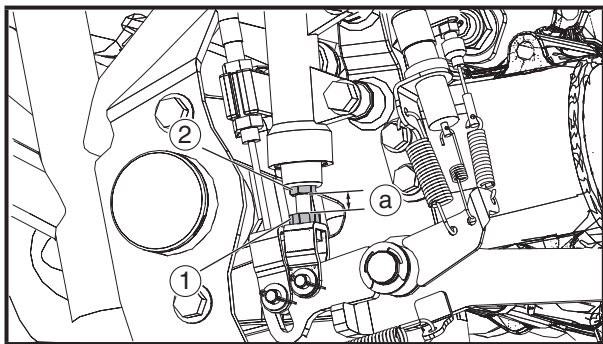
ADJUSTING THE REAR PEDAL POSITION

1. Measure:
 - rear brake pedal height (a)
 Out of specification → Adjust.

Rear brake pedal height 47.0–57.0 mm (1.85–2.24 in)

2. Remove:
 - seat
 - right side cover
 - right footboard

Refer to “SEAT, SIDE COVERS AND FOOTREST BOARDS”.



3. Adjust:
 - rear brake pedal height

- a. Loosen the locknut (1).
- b. Turn the adjusting bolt (2) until the brake pedal height is within the specified limits.
- c. Tighten the locknut.

TIP

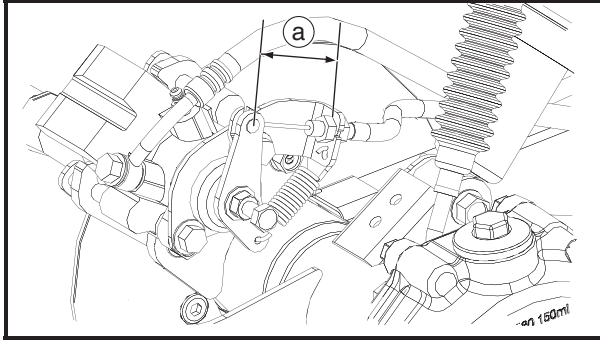
When adjusting the brake pedal height make sure the locknut-to-adjusting bolt clearance (a) does not exceed 8 mm (0.31 in).

⚠ WARNING

After this adjustment is performed, lift the front and rear wheels off the ground by placing a block under the engine, and spin the rear wheels to ensure there is no brake drag. If any brake drag is noticed, perform the above steps again.

4. Install:
 - right footboard
 - right side cover
 - seat

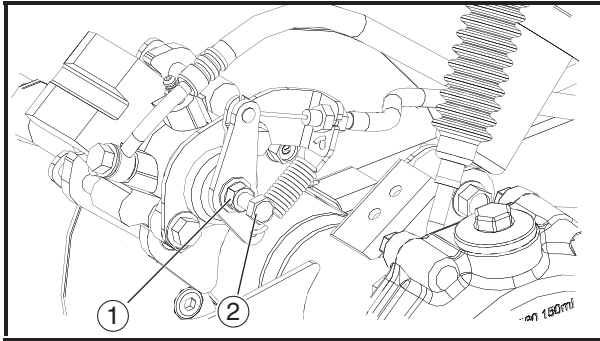
Refer to “SEAT, SIDE COVERS AND FOOTREST BOARDS”.



ADJUSTING THE PARKING BRAKE

1. Check:
 - parking brake cable end length (a)
Out of specification → Adjust.

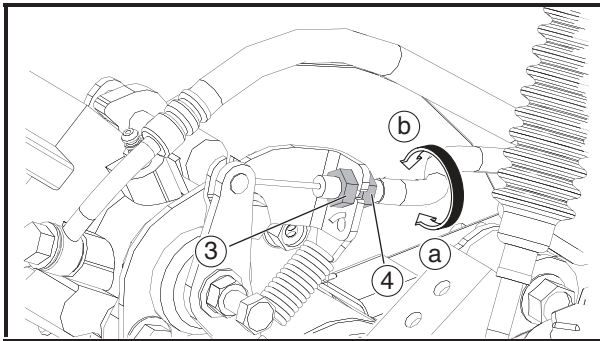
Parking brake cable end length
52–56 mm (2.05–2.20 in)



2. Adjust:
 - parking brake cable end length

- a. Loosen the locknut (1) and adjusting bolt (2).
- b. Loosen the locknut (3).
- c. Turn the adjusting nut (4) in direction (a) or (b) until the specified brake cable end length is obtained.

Parking brake cable end length
52–56 mm (2.05–2.20 in)



- d. Tighten the locknut (3).
- e. Slowly tighten the adjusting bolt to the specified torque.

Tighten the adjusting bolt:
0.3 Nm (0.03 m • kg, 0.22 ft • lb)

- f. Turn it 1/8 counterclockwise.
- g. Tighten the locknut (1).

Tighten the locknut:
16 Nm (1.6 m • kg, 11 ft • lb)

⚠ WARNING

After this adjustment is performed, lift the rear wheels off the ground by placing a block under the engine, and spin the rear wheels to ensure there is no brake drag. If any brake drag is noticed perform the above steps again.

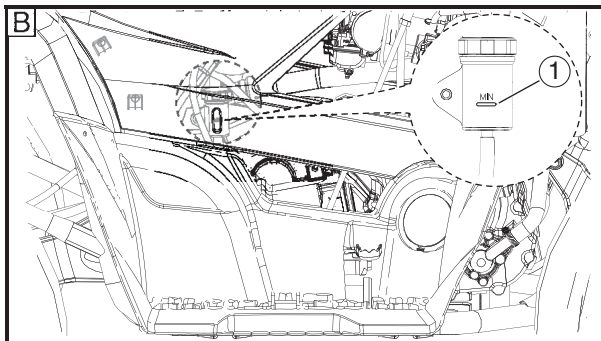
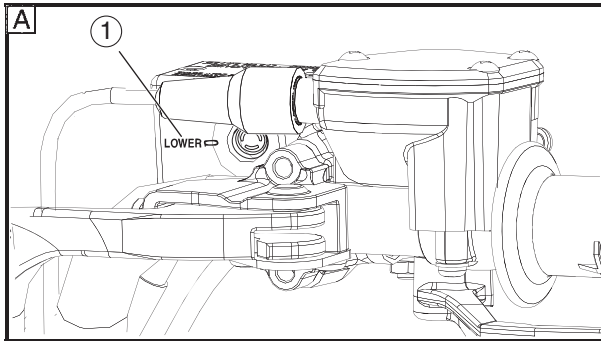


CHECKING THE BRAKE FLUID LEVEL

1. Place the machine on a level surface.

TIP

When checking the brake fluid level, make sure that the top of the brake master cylinder reservoir or brake fluid reservoir is horizontal.



2. Check:

- brake fluid level
Below the minimum level mark ① → Add the recommended brake fluid to the proper level.



**Recommended brake fluid
DOT 4**

A Front brake

B Rear brake

⚠ WARNING

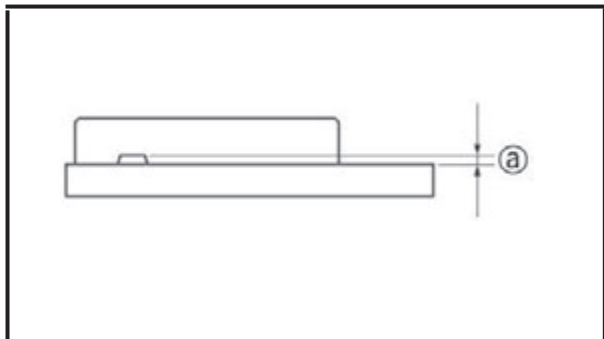
- **Use only the designated brake fluid.** Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- **Refill with the same type of brake fluid that is already in the system.** Mixing brake fluids may result in a harmful chemical reaction, leading to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

NOTICE

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

TIP

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

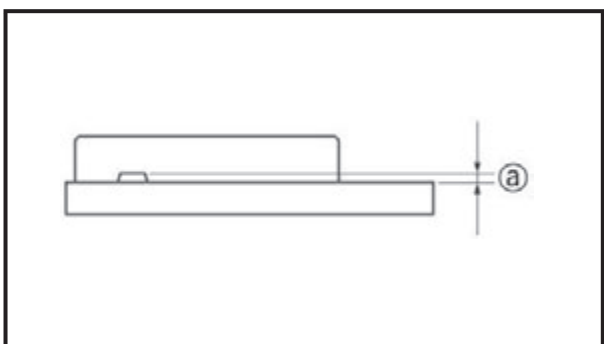


CHECKING THE FRONT BRAKE PADS

1. Remove:
 - front wheels
Refer to “FRONT AND REAR WHEELS” in chapter 6.
2. Check:
 - brake pads
Wear indicators almost touch the brake disc
Ⓐ → Replace the brake pads as a set.Refer to “FRONT AND REAR BRAKES” in chapter 6.

Brake pad wear limit Ⓐ 1.0 mm (0.04 in)

3. Operate the front brake lever.
4. Install:
 - front wheels
Refer to “FRONT AND REAR WHEELS” in chapter 6.



CHECKING THE REAR BRAKE PADS

1. Check:
 - brake pads
Wear indicators almost touch the brake disc
Ⓐ → Replace the brake pads as a set.Refer to “FRONT AND REAR BRAKES” in chapter 6.

Brake pad wear limit Ⓐ 1.0 mm (0.04 in)

2. Operate the brake pedal and the rear brake lever.



ADJUSTING THE REAR BRAKE LIGHT SWITCH

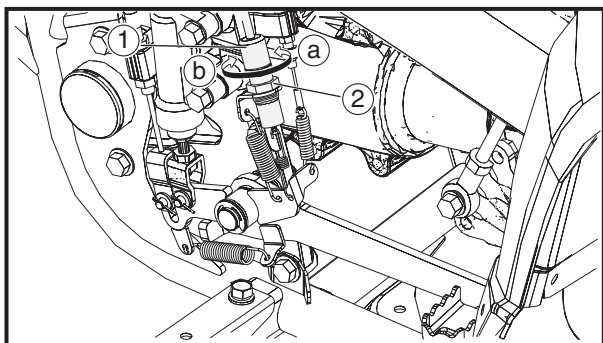
TIP

- 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

- a. Hold the main body ① of the rear brake light switch so that it does not rotate and turn the adjusting nut ② in direction ③ or ④ until the rear brake light comes on at the proper time.

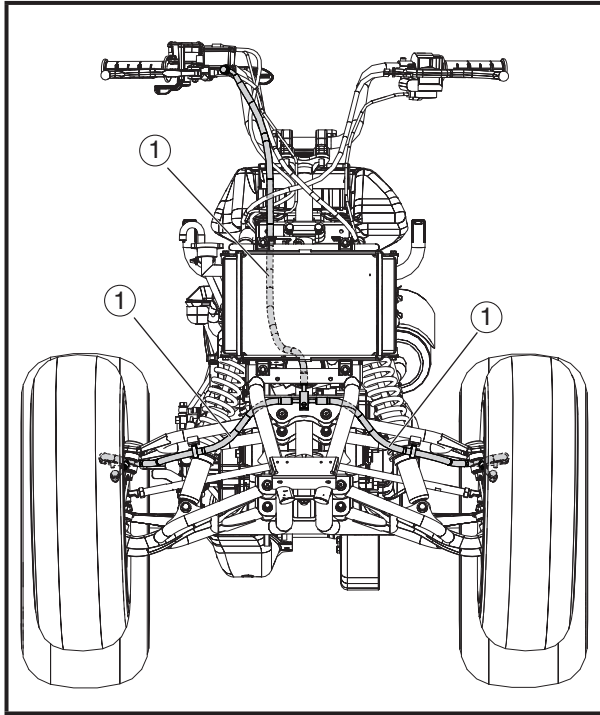


Direction ③	Brake light comes on sooner.
Direction ④	Brake light comes on later.



CHECKING THE BRAKE HOSES

1. Remove:
 - seat
 - front fender
 Refer to “SEAT, FENDERS AND FUEL TANK”.

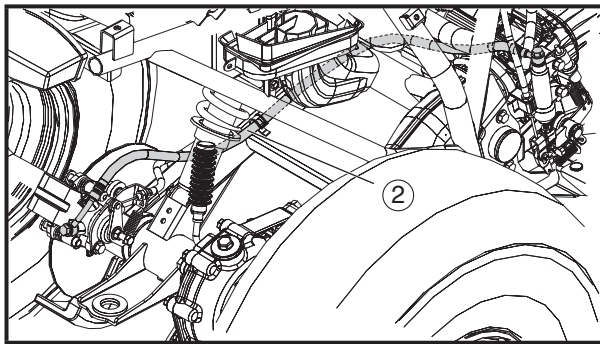


2. Check:
 - front brake hoses ①
 - rear brake hose ②
 Cracks/wear/damage → Replace.

3. Check:
 - brake hose clamps
 Loosen → Tighten.
4. Hold the machine in an upright position and apply the front or rear brake.

5. Check:
 - brake hoses
 Apply the brake lever or brake pedal several times.
 Fluid leakage → Replace the hoses or pipe.
 Refer to “FRONT AND REAR BRAKES” in chapter 6.

6. Install:
 - front fender
 - seat
 Refer to “SEAT, FENDERS AND FUEL TANK”.





BLEEDING THE HYDRAULIC BRAKE SYSTEM

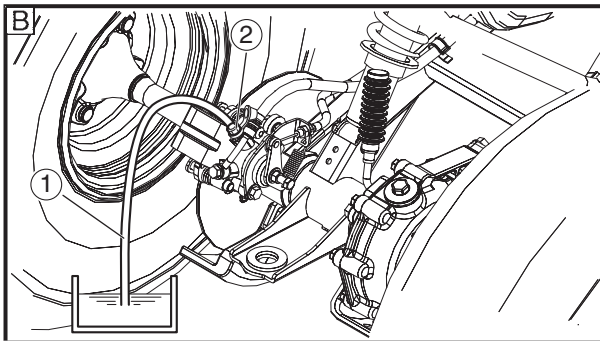
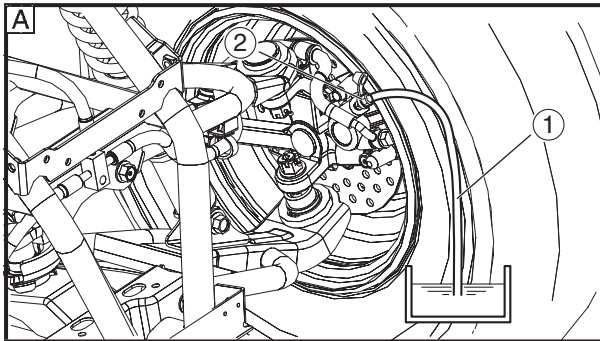
⚠ WARNING

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.

TIP

- 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.



1. 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 lever or brake pedal several times.
- f. Fully squeeze the brake lever or fully depress the brake pedal and hold it in position.
- g. Loosen the bleed screw.

TIP

Loosening the bleed screw will release the pressure and cause the brake lever to contact the 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.

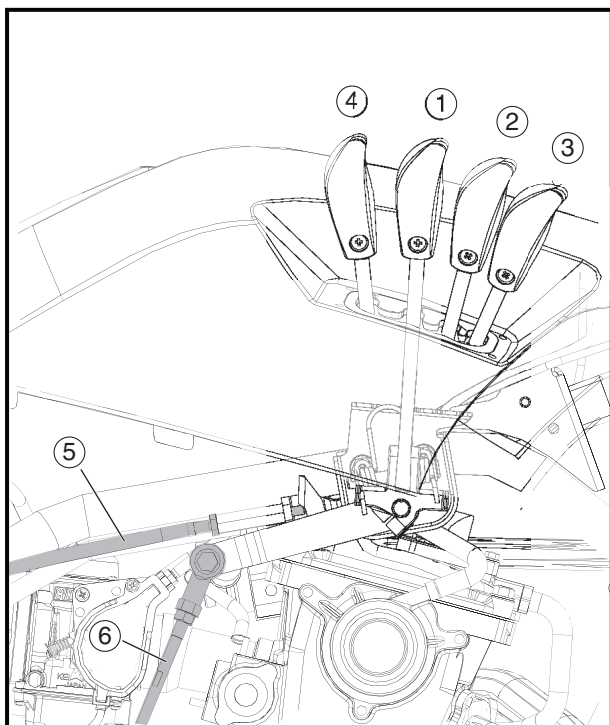


**Bleed screw:
7 Nm (0.7 m·kg, 5.1 ft·lb)**

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

⚠ WARNING

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



ADJUSTMENT THE SELECT LEVER CONTROL CABLE AND SHIFT ROD

- neutral ①
- high ②
- low ③
- reverse ④
- control cable ⑤
- select lever shift rod ⑥

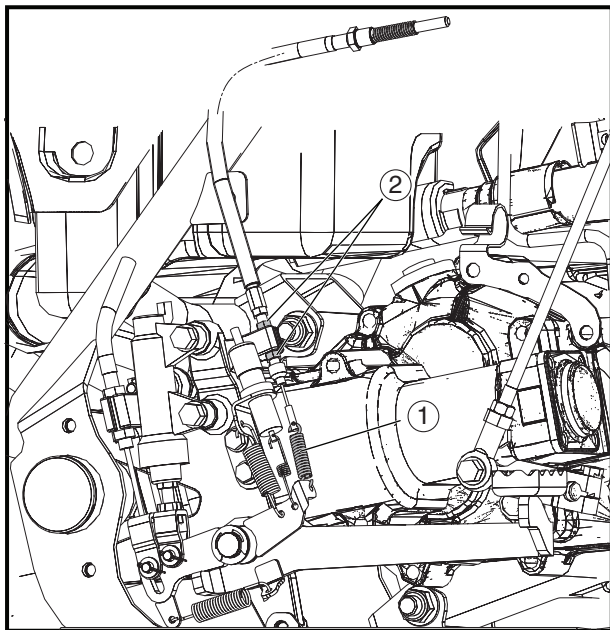
⚠ WARNING

Before moving the select lever, bring the machine to a complete stop and return the throttle lever to its closed position. Otherwise the transmission may be damaged.

- 1. Adjust:
 - rear brake pedal positionRefer to “ADJUSTING THE REAR PEDAL POSITION”.

- 2. Remove:
 - seat
 - right side cover
 - right footboard

Refer to “SEAT, SIDE COVERS AND FOOTREST BOARDS”.



3. Adjust:
- select lever control cable
 - select lever shift rod

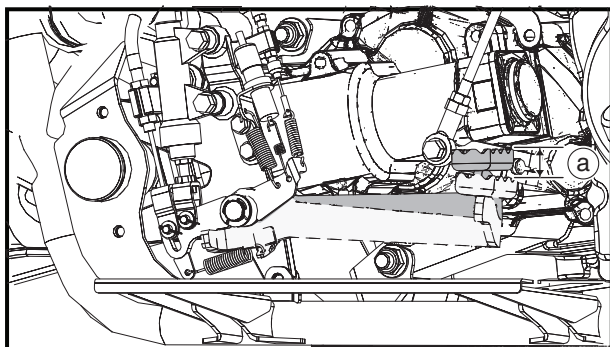
Select lever control cable and select lever shift rod adjustment steps:

Control cable:

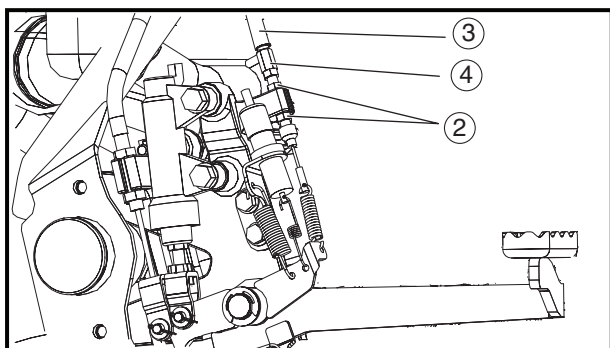
- Make sure the select lever is in NEUTRAL.
- Adjust the control cable so there is zero free play in the cable. When the adjustment is correct, slack in the return spring (1) will be taken up.

TIP

In some cases it will be necessary to further adjust the cable with the locknuts (2) arrangement that holds the cable to its mount.



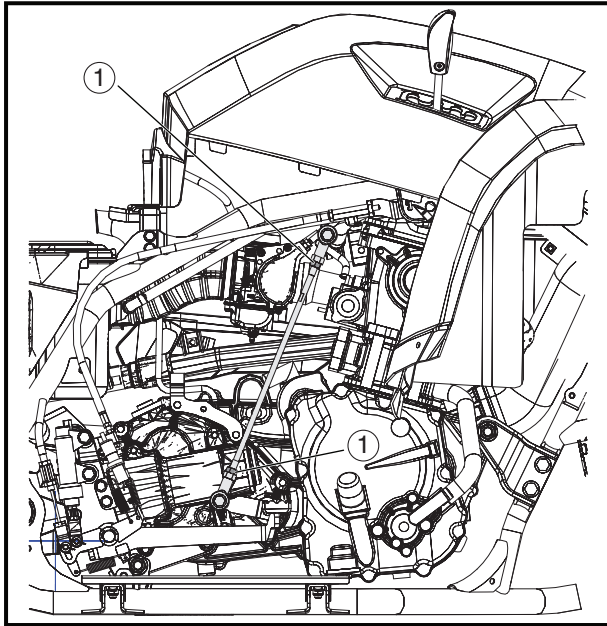
- When the brake begins to work “(a) = 20 ~ 30 mm (0.8 ~ 1.2 in)”, verify that the select lever can be shifted to REVERSE from NEUTRAL and to NEUTRAL from REVERSE.
- Before the brake begins to work “(a) = 0 ~ 20 mm (0 ~ 0.8 in)”, verify that the select lever cannot be shifted to REVERSE from NEUTRAL and to NEUTRAL from REVERSE.



- Check that locknuts (2) are tightened correctly.
- If the operation of the select lever is incorrect, adjust the select lever control cable (3) with the adjuster (4).

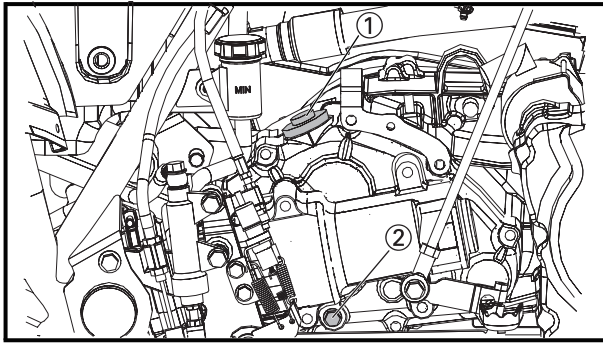
ADJUSTMENT THE SELECT LEVER CONTROL CABLE AND SHIFT ROD

CHK
ADJ




Select lever shift rod:

- g. Make sure the select lever is in NEUTRAL.
- h. Loosen both locknuts ① .
- i. Adjust the shift rod length for smooth and correct shifting.
- j. Tighten the locknuts ① .



CHANGING THE TRANSFER GEAR OIL

1. Place the machine on a level surface.
2. Place a receptacle under the transfer gear case.
3. Remove:
 - right footboard
 - right side cover
 - seat
4. Remove:
 - transfer gear filling bolt ①
 - transfer gear oil drain bolt ②
5. Drain:
 - transfer gear oil
6. Install:
 - transfer gear oil drain bolt

 **40 Nm (4.0 m·kgf, 28.9 ft·lbf)**

TIP

Check the gasket (drain bolt). If it is damaged, replace it with a new one.

7. Fill:
 - transfer gear case




Total amount
1.30 L (1.37 US qt) (1.14 Imp.qt)
Recommended oil
SAE 90 API GL-5 Hypoid gear oil

NOTICE

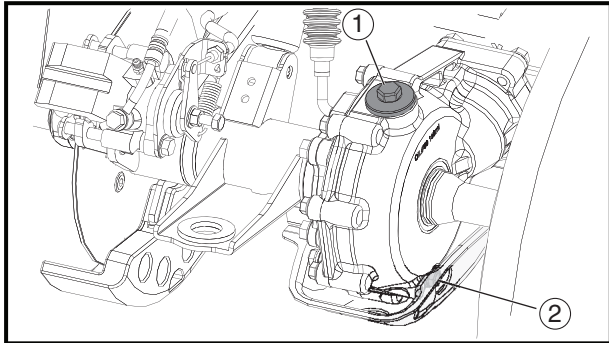
Take care not to allow foreign material to enter the transfer gear case.

8. Install:
 - transfer gear filling bolt

 **15 Nm (1.5 m·kg, 10.8 ft·lb)**

9. Install:
 - right footboard
 - right side cover
 - seat

Refer to “SEAT, SIDE COVERS AND FOOTREST BOARDS”.



CHANGING THE FINAL DRIVE GEAR OIL

1. Place the machine on a level surface.
2. Place a receptacle under the final gear case.

3. Remove:

- final drive gear filling bolt ①
- final drive gear oil drain bolt ②

4. Drain:

- final drive gear oil

5. Install:

- final drive gear oil drain bolt

30 Nm (3.0 m·kgf, 21.7 ft·lbf)

TIP

Check the gasket (drain bolt). If it is damaged, replace it with a new one.

6. Fill:

- final drive gear case



Total amount

0.15 L (0.16 US qt, 0.13 Imp.qt)

Recommended oil

SAE 80 API GL-4 Hypoid gear oil

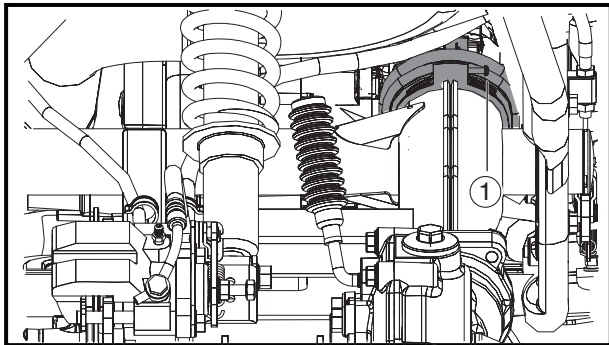
NOTICE

Take care not to allow foreign material to enter the final gear case.

7. Install:

- final drive gear filling bolt

15 Nm (1.5 m·kgf, 10.8 ft·lbf)



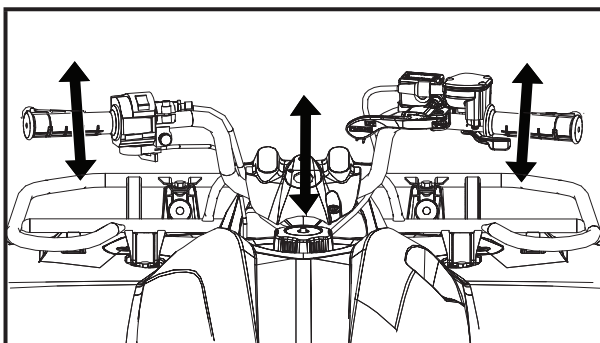
CHECKING THE REAR AXLE BOOT

1. Check:

- dust boots ①

Damage → Replace.

Refer to “DIFFERENTIAL GEAR AND CONSTANT VELOCITY JOINT” in CHAPTER 6.



CHECKING THE STEERING SYSTEM

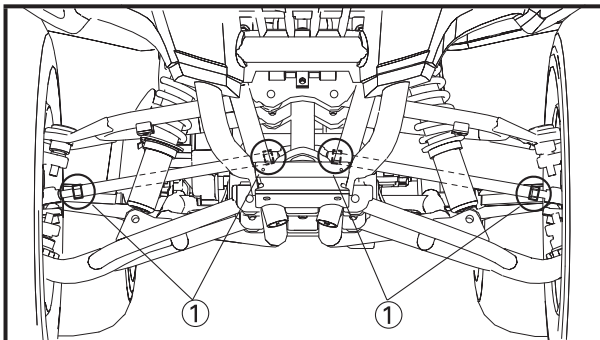
1. Place the machine on a level surface.

2. Check:

- steering assembly bushings

Move the handlebar up and down, and/or back and forth.

Excessive play → Replace the steering stem bushings.

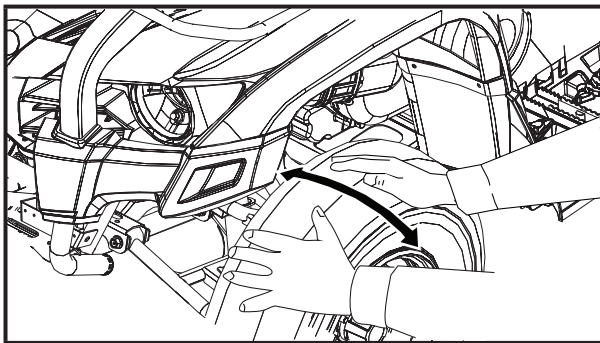


3. Check:

- tie-rod ends

Turn the handlebar to the left and right until it stops completely, and then move the handlebar slightly in the opposite direction.

Tie-rod end(s) ① have vertical play → Replace the tie-rod end(s).

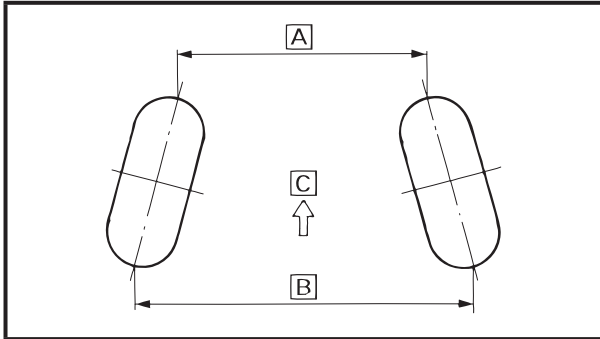
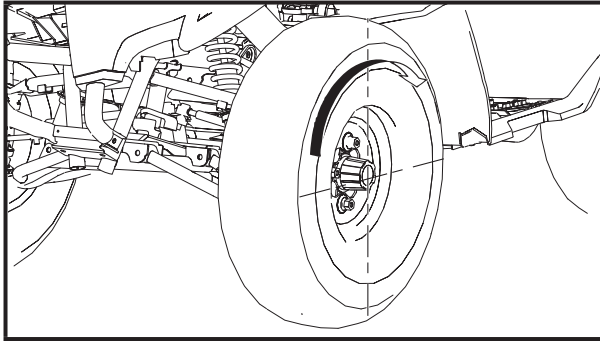


4. Raise the front end of the machine so that there is no weight on the front wheels.

5. Check:

- ball joints and/or wheel bearings

Move the wheels laterally back and forth. Excessive free play → Replace the front arms (upper and lower) and/or wheel bearings.



ADJUSTING THE TOE-IN

1. Place the machine on a level surface.
2. Measure:
 - toe-in
 Out of specification → Adjust.

Toe-in 15 mm (0.59 in)

TIP

Before measuring the toe-in, make sure that the tire pressure is correct.

- a. Mark both front tire tread centers.
- b. Face the handlebar straight ahead.
- c. Measure the width **A** between the marks.
- d. Rotate the front tires 180° until the marks are exactly opposite one another.
- e. Measure the width **B** between the marks.
- f. Calculate the toe-in using the formula given below.

$\text{Toe-in} = \text{B} - \text{A}$

- g. If the toe-in is incorrect, adjust it.
 - Forward

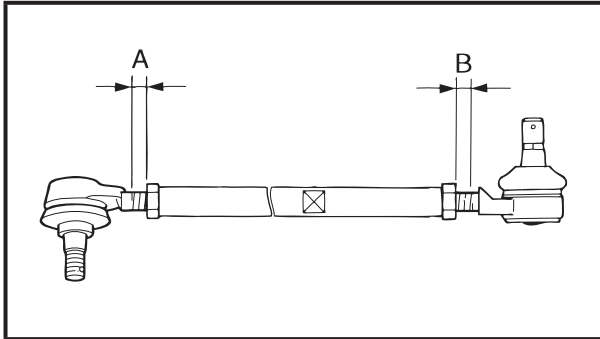
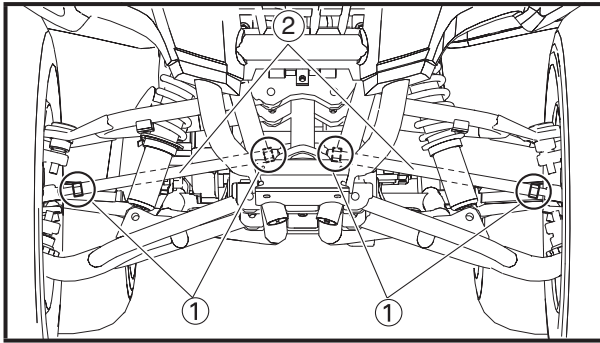
3. Adjust:
 - toe-in


⚠ WARNING

- Be sure that both tie-rods are turned the same amount. If not, the machine will drift right or left even though the handlebar is positioned straight. This may lead to mis-handling and an accident.
- After setting the toe-in to specification, run the machine slowly for some distance with both hands lightly holding the handlebar and check that the handlebar responds correctly. If not, turn either the right or left tie-rod within the toe-in specification.

ADJUSTING THE TOE-IN/CHECKING THE FRONT AND REAR SHOCK ABSORBERS

CHK
ADJ

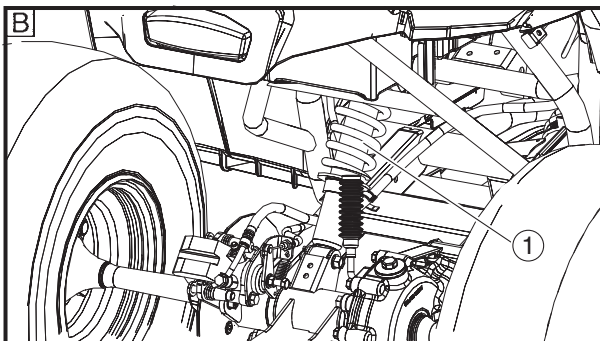
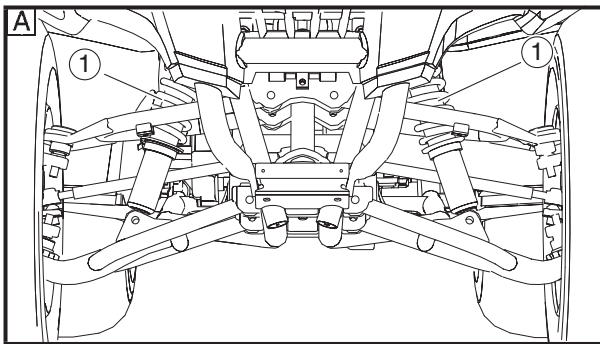


- Mark both tie-rod ends. This reference point will be needed during adjustment.
- Loosen the locknuts (tie-rod end) ① of both tie-rods.
- The same number of turns should be given to both the right and left tie-rods ② until the specified toe-in is obtained. This is to keep the length of the rods the same.
- Tighten the rod end locknuts of both tie-rods.  35 Nm (3.5 m·kg, 25.3 ft·lb)



TIP

Adjust the rod ends so that A and B are equal.

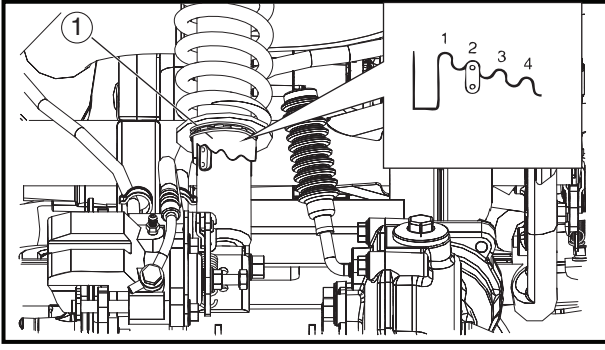
CHECKING THE FRONT AND REAR SHOCK ABSORBERS



- Place the machine on a level surface.
- Check:
 - damper rod ①
Bends/damage → Replace the front/rear shock absorber assembly.
 - oil leakage
Excessive oil leakage → Replace the front/rear shock absorber assembly.
 - cylinder
Damage → the front/rear shock absorber assembly.
 - spring
Fatigue → the front/rear shock absorber assembly.
Refer to “FRONT ARMS AND FRONT SHOCK ABSORBER ASSEMBLIES” and “REAR SHOCK ABSORBER AND SWINGARM” in chapter 8.
- Check:
 - operation
Pump the shock absorbers up and down for several times.
Unsmooth operation → Replace the front/rear shock absorber assembly.
Refer to “ADJUSTING THE REAR SHOCK ABSORBERS”.

-  Front shock absorber
 Rear shock absorber

ADJUSTMENT THE REAR SHOCK ABSORBER



1. Adjust:
 - Spring preload
Turn the adjuster ① to increase or decrease the spring preload.

TIP _____
The spring preload of the rear shock absorber can be adjusted to suit the rider's preference, weight, and the riding conditions.

Standard position: 2 Minimum (Soft) position: 1 Maximum (Hard) position: 4



CHECKING THE TIRES

WARNING

This model is equipped with low pressure tires. It is important that they be inflated correctly and maintained at the proper pressures.

- **TIRE CHARACTERISTICS**

- 1) Tire characteristics influence the handling of ATVs. The tires listed below have been approved by Yamaha Motor Co., Ltd. for this model. If other tire combinations are used, they can adversely affect your machine's handling characteristics and are therefore not recommended.

	Manufacturer	Size	Type
Front	MAXXIS	AT22 × 7-10	M919
Rear	MAXXIS	AT22 × 10-9	M920

- **TIRE PRESSURE**

- 1) Recommended tire pressure
Front 30.0 kPa (0.300 kgf/cm², 4.4 psi)
Rear 25.0 kPa (0.250 kgf/cm², 3.6 psi)
- 2) Tire pressure below the minimum specification could cause the tire to dislodge from the rim under severe riding conditions.

The following are minimums:

Front 27.0 kPa (0.270 kgf/cm², 4.0 psi)

Rear 22.0 kPa (0.220 kgf/cm², 3.2 psi)

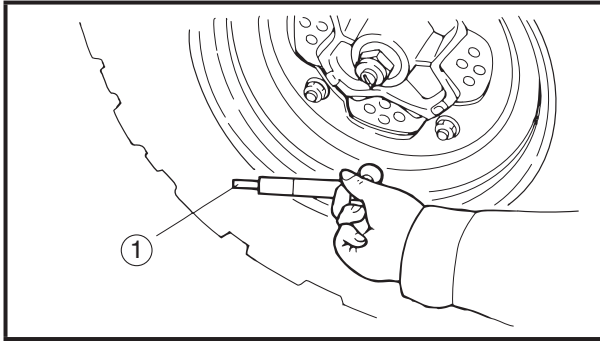
- 3) Use no more than
Front 250 kPa (2.6 kg/cm², 36 psi)
Rear 250 kPa (2.6 kg/cm², 36 psi)
when seating the tire beads. Higher pressures may cause the tire to burst. Inflate the tires slowly and carefully. Fast inflation could cause the tire to burst.

- **MAXIMUM LOADING LIMIT**

- 1) Vehicle load limits: 155.0 kg (342 lb)

*Total weight of the cargo, rider, and accessories.

Be extra careful of the machine balance and stability when towing a trailer.



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

TIP

- The low-pressure tire gauge ① is included as standard equipment.
- If dust or the like is stuck to this gauge, it will not provide the correct readings. Therefore, take two measurements of the tire's pressure and use the second reading.

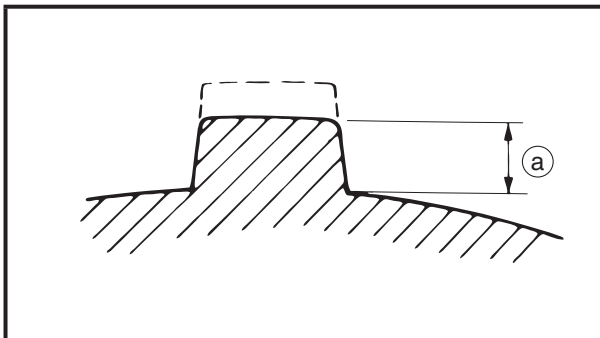
Cold tire pressure	Front	Rear
Standard	30.0 kPa (0.300 kgf/cm ² , 4.4 psi)	25.0 kPa (0.250 kgf/cm ² , 3.6 psi)
Minimum	27.0 kPa (0.270 kgf/cm ² , 4.0 psi)	22.0 kPa (0.220 kgf/cm ² , 3.2 psi)
Maximum	33.0 kPa (0.330 kgf/cm ² , 4.8 psi)	28.0 kPa (0.280 kgf/cm ² , 4.1 psi)

⚠ WARNING

Uneven or improper tire pressure may adversely affect the handling of this machine and may cause loss of control.

- Maintain proper tire pressures.
- Set tire pressures when the tires are cold.
- Tire pressures must be equal in both front tires and equal in both rear tires.

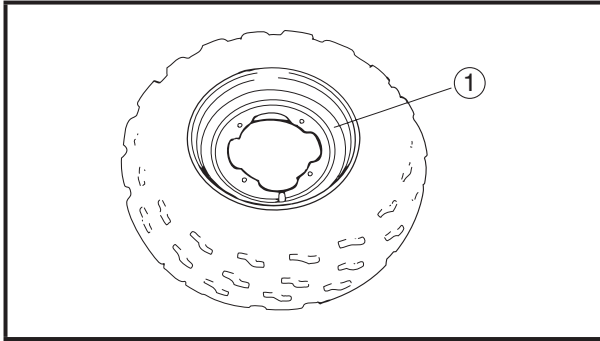
2. Check:
 - tire surfaces
 - Wear/damage → Replace.



Tire wear limit ② Front and rear: 3.0 mm (0.12 in)

⚠ WARNING

It is dangerous to ride with a worn-out tire. When tire wear is out of specification, replace the tire immediately.



CHECKING THE WHEELS

1. Check:
 - wheel ①
Damage → Replace.

TIP

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

⚠ WARNING

- Never attempt even small repairs to the wheel.
- Ride conservatively after installing a tire to allow it to seat itself properly on the rim.

CHECKING AND LUBRICATING THE CABLES

⚠ WARNING

A damaged cable sheath may cause corrosion and interfere with the cable movement. An unsafe condition may result so replace a damaged cable as soon as possible.

1. Check:
 - cable sheath
Damage → Replace.
2. Check:
 - cable operation
Unsmooth operation → Lubricate or replace.



Recommended lubricant
Yamaha chain and cable lube or engine oil

TIP

Hold the cable end up and apply several drops of lubricant to the cable.

3. Apply:
 - Lithium-soap-based grease
(onto end of the cable)



LUBRICATING THE LEVERS AND PEDALS

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



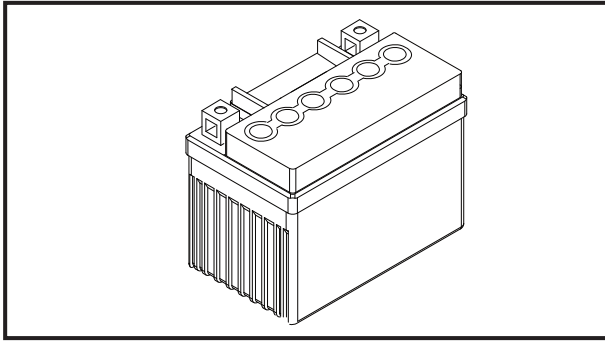
Recommended lubricants

Brake lever

Silicone grease

Clutch lever and brake pedal

Lithium-soap-based grease



ELECTRICAL SYSTEM

CHECKING AND CHARGING THE BATTERY

⚠ WARNING

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

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

FIRST AID IN CASE OF BODILY CONTACT: EXTERNAL

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

INTERNAL

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

NOTICE

- 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 VRLA (Valve Regulated Lead Acid) battery are different from those of conventional batteries. The VRLA (Valve Regulated Lead Acid) 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.



TIP

Since VRLA (Valve Regulated Lead Acid) 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:

- seat
- battery holding plate

Refer to “SEAT, FENDERS AND FUEL TANK”.

2. Disconnect:

- battery leads
(from the battery terminals)

NOTICE

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

3. Remove:

- battery

4. Check:

- battery charge

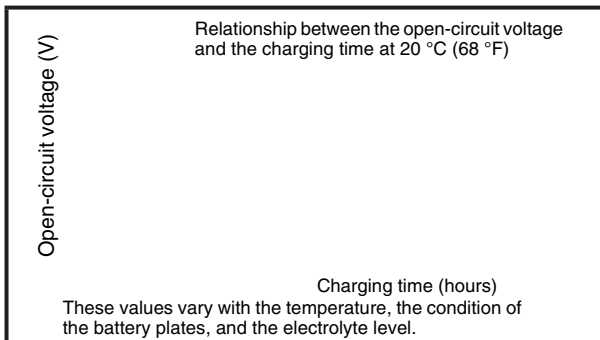
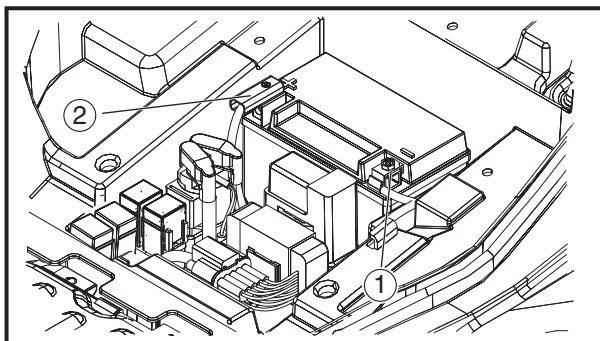
- a. Connect a pocket tester to the battery terminals.

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

TIP

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

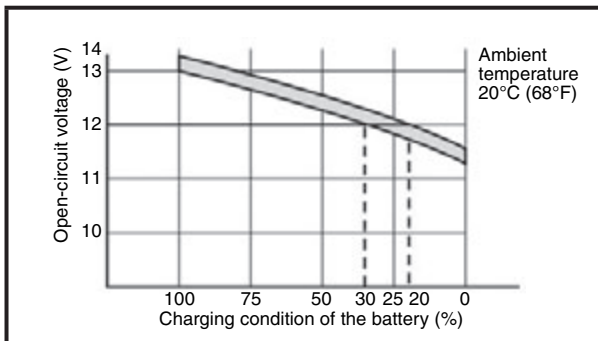
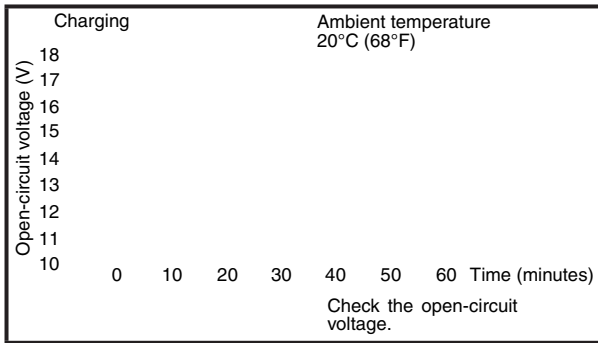
- b. Check the charge of the battery, as shown in the charts and the following example.





Example

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



5. Charge:

- battery (refer to the appropriate charging method illustration)

WARNING

Do not quick charge a battery.

NOTICE

- Never remove the VRLA (Valve Regulated Lead Acid) 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 machine. (If charging has to be done with the battery mounted on the machine, 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 VRLA (Valve Regulated Lead Acid) battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.
-

Charging method using a variable-current (voltage) charger

Charger

Ammeter

Measure the open-circuit voltage prior to charging.

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

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

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

YES

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

NO

Adjust the charging voltage to 20 ~ 25 V.

Adjust the voltage to obtain the standard charging amperage.

YES

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

NO

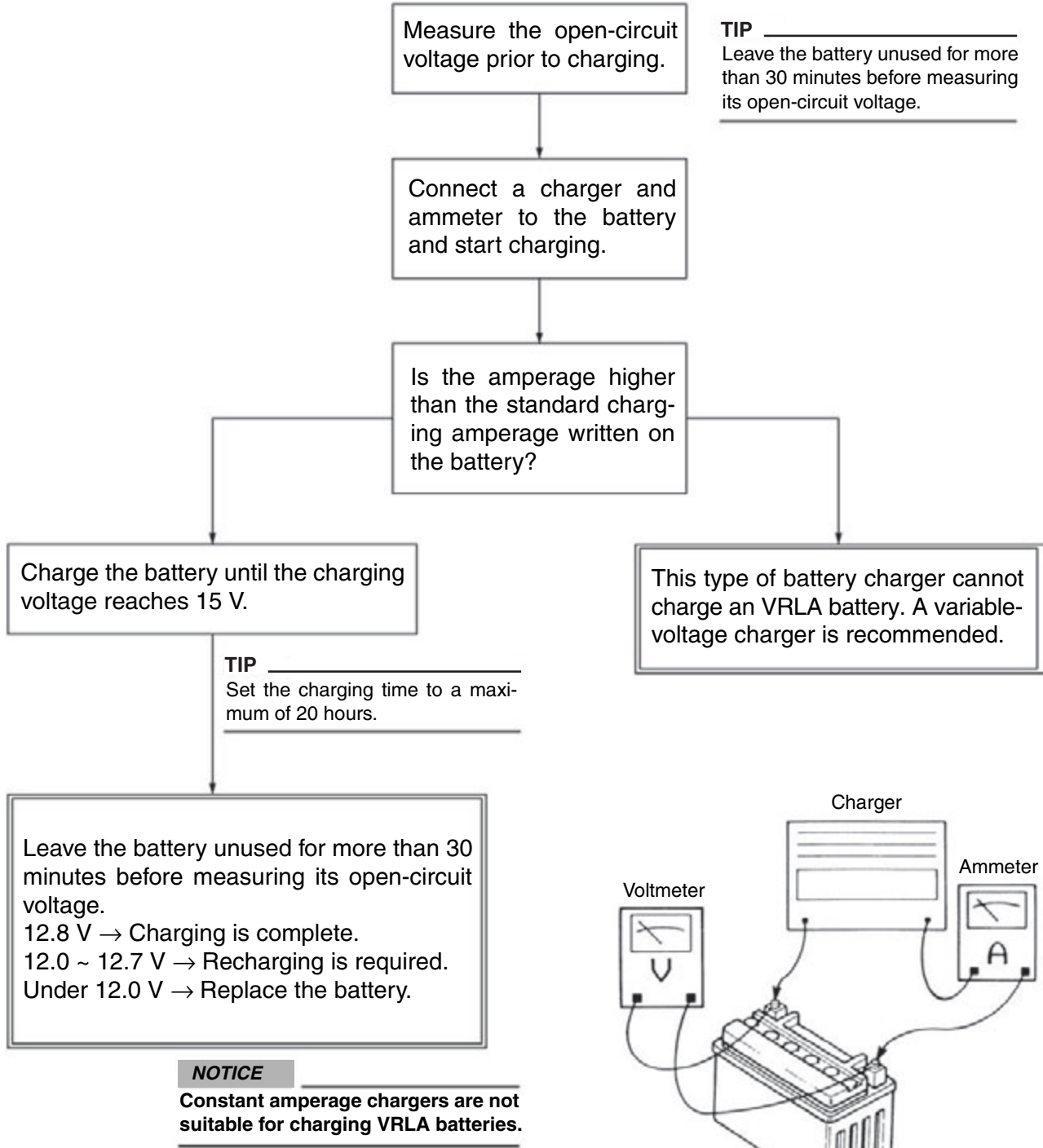
Set the timer to the charging time determined by the open-circuit voltage.
 Refer to "CHECKING AND CHARGING THE BATTERY".

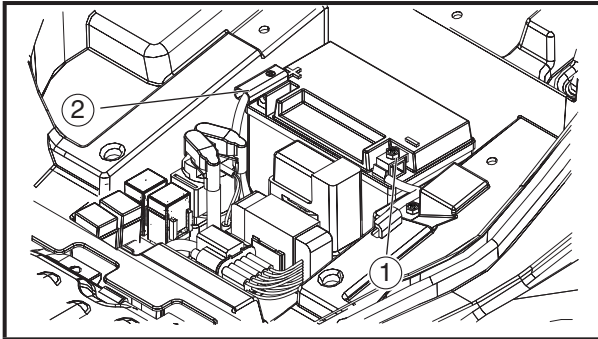
If the amperage does not exceed the standard charging amperage after 5 minutes, replace the battery.

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

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

Charging method using a constant voltage charger





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

NOTICE

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 holding plate
 - seat
Refer to “SEAT, FENDERS AND FUEL TANK”.

**CHECKING THE FUSES**

The following procedure applies to all of the fuses.

NOTICE

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

1. Remove:

- seat

Refer to “SEAT, FENDERS AND FUEL TANK”.

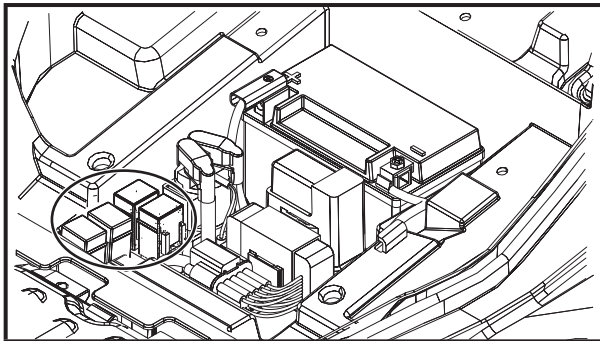
2. Check:

- fuse

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

TIP

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



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

- If the pocket tester indicates “ ∞ ”, replace the fuse.

3. Replace:

- blown fuse

- Set the main switch to “OFF”.
- Install a new fuse of the correct amperage.
- Set on the switches to verify if the electrical circuit is operational.
- If the fuse immediately blows again, check the electrical circuit.



Items	Amperage rating	Q'ty
Main fuse	30.0 A	1
Fan fuse	10.0 A	1
Ignition fuse	10.0 A	1
Headlight fuse	10.0 A	1
Signaling system fuse	10.0 A	1

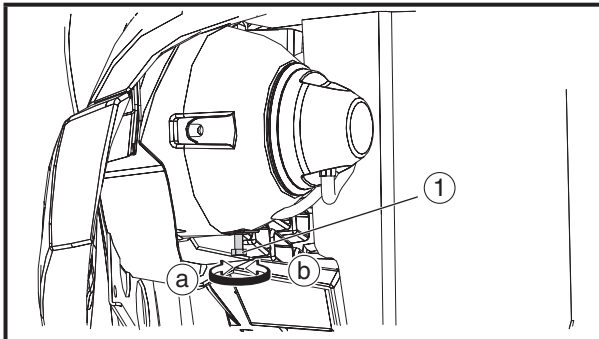
⚠ WARNING

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.

4. Install:

- battery cover
- seat

Refer to “SEAT, FENDERS AND FUEL TANK”.



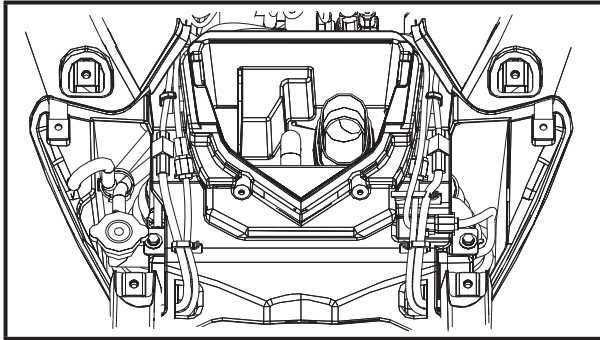
ADJUSTING THE HEADLIGHT BEAM

1. Adjust:

- headlight beam (vertically)

a. Turn the adjusting bolt ① in direction ② or ③.

Direction ②	Headlight beam is raised.
Direction ③	Headlight beam is lowered.

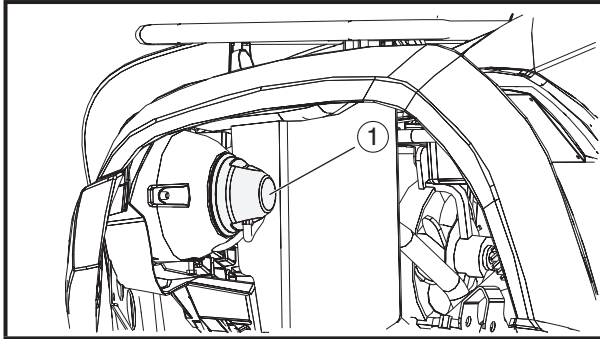


REPLACING A HEADLIGHT BULB

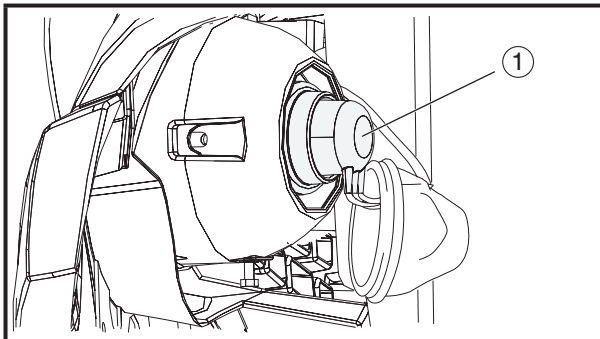
1. Remove:
 - Front carrier
 - Front fender panel

Refer to "FRONT CARRIER, FRONT BUMPER AND FRONT FENDER".

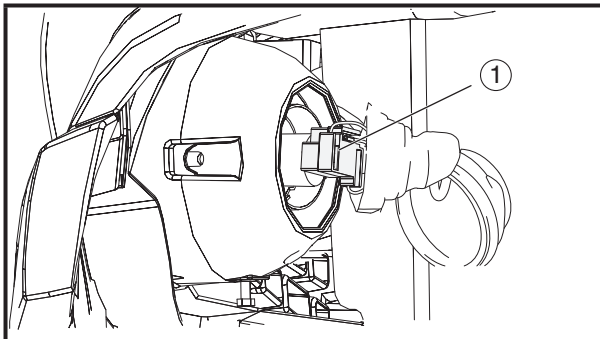
2. Disconnect:
 - headlight lead coupler ①



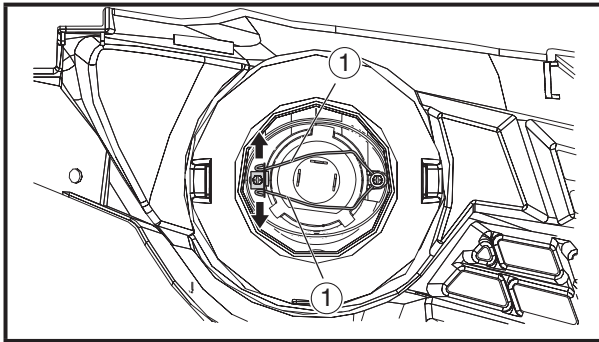
3. Remove:
 - cover ①



4. Remove:
 - headlight bulb holder cover ①



5. Remove:
 - connector ①



6. Remove:
- Headlight bulb holder ①
 - bulb

TIP

Push the headlight bulb holder inward, pull it outward and remove the defective bulb.

⚠ WARNING

Keep flammable products and your hands away from the bulb while it is on, since it will be hot. Do not touch the bulb until it cools down.

7. Install:

- bulb **New**
Secure the new bulb with the headlight unit.

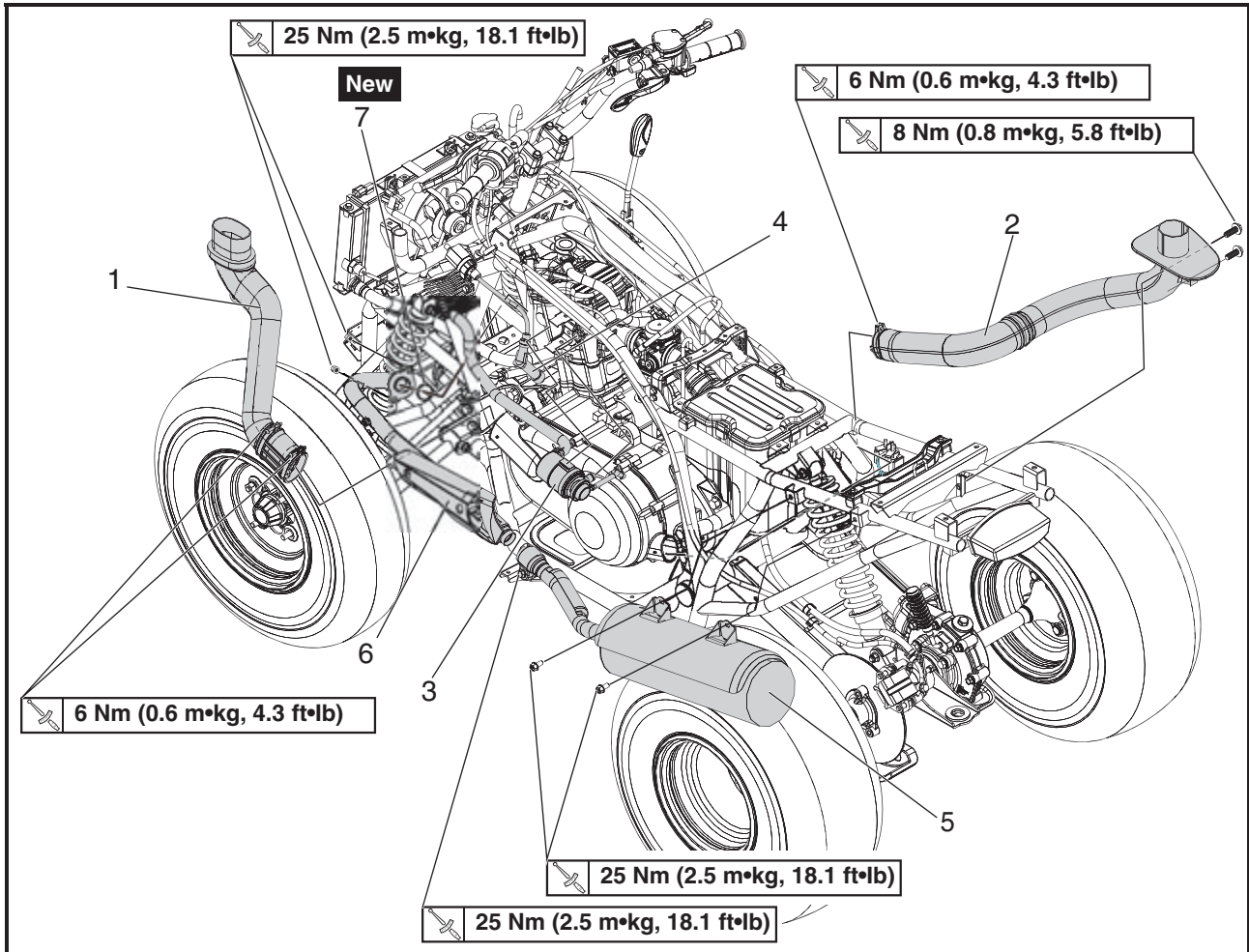
NOTICE

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

ENGINE

ENGINE REMOVAL

AIR DUCTS, A.I.C.V., MUFFLER AND EXHAUST PIPE



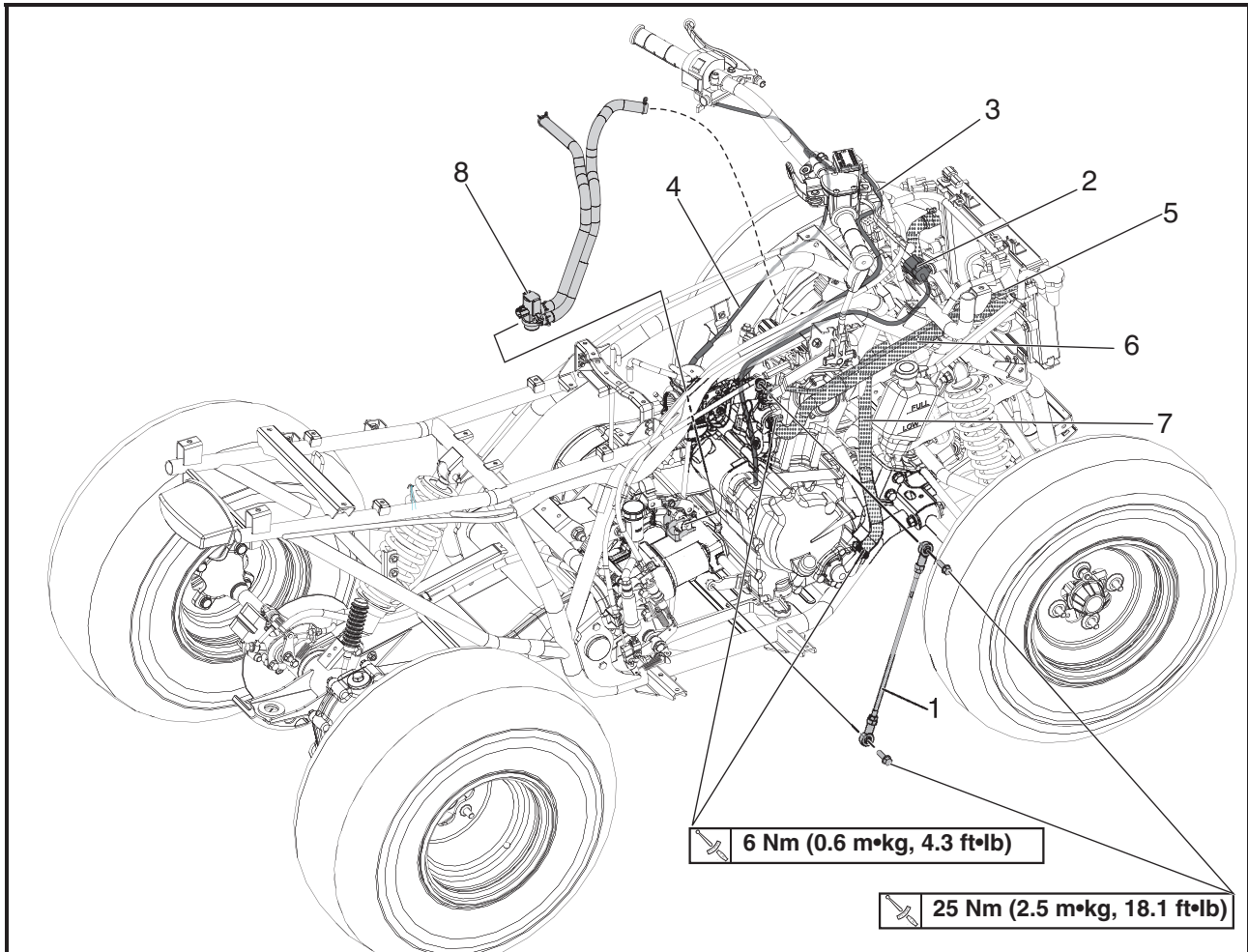
4

Order	Job/Parts to remove	Q'ty	Remarks
	Removing the air ducts, A.I.C.V., muffler and exhaust pipe Seat, side covers and footrest boards Front carrier, front bumper and front fender Rear fender and air fillter case Fuel tank		Remove the parts in the order listed.
			Refer to "SEAT, FENDERS AND FUEL TANK" in chapter 3.
1	Air duct assembly 1	1	
2	Air duct assembly 2	1	
3	A.I.C.V. assembly	1	
4	Spark plug lead	1	
5	Muffler	1	
6	Exhaust pipe	1	
7	Gasket	1	
			For installation, reverse the removal procedure.

ENGINE

ENGINE REMOVAL

SELECT LEVER SHIFT ROD, CABLES, LEAD AND HOSES

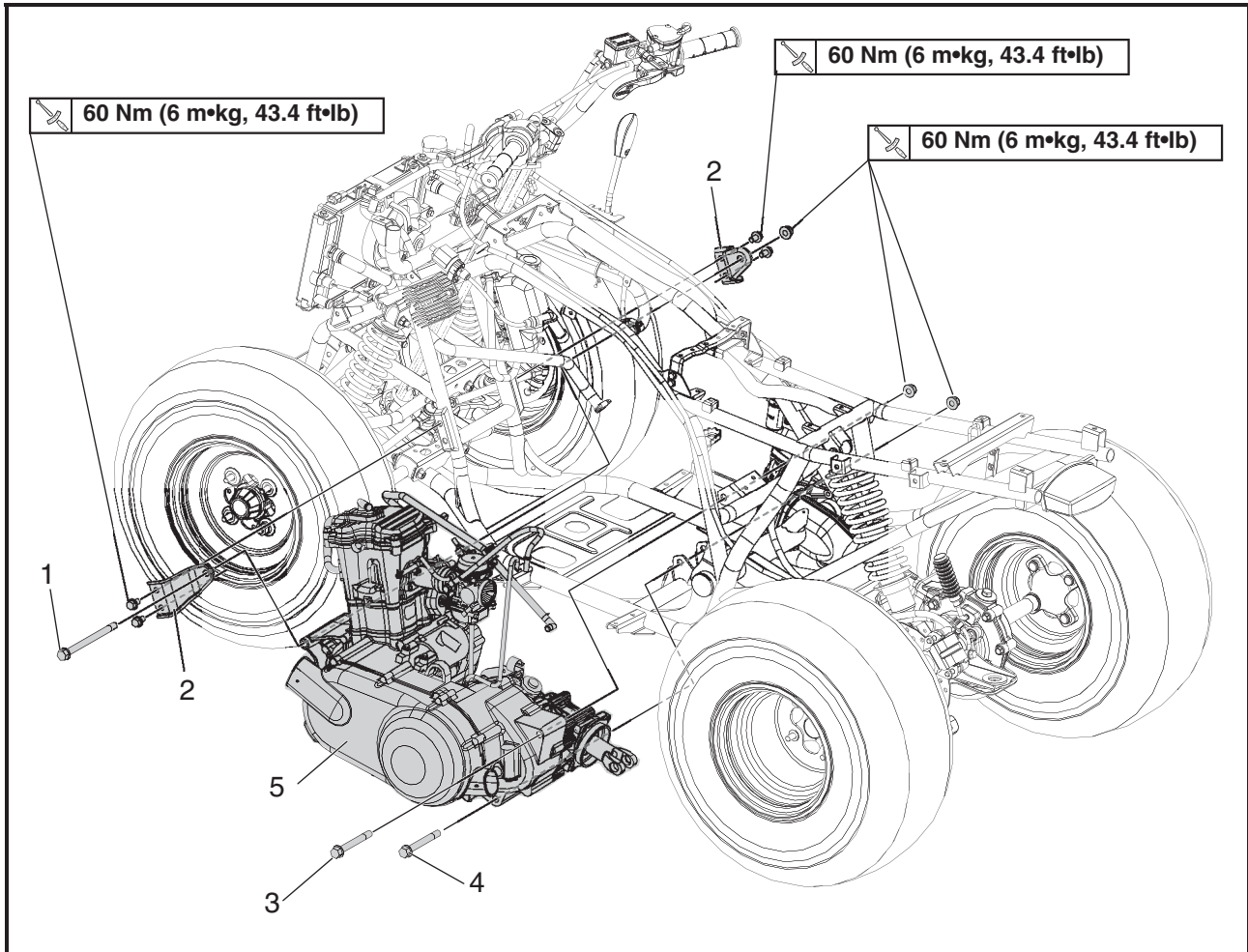


4

Order	Job/Parts to remove	Q'ty	Remarks
	Removing the elect lever shift rod, cables, lead and hoses. Seat, side covers and footrest boards Front carrier, front bumper and front fender Rear fender and air fillter case Fuel tank		Remove the parts in the order listed. Refer to "SEAT, FENDERS AND FUEL TANK" in chapter 3.
1	Select lever shift rod	1	
2	AC magneto coupler	1	Disconnect.
3	Throttle cable	1	
4	Starter cable	1	
5	Coolant reservoir hose	1	Disconnect.
6	Radiator inlet hose	1	Disconnect.
7	Radiator outlet hose	1	Disconnect.
8	A.I.C.V. valve assembly	1	Disconnect.
			For installation, reverse the removal procedure.

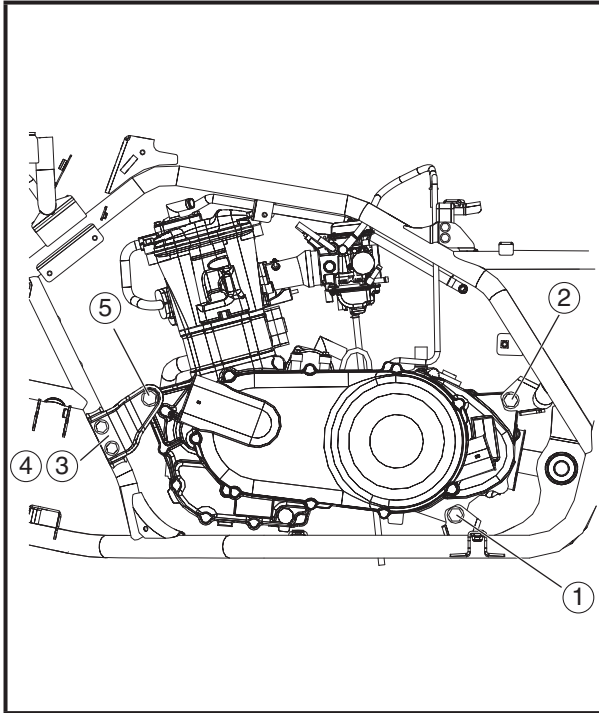
ENGINE

ENGINE MOUNTING BOLTS



4

Order	Job/Parts to remove	Q'ty	Remarks
	Removing the engine mounting bolts		Remove the parts in the order listed.
1	Engine mounting bolt (front)	1	
2	Engine bracket (L/R)	1/1	
3	Engine mounting bolt (rear upper)	1	
4	Engine mounting bolt (rear lower)	1	
5	Engine assembly	1	
			For installation, reverse the removal procedure.

**INSTALLING THE ENGINE**

1. Install:

- Engine mounting bolt (rear lower side) ①
- Engine mounting bolt (rear upper side) ②
- Engine brackets (front side) ③ ④
- Engine mounting bolt (front side) ⑤

TIP

- The direction of the bolt insertion is made from the right side of the body.
- Do not fully tighten the bolts and nuts.

2. Tighten:

- Engine mounting nut (rear lower side) ①
- Engine mounting nut (rear upper side) ②
- Engine mounting nut (front side) ⑤
- Engine bracket bolts (front side)

Engine mounting nut (rear lower side)

60 Nm (6.0 m•kg, 43.4 ft•lb)

Engine mounting nut (rear upper side)

60 Nm (6.0 m•kg, 43.4 ft•lb)

Engine mounting nut (front side)

60 Nm (6.0 m•kg, 43.4 ft•lb)

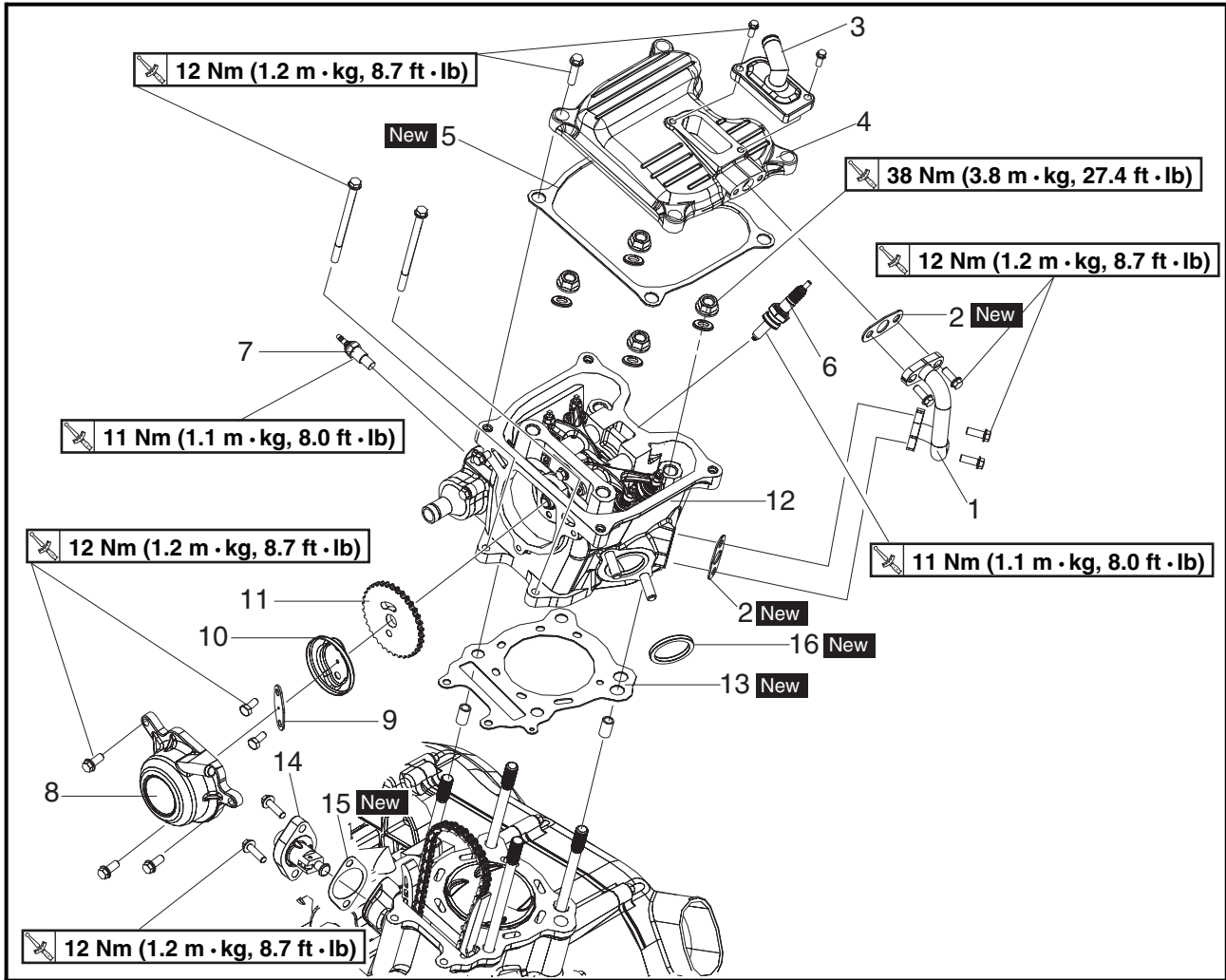
Engine bracket bolt (M10)

60 Nm (6.0 m•kg, 43.4 ft•lb)

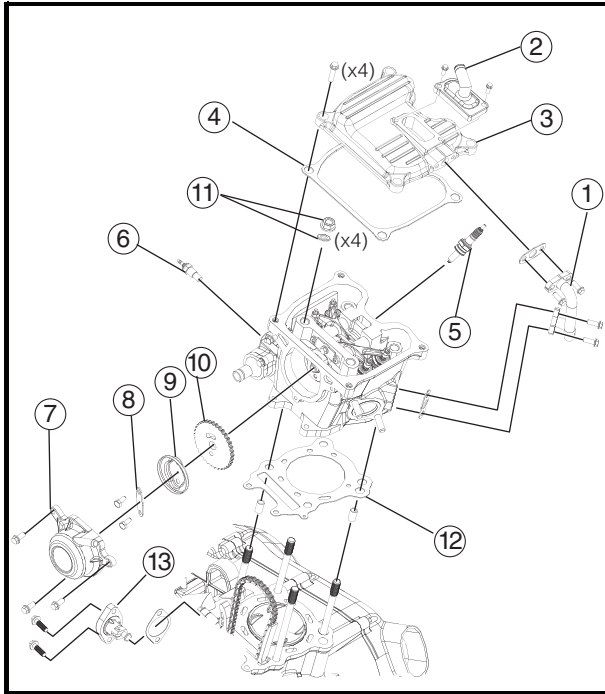


EBS00218

CYLINDER HEAD



Order	Job/Part	Q'ty	Remarks
	Removing the cylinder head		
	Carburetor assembly		Remove the parts in the order listed.
	Exhaust pipe/muffler		Refer to "CARBURETOR" in chapter 5.
			Refer to "ENGINE".
1	Pipe	1	
2	air pipe gasket	2	
3	Reed valve assembly	1	
4	Cylinder head cover	1	
5	Head cover gasket	1	
6	Spark plug	1	
7	Therm unit	1	
8	Breather assembly	1	
9	Bolt stopper plate	1	
10	Breather plate	1	
11	Sprocket	1	
12	Cylinder head	1	
13	Cylinder head gasket	1	
14	Timing chain tensioner	1	
15	gasket	1	
16	exhaust pipe gasket	1	For installation, reverse the removal procedure.



REMOVING THE CYLINDER HEAD

1. Remove:

- pipe ①
- reed pipe assy. ②
- cylinder head cover ③
- head cover gasket ④
- spark plug ⑤
- therm unit ⑥
- breather assy. ⑦
- bolt stopper plate ⑧

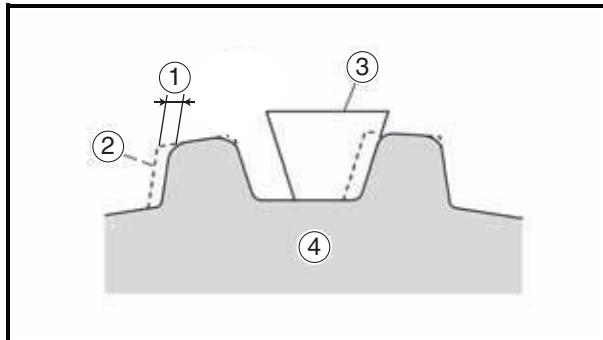
TIP

Working in a crisscross pattern, loosen each nut 1/4 of a turn.

- breather plate ⑨
- sprocket ⑩
- holding nut/ sealing washer ⑪
- cylinder head gasket ⑫
- timing chain tensioner ⑬

TIP

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



CHECKING THE CAMSHAFT SPROCKET AND THE TIMING CHAIN TENSIONER

1. Check:

- camshaft sprocket
More than 1/4 tooth wear ① → Replace the cam shaft comp. and timing chain as a set.

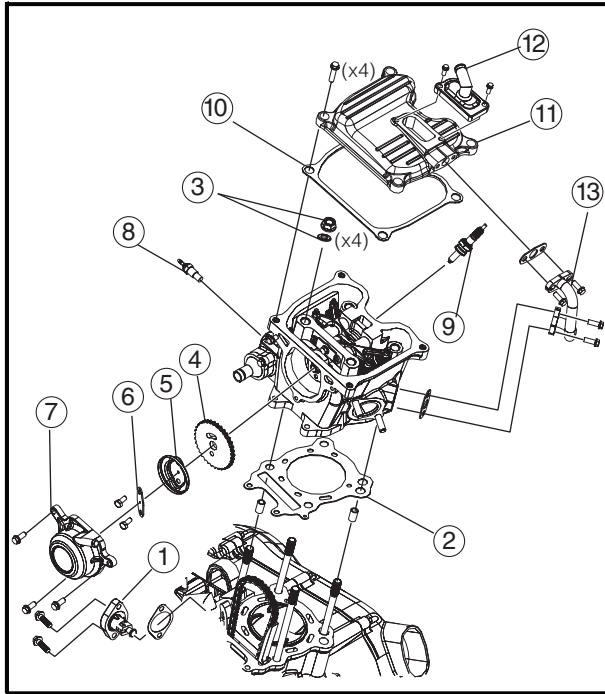
- ① 1/4 of a tooth
- ② correct
- ③ roller
- ④ sprocket

2. Check:

- timing chain tensioner
Cracks/damage → Replace.



INSTALLING THE CYLINDER HEAD

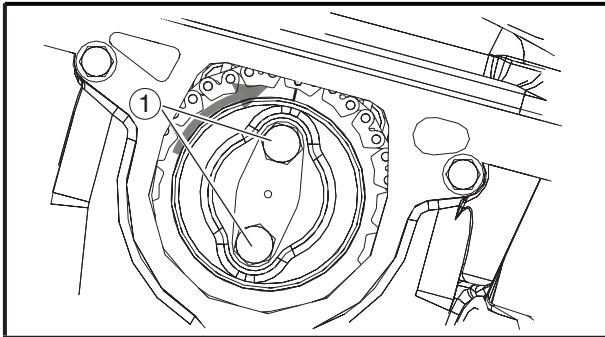


1. Install:

- timing chain tensioner ①
- cylinder head gasket ②
- holding nut/ sealing washer ③
- sprocket ④
- breather plate ⑤
- bolt stopper plate ⑥
- breather assy. ⑦
- therm unit ⑧
- spark plug ⑨
- head cover gasket ⑩
- cylinder head cover ⑪
- reed pipe assy. ⑫
- pipe ⑬

TIP

Tighten the nuts in two stages and a crisscross pattern.



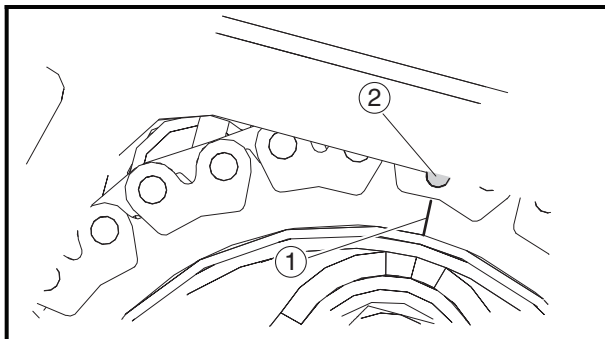
2. Install:

- camshaft sprocket

a. Turn camshaft bolt ① in clockwise direction.

TIP

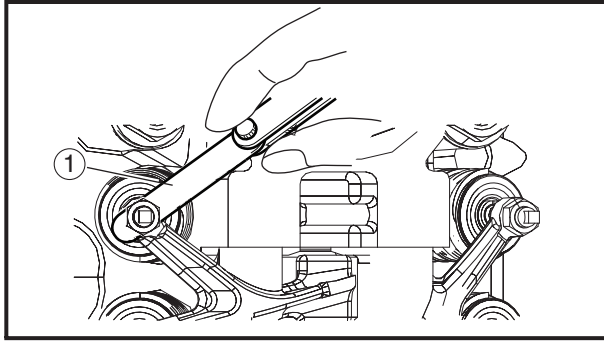
Do not turn the bolt in Counterclockwise direction to prevent from camshaft bolt looseness.



b. Align the "I" mark ① on the camshaft sprocket with the stationary pointer ② on the cylinder head. When the "I" mark is aligned with the stationary pointer, the piston is at the Top Dead Center (TDC) on the compression stroke.

TIP

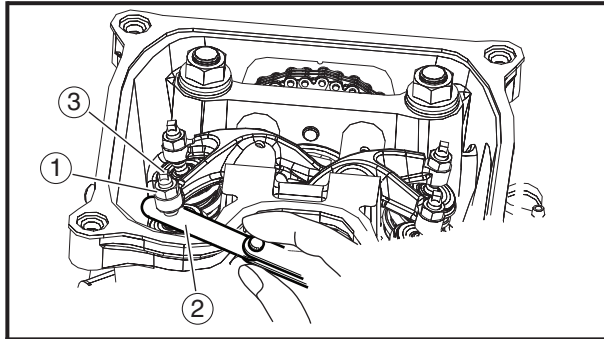
- When the piston is at the Top Dead Center (TDC) on the compression stroke, there should be clearance between the valve stem tips and their respective adjusting screws.



- c. Measure the valve clearance with a thickness gauge (1).
Out of specification → Adjust.



Thickness gauge
90890-03079
Narrow gauge set
YM-34483



3. Adjust:
• valve clearance

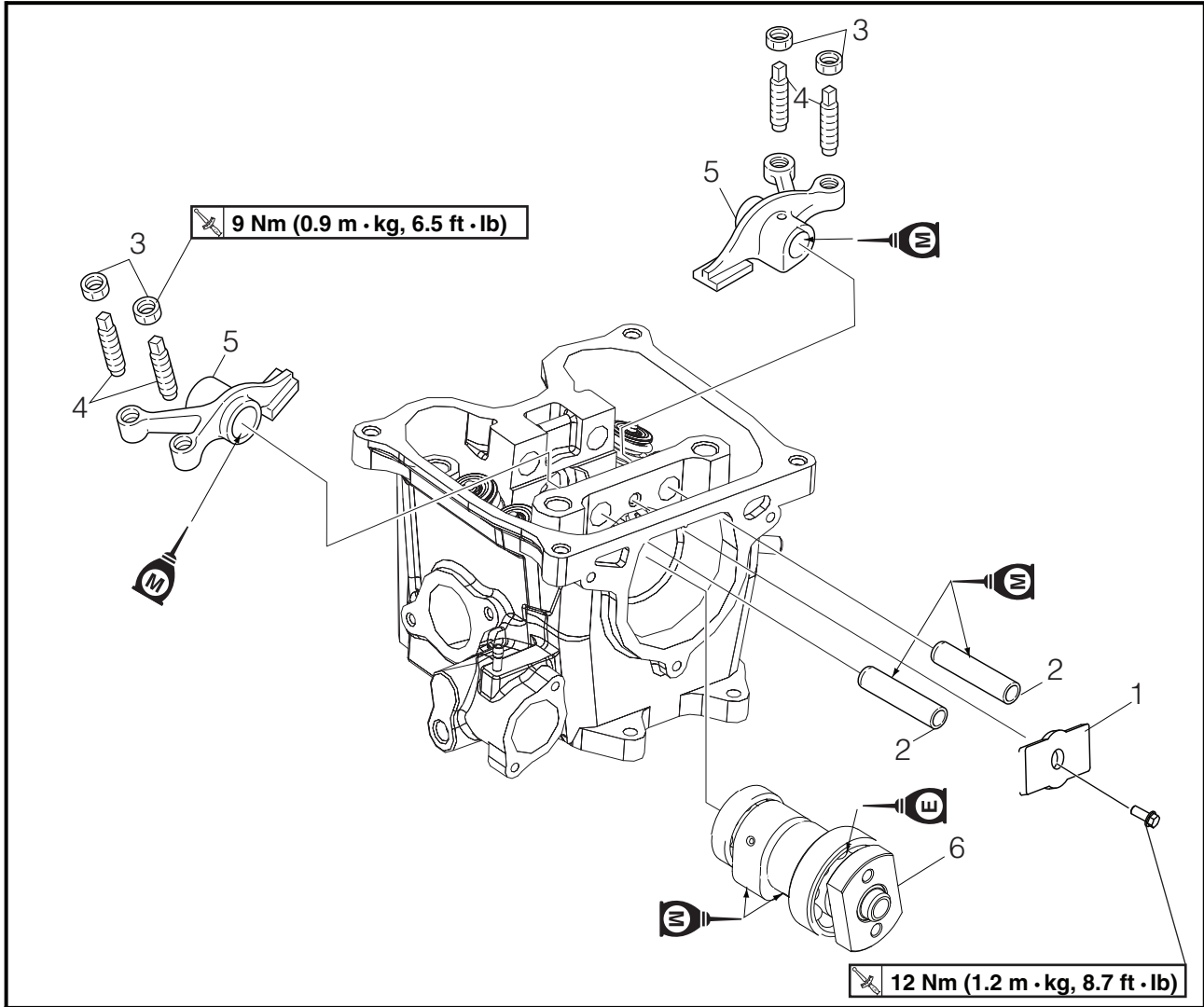
- a. Loosen the locknut (1).
- b. Insert a thickness gauge (2) between the adjuster end and the valve end.
- c. Turn the adjuster (3) clockwise or counterclockwise with the tappet adjusting tool until the proper clearance is obtained.



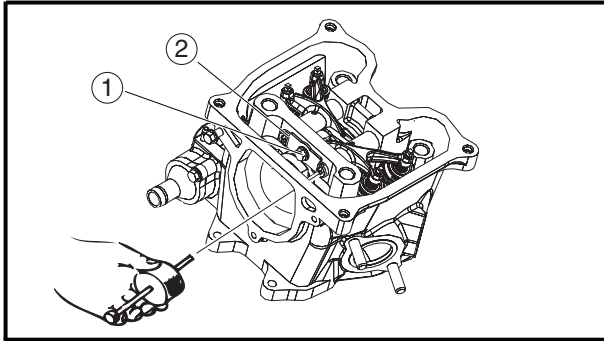
Tappet adjusting tool
90890-01311
Six piece tappet set
YM-A5970



ROCKER ARMS AND CAMSHAFT



Order	Job/Part	Q'ty	Remarks
	Removing the camshaft and rocker arms		Remove the parts in the order listed.
	Cylinder head		Refer to "CYLINDER HEAD".
1	Plate	1	Refer to "REMOVING THE ROCKER ARMS AND CAMSHAFT" and "INSTALLING THE CAMSHAFT AND ROCKER ARMS".
2	Rocker arm shaft	4	
3	Locknut	4	
4	Valve adjusting screw	4	
5	Rocker arm	2	
6	Camshaft	1	
			For installation, reverse the removal procedure.

**REMOVING THE ROCKER ARMS AND CAMSHAFT**

1. Loosen:
 - bolt ①
2. Remove:
 - plate ②
 - intake rocker arm shaft
 - exhaust rocker arm shaft
 - intake rocker arm
 - exhaust rocker arm

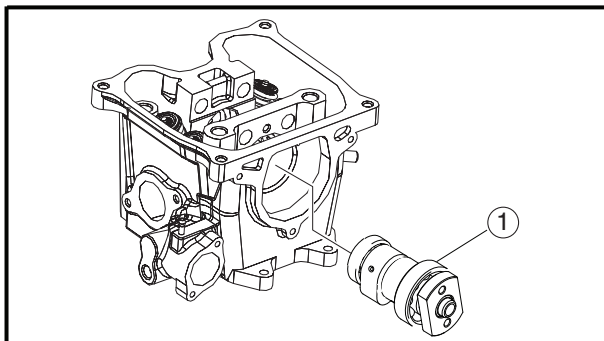
TIP

Remove the rocker arm shafts with a hammer bolt and weight.

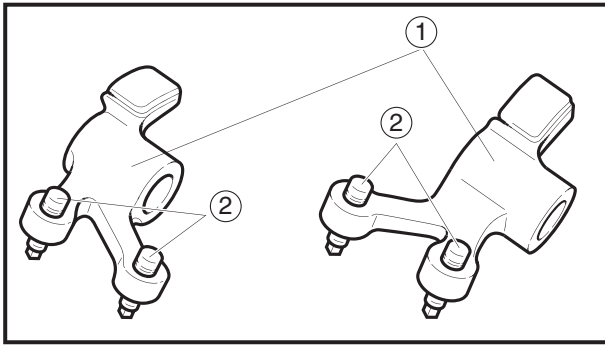


Slide hammer bolt (M5)
P/N. 90890-04158
YM-04158

Weight
P/N. 90890-01084
YU-01083-3



3. Remove:
 - Camshaft comp. ①

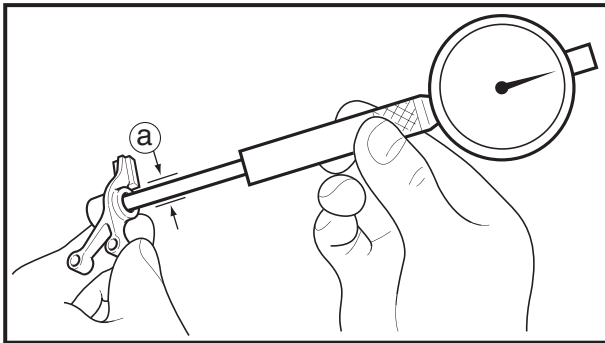


EAS00206

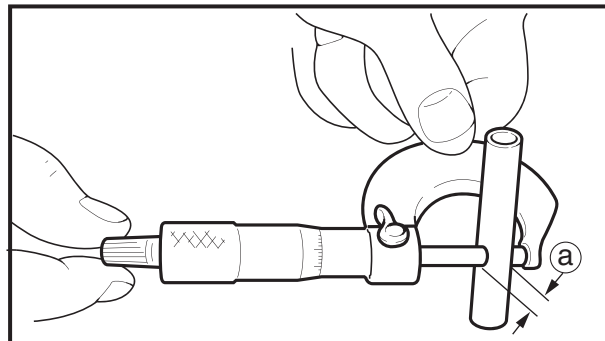
CHECKING THE ROCKER ARMS AND ROCKER ARM SHAFTS

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 ③
Out of specification → Replace.



Rocker arm inside diameter
11.982~12.000 mm (0.4717~0.4724 in)
<Limit>: 12.080mm (0.4756 in)



4. Measure:
 - rocker arm shaft outside diameter ④
Out of specification → Replace.

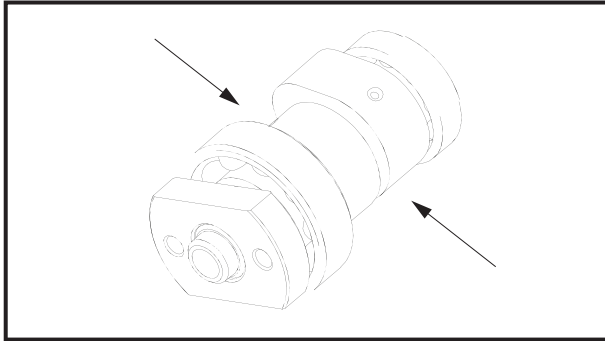
Rocker arm shaft outside diameter
11.996~11.984 mm (0.4723~0.4718 in)
<Limit>: 11.936 mm (0.4699 in)

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.

Above 0.034 mm(0.001 in) → Replace the defective part(s).

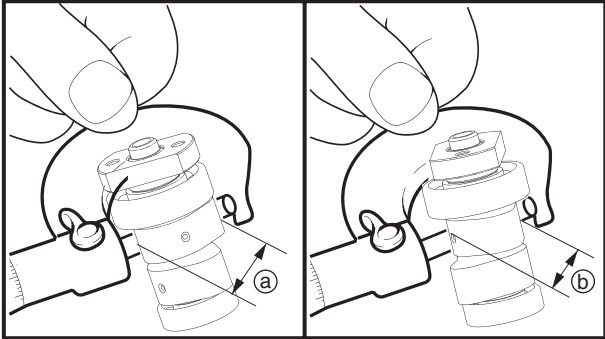
Rocker-arm-to-rocker-arm-shaft clearance
0.016 mm (0.0006 in)
<Limit>: 0.144 mm (0.0057 in)



EAS00205

CHECKING THE CAMSHAFT

1. Check:
 - camshaft bushings
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.



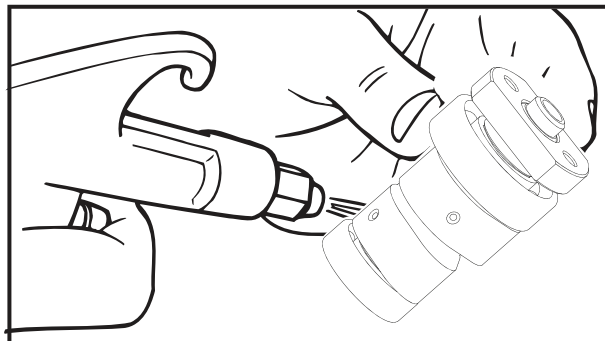
Camshaft lobe dimension limit

Intake

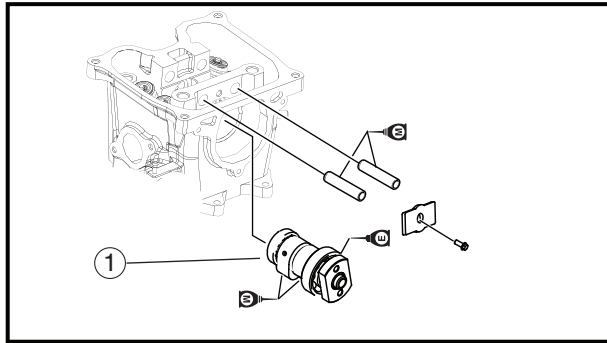
- (a) 34.880 mm (1.3732 in)
<Limit>: 34.860 mm (1.3724 in)
- (b) 34.740 mm (1.3677 in)
<Limit>: 34.725 mm (1.3671 in)

Exhaust

- (a) 34.880 mm (1.3732 in)
<Limit>: 34.860 mm (1.3724 in)
- (b) 34.740 mm (1.3677 in)
<Limit>: 34.725 mm (1.3671 in)




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



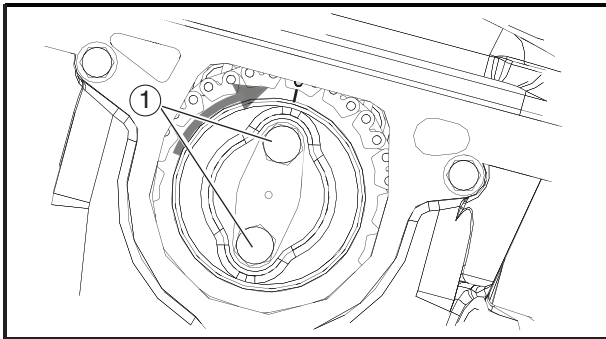
INSTALLING THE CAMSHAFT AND ROCKER ARMS

1. Lubricate:
 - camshaft (1)

	Recommended lubricant Camshaft Molybdenum disulfide oil Camshaft bearing Engine oil
-----------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------

2. Lubricate:
 - rocker arm shafts

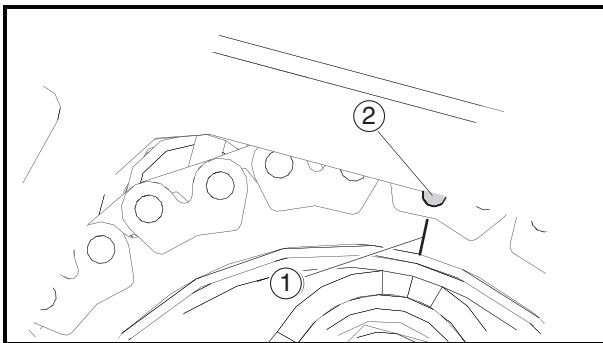
	Recommended lubricant Molybdenum disulfide oil
-----------------------------------------------------------------------------------	----------------------------------------------------------



3. Install:
 - camshaft comp.
 - a. Turn camshaft bolt (1) in clockwise direction.

TIP

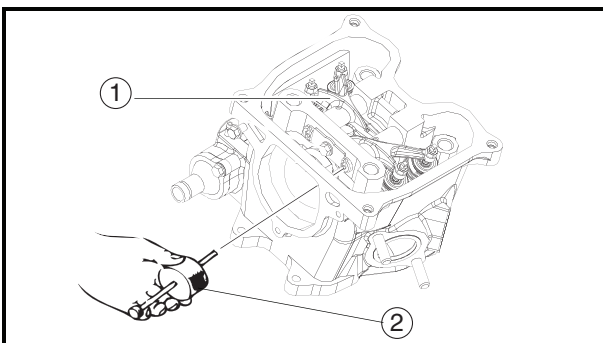
- Do not turn the bolt in Counterclockwise direction to prevent from camshaft bolt looseness.



- b. Align the "I" mark (1) on the camshaft sprocket with the stationary pointer (2) on the cylinder head. When the "I" mark is aligned with the stationary pointer, the piston is at the Top Dead Center (TDC) on the compression stroke.

TIP

- When the piston is at the Top Dead Center (TDC) on the compression stroke, there should be clearance between the valve stem tips and their respective adjusting screws.



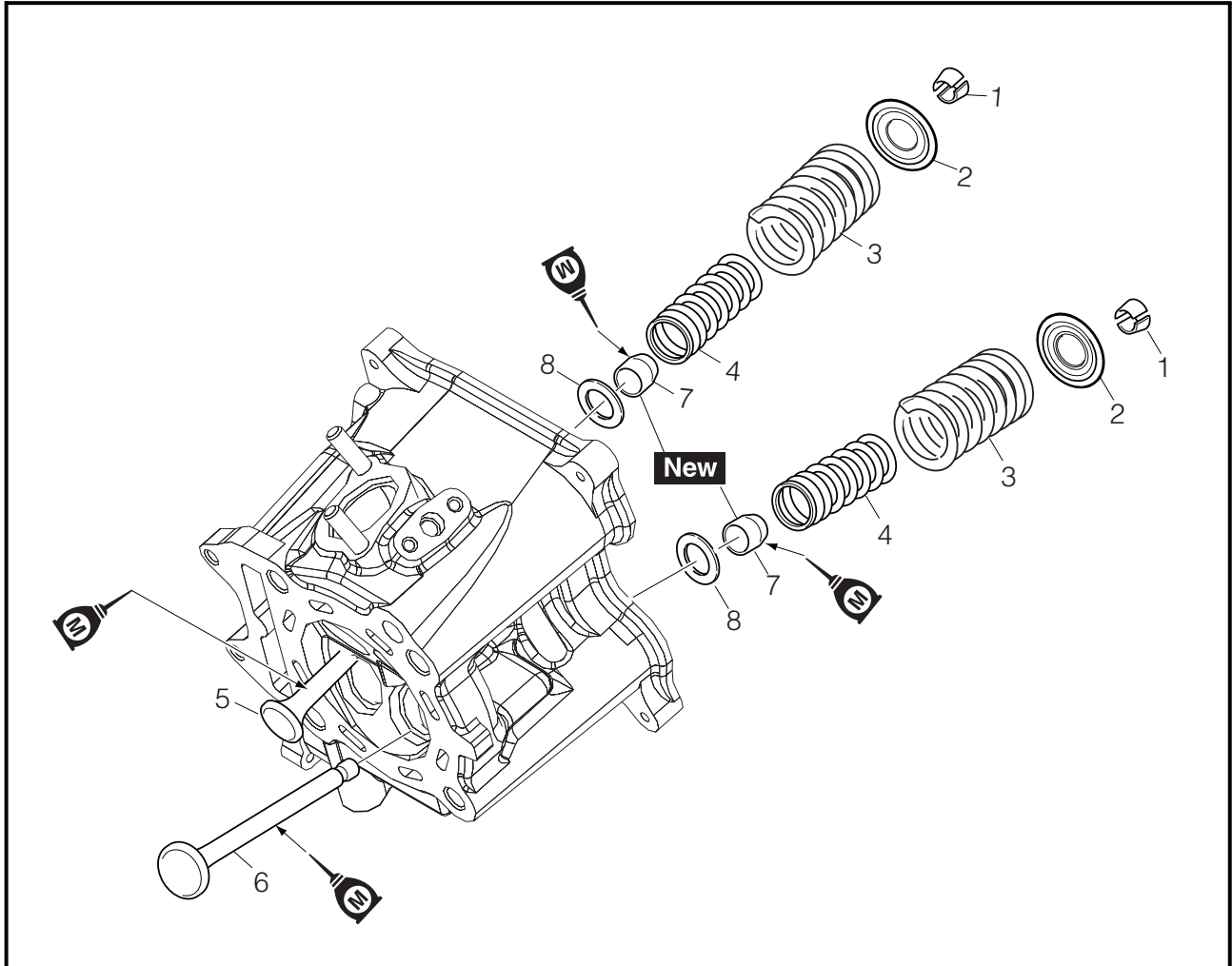
4. Apply:
 - engine oil
(onto the rocker arm shafts)
5. Install:
 - rocker arms (1)
 - rocker arm shafts

TIP

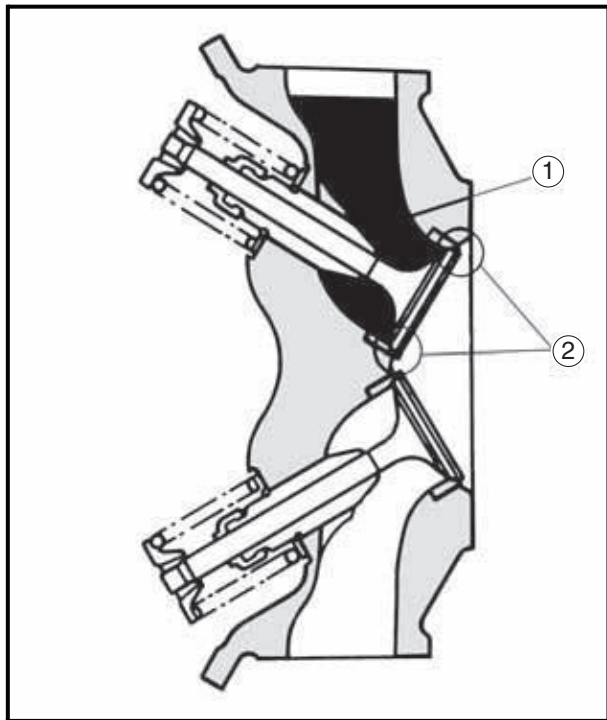
Use a slide hammer bolt (2) to install the rocker arm shaft.



VALVES AND VALVE SPRINGS



Order	Job/Part	Q'ty	Remarks
	Removing the valves and valve springs		Remove the parts in the order listed.
	Cylinder head		Refer to "CYLINDER HEAD".
	Rocker arm and rocker arm shaft		Refer to "REMOVING THE ROCKER ARMS AND CAMSHAFT"
1	Valve cotter	8	Refer to "INSTALLING THE VALVES AND VALVE SPRINGS".
2	Valve spring retainer	4	
3	Valve outer spring	4	
4	Valve inner spring	4	
5	Valve (intake)	2	
6	Valve (exhaust)	2	
7	Valve stem seal	4	
8	Valve spring seat	4	
			For installation, reverse the removal procedure.



EBS00238

REMOVING THE VALVES AND VALVE SPRINGS

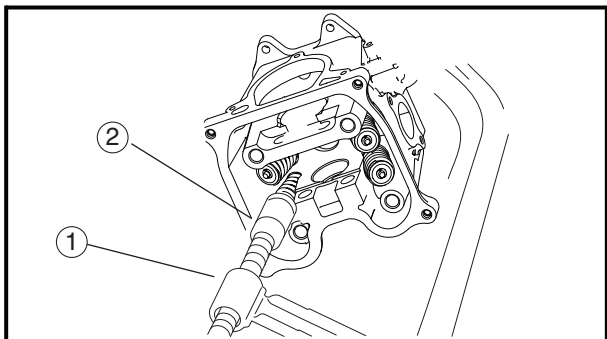
1. Check:

- valve sealing

Leakage at the valve seat → Check the valve face, valve seat and valve seat width. Refer to “CHECKING THE VALVES AND VALVE SPRINGS”.



- Pour a clean solvent ① into the intake and exhaust ports.
- Check that the valve seals properly. There should be no leakage at the valve seat ②.



2. Remove:

- valve cotters

TIP

Attach a valve spring compressor ① and attachment ② between the valve spring retainer and the cylinder head to remove the valve cotters.



Valve spring compressor
P/N. YM-04019, 90890-04019
Valve spring compressor attachment
P/N. YM-01253-1, 90890-01243



EBS00240

CHECKING THE VALVES AND VALVE SPRINGS

1. Measure:

- stem-to-guide clearance

$$\text{Stem-to-guide clearance} = \text{valve guide inside diameter } \textcircled{a} - \text{valve stem diameter } \textcircled{b}$$

Out of specification → Replace the cylinder head ass'y.



Stem-to-guide clearance

Intake

0.010 ~ 0.037 mm
(0.0004 ~ 0.0015 in)
<Limit>: 0.08 mm (0.0031 in)

Exhaust

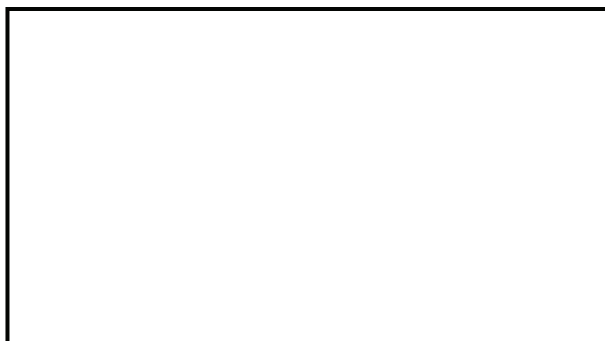
0.025 ~ 0.052 mm
(0.0010 ~ 0.0020 in)
<Limit>: 0.10 mm (0.0039 in)

2. Check:

- valve face
Pitting/wear → Grind the face.
- valve stem end
Mushroom shape or diameter larger than the body of the stem → Replace.

3. Measure:

- margin thickness \textcircled{a}
Out of specification → Replace.



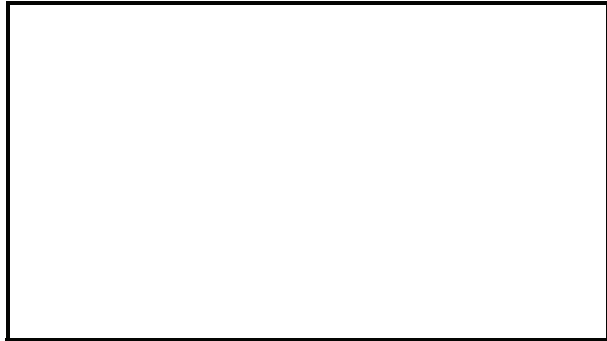
Margin thickness

Intake

0.50 ~ 0.90 mm
(0.0197 ~ 0.0354 in)

Exhaust

0.80 ~ 1.20 mm
(0.0315 ~ 0.0472 in)



8. Lap:
- valve face
 - valve seat

TIP _____

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



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

NOTICE _____

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



- b. Apply molybdenum disulfide oil to 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 compound.

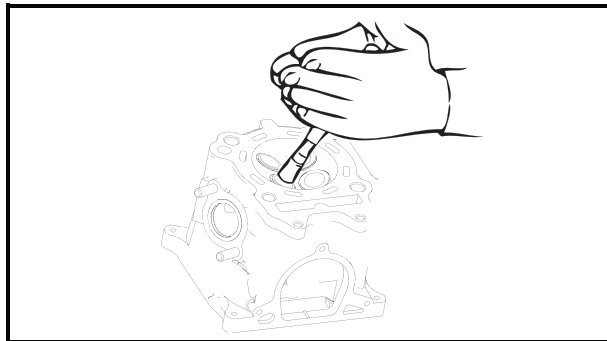
TIP _____

For 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.

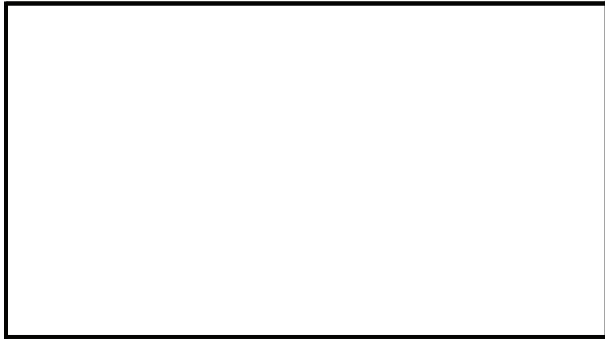
TIP _____

After every lapping operation be sure to clean off all of the compound from the valve face and valve seat.



- f. Apply Mechanic's blueing dye (Dykem) to the valve face.
g. Install the valve into the cylinder head.
h. Press the valve through the valve guide and onto the valve seat to make a clear pattern.
i. Measure the valve seat width again. If the valve seat width is out of specification, reface and relap the valve seat.





9. Measure:

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



Valve spring free length

Inner spring
38.700 mm (1.5236 in)
<limit>: 35.200 mm (1.3858 in)
Outer spring
40.400 mm (1.5906 in)
<limit>: 36.900 mm (1.4528 in)



10. Measure:

- compressed spring force ^(a)
Out of specification → Replace.
- ^(b) Installed length



Compressed spring force

Inner spring
41.49 ~ 57.19 N
(4.23 ~ 5.83 kg, 9.32 ~ 12.85 lb)
Outer spring
73.97 ~ 103.40 N
(7.54 ~ 10.54 kg, 16.63 ~ 23.243 lb)



11. Measure:

- spring tilt ^(a)
Out of specification → Replace.



Spring tilt limit

Inner
2.5°/1.60 mm (2.5°/0.063 in)



EBS00241

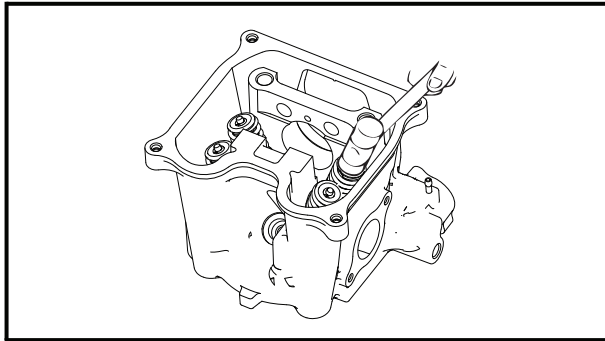
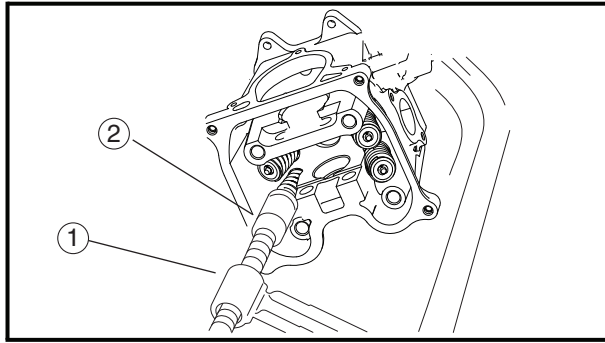
INSTALLING THE VALVES AND VALVE SPRINGS

1. Apply:
 - molybdenum disulfide oil
(onto the valve stem and valve stem seal)
2. Install:
 - valve spring seats
 - valve stem seals **New**
 - valves
 - valve springs
 - valve spring retainers

TIP

Install the valve springs with the larger pitch ^(a) facing upwards.

^(b) Smaller pitch



3. Install:
 - valve cotters

TIP

Install the valve cotters while compressing the valve spring with the valve spring compressor ① and attachment ②.



Valve spring compressor
 P/N. YM-04019, 90890-04019
Valve spring compressor attachment
 P/N. YM-01253-1, 90890-01243

4. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a piece of wood.

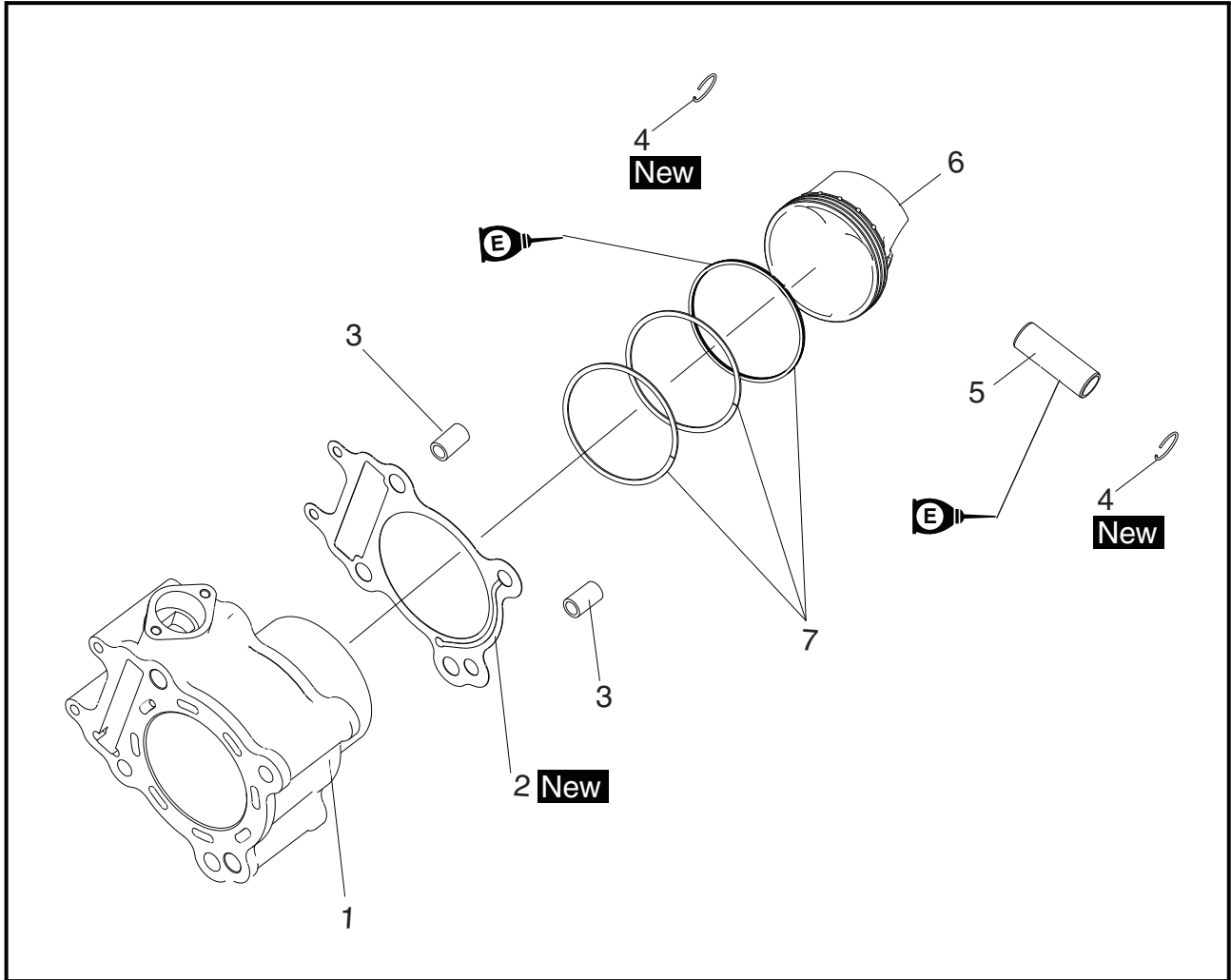
NOTICE

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



EBS00245

CYLINDER AND PISTON

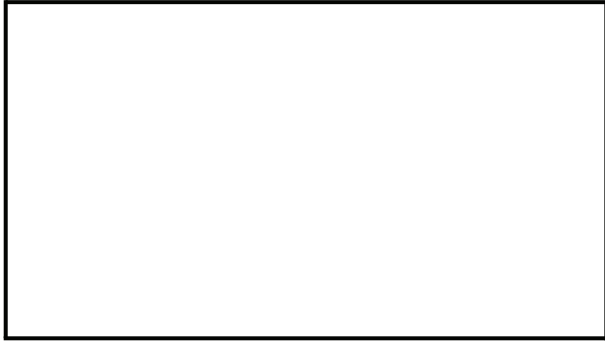



Order	Job/Part	Q'ty	Remarks
	Removing the cylinder and piston		Remove the parts in the order listed.
	Cylinder head		Refer to "CYLINDER HEAD".
1	Cylinder	1	Refer to "INSTALLING THE CYLINDER".
2	Cylinder gasket	1	
3	Dowel pin	2	
4	Piston pin clip	2	
5	Piston pin	1	Refer to "REMOVING THE PISTON" and "INSTALLING THE PISTON".
6	Piston	1	
7	Piston ring set	1	
			For installation, reverse the removal procedure.

Cylinder bore "C"	74.995~75.015 mm (2.9526~2.9533 in)
Taper limit "T"	0.05 mm (0.002 in)
Out-of-round "R"	0.01 mm (0.0004 in)

"C" = maximum of D ₁ ~ D ₂
"T" = maximum of D ₁ or D ₂ – maximum of D ₅ or D ₆
"R" = maximum of D ₁ , D ₃ or D ₅ – minimum of D ₂ , D ₄ or D ₆


- b. If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.
- c. Measure piston skirt diameter "P" with the micrometer.
 - Ⓐ 5 mm (0.20 in) from the bottom edge of the piston



	Piston size "P"
Standard	74.430~75.480 mm (2.9303~2.9717 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.

<p>Piston-to-cylinder clearance = Cylinder bore "C" – Piston skirt diameter "P"</p>

	<p>Piston-to-cylinder clearance 0.010 ~ 0.040 mm (0.0004 ~ 0.0016 in) <Limit>: 0.10 mm (0.0039 in)</p>
-------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------

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





EBS00250

CHECKING THE PISTON RINGS

1. Measure:

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

TIP

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



Piston ring side clearance

Top ring

0.015 ~ 0.055 mm

(0.0006 ~ 0.0022 in)

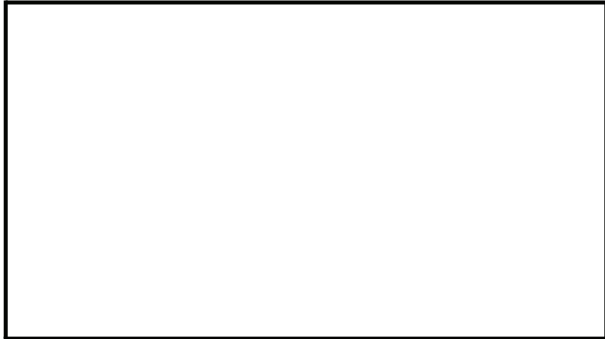
<Limit>: 0.09 mm (0.0035 in)

2nd ring

0.015 ~ 0.055 mm

(0.0006 ~ 0.0022 in)

<Limit>: 0.09 mm (0.0035 in)



2. Install:

- piston ring
(into the cylinder)

TIP

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

3. Measure:

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

TIP

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



Piston ring end gap

Top ring

0.150~0.300 mm

(0.0059~0.0118 in)

<Limit>: 0.500 mm (0.0197 in)

2nd ring

0.300~0.450 mm

(0.0118~0.0177 in)

<Limit>: 0.650 mm (0.0256 in)

Oil ring

0.200 ~ 0.700 mm

(0.0079 ~ 0.0276 in)

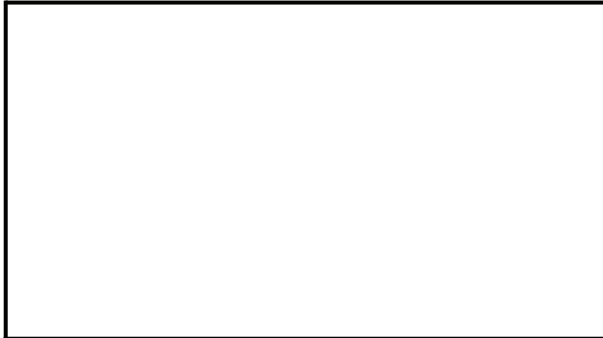


EBS00251

CHECKING THE PISTON PIN

1. Check:

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

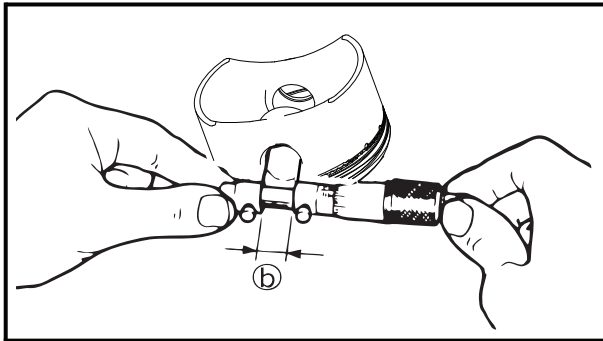


2. Measure:

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



Piston pin outside diameter
16.994~17.000 mm
(0.6691~0.6693 in)
<Limit>: 16.960 mm (0.6677 in)



3. Measure:

- piston pin bore diameter (b)
Out of specification → Replace the piston.



Piston pin bore diameter
17.002~17.008 mm
(0.6694~0.6696 in)
<Limit>: 17.020 mm (0.671 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 clearance
0.002 ~ 0.014 mm
(0.0001 ~ 0.0006 in)



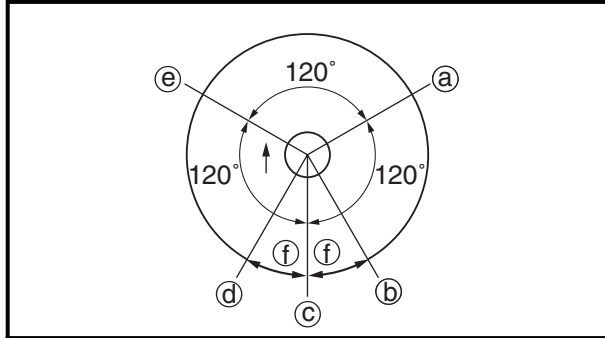
EBS00252

INSTALLING THE PISTON

1. Install:
 - piston rings
(onto the piston)

TIP

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



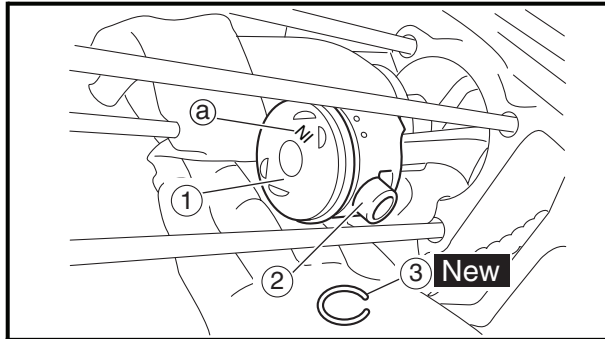
2. Position:
 - top ring
 - 2nd ring
 - oil ring
 Offset the piston ring end gaps as shown.

- Ⓐ top ring end
- Ⓑ upper oil ring rail end
- Ⓒ expander end
- Ⓓ lower oil ring rail end
- Ⓔ 2nd ring end
- Ⓕ 20 mm (0.79 in)

3. Install:
 - piston ①
 - piston pin ②
 - piston pin clips ③ **New**

TIP

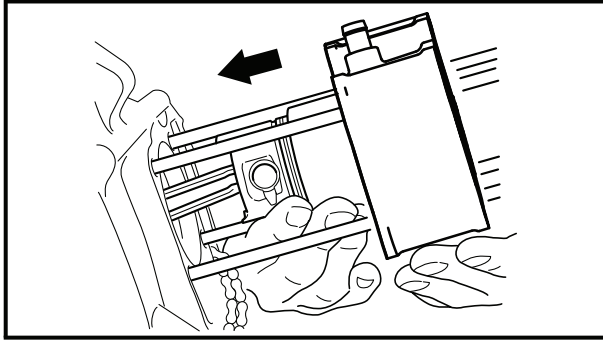
- Apply engine oil onto the piston pin, piston rings and piston.
- Be sure that the "IN" mark Ⓐ on the piston points to the intake side of the engine.
- Before installing the piston pin clips, cover the crankcase with a clean rag to prevent the piston pin clips from falling into the crankcase.



4. Lubricate:
 - piston
 - piston rings
 - cylinder

TIP

Apply a liberal coating of engine oil.



EBS00253

INSTALLING THE CYLINDER

1. Install:

- cylinder

TIP

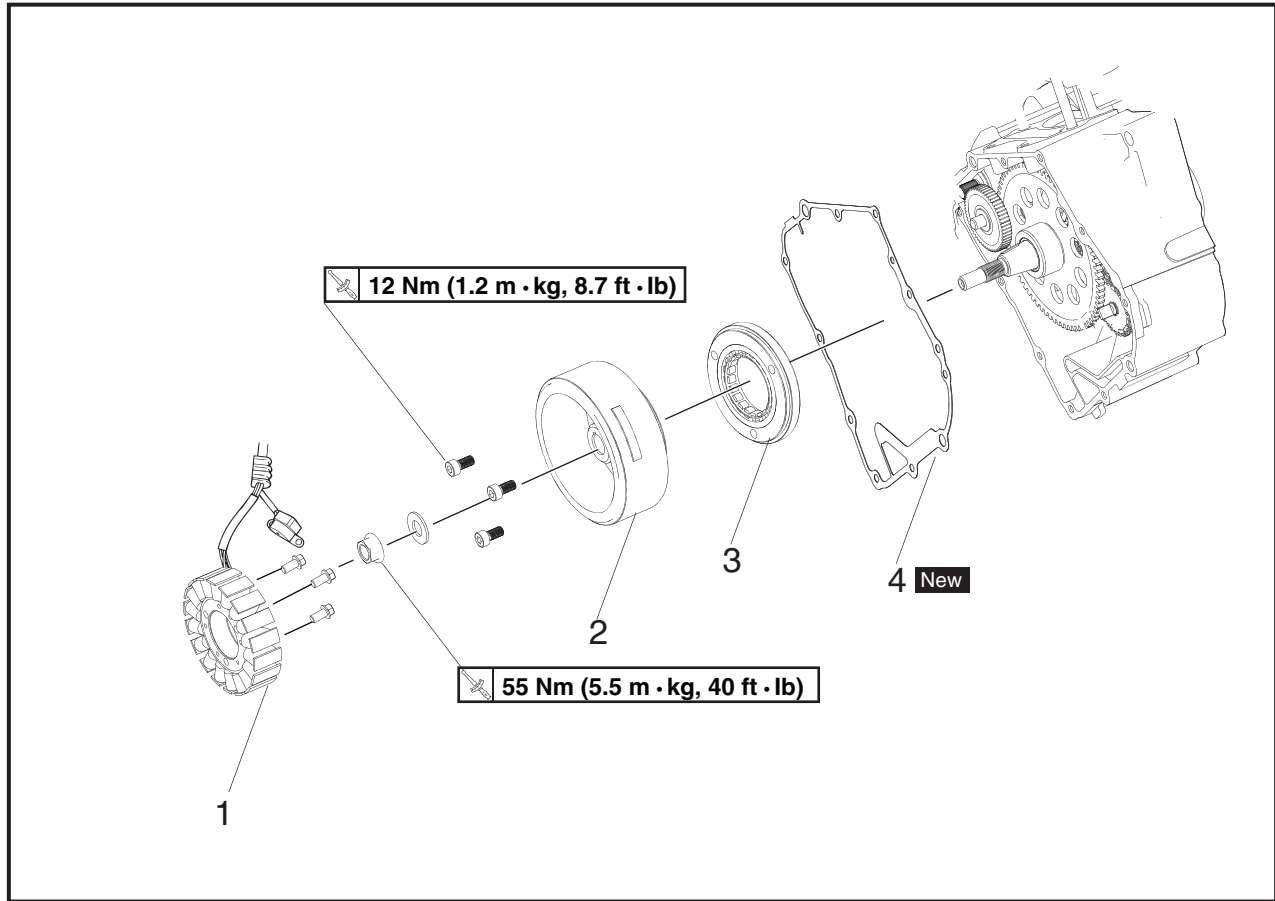
Install the cylinder with one hand while compressing the piston rings with the other hand.

NOTICE

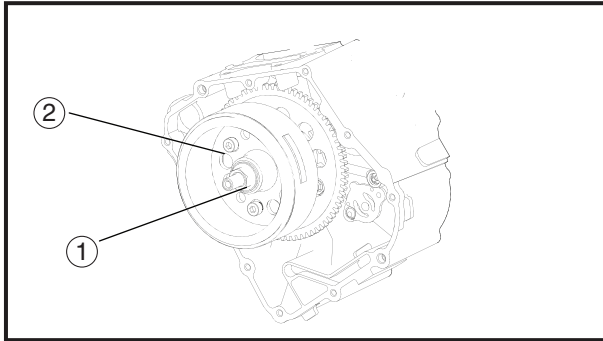
- Be careful not to damage the timing chain damper during installation.
- Pass the timing chain through the timing chain cavity.



C.D.I. MAGNETO



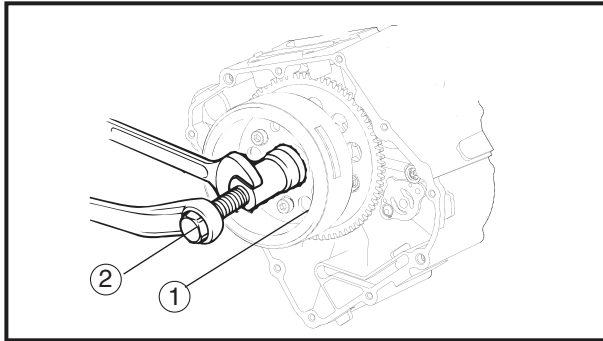
Order	Job/Part	Q'ty	Remarks
	Removing the C.D.I. magneto		Disassemble the parts in the order listed.
1	Stator coil assembly	1	Refer to "INSTALLING STATOR COIL ASSEMBLY".
2	C.D.I. magneto rotor	1	NOTICE _____ Disconnect the C.D.I. magneto lead coupler. _____ For installation, reverse the removal procedure.
3	Starter clutch assembly	1	
4	Gasket	1	



EBS00259

REMOVING THE C.D.I. MAGNETO ROTOR

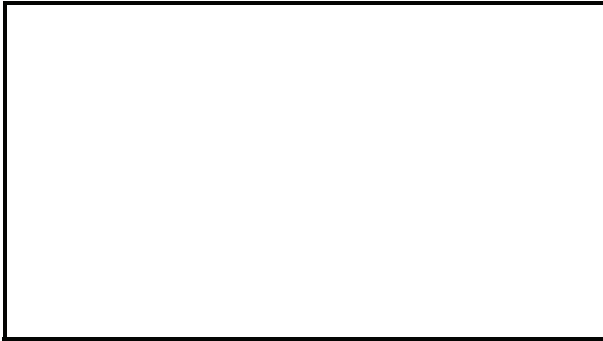
1. Remove:
 - nut ①
 - plate washer
 - bolt ②



2. Remove:
 - C.D.I. magneto rotor ①
(with flywheel puller ②)



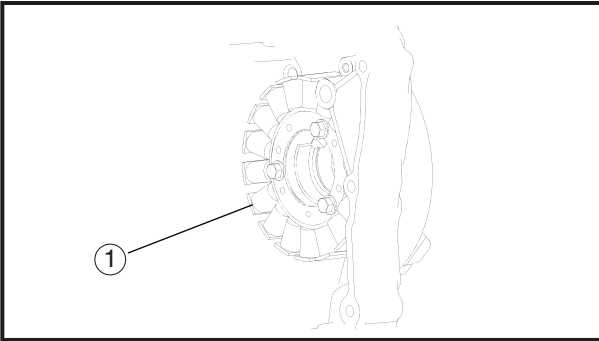
Flywheel puller
90890-01404 (YM-01404)



EBS00262

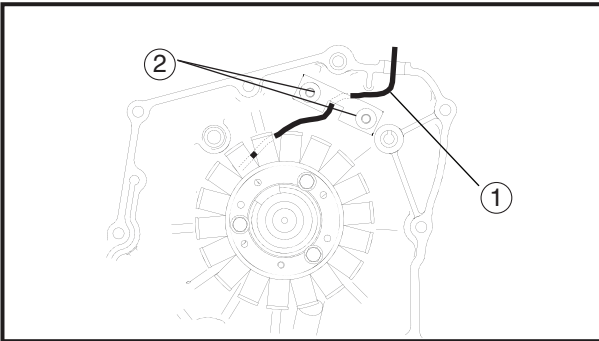
CHECKING THE PICKUP COIL/STATOR ASSEMBLY

1. Check:
 - pickup coil/stator assembly
Damage → Replace.



INSTALLING THE PICKUP COIL AND STATOR ASSEMBLY

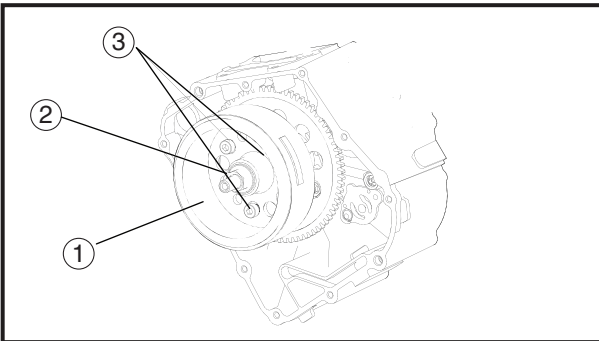
1. Install:
 - Stator assembly (1)



2. Install:
 - Pickup coil

TIP

Tighten the bolts (2) to secure the stator assembly cable (1).



EBS00268


INSTALLING THE C.D.I. MAGNETO ROTOR

1. Install:
 - C.D.I. magneto rotor (1)

TIP

- Clean the tapered portion of the crankshaft and the magneto rotor hub.
- When installing the magneto rotor, make sure the woodruff key is properly seated in the keyway of the crankshaft.

2. Tighten:
 - nut (2)

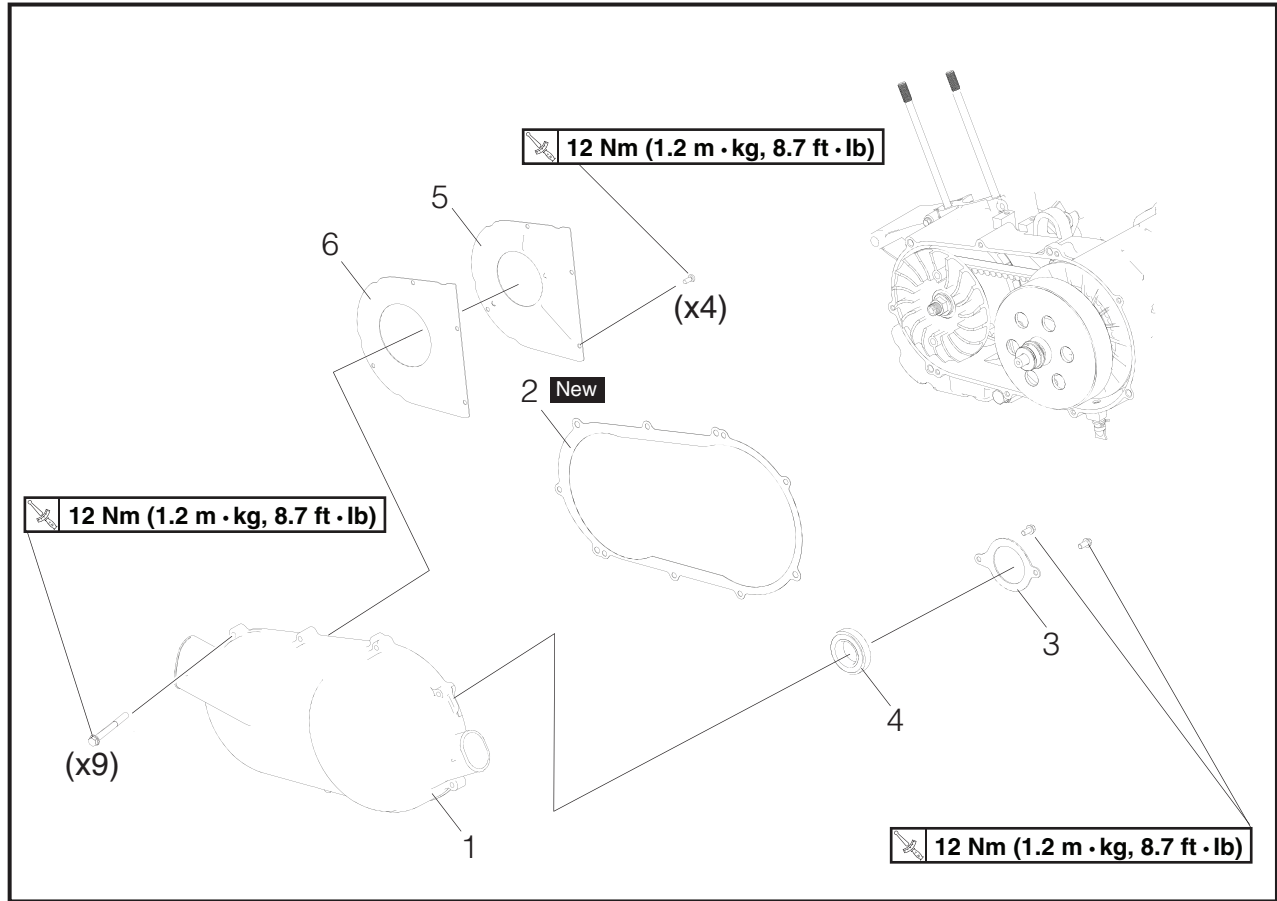
 55 Nm (5.5 m • kg, 40.0 ft • lb)

- bolt (3)



EAS00316

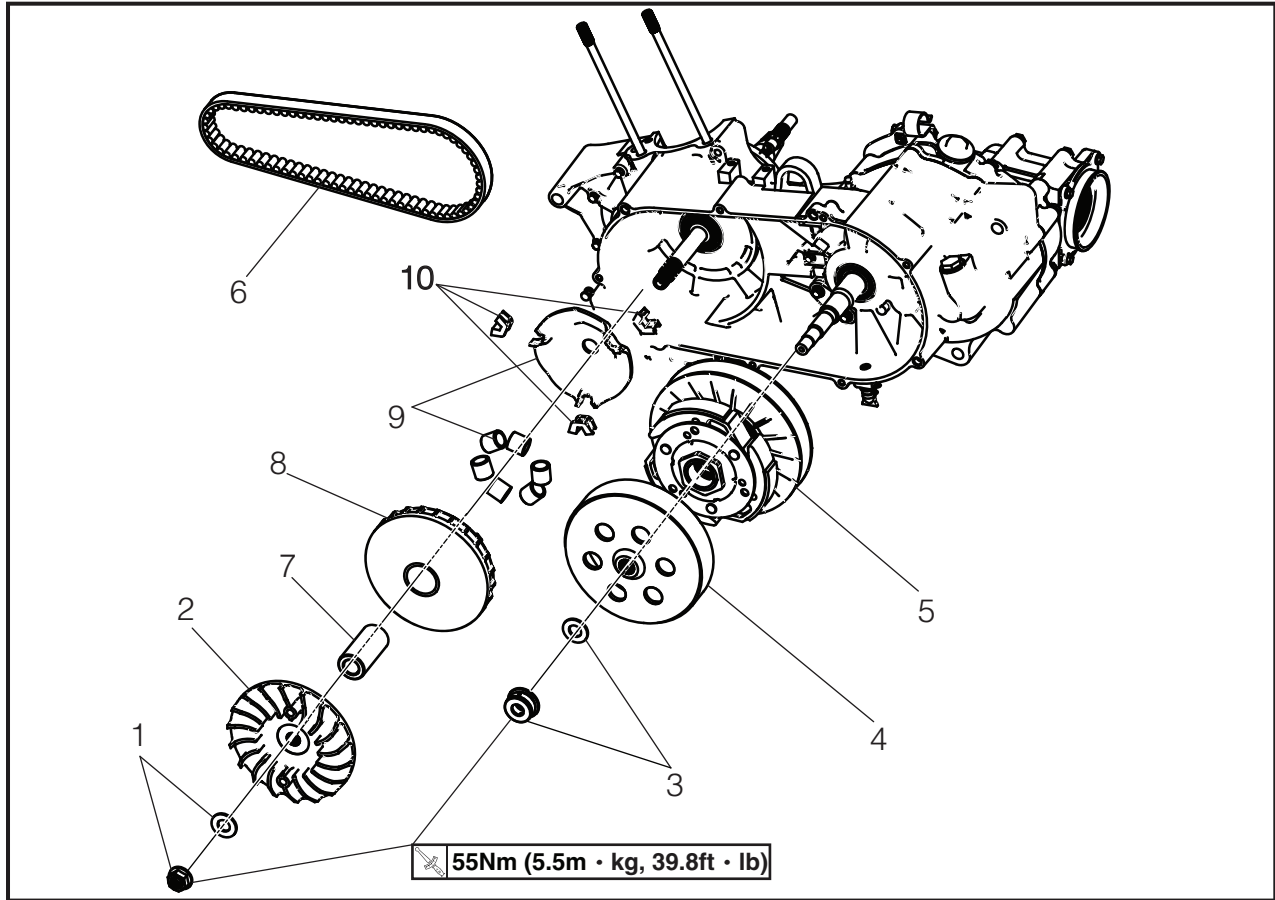
**BELT DRIVE
CRANKCASE COVER**



Order	Job/Part	Q'ty	Remarks
	Removing the belt drive		
1	Crankcase cover	1	Remove the parts in the order listed.
2	Crankcase cover gasket	1	
3	Bearing cover plate	1	
4	Bearing	1	
5	Dust seal plate	1	
6	Gasket	1	
			For installation, reverse the removal procedure.



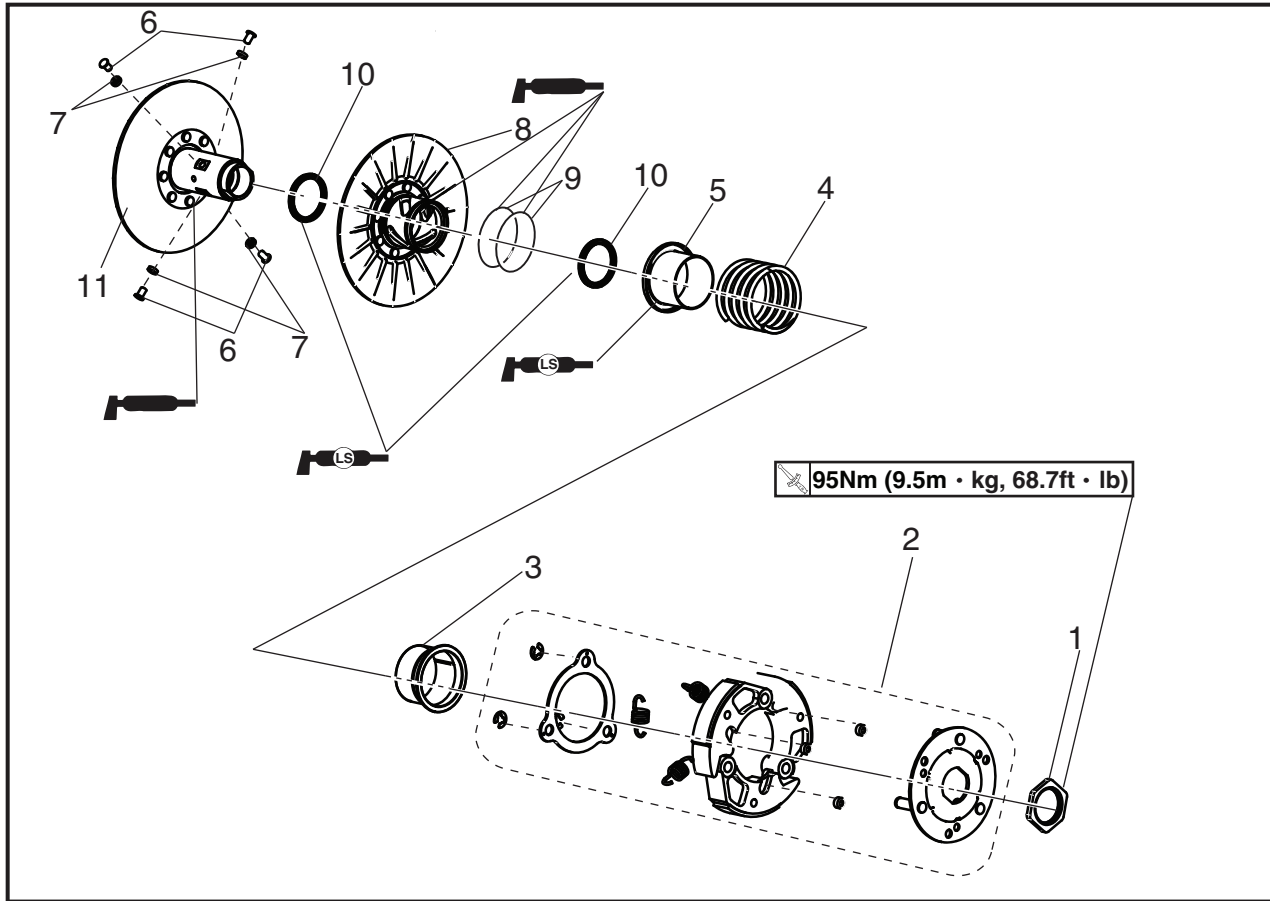
V-BELT, CLUTCH, PRIMARY AND SECONDARY SHEAVE



Order	Job/Part	Q'ty	Remarks
	Removing the V-belt, clutch, primary and secondary sheave		Remove the parts in the order listed.
1	Primary sheave nut / Plate washer	1/1	
2	Primary fixed sheave	1	Refer to " REMOVING THE PRIMARY SHEAVE " .
3	Secondary sheave nut/ Washer	1/1	
4	Clutch housing	1	
5	Secondary sheave assembly	1	
6	V-belt	1	Refer to " REMOVING THE SECONDARY SHEAVE AND V-BELT " .
7	Collar	1	
8	Primary sliding sheave	1	
9	Cam / Weight	1/6	
10	Slider	3	
			For installation, reverse the removal procedure.



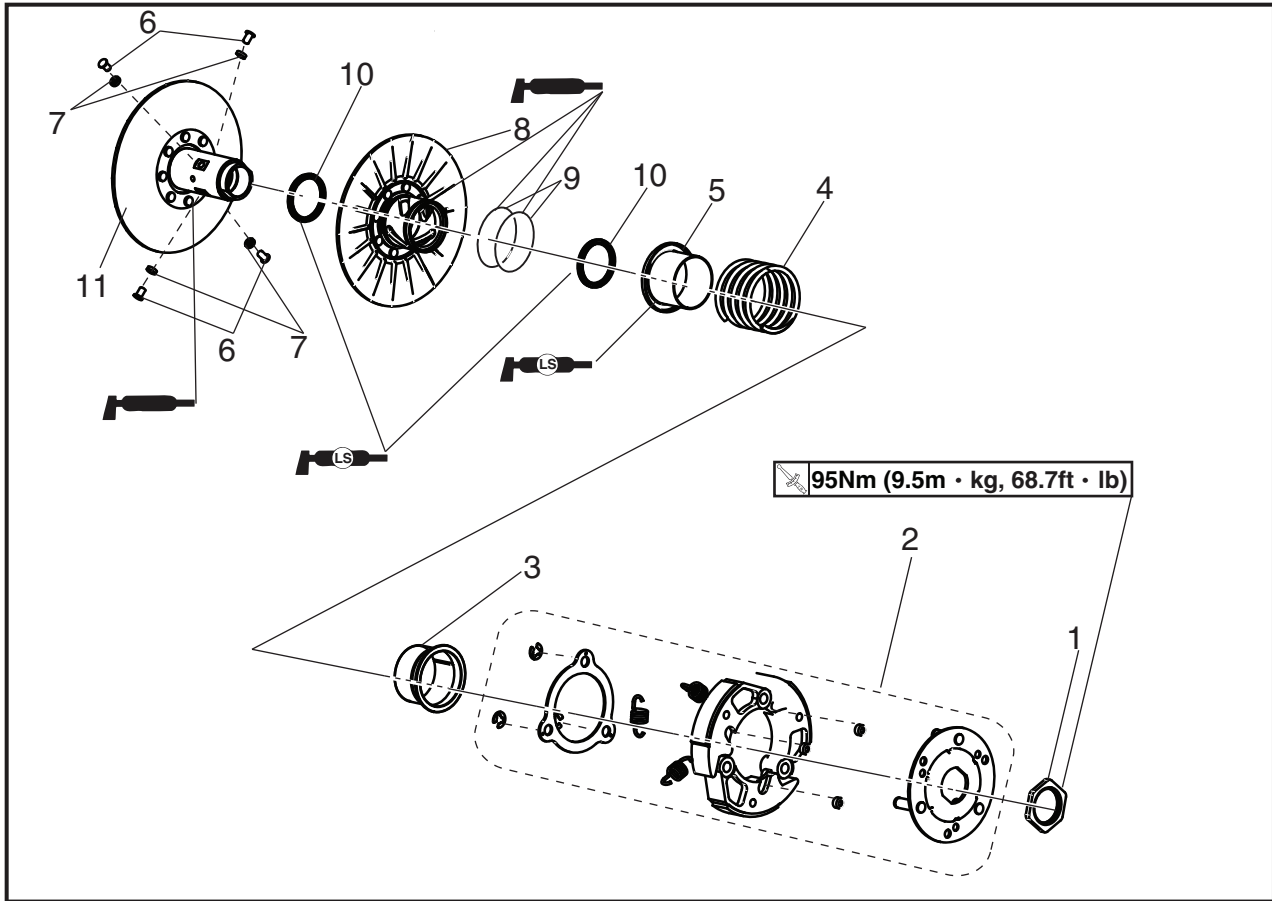
DISASSEMBLING THE SECONDARY SHEAVE



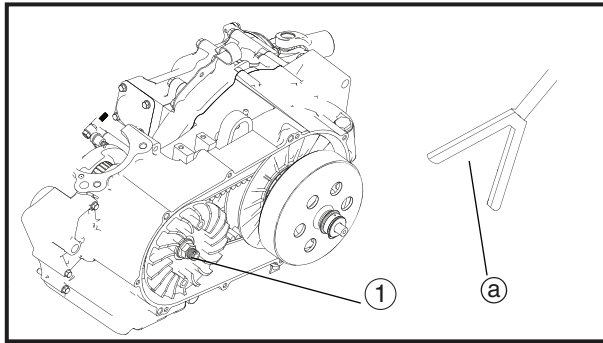
Order	Job/Part	Q'ty	Remarks
	Disassembling the secondary sheave		Disassemble the parts in the order listed.
1	Nut	1	
2	Clutch carrier assembly	1	
3	Spring seat -1	1	Refer to " REMOVING THE SECONDARY SHEAVE AND V-BELT " .
4	Compression spring	1	
5	Spring seat - 2	1	
6	Guide pin	4	



DISASSEMBLING THE SECONDARY SHEAVE



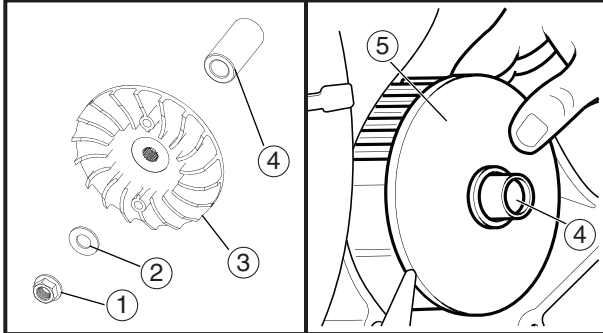
Order	Job/Part	Q'ty	Remarks
7	Guide roller	4	
8	Secondary sliding sheave	1	
9	O-ring	2	
10	Oil seal	2	
11	Secondary fixed sheave	1	
			For assembly, reverse the disassembly procedure.



EAS00317

REMOVING THE PRIMARY SHEAVE

1. Remove:
 - primary sheave nut ①
 - plate washer ②
 - primary fixed sheave ③
 - collar ④
 - primary sliding sheave ⑤



TIP

While holding the clutch housing with the rotor holding tool @, loosen the secondary sheave nut.

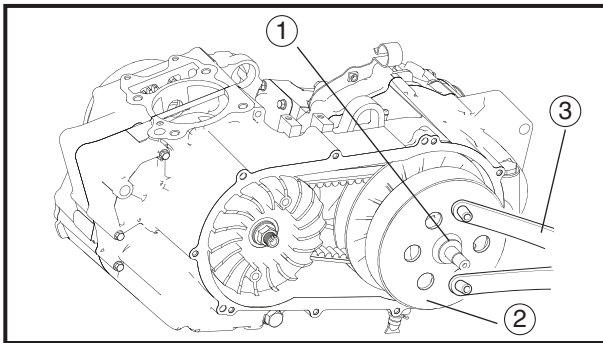


Rotor holding tool:
90890-01235 (YU-01235)

EAS00318

REMOVING THE SECONDARY SHEAVE AND V-BELT

1. Remove:
 - secondary sheave nut ①
 - clutch housing ②



TIP

While holding the clutch housing with the rotor holding tool ③, loosen the secondary sheave nut.

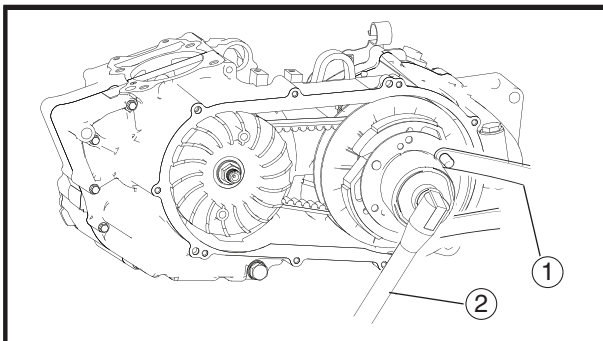


Rotor holding tool:
90890-01235 (YU-01235)

2. Loosen:
 - clutch carrier nut

NOTICE

Do not remove the clutch carrier nut at this stage.

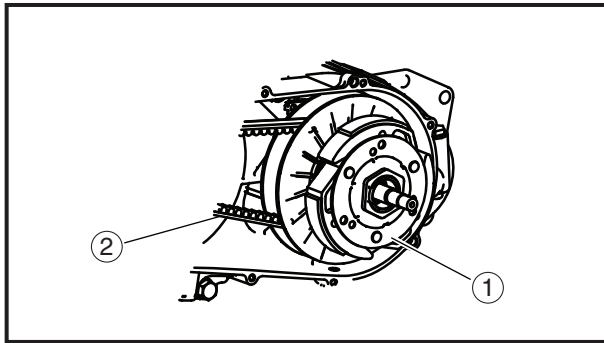


TIP

While holding the clutch carrier with the rotor holding tool ①, loosen the clutch carrier nut one full turn with the socket wrench (39 mm) ②.



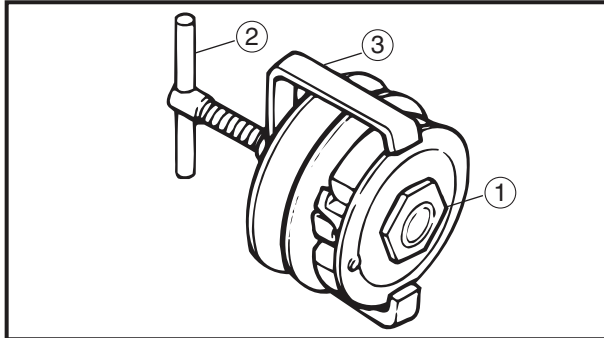
Rotor holding tool:
90890-01235 (YU-01235)
Socket wrench(39 mm):
90890-01493 (YM-01493)



3. Remove:
 - secondary sheave assembly ①
 - V-belt ②

TIP

Remove the V-belt and clutch assembly from the primary sheave side.



EAS00319

DISASSEMBLING THE SECONDARY SHEAVE

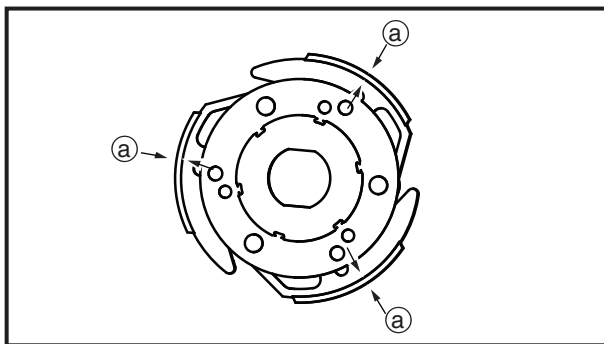
1. Remove:
 - clutch carrier nut ①

TIP

Install the clutch spring holder ② and clutch spring holder arm ③ onto the secondary sheave as shown. Then, compress the spring, and remove the clutch carrier nut ①.



Clutch spring holder
 90890-01337(YM-33285)
Clutch spring holder arm
 90890-01464(YM-33285-6)



CHECKING THE CLUTCH SHOE

1. Measure:
 - Clutch shoe

Scratches → Glaze using coarse sandpaper.
 Damage/wear → Replace the clutch carrier assembly



Clutch shoe thickness
 <Limit>: 3.000mm (0.0181 in)

TIP

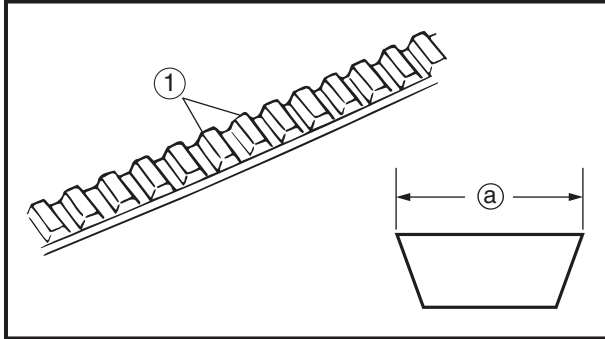
- Inspect clutch shoes ①.
- After removing the clutch weight spring, do not use them again.
- Replace the all three as a set.




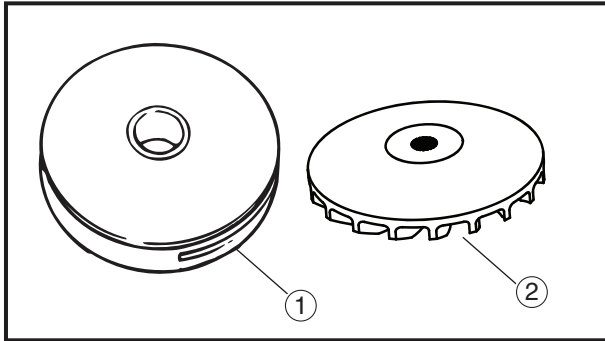
EAS00320

CHECKING THE V-BELT

1. Check:
 - V-belt ①
Cracks/damage/wear → Replace.
Grease/oil → Clean the primary and secondary sheave.
2. Measure:
 - V-belt width ②
Out of specification → Replace.



	<p>V-belt width <Limit>: 22.500 mm (0.8858 in)</p>
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CHECKING THE PRIMARY SHEAVE

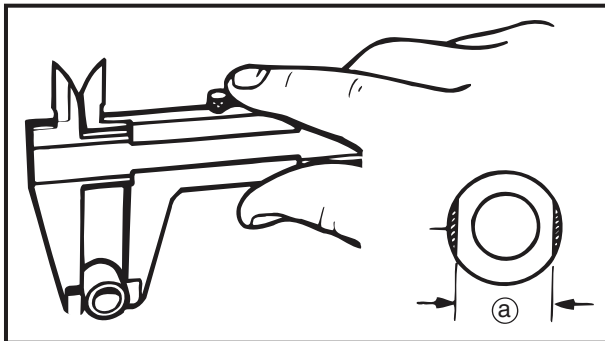
1. Check:
 - Primary sliding sheave ①
 - Primary fixed sheave ②
Cracks/damage/wear → Replace the primary sliding sheave, primary fixed sheave and V-belt.


EAS00321

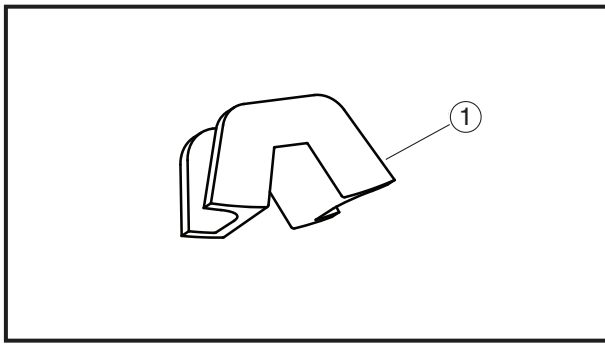
CHECKING THE PRIMARY SHEAVE WEIGHTS

The following procedure applies to all of the primary sheave weights.

1. Check:
 - primary sheave weight
Cracks/damage/wear → Replace.
2. Measure:
 - primary sheave weight outside diameter ②
Out of specification → Replace.

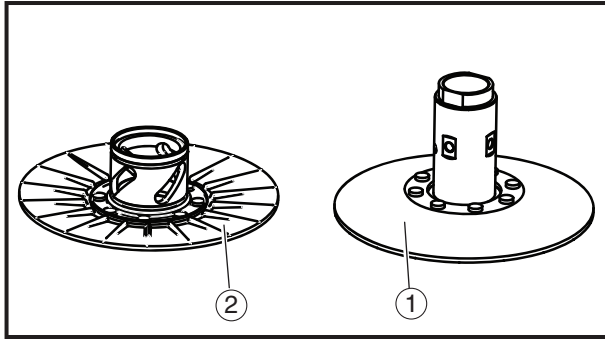


	<p>Primary sheave weight outside diameter 19.500~20.000 mm (0.7677~0.7874 in) <Limit>: 19.000 mm (0.7480 in)</p>
-------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------



CHECKING THE SLIDER

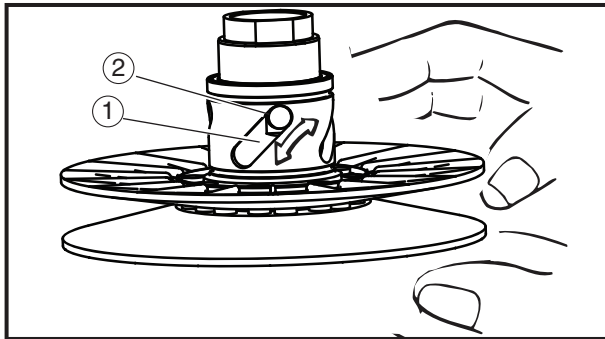
1. Check:
 - slider ①
 - Damage/wear → Replace



EAS00322

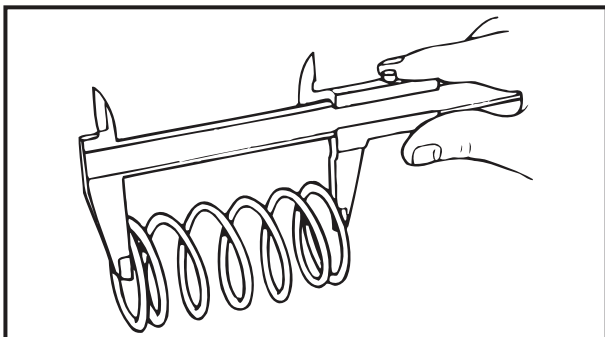
CHECKING THE SECONDARY SHEAVE

1. Check:
 - secondary fixed sheave ①
 - secondary sliding sheave ②
 - Cracks/damage/wear → Replace the secondary fixed and sliding sheaves as a set.




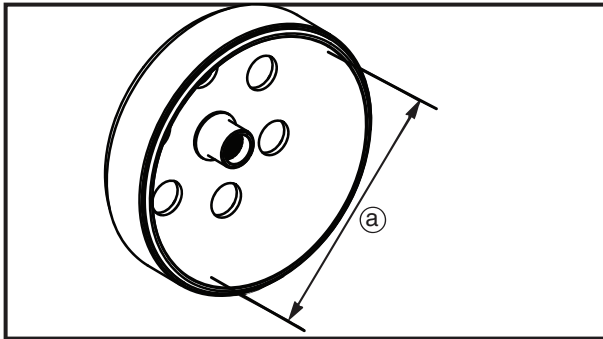
2. Check:
 - torque cam groove ①
 - Damage/wear → Replace the secondary fixed and sliding sheaves as a set.

3. Check:
 - guide pin ②
 - Damage/wear → Replace the secondary fixed and sliding sheaves as a set.



4. Measure:
 - Compression spring free length
 - Out of specification → Replace.

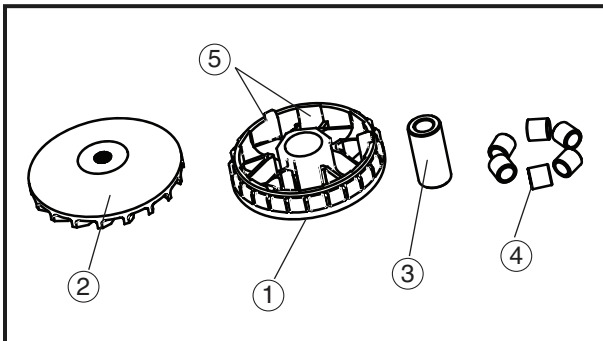
	<p>Compression spring free length 102.400 mm (4.0315 in) <Limit>: 97.400 mm (3.8346 in)</p>
-------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------



5. Measure:
- Clutch housing internal diameter (a)
- Out of specification → Replace.



Clutch housing internal diameter
 144.850~145.150 mm (5.7028~
 5.7146 in)
 <Limit>: 145.450 mm (5.7264 in)



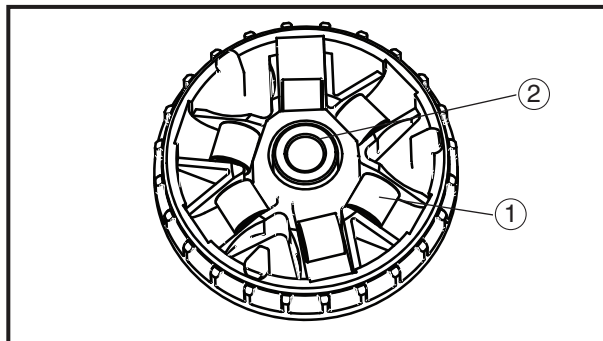
EAS00323

ASSEMBLING THE PRIMARY SHEAVE

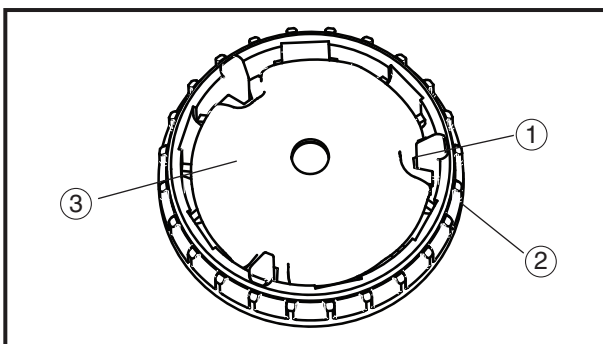
1. Clean:
- primary sliding sheave (1)
 - primary fixed sheave (2)
 - collar (3)
 - primary sheave weights (4)

TIP

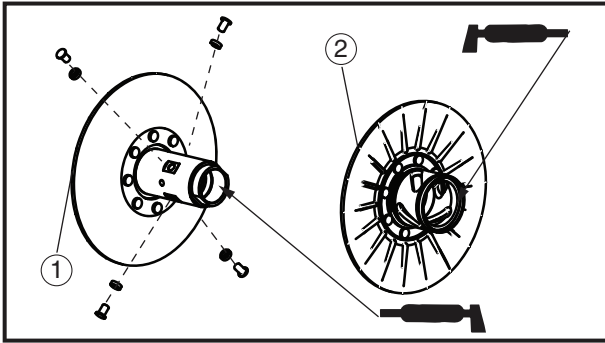
Use thinner to clean up grease, dirt on the primary sliding sheave cam side (5).



2. Install:
- primary sheave weights (1)
 - collar (2)



3. Install:
- slider (1)
 - primary sliding sheave (2)
 - cam (3)

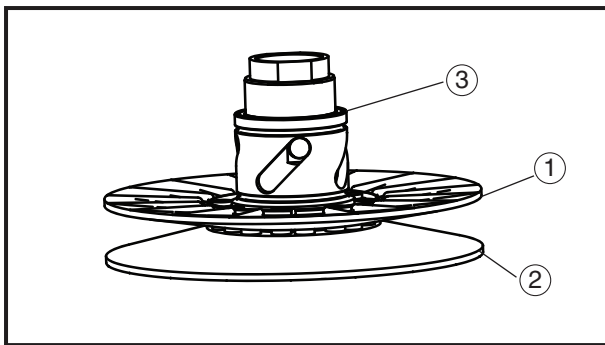


EAS00324

ASSEMBLING THE SECONDARY SHEAVE

1. Lubricate:
 - secondary fixed sheave's inner surface ①
 - secondary sliding sheave's inner surface ②
 - torque cam groove
 - oil seals
 - bearings
(with the recommended lubricant)

	<p>Recommended lubricant BEL-RAY assembly lube</p>
--	----------------------------------------------------------------------

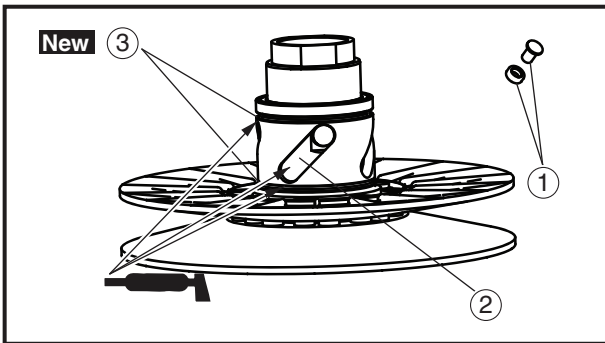


2. Install:
 - secondary sliding sheave ①

TIP

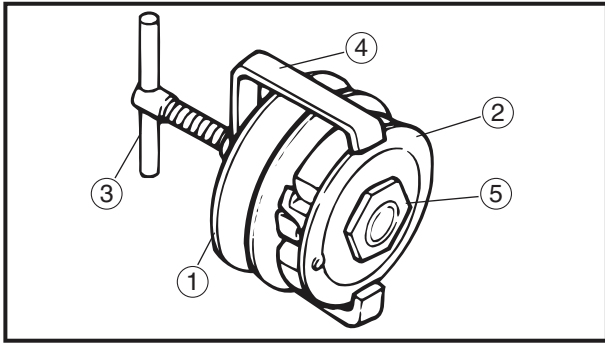
Install the secondary sliding sheave onto the secondary fixed sheave ② with the oil seal guide ③.

	<p>Oil seal guide 90890-01384 (YM-33299)</p>
--	----------------------------------------------------------------



3. Install:
 - guide pin and guide roller ①
4. Lubricate:
 - guide pin groove ②
 - o-ring **New** ③
(with the recommended lubricant)

	<p>Recommended lubricant BEL-RAY assembly lube</p>
--	----------------------------------------------------------------------



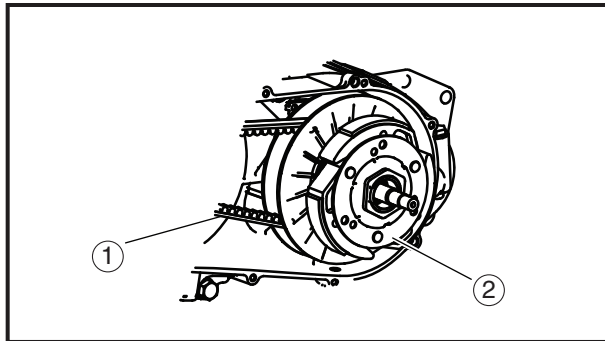
5. Install:
- secondary sheave ①
 - spring
 - clutch carrier ②

TIP

Attach the clutch spring holder ③ and clutch spring holder arm ④ onto the secondary sheave as shown. Then, compress the spring, and tighten the clutch carrier nut ⑤.



Clutch spring holder
90890-01337(YM-33285)
Clutch spring holder arm
90890-01464(YM-33285-6)



EAS00325

INSTALLING THE BELT DRIVE

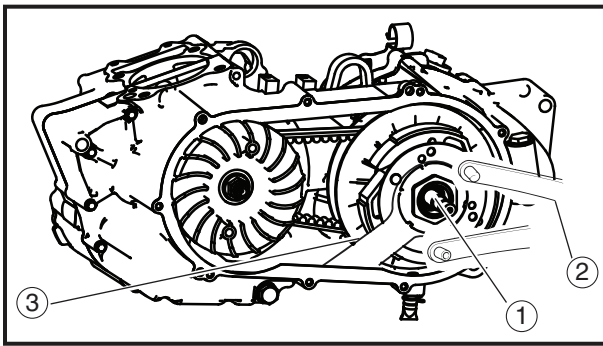
1. Install:
- V-belt ①
 - clutch assembly ②

NOTICE

Do not allow grease to contact the V-belt, secondary sheave assembly.

TIP

Install the V-belt onto the primary sheave side.



2. Install:
- clutch carrier nut (1)

90 Nm (9.0 m • kg, 65.1 ft • lb)

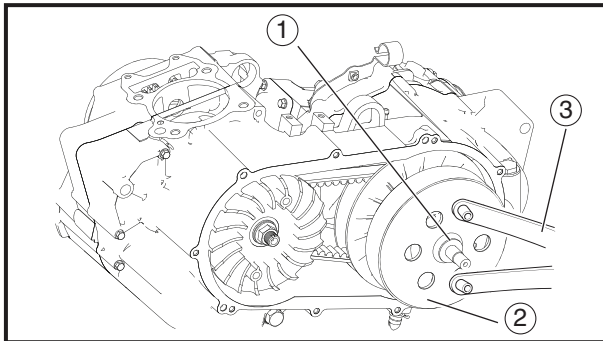
TIP

While holding the clutch carrier with the rotor holding tool (2), tighten the clutch carrier nut with the locknut wrench (3).



Rotor holding tool
90890-01235

Locknut wrench
90890-01348 (YM-01348)



3. Install:
- clutch housing (1)
 - secondary sheave nut (2)

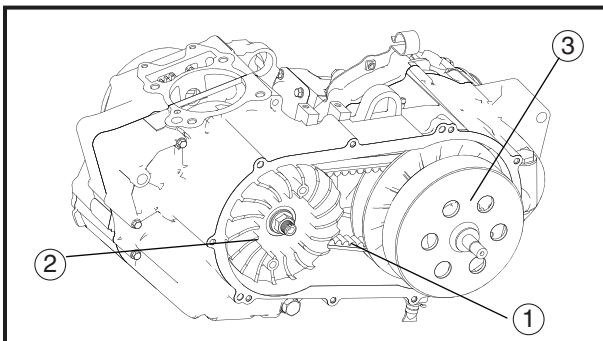
55 Nm (5.5 m • kg, 39.8 ft • lb)

TIP

Tighten the secondary sheave nut with the rotor holding tool (3).



Rotor holding tool
90890-01235



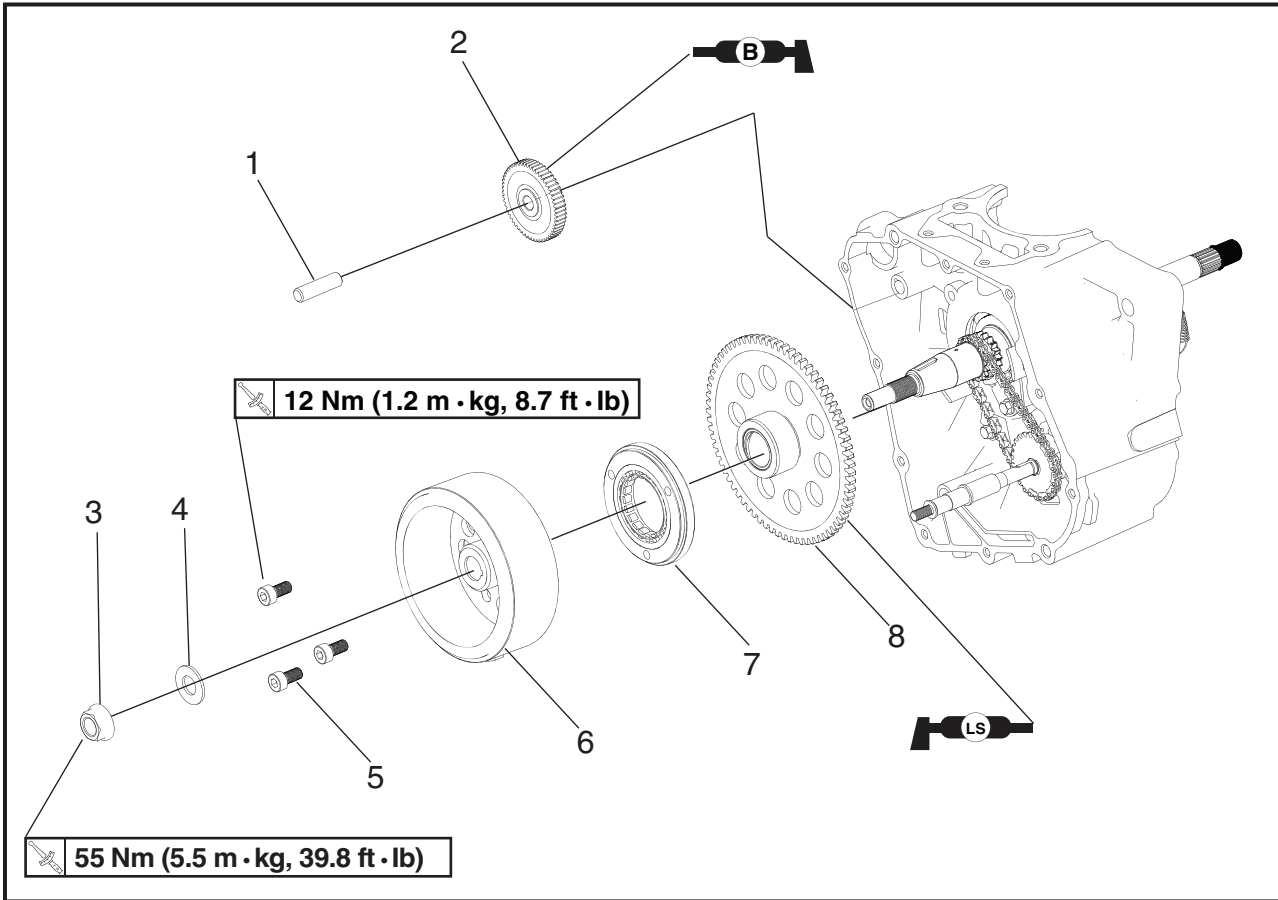
4. Position:
- V-belt (1)

TIP

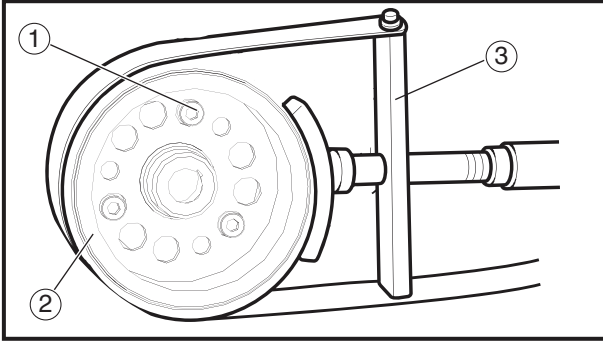
Position the V-belt in the primary sheave (2) (when the pulley is at its widest position) and in the secondary sheave (3) (when the pulley is at its narrowest position), and make sure the V-belt is tight.



STARTER CLUTCH



Order	Job/Part	Q'ty	Remarks
	Removing the starter clutch		Disassemble the parts in the order listed.
1	Shaft	1	
2	Idle gear	1	
3	Nut	1	
4	Washer	1	
5	Bolt	3	
6	Rotor assembly	1	
7	Starter clutch assembly	1	
8	Starter wheel gear	1	
			For installation, reverse the removal procedure.



REMOVING THE STARTER CLUTCH

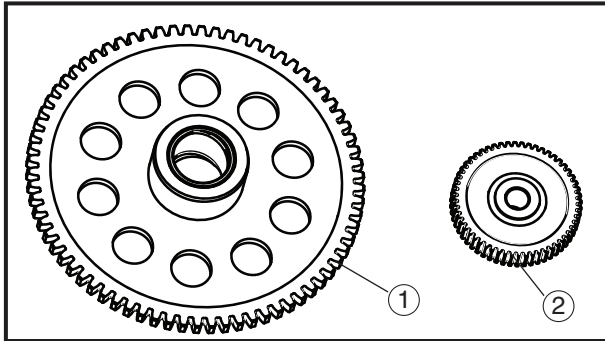
1. Remove:
 - starter clutch bolts (1)

TIP

- Hold the AC magneto rotor (2) with the sheave holder (3) while removing the starter clutch bolts.
- Do not allow the sheave holder to touch the projection on the AC magneto rotor.

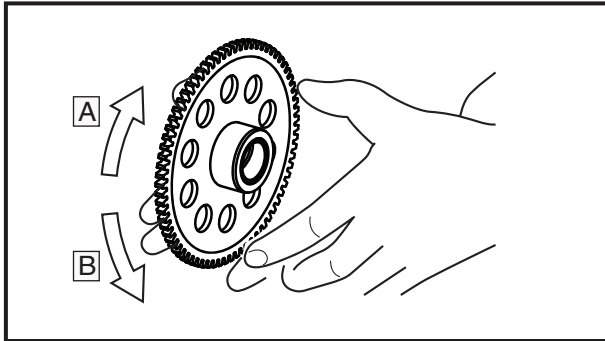


Sheave holder
90890-01701
Primary clutch holder
YS-01880-A



CHECKING THE STARTER WHEEL GEAR

1. Check:
 - starter wheel gear (1)
 - idle gear (2)
 - Burrs/chips/roughness/wear → Replace

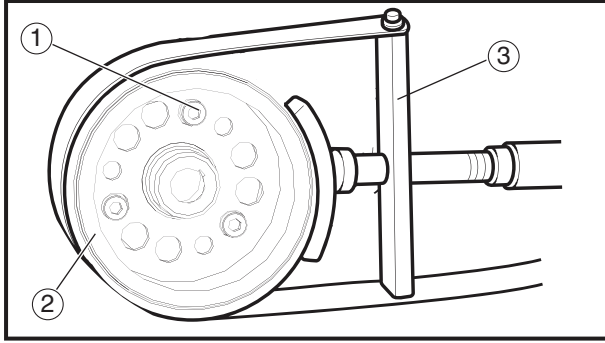


2. Check:
 - starter clutch operation



- a. Install the starter wheel gear (1) onto the idle gear (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.



**INSTALLING THE STARTER CLUTCH**

1. Install:

- starter clutch bolts ①



Starter clutch bolt
30 Nm (3.0 m·kg, 22 ft·lb)
LOCTITE®

TIP

- While holding the AC magneto rotor ② with the sheave holder ③, tighten the starter clutch bolts.
- Do not allow the sheave holder to touch the projection on the AC magneto rotor.

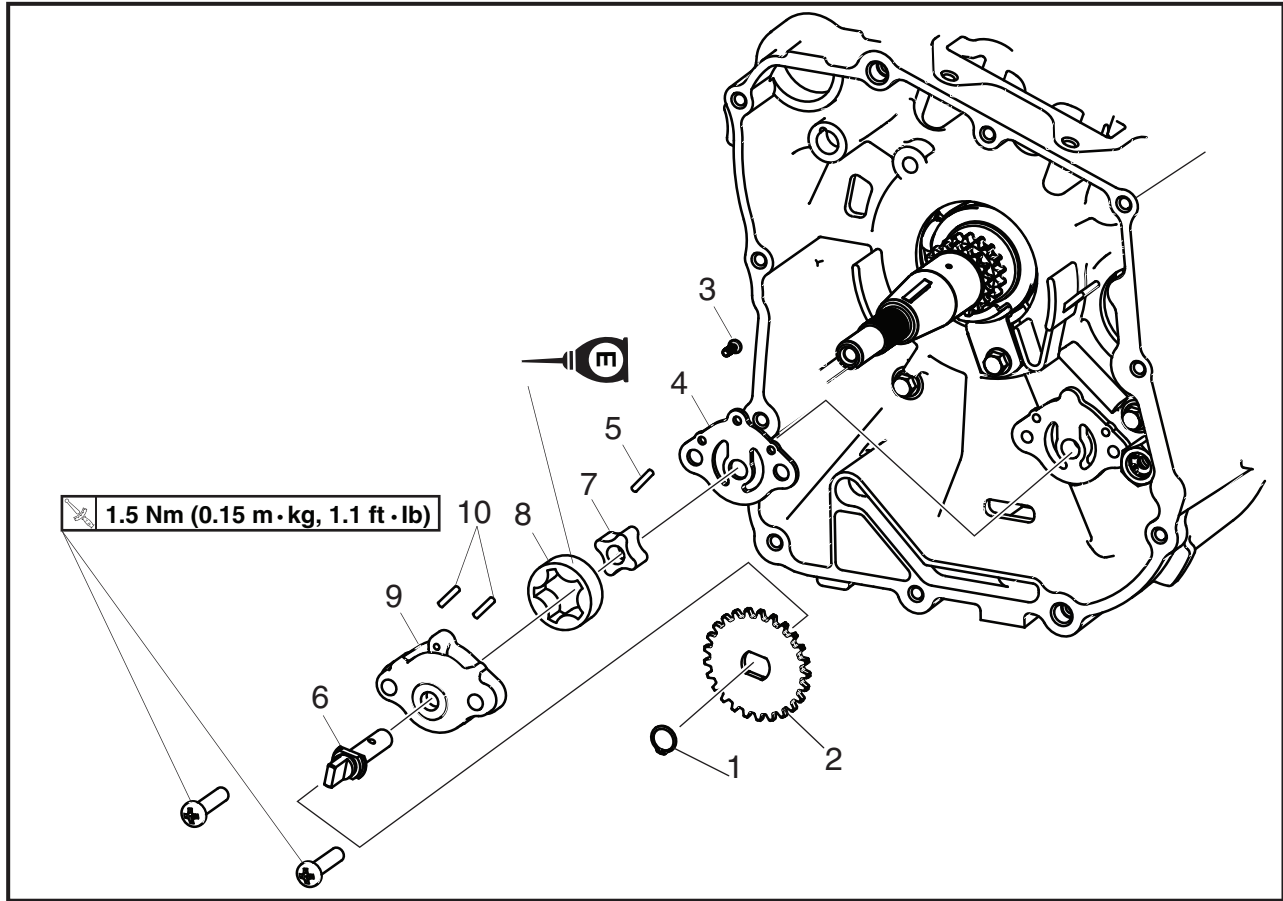


Sheave holder
90890-01701
Primary clutch holder
YS-01880-A

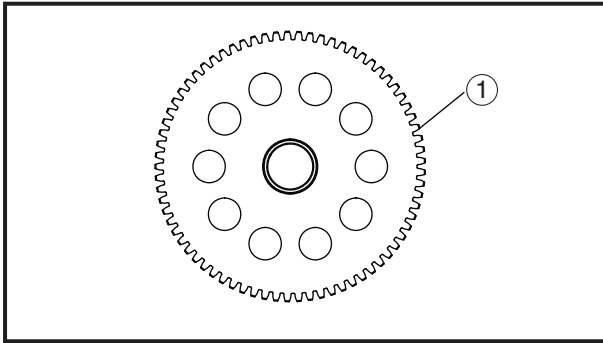


EBS00315

OIL PUMP



Order	Job/Part	Q'ty	Remarks
	Disassembling the oil pump		Remove the parts in the order listed. Refer to " C.D.I. MAGNETO "
1	Circlip	1	
2	Oil pump driven sprocket	1	
3	Screw	1	
4	Oil pump housing	1	
5	Dowel pin	1	
6	Roller	1	
7	Inner rotor	1	
8	Outer motor	1	
9	Oil pump body	1	
10	Dowel pin	2	
			For assembly, reverse the disassembly procedure.

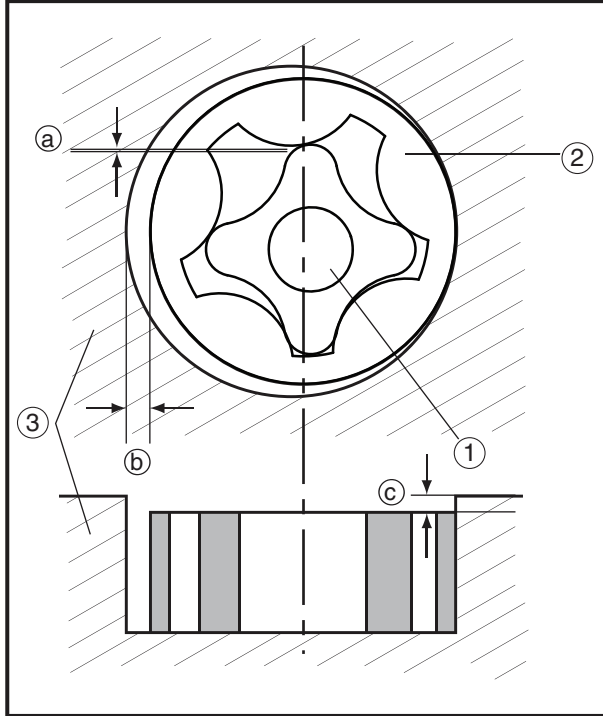


EAS00364

CHECKING THE OIL PUMP

1. Check:

- oil pump driven gear ①
Cracks/damage/wear → Replace the defective part(s).



2. Measure:

- inner-rotor-to-outer-rotor-tip clearance ①
- outer-rotor-to-oil-pump-housing clearance ②
- oil-pump-housing-to-inner-rotor-and-outer-rotor clearance ③
- Out of specification → Replace the oil pump.

- ① Inner rotor
- ② Outer rotor
- ③ Oil pump housing

**Inner-rotor-to-outer-rotor-tip clearance**

<Limit>: 0.200mm (0.0079 in)

Outer-rotor-to-oil-pump-housing clearance

<Limit>: 0.250 mm (0.0098 in)

Oil-pump-housing-to-inner-rotor-and-outer-rotor clearance

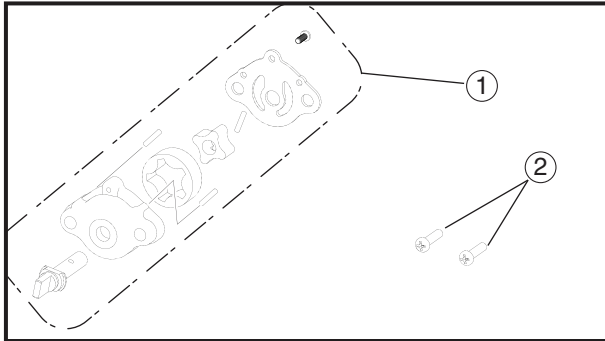
<Limit>: 0.120 mm (0.0047 in)



3. Check:

- oil pump operation

Rough movement → Repeat steps (1) and (2) or replace the defective part(s).




EAS00376

INSTALLING THE OIL PUMP

1. Install:

- oil pump assembly ①
- oil pump screws ②

 1.5 Nm (0.15 m • kg, 1.1 ft • lb)

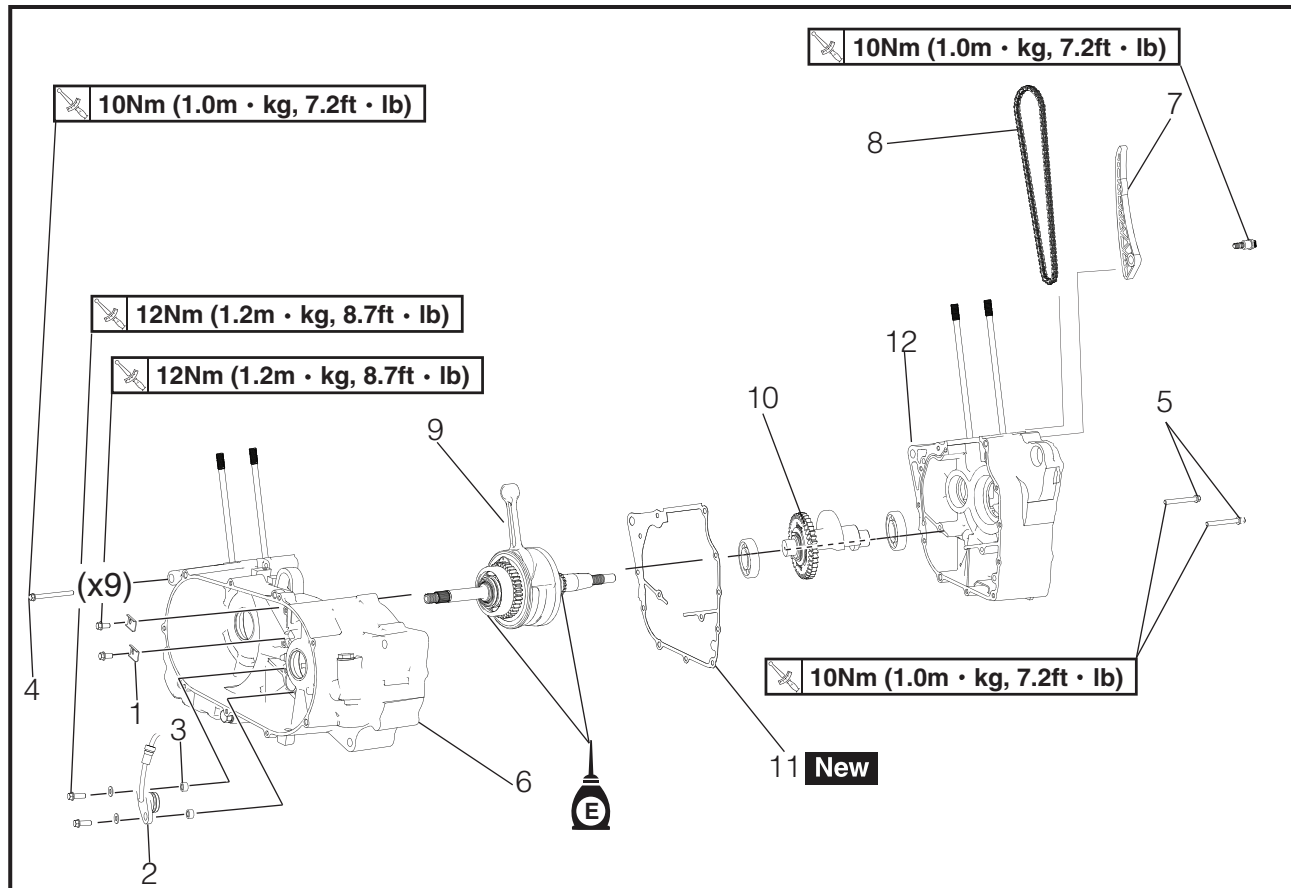
NOTICE

After tightening the bolts, make sure the oil pump turns smoothly.

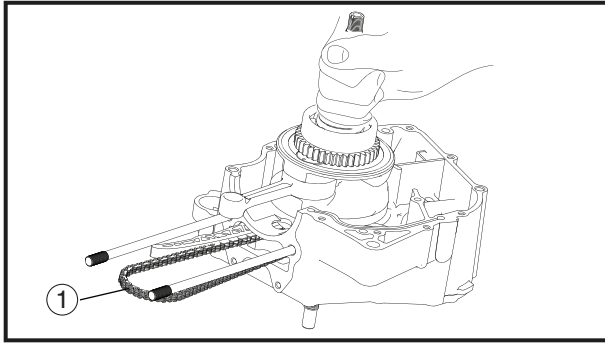


EBS00319

CRANKCASE AND CRANKSHAFT



Order	Job/Part	Q'ty	Remarks
	Removing the crankshaft assembly		Remove the parts in the order listed.
	Engine		Refer to "ENGINE".
	Cylinder head		Refer to "CYLINDER HEAD".
	Cylinder piston		Refer to "CYLINDER AND PISTON".
	V-belt, clutch, primary / Secondary sheave		Refer to "V-BELT, CLUTCH, PRIMARY AND SECONDARY SHEAVE".
	Starter clutch		Refer to "STARTER CLUTCH AND STARTER MOTOR".
	C.D.I. magneto		Refer to "C.D.I. MAGNETO".
	Oil pump		Refer to "OIL PUMP".
1	Bearing cover plate	2	
2	Change switch assembly	2	
3	Change switch collar	2	
4	Bolt-1	10	
5	Bolt-2	2	
6	Left crankcase	1	
7	Timing chain guide	1	
8	Timing chain	1	
9	Crankshaft assembly	1	
10	Balance shaft	1	Refer to "INSTALLING THE CRANKSHAFT".
11	Crankcase cover	1	
12	Right crankcase	1	
			For installation, reverse the removal procedure.



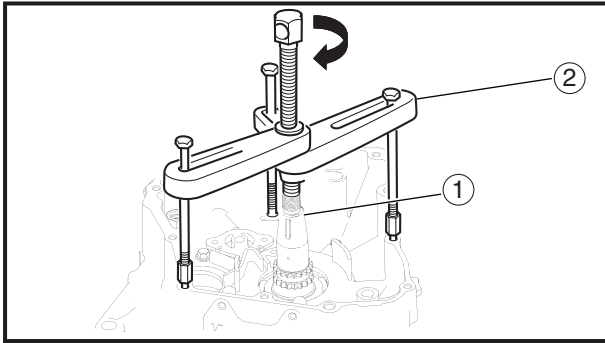
EAS00389

REMOVING THE CRANKSHAFT ASSEMBLY

1. Remove:
 - timing chain (1)

TIP

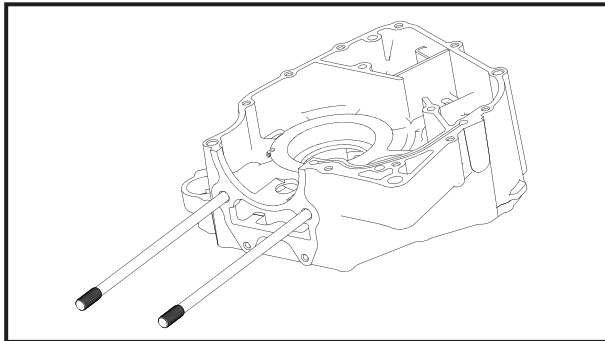
- Before removing the crankshaft assembly, remove the timing chain from the crankshaft sprocket.
- The crankshaft assembly cannot be removed if the timing chain is attached onto the crankshaft sprocket.



2. Remove:
 - crankshaft (1)

TIP

- Remove the crankshaft with the crankcase separating tool (2).
- Make sure the crankcase separating tool is centered over the crankshaft.



NOTICE

- To protect the end of the crankshaft, place an appropriate sized socket between the crankcase separating tool bolt and the crankshaft.
- Do not tap on the crankcase.



Crankcase separating tool
90890-04152
Crankcase separator
YU-A9642

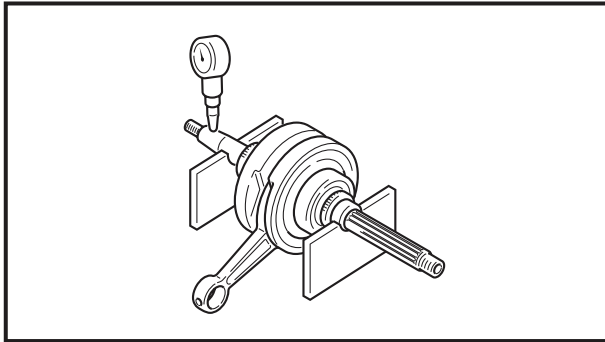
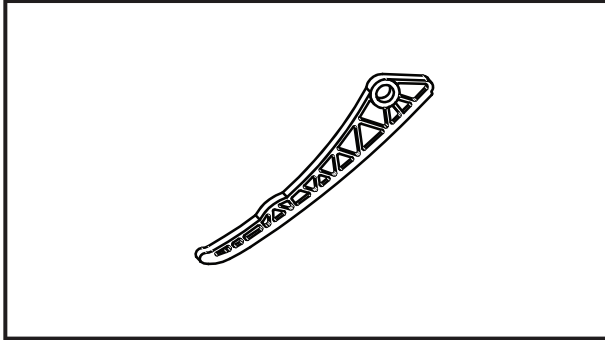


EAS00207

CHECKING THE TIMING CHAIN AND TIMING CHAIN GUIDES

1. Check:
 - timing chain
Damage/stiffness → Replace the timing chain.

2. Check:
 - timing chain guide
Damage/wear → Replace the timing chain guide.



EAS00394

CHECKING THE CRANKSHAFT AND CONNECTING ROD

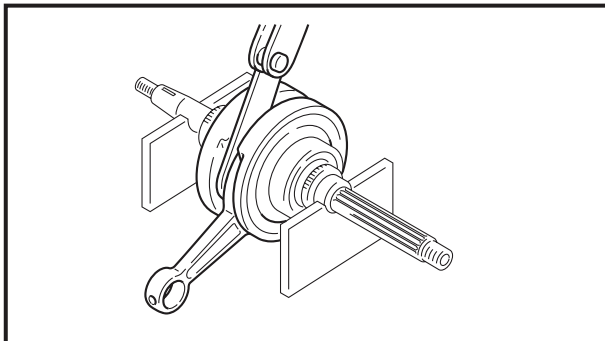
1. Measure:
 - crankshaft runout
Out of specification → Replace the crankshaft, bearing or both.

TIP _____

Turn the crankshaft slowly.



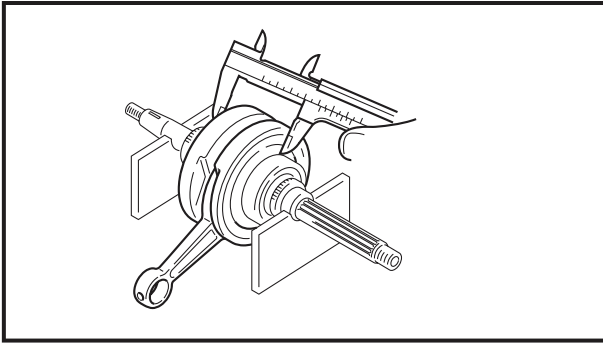
Maximum crankshaft runout
0.100 mm (0.0039 in)



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



Big end side clearance
0.600 mm (0.0236 in)

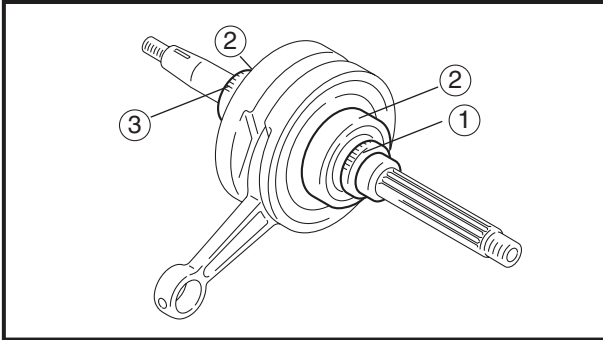


3. Measure:
 - crankshaft width
 Out of specification → Replace the crankshaft.

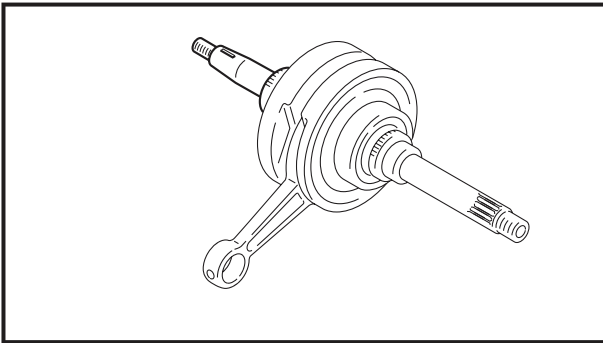


Crankshaft width

56.00 ~ 56.05 mm (2.205 ~ 2.207 in)



4. Check:
 - crankshaft sprocket ①
Damage/wear → Replace the crankshaft.
 - bearing ②
Cracks/damage/wear → Replace the crankshaft.
 - oil pump drive gear ③
Damage/wear → Replace the crankshaft.

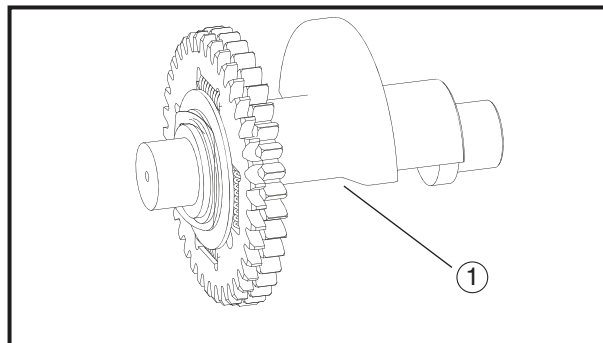


5. Check:
 - crankshaft journal
Scratches/wear → Replace the crankshaft.

EAS00408

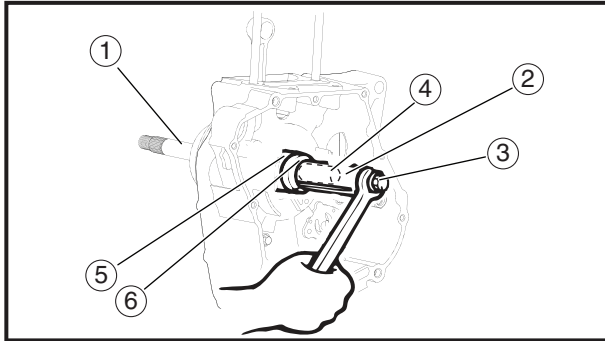
INSTALLING THE CRANKSHAFT

1. Install:
 - balance shaft ①



TIP

Replace the balance shaft if there are cracks, wear or damages.



2. Install:
- crankshaft ①

TIP

Install the crankshaft assembly with the crankshaft installer pot ②, crankshaft installer bolt ③, adapter (M14) ④, spacer (crankshaft installer) ⑤ and spacer ⑥.



Crankshaft installer pot
90890-01274

Installing pot
YU-90058

Crankshaft installer bolt
90890-01275

Bolt
YU-90060

Adapter (M14)
90890-04163

Adapter
YM-04163

Spacer (crankshaft installer)
90890-04164

YM-04164

Pot spacer
YM-91044

Spacer
90890-01288

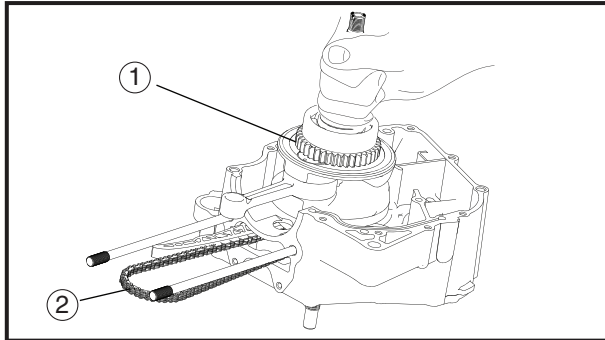
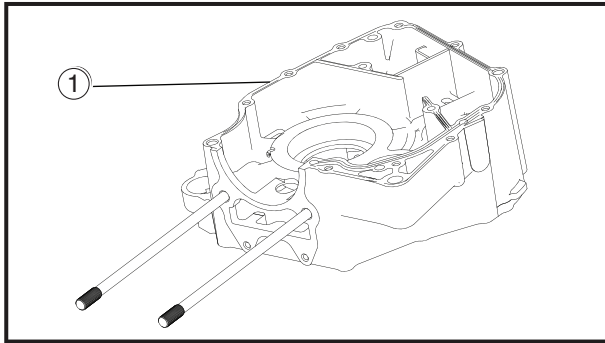
Pot spacer
YU-90059

NOTICE

Apply engine oil to each bearing to protect the crankshaft against scratches and to make installation easier.

TIP

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.




EAS00418

ASSEMBLING THE CRANKCASE

1. Thoroughly clean all the gasket mating surfaces and crankcase mating surfaces.
2. Install:
 - crankcase gasket ①
(onto the crankcase mating surfaces)

3. Install:
 - crankshaft ①
 - timing chain ②

4. Tighten:
 - crankcase

	10 Nm (1.0 m • kg, 7.2ft • lb)
-------------------------------------------------------------------------------------	--------------------------------

NOTICE

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.

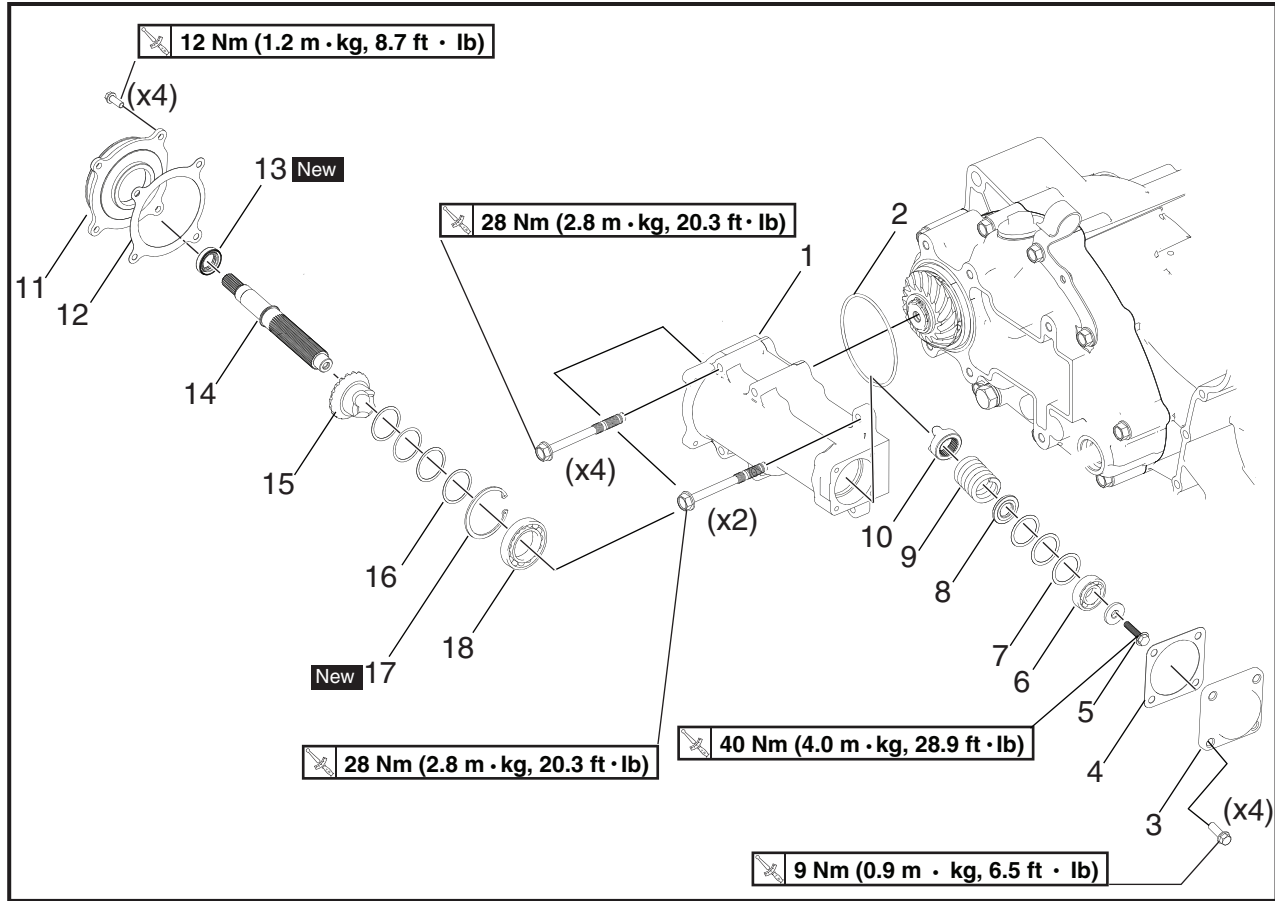
TIP

Put the timing chain in parallel into the crankcase. Manually rotate the crankshaft to check whether it is tightly engaged with the timing chain (if not, install again.)



EAS00419

TRANSMISSION

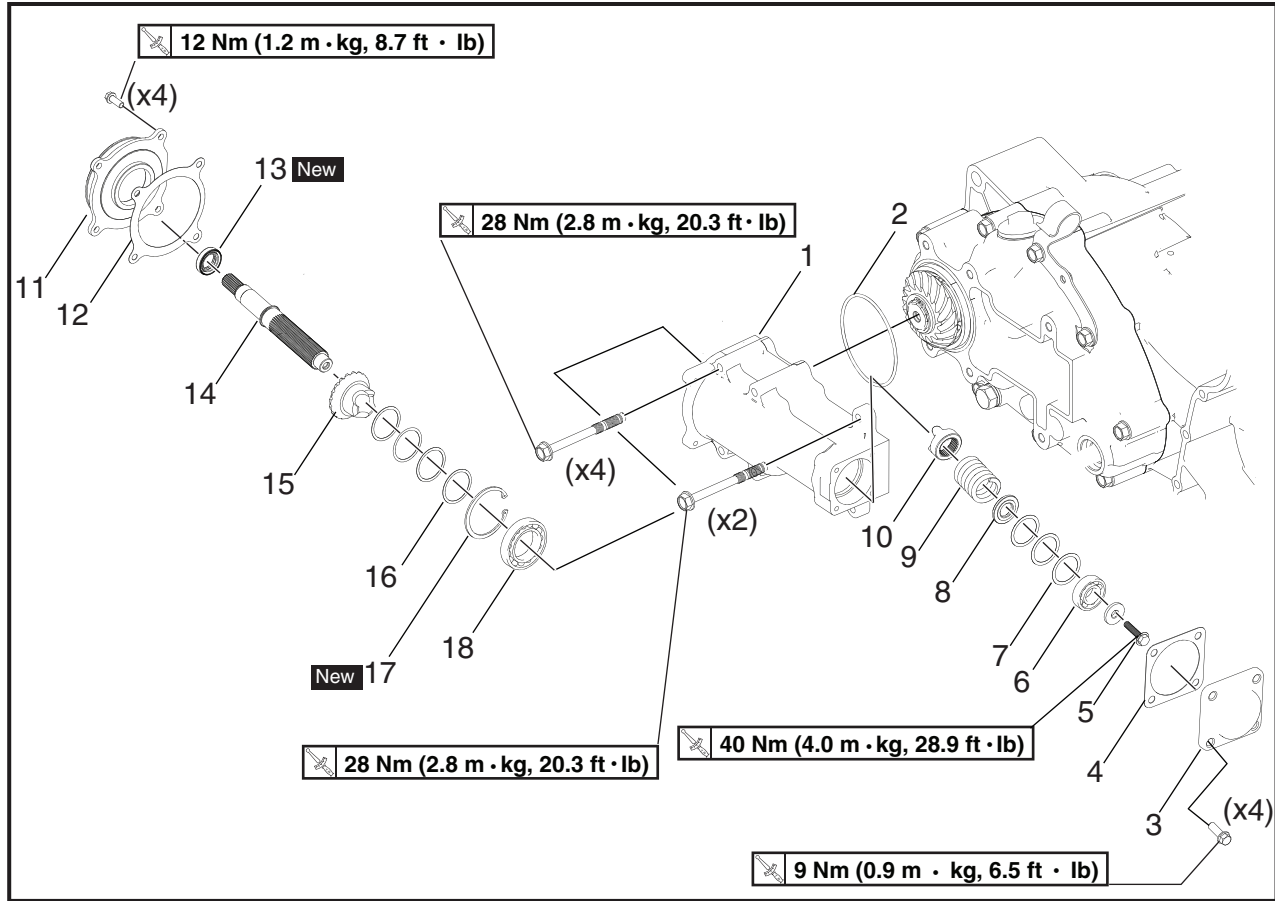


Order	Job/Part	Q'ty	Remarks	
	Removing the transfer case assembly		Remove the parts in the order listed.	
	Transmission oil		Drain.	
	Crankcase cover		Refer to "BELT DRIVE ".	
	Belt drive			
	Secondary sheave			
1	Transfer case-1	1		Refer to "V-BELT, CLUTCH, PRIMARY AND SECONDARY SHEAVE ".
2	O-ring	1		
3	Transfer case-2	1		
4	Gasket	1		
5	Bolt	1		
6	Bearing-2	1		
7	Thrust shim	3		
8	Washer	1		
9	Spring	1		
10	Driven cam	1		
11	Bearing housing	1		

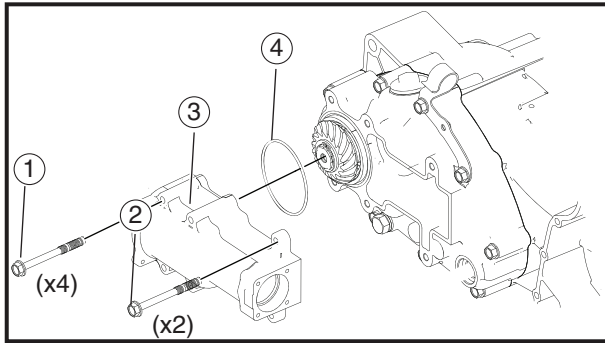


EAS00419

TRANSMISSION



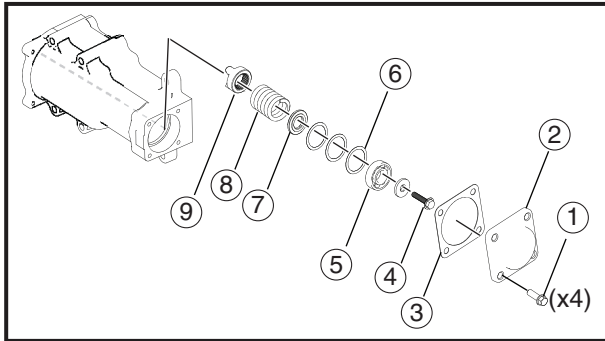
Order	Job/Part	Q'ty	Remarks
12	Housing cap gasket	1	For installation, reverse the removal procedure.
13	Oil seal	1	
14	Shaft	1	
15	Driven pinion	1	
16	Shim	4	
17	Circlip	1	
18	Bearing-1	1	



REMOVING THE TRANSFER CASE ASSY

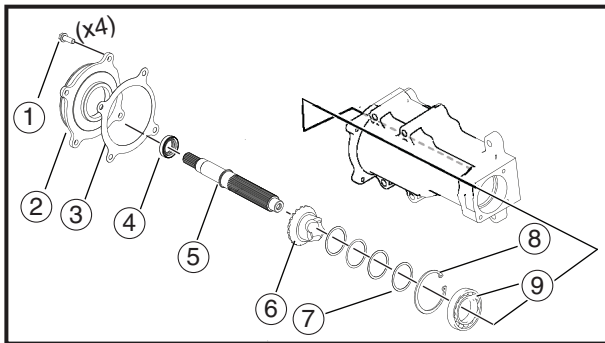
1. Remove:

- bolt-1 (1)
- bolt-2 (2)
- transfer case-1 (3)
- o-ring (4)



2. Remove:

- bolt (1)
- transfer case-2 (2)
- gasket (3)
- cap bolt (4)
- bearing-2 (5)
- thrust shim (6)
- washer (7)
- spring (8)
- driven cam (9)



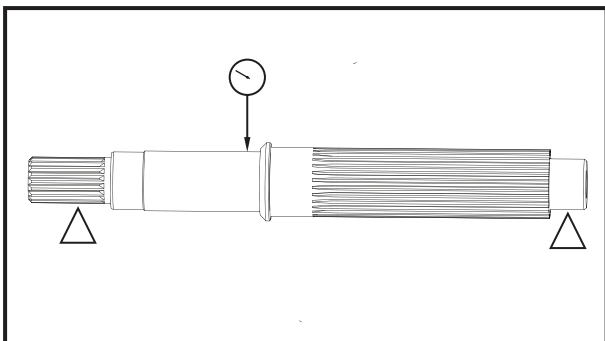
3. Remove:

- bolt (1)
- bearing housing (2)
- gasket (3)
- oil seal (4)
- shaft (5)
- driven pinion (6)
- shim (7)
- circlip (8)
- bearing-1 (9)

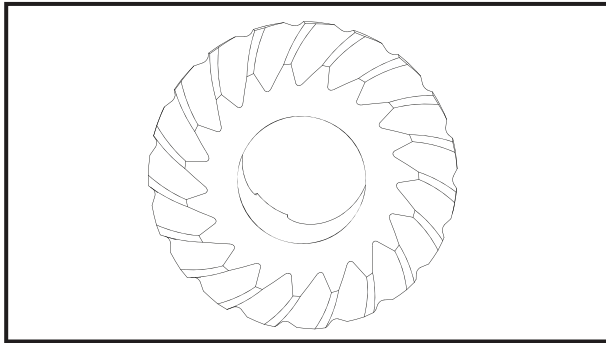
CHECKING THE SHAFT-1 AND DRIVEN PINION

1. Measure:

- shaft runout
(with a centering device and dial gauge)
Out of specification → Replace the drive axle.



Shaft runout limit
0.08 mm (0.0031 in)



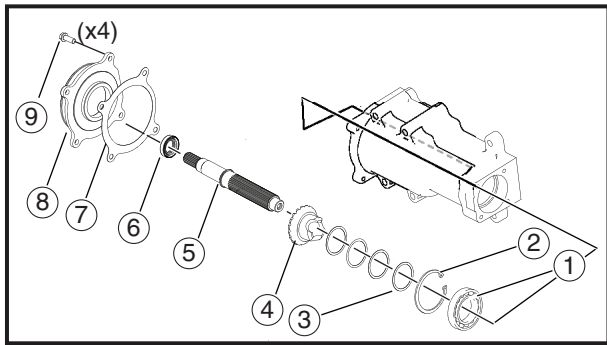
2. Check:
 - driven pinion
Blue discoloration/pitting/wear → Replace the defective gear(s).
3. Check:
 - driven pinion engagement
(each pinion gear to its respective wheel gear)
Incorrect → Reassemble the transmission axle assemblies.
4. Check:
 - driven pinion movement
Rough movement → Replace the defective part(s).

INSTALLING THE TRANSFER CASE ASSY

1. Install:

- bearing-1 ①
- circlip ②
- shim ③
- driven pinion ④
- shaft ⑤
- oil seal ⑥
- housing cap gasket ⑦
- bearing housing bolt ⑧
- bolt ⑨

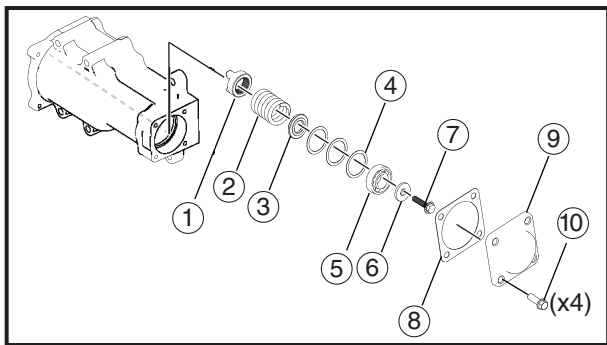
12 Nm (1.2 m · kg, 8.7 ft · lb)



2. Install:

- driven cam ①
- spring ②
- washer ③
- thrust shim ④
- bearing-2 ⑤
- washer ⑥
- cap bolt ⑦
- gasket ⑧
- transfer case-2 ⑨
- bolt ⑩

9 Nm (0.9 m · kg, 6.5 ft · lb)



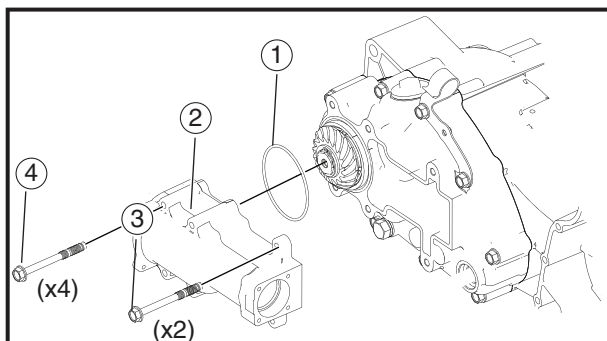
3. Install:

- o-ring ①
- transfer case-1 ②
- bolt-2 ③

28 Nm (2.8 m · kg, 20.3 ft · lb)

- bolt-1 ④

28 Nm (2.8 m · kg, 20.3 ft · lb)

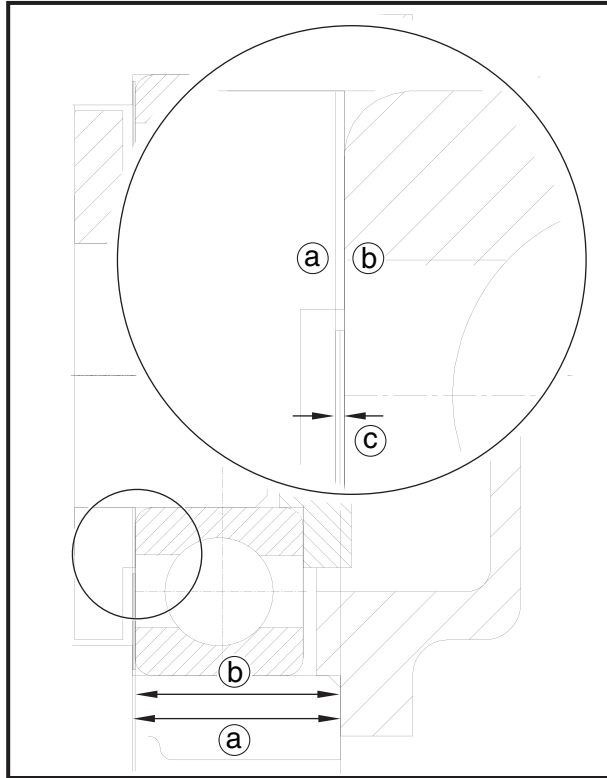




ADJUSTING THE BEARING-2 SHIM

1. Measure:

- Washer-to-bore bottom clearance (c)



(a) = bore bottom-to case back clearance

(b) = washer-to-case back clearance

(c) = (a) - (b)

2. Calculate:

- Number of shims
(with the following formula)

Washer-to-bore bottom clearance (c)

0.1(shim thickness)

= number of shims required (truncated)

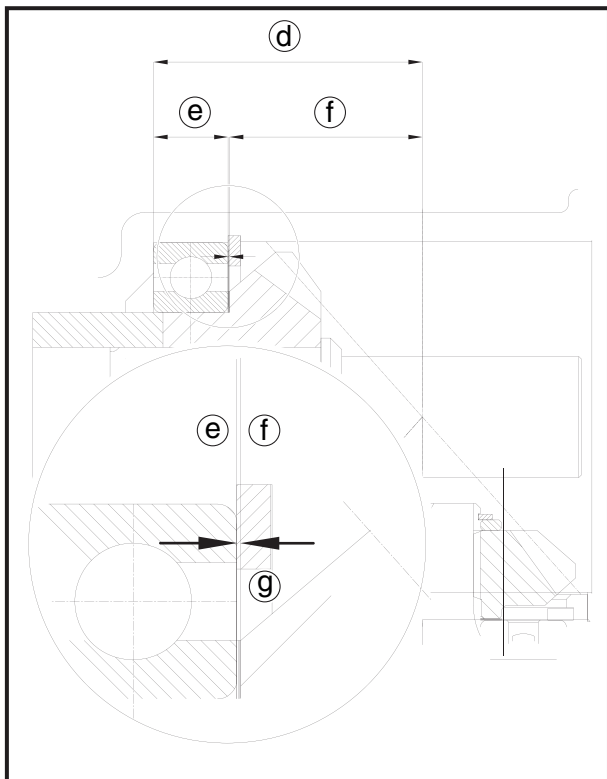
3. Install:

- Required quantity of shims

ADJUSTING THE BEARING-1 SHIM

1. Measure:

- Driven pinion-to-bearing clearance (g)



(d) = pitch point-to-bore bottom clearance
(specified as 57.8 mm or 2.276 in)

(e) = bearing height
(specified as 16.0 mm or 0.630 in)

(f) = pitch point-to-crown clearance
(specified as 41.5 mm or 1.634 in)

(g) = (d) - ((e) + (f))



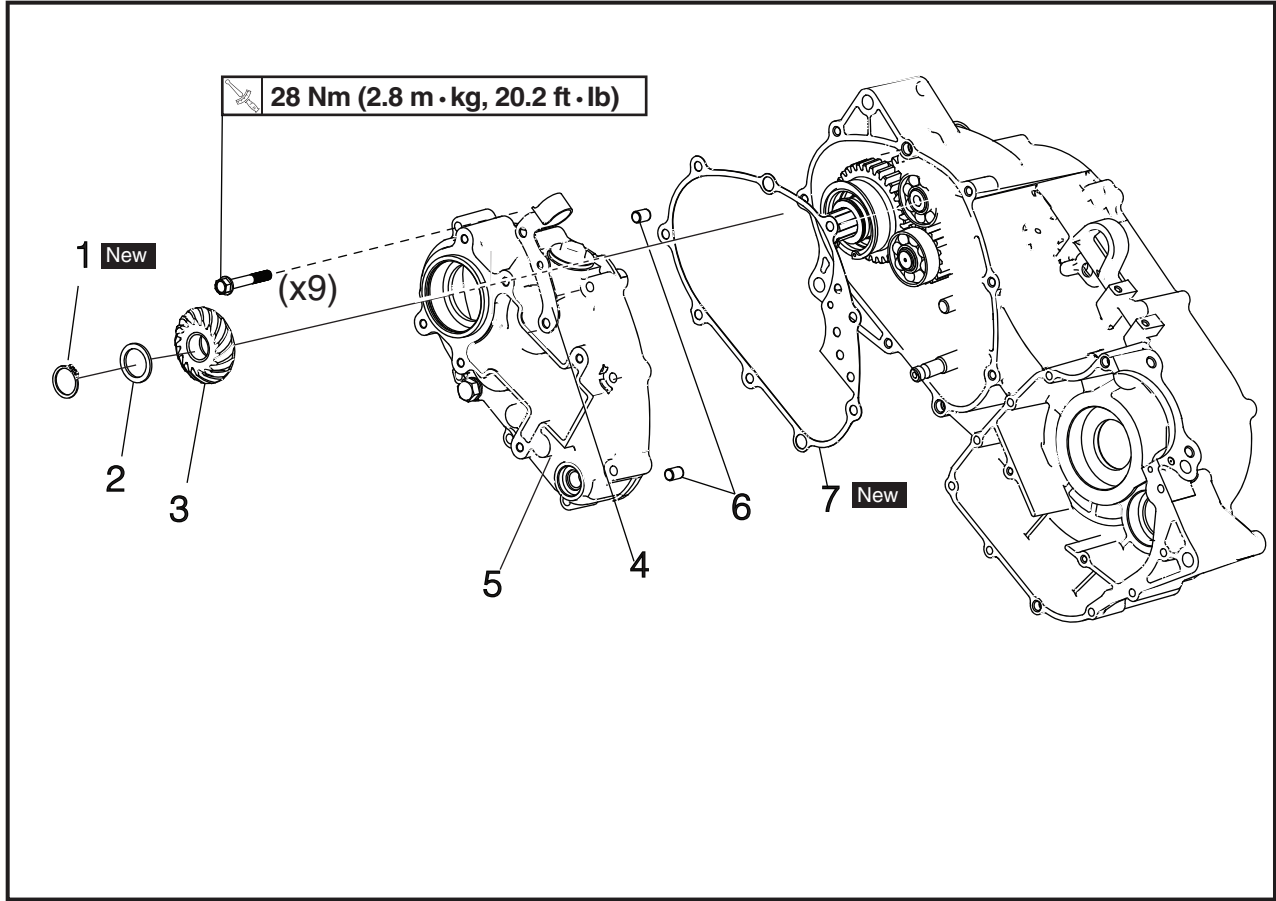
2. Calculate:

- Number of shims
(with the following formula)

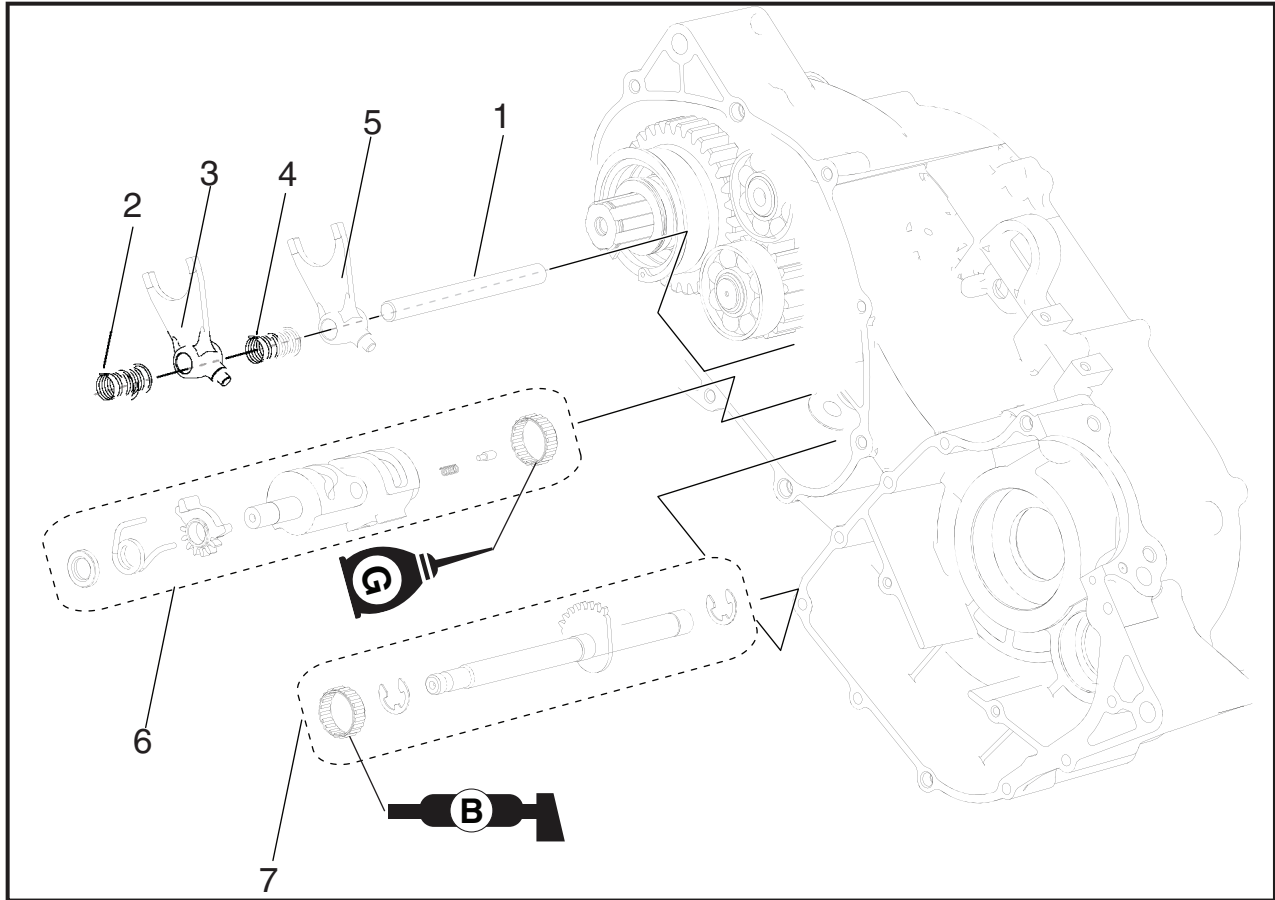
$$\frac{\text{Driven pinion-to-bearing clearance } \textcircled{9}}{0.1(\text{shim thickness})} = \text{number of shims required (truncated)}$$

3. Install:

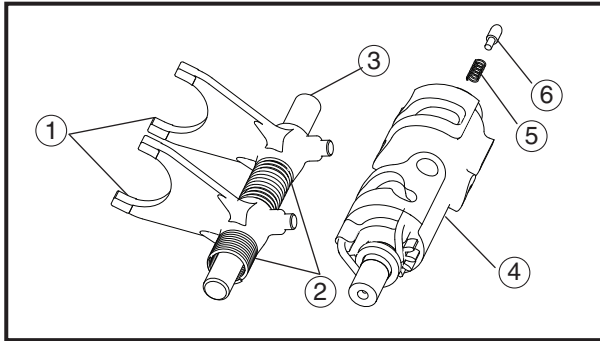
- Required quantity of shims



Order	Job/Part	Q'ty	Remarks
	Removing the transmission cover		Remove the parts in the order listed.
	Transmission oil		Drain.
	Crankcase cover		Refer to "BELT DRIVE ".
	Belt drive		Refer to "V-BELT, CLUTCH, PRIMARY AND SECONDARY SHEAVE ".
	Secondary sheave		
1	Circlip	1	
2	Thrust washer	1	
3	Drive pinion	1	
4	Cover stay	1	
5	Cover plate	1	
6	Dowel pin	2	
7	Gear case gasket	1	
			For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	Removing the shift cam and shift shaft		Remove the parts in the order listed.
1	Shift fork guide bar	1	
2	Spring-1	1	
3	Shift fork-1	1	
4	Spring-2	1	
5	Shift fork-2	1	
6	Shift cam assembly	1	
7	Shift shaft assembly	1	
			For installation, reverse the removal procedure.

**CHECKING THE SHIFT FORKS**

The following procedure applies to all of the shift forks.

1. Check:

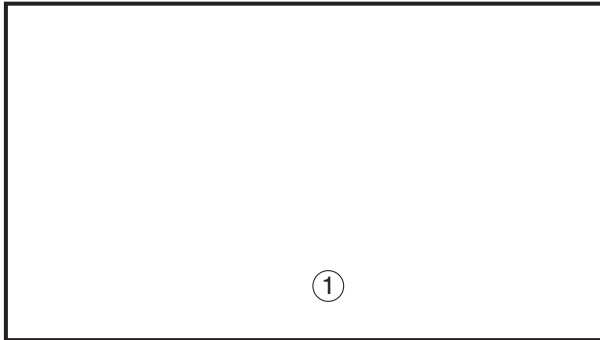
- Shift fork movement
(along the shift fork guide bar)
Rough movement → Replace the shift forks and shift fork guide bar as a set.

- ① Shift forks 1 and 2
- ② Springs 1 and 2
- ③ Shift fork guide bar
- ④ Gear indication drill spring
- ⑤ Gear indication drill
- ⑥ Shift cam assembly



2. Check:

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

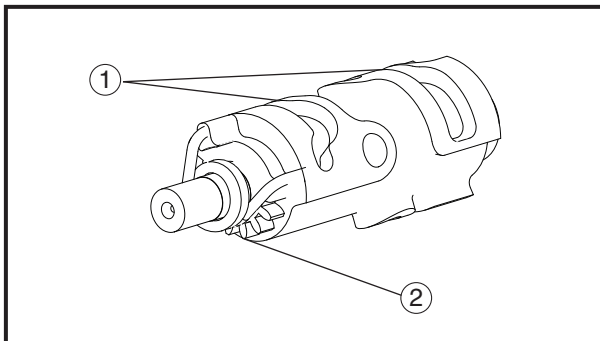


3. Check:

- Shift fork guide bar ①
Roll the shift fork guide bar on a flat surface.
Bends → Replace.

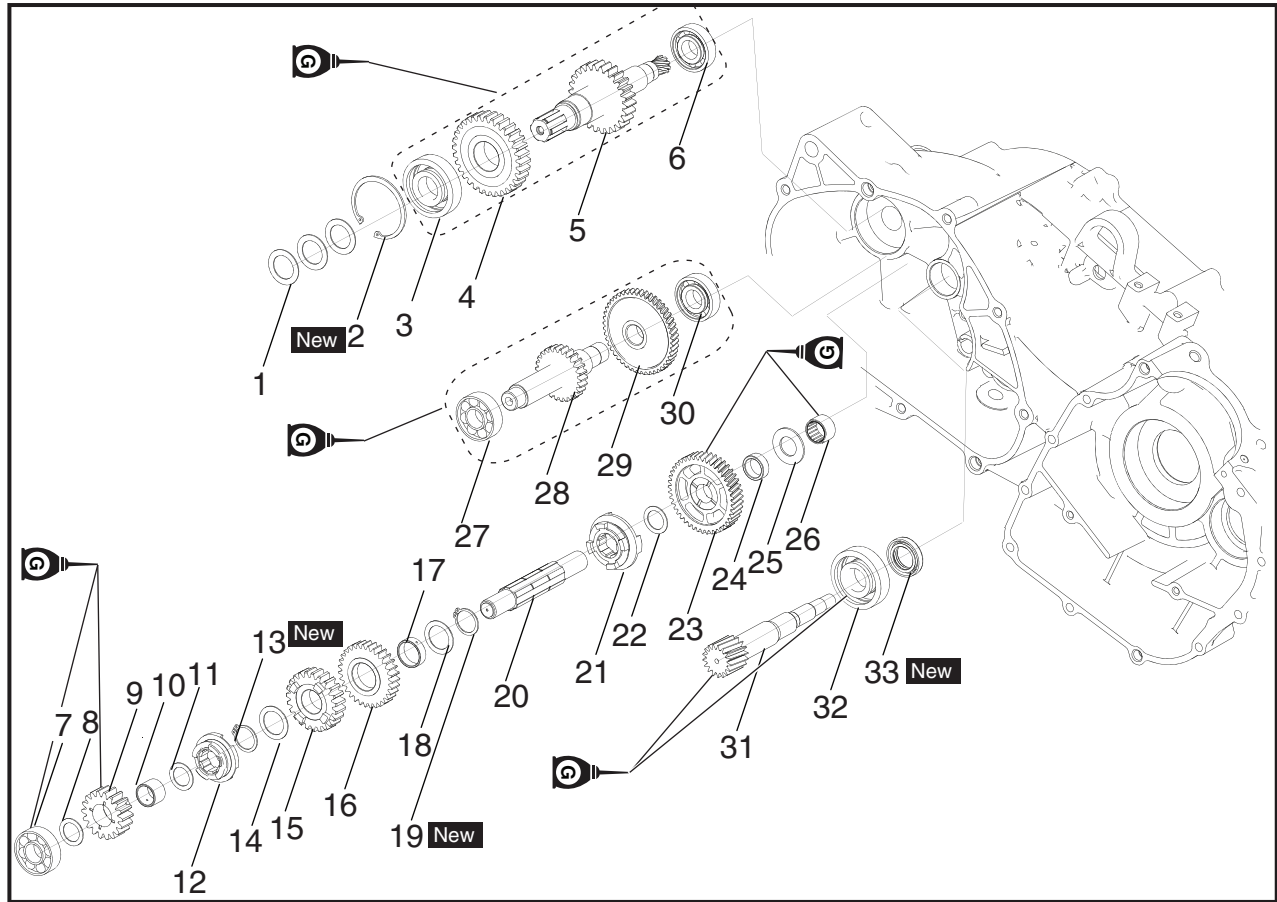
⚠ WARNING

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

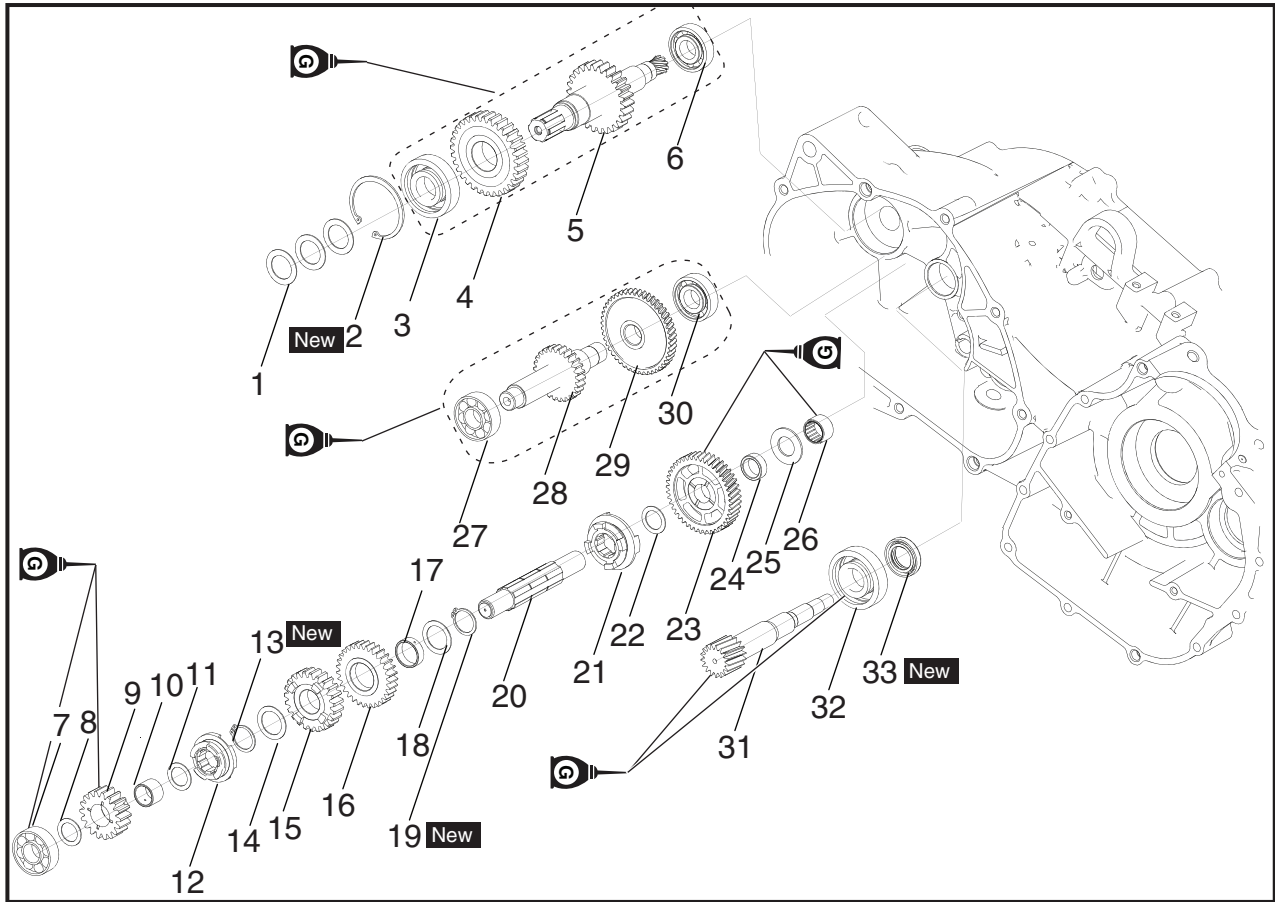
**CHECKING THE SHIFT CAM ASSEMBLY**

1. Check:

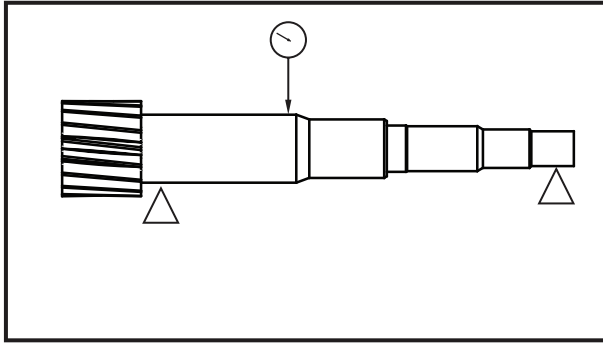
- Shift cam groove ①
Damage/scratches/wear → Replace the shift drum assembly.
- Shift cam segment ②
Damage/wear → Replace the shift drum assembly.
- Shift drum bearing
Damage/pitting → Replace the shift drum assembly.



Order	Job/Part	Q'ty	Remarks
	Removing the transmission		Remove the parts in the order listed.
1	Pinion shim	3	
2	Circlip-1	1	
3	Bearing-1	1	
4	Low wheel gear	1	
5	Middle shaft	1	
6	Bearing-2	1	
7	Bearing-3	1	
8	Gear hold washer-1	1	
9	Low pinion gear	1	
10	Collar-1	1	
11	Gear hold washer-2	1	
12	Dog clutch-1	1	
13	Circlip-2	1	
14	Thrush washer	1	
15	High pinion gear	1	
16	Reverse wheel gear-1	1	
17	Collar-2	1	
18	Gear hold washer-3	1	



Order	Job/Part	Q'ty	Remarks
19	Circlip-3	1	For installation, reverse the removal procedure.
20	Drive axle	1	
21	Dog clutch-2	1	
22	Gear hold washer-4	1	
23	1st wheel gear	1	
24	Collar-3	1	
25	Gear hold washer-5	1	
26	Bearing-4	1	
27	Bearing-5	1	
28	Idle axle	1	
29	Reverse wheel gear-2	1	
30	Bearing-6	1	
31	Counter axle	1	
32	Bearing-7	1	
33	Oil seal	1	



EAS00425

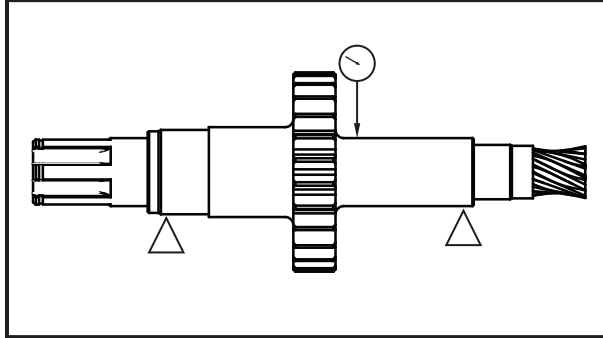
CHECKING THE TRANSMISSION

1. Measure:

- counter axle runout
(with a centering device and dial gauge)
Out of specification → Replace the main axle.



Counter axle runout limit
0.08 mm (0.0031 in)

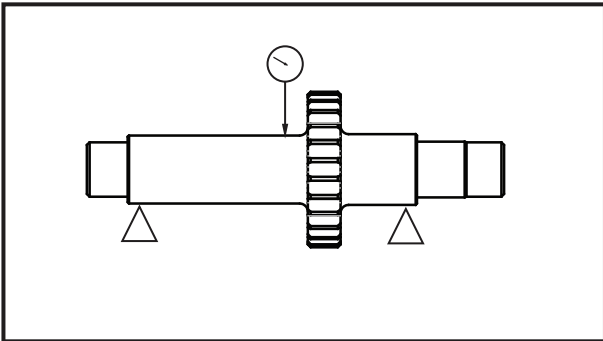


2. Measure:

- middle shaft runout
(with a centering device and dial gauge)
Out of specification → Replace the drive axle.



Middle shaft runout limit
0.08 mm (0.0031 in)

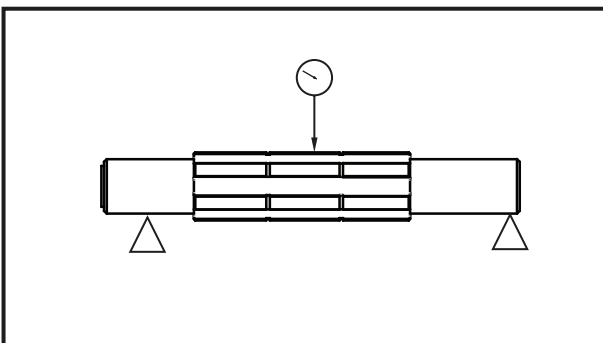


3. Measure:

- idle axle runout
(with a centering device and dial gauge)
Out of specification → Replace the drive axle.



Idle axle runout limit
0.08 mm (0.0031 in)

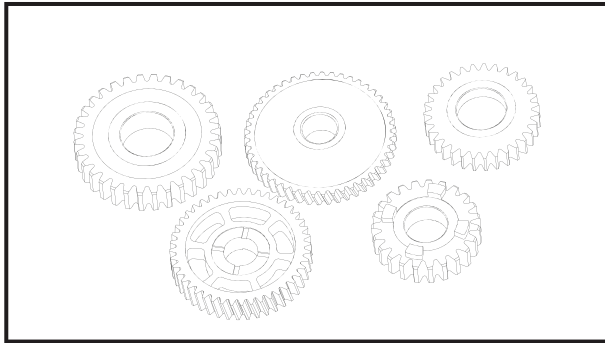


4. Measure:

- drive axle runout
(with a centering device and dial gauge)
Out of specification → Replace the drive axle.



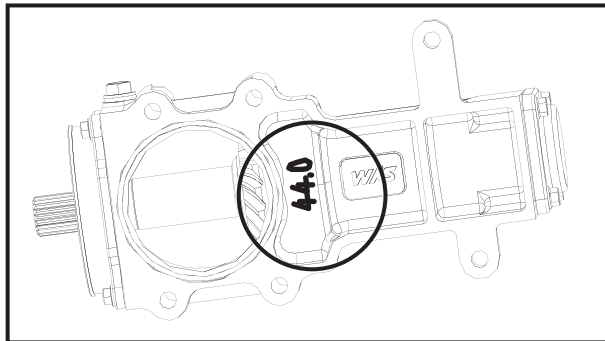
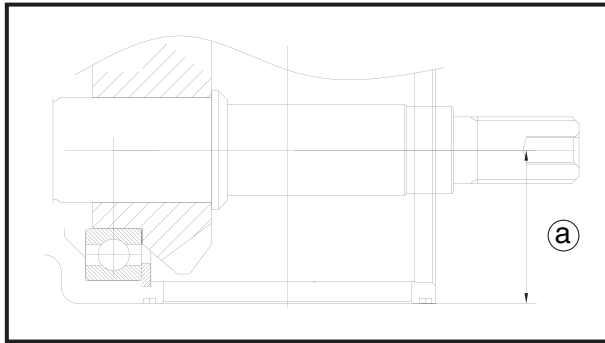
Drive axle runout limit
0.08 mm (0.0031 in)



5. Check:
 - transmission gears
Blue discoloration/pitting/wear → Replace the defective gear(s).
6. Check:
 - transmission gear engagement
(each pinion gear to its respective wheel gear)
Incorrect → Reassemble the transmission axle assemblies.
7. Check:
 - transmission gear movement
Rough movement → Replace the defective part(s).

ADJUSTING THE DRIVE PINION SHIM

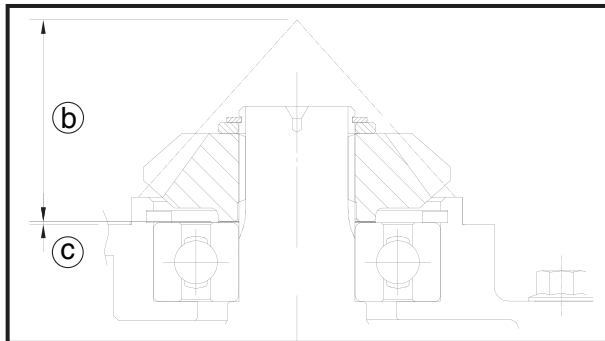
1. Measure:
 - Shaft axis-to-coupling surface clearance
(a)



TIP

Shaft axis-to-coupling surface clearance can be derived from the transfer case-1 (as illustrated).

2. Calculate:
 - Number of shims
(with the following formula)

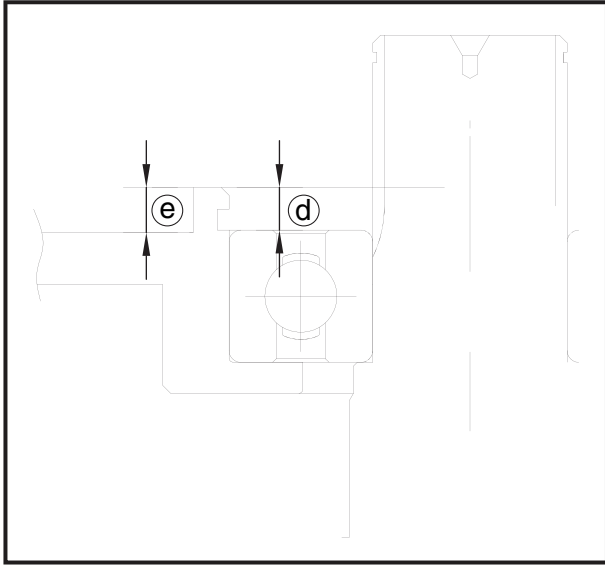


$$\frac{a - (b + c)}{0.1(\text{shim thickness})} = \text{number of shims required (truncated)}$$



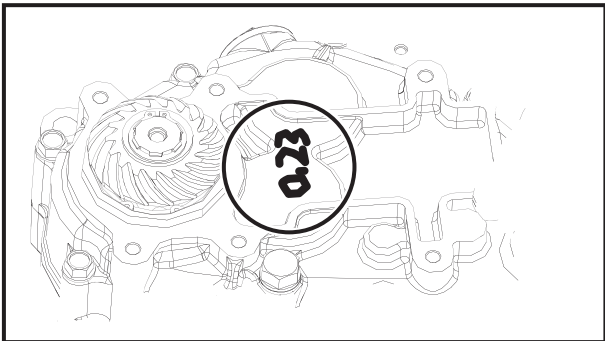
ⓑ = pitch point-to-back clearance
(specified as 43.4 mm or 1.709 in)

ⓒ = coupling surface-to-bearing
clearance



TIP

Calculate the coupling surface-to-bearing clearance by subtracting crown-to-bearing clearance ⓓ from crown-to-coupling surface clearance ⓔ .



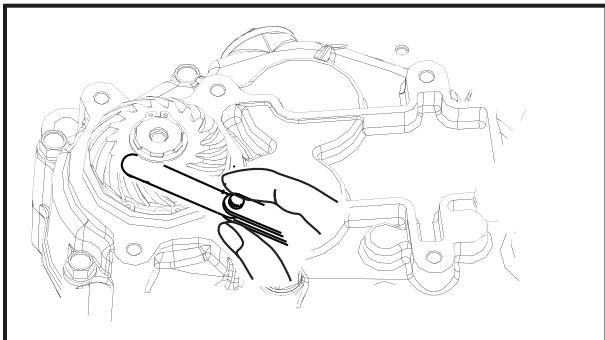
TIP

Coupling surface-to-bearing clearance can be derived from the mission case (as illustrated).

3. Install:
 - Required quantity of shims

SELECTING THE FINAL SHAFT CIRCLIP WASHER

1. Install:
 - Circlip
2. Measure:
 - Drive pinion-to-circlip clearance (with a thickness gauge)





Thickness gauge
90890-03079
Narrow gauge set
YM-34483

3. Select:

- Suitable washer
(using the following table)

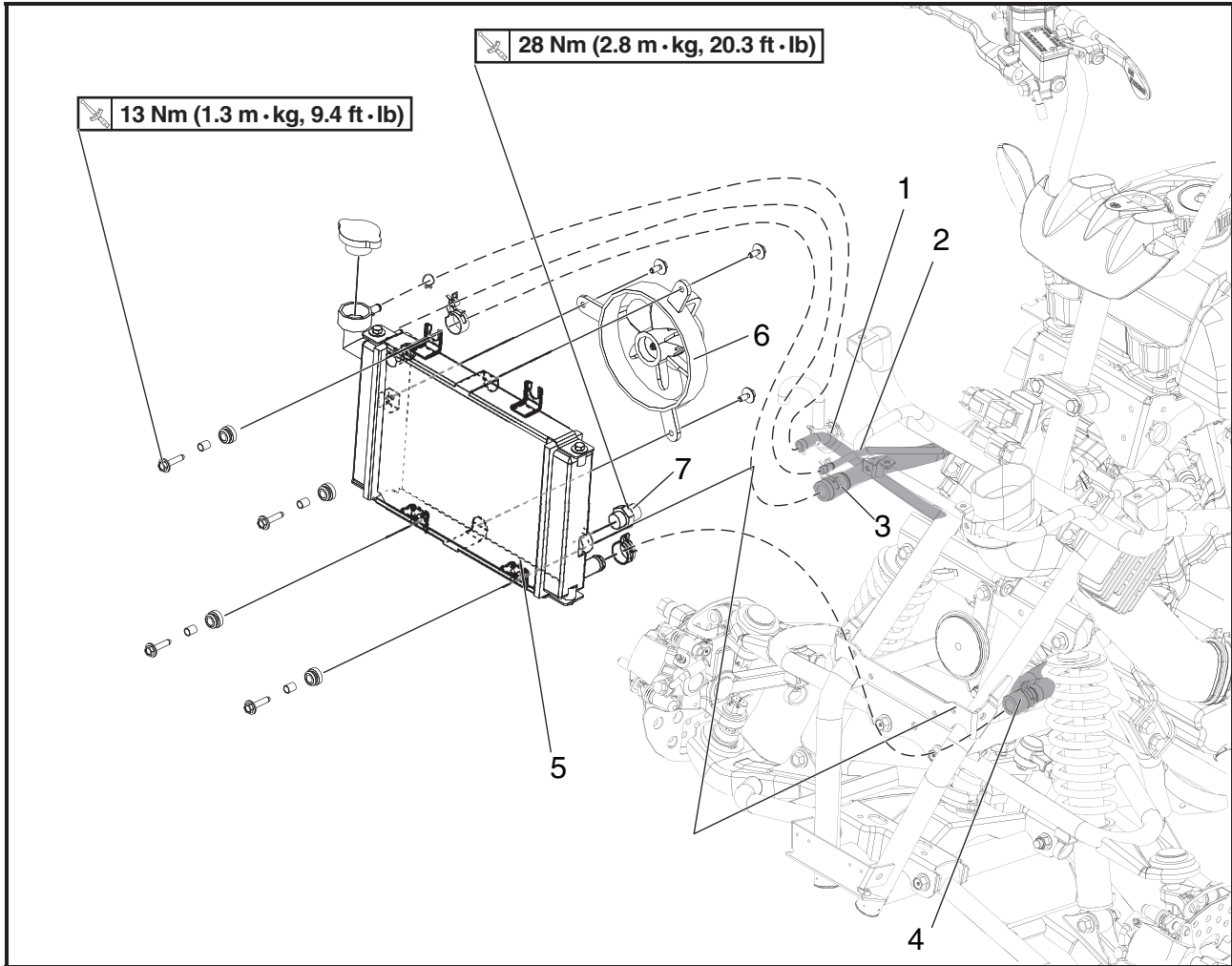
P/N	SPEC.	COLOR
1SC-E7529-00	2.1 ± 0.01	GREEN
1SC-E7529-10	2.2 ± 0.01	BROWN
1SC-E7529-20	2.3 ± 0.01	YELLOW
1SC-E7529-30	2.4 ± 0.01	BLUE
1SC-E7529-40	2.5 ± 0.01	RED

TIP

Each size has its corresponding color.

COOLING SYSTEM

RADIATOR



Order	Job/Part	Q'ty	Remarks
	Removing the radiator		Remove the parts in the order listed.
	Seat/fuel tank cover/side covers /front fender		Refer to "SEAT, FENDERS AND FUEL TANK" in chapter 3.
	Coolant		Drain.
1	Coolant reservoir hose	1	Disconnect.
2	Rubber tube	1	Disconnect.
3	Radiator outlet hose	1	Disconnect.
4	Radiator inlet hose	1	Disconnect.
5	Radiator	1	
6	Radiator fan	1	Disconnect radiator fan coupler.
7	Thermo switch	1	Disconnect thermo switch coupler.
			For installation, reverse the removal procedure.



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INSTALLING THE RADIATOR

1. Fill:

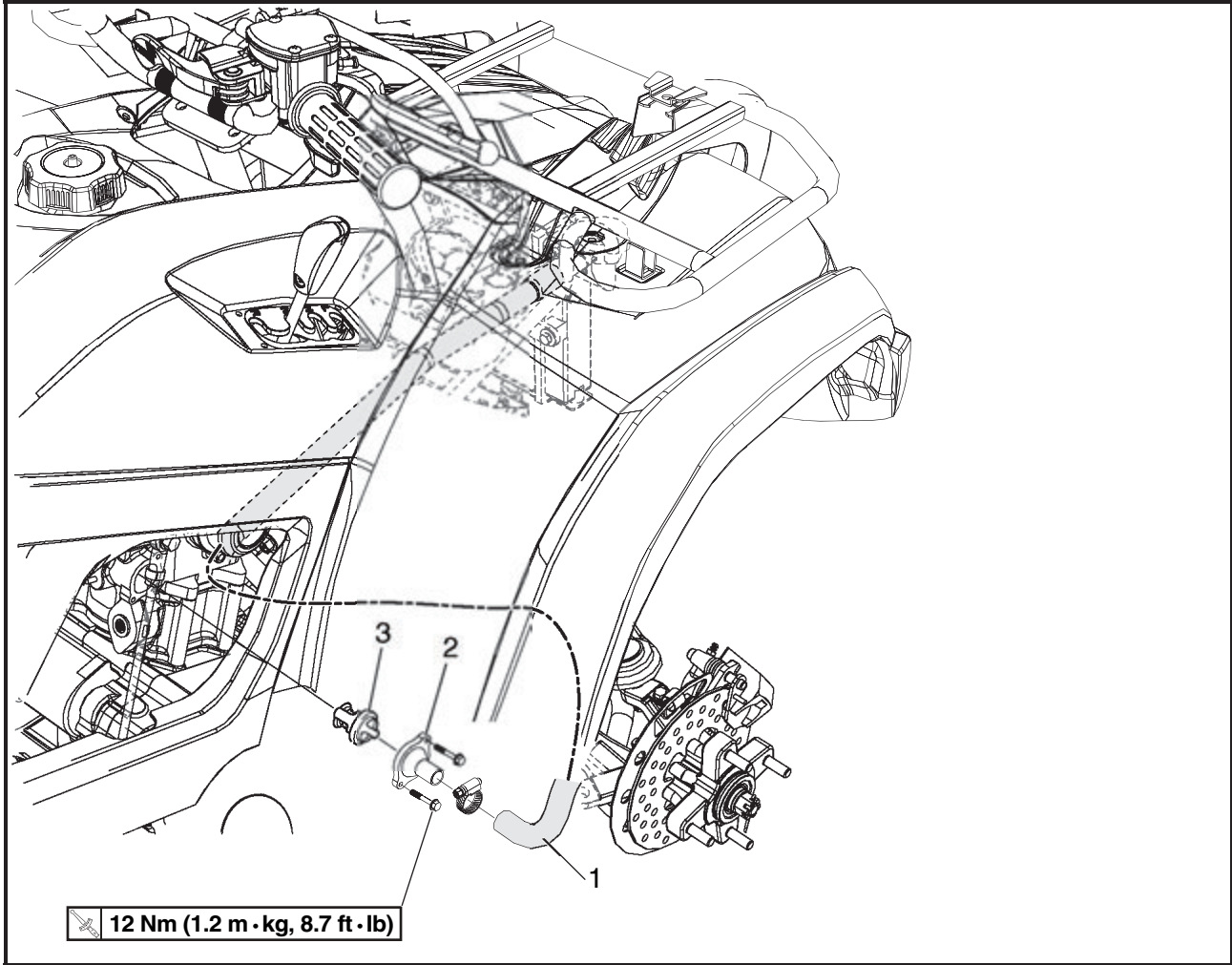
- cooling system
(with the specified amount of the recommended coolant)

Refer to “CHANGING THE COOLANT” in chapter 3.

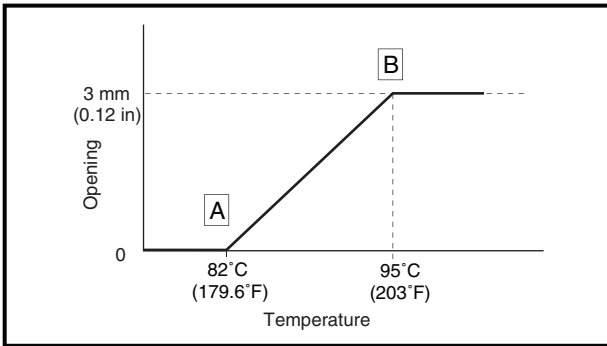
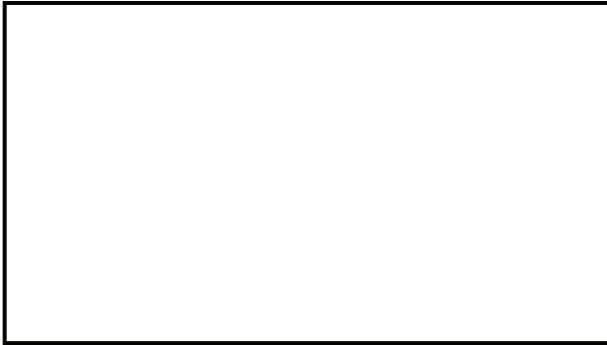
2. Check:

- cooling system
Leaks → Repair or replace any faulty part.

THERMOSTAT



Order	Job/Part	Q'ty	Remarks
	Thermostat removal		Remove the parts in the order below.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in CHAPTER 3.
1	Radiator inlet hose	1	
2	Thermostat cover	1	
3	Thermostat	1	
			For installation, reverse the removal procedure.



CHECKING THE THERMOSTAT

1. Check:

- Thermostat ①
Does not open at 63.5 ~ 65.5 °C (146.3 ~ 149.9 °F) → Replace.

Checking steps:

- Suspend the thermostat in a container filled with water.
- Slowly heat the water.
- Place a thermometer in the water.
- While stirring the water, observe the thermostat and thermometer's indicated temperature.

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

TIP

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

2. Inspect:

- Thermostat housing cover
- Thermostat housing
Cracks/damage → Replace.

INSTALLING THE THERMOSTAT

1. Install:

- Thermostat
- Thermostat housing cover

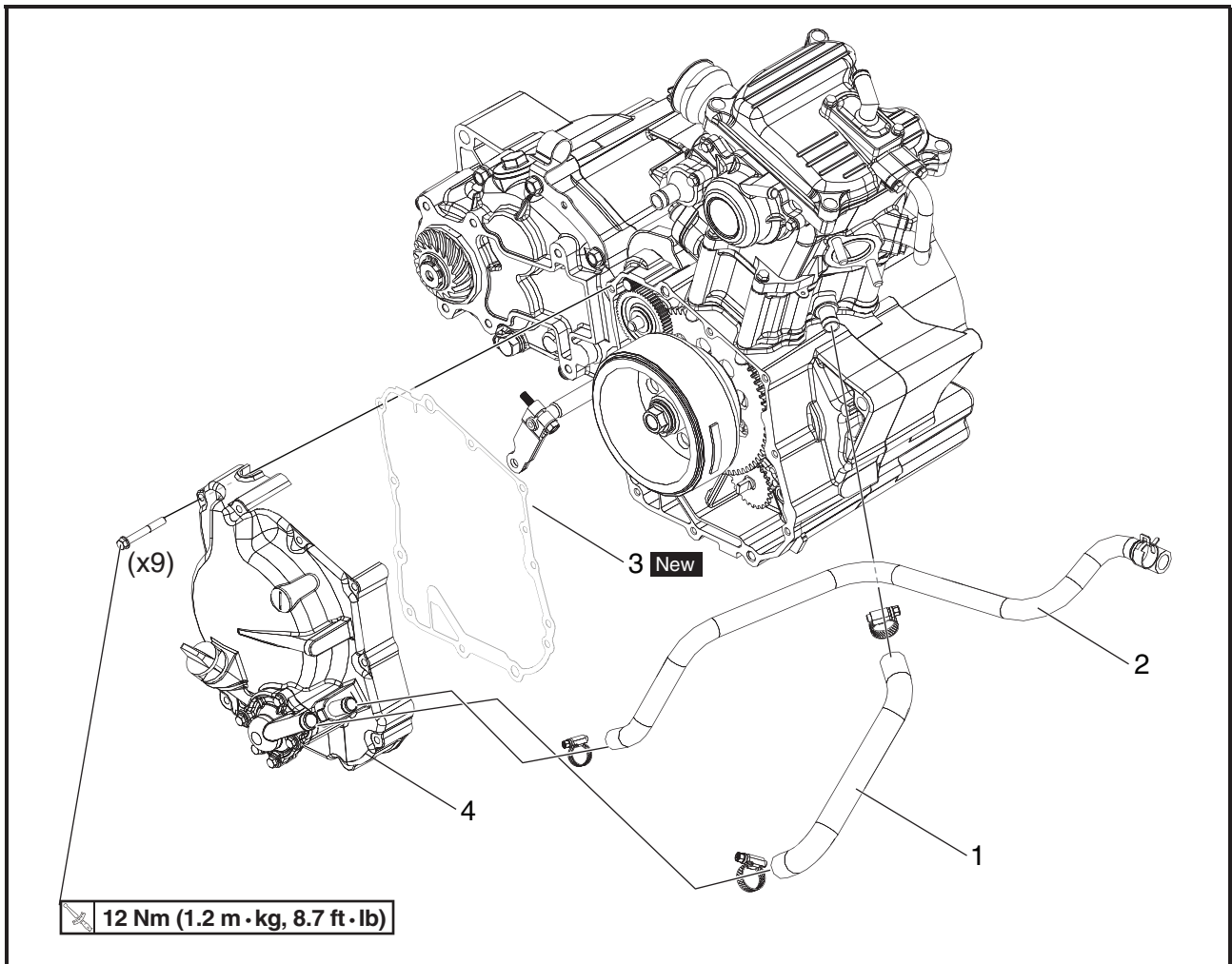
2. Fill:

- Cooling system
(with the specified amount of the recommended coolant)
Refer to "COOLANT REPLACEMENT" in CHAPTER 3.

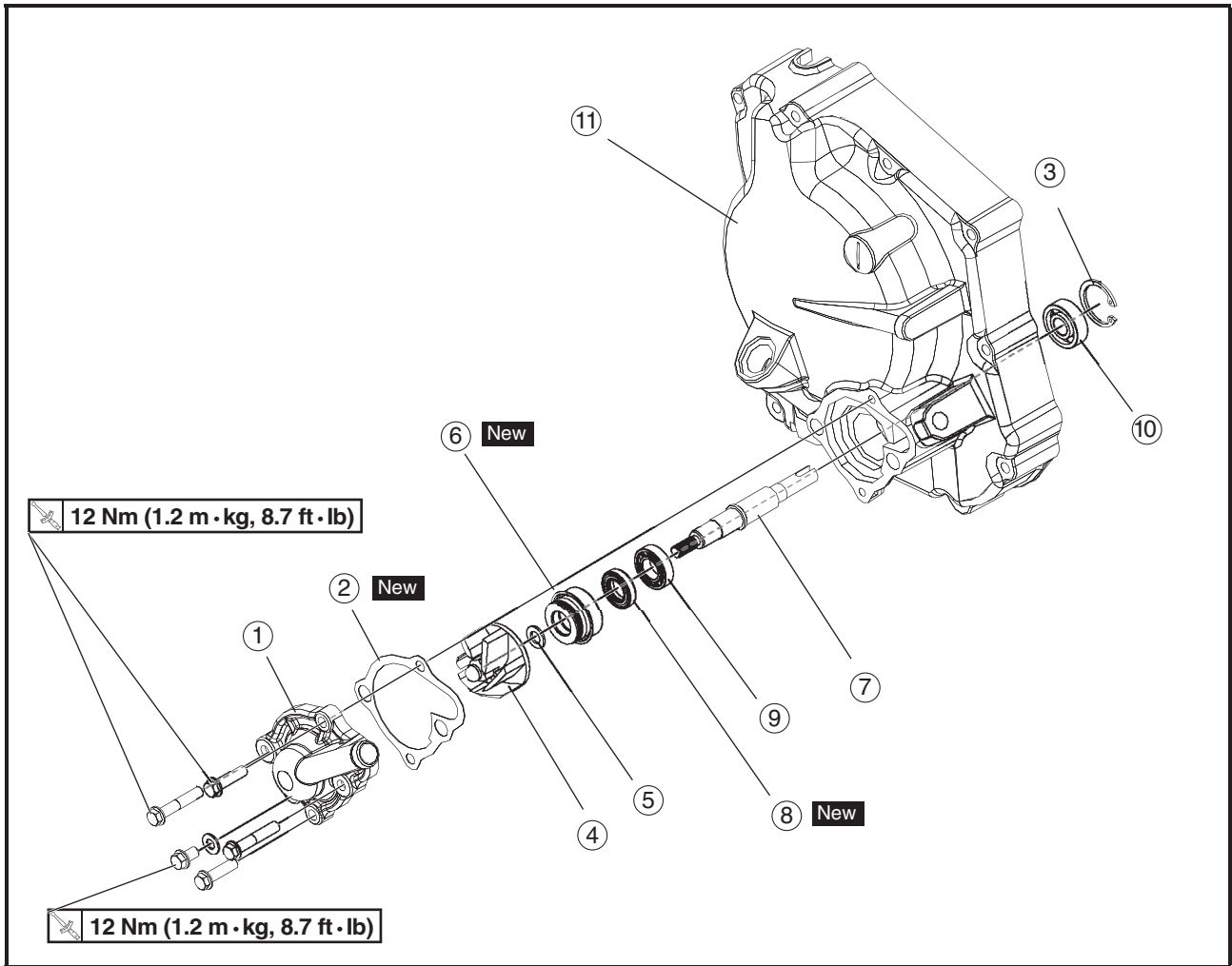
3. Check:

- Cooling system
Leak → Repair or replace any faulty part.

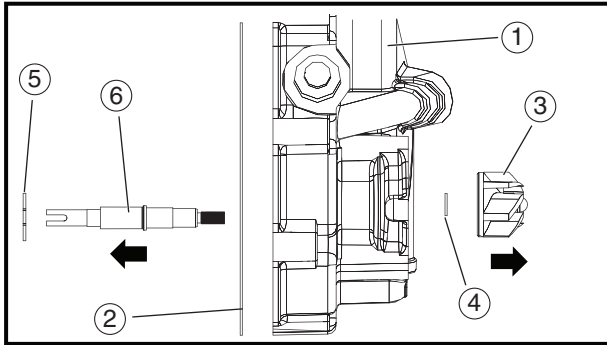
WATER PUMP



Order	Job/Part	Q'ty	Remarks
	Water pump removal Seat, right side cover, right footboard and engine side cover Engine oil		Remove the parts in the order below. Refer to "SEAT, SIDE COVERS AND FOOTREST BOARDS" in CHAPTER 3. Drain. Refer to "CHANGING THE ENGINE OIL" in CHAPTER 3.
1	Water pump outlet hose	1	
2	Water pump inlet hose	1	
3	Gasket	1	
4	Water pump assembly	1	
			For installation, reverse the removal pro- cedure.



Order	Job/Part	Q'ty	Remarks
	Water pump disassembly		Remove the parts in the order below.
1	Water pump housing cover	1	
2	Gasket	1	
3	Circlip	1	
4	Water pump impeller	1	
5	Washer	1	
6	Water pump seal	1	
7	Water pump shaft	1	
8	Oil seal	1	
9	Bearing	1	
10	Bearing	1	
11	Water pump housing	1	
			For assembly, reverse the disassembly procedure.



REMOVING THE WATER PUMP

1.Remove:

- Water pump housing ①
- Gasket ②
- Water pump impeller ③
(remove the impeller with a pump impeller.)

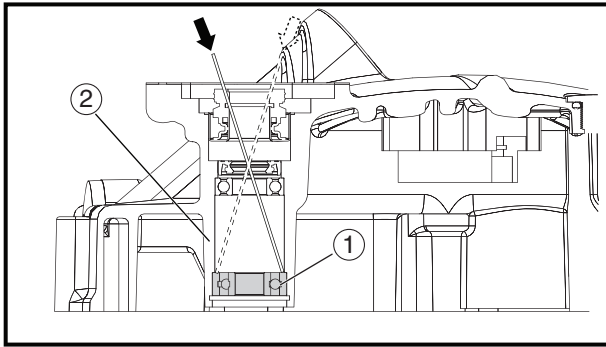
TIP

The impeller is provided with left turn thread.

- Washer ④
- Circlip ⑤
- Water pump shaft ⑥

TIP

Do not scratch the impeller shaft.



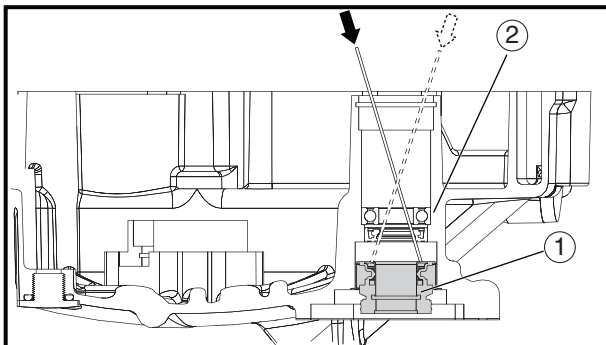
2.Remove:

- Bearing ①

TIP

Tap out the bearing from the outside of the water pump housing.

- Water pump housing ②



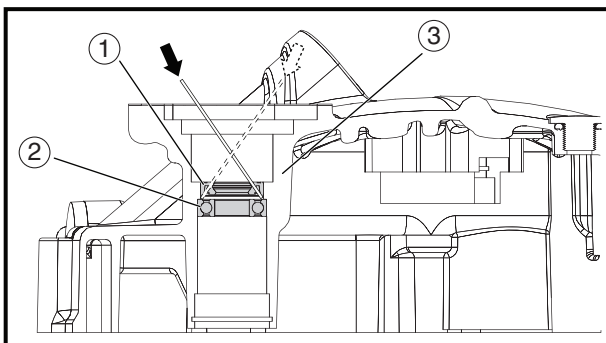
3.Remove:

- Water pump seal ①

TIP

Tap out the water pump seal the inside of the water pump housing.

- Water pump housing ②



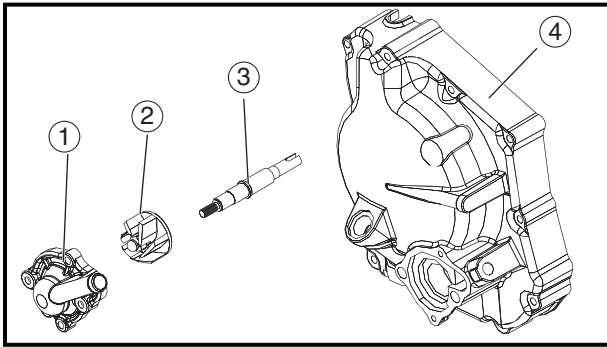
4.Remove:

- Oil seal ①
- Bearing ②

TIP

Tap out the bearing and oil seal from the outside of the water pump housing.

- Water pump housing ③



CHECKING THE WATER PUMP

1. Check:

- Water pump housing cover ①
- Water pump impeller ②
- Water pump shaft ③
- Water pump housing ④

Cracks/damage/wear → Replace.

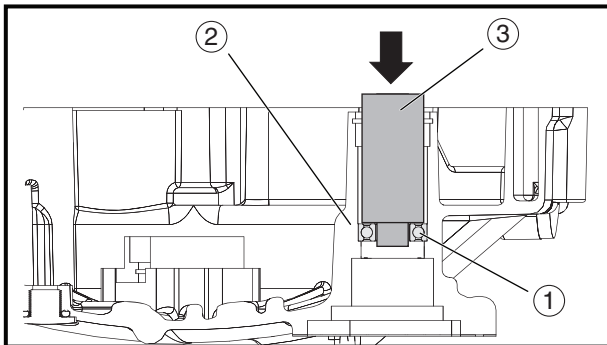
2. Check:

- Water pump seal
- Oil seal

Cracks/damage/wear → Replace.

- Bearing

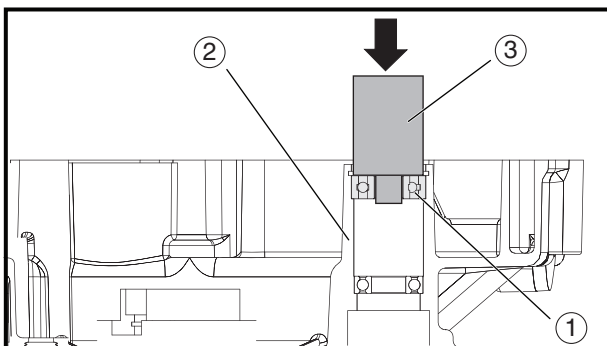
Rough movement → Replace.



INSTALLING THE WATER PUMP

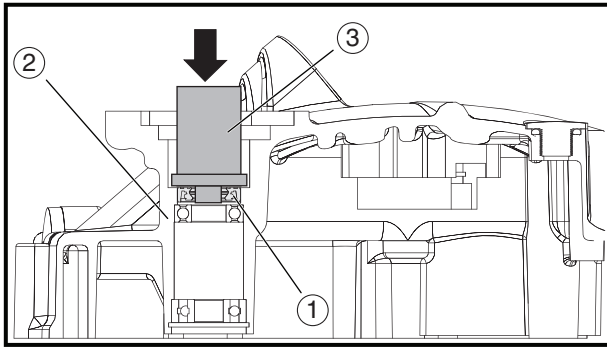
1. Install:

- Bearing ①
(into the water pump housing ②)
- Inner bearing puller ③



2. Install:

- Bearing ①
(into the water pump housing ②)
- Inner bearing puller ③

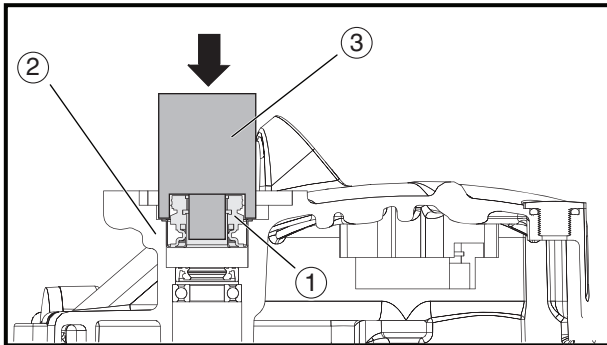


3. Install:

- Oil seal (1) **New**
(into the water pump housing (2))
- Water pump oil seal driver (3)

TIP _____

- Before installing the oil seal, apply tap water or coolant onto its outer surface.



4. Install:

- Water pump seal (1) **New**
(into the water pump housing (2))
- Water pump mechanical seal driver (3)

NOTICE _____

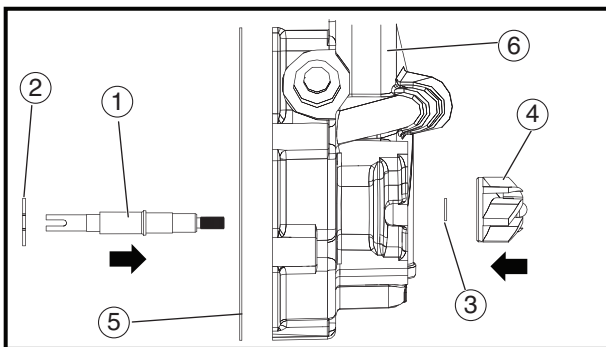
Never lubricate the water pump seal surface with oil or grease.

TIP _____

Install the water pump seal with the special tools.



Mechanical seal installer (3) :
P/N. YM-33221, 90890-04078



5. Install:

- Water pump shaft (1)
- Circlip (2)
- Washer (3)

TIP _____

Do not scratch the impeller shaft.

- Water pump impeller (4)
- Gasket (5)
- Water pump housing (6)

(Install the impeller with a pump impeller.)

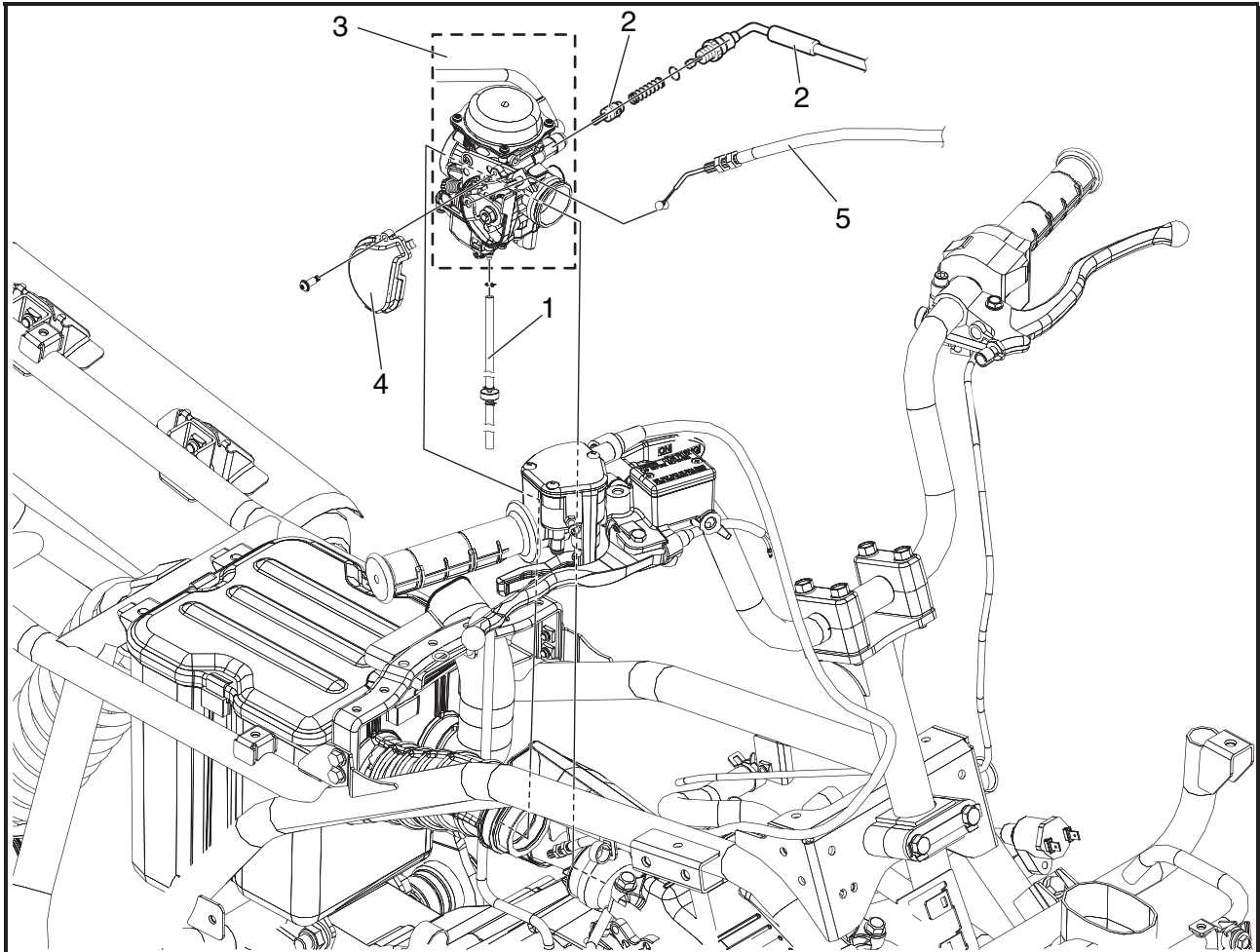
TIP _____

The impeller is provided with left turn thread.



CARBURETOR

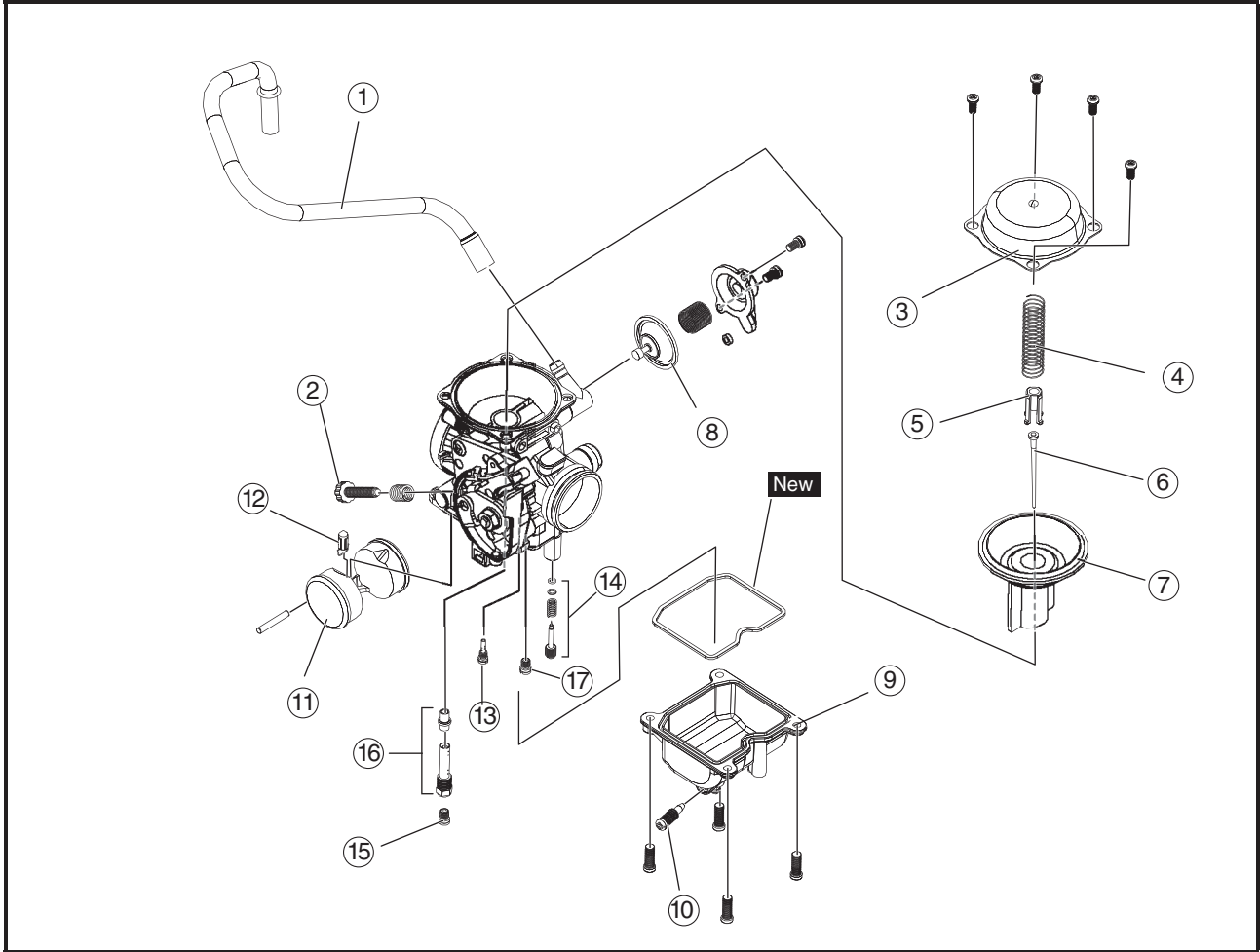
CARBURETOR



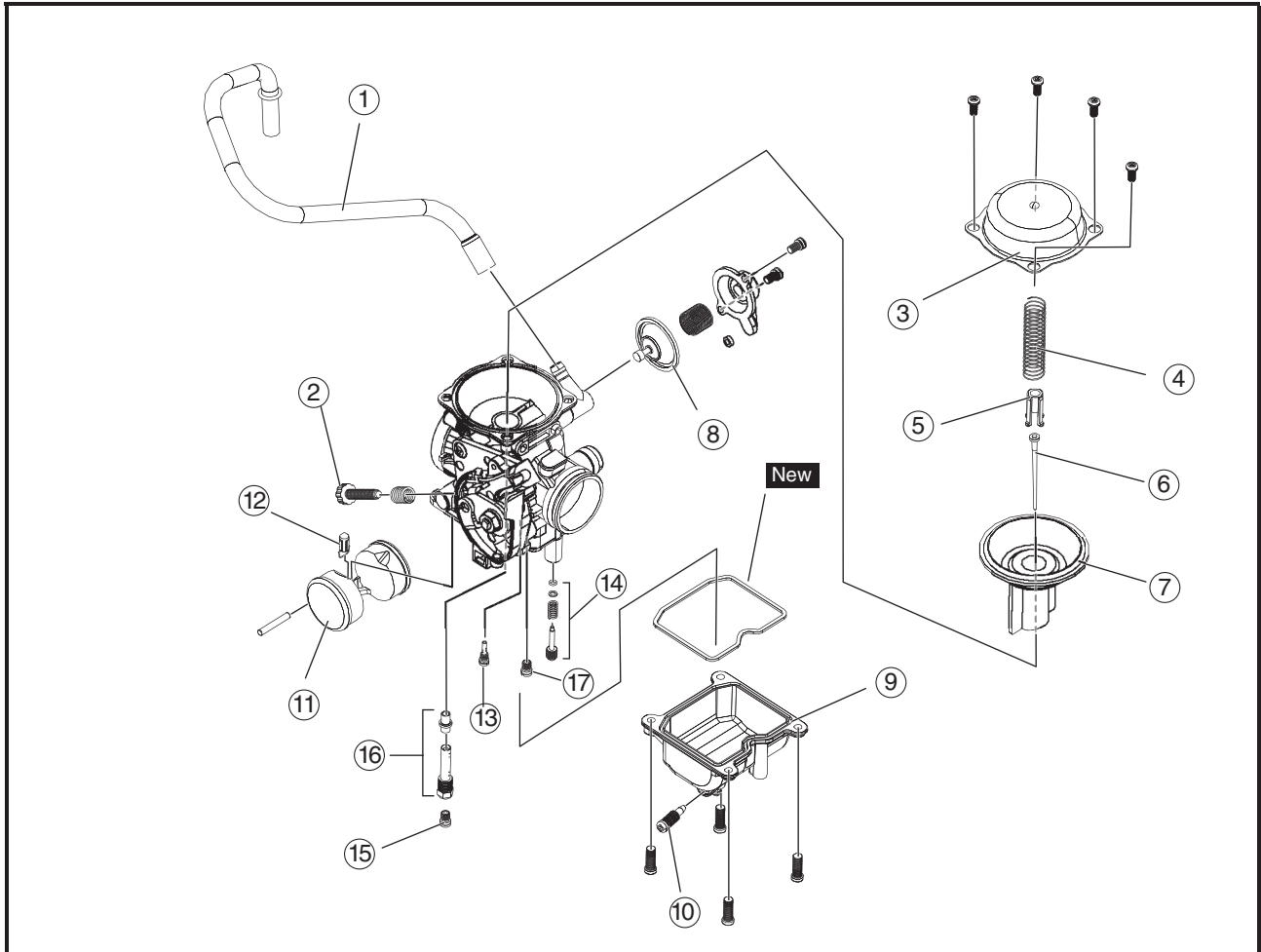
Order	Job/Part	Q'ty	Remarks
	Carburetor removal		Remove the parts in the order below. Refer to "SEAT, FENDERS AND FUEL TANK" in CHAPTER 3.
1	Drain hose	1	
2	Starter cable/starter plunger	1/1	
3	Carburetor assembly	1	
4	Throttle valve cover	1	
5	Throttle cable	1	TIP _____ After removing the carburetor assembly, remove the throttle cable.
			For installation, reverse the removal procedure.

CARBURETOR

CARBURETOR



Order	Job/Part	Q'ty	Remarks
	Carburetor disassembly		Disassemble the parts in the order below.
1	Air vent hose	1	
2	Throttle stop screw	1	
3	Vacuum chamber cover	1	
4	Spring	1	
5	Jet needle holder	1	
6	Jet needle set	1	
7	Piston valve	1	
8	Coasting enricher	1	
9	Float chamber	1	
10	Drain screw	1	
11	Float	1	Refer to "CARBURETOR ASSEMBLY".
12	Needle valve	1	



Order	Job/Part	Q'ty	Remarks
13	Pilot jet	1	Refer to "DISASSEMBLY THE CARBURETOR" AND "ASSEMBLY THE CARBURETOR". For assembly, reverse the disassembly procedure.
14	Air adjusting screw	1	
15	Main jet	1	
16	Needle jet	1	
17	Starter jet	1	



EBS00146

DISASSEMBLING THE CARBURETOR

TIP

Before disassembling the carburetor, make sure to note the number of times the pilot screw is turned out from the seated position to its set position.

EAS00485

CHECKING THE CARBURETOR

1. Check:

- carburetor body
- float chamber
Cracks/damage → Replace.
- fuel passages
Obstruction → Clean.
- float chamber body ①
Dirt → Clean.
- float chamber rubber gasket ② **New**
Cracks/damage/wear → Replace.

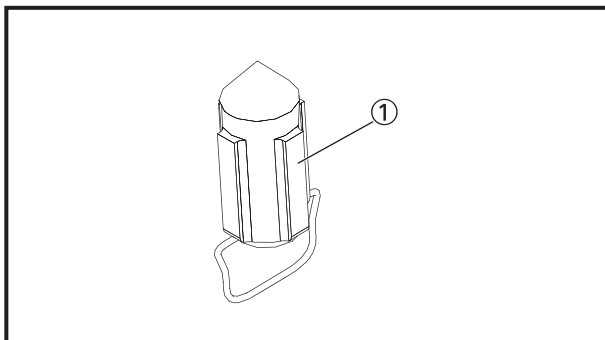
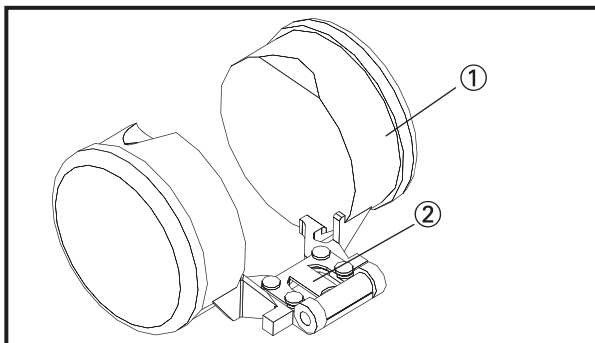
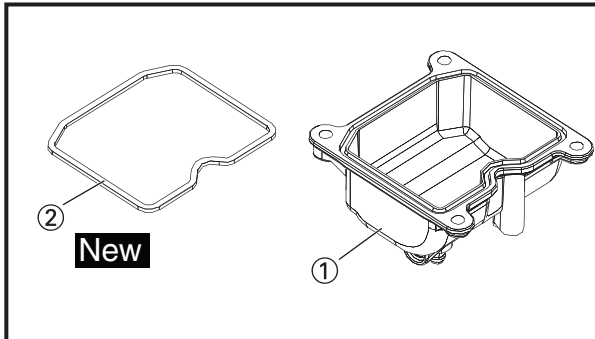
- a. Wash the carburetor in a petroleum-based solvent. Do not use any caustic carburetor cleaning solution.
- b. Blow out all of the passages and jets with compressed air.

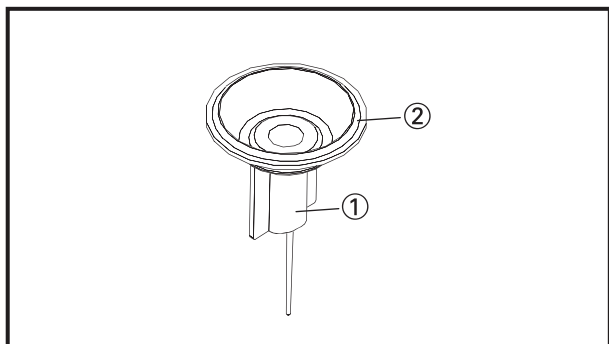
2. Check:

- float ①
- float tang ②
Damage → Replace.

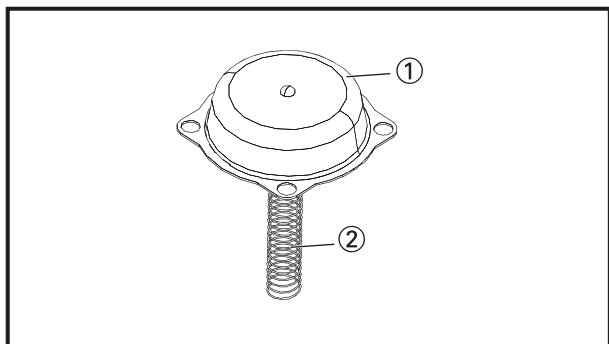
3. Check:

- needle valve ①
Damage/obstruction/wear → Replace the needle valve.

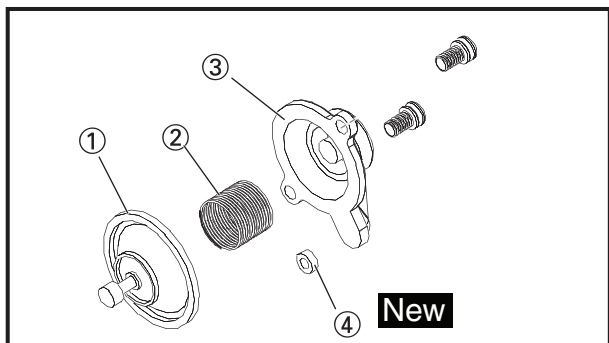




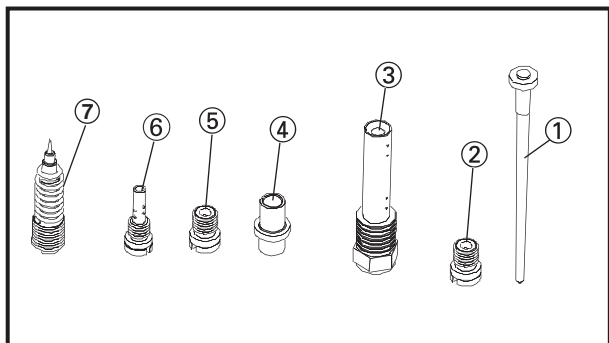
4. Check:
- piston valve ①
Damage/scratches/wear → Replace.
 - piston valve diaphragm ②
Cracks/tears → Replace.



5. Check:
- vacuum chamber cover ①
 - piston valve spring ②
Cracks/damage → Replace.



6. Check:
- diaphragm (coasting enricher) ①
 - spring ②
 - cover ③
 - o-ring ④ **New**
Cracks/damage/wear → Replace.

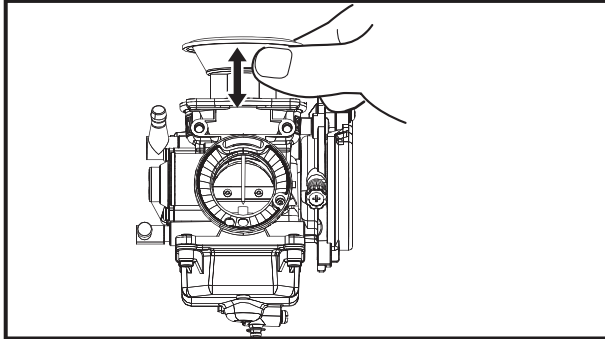


7. Check:
- jet needle ①
 - main jet ②
 - needle jet holder ③
 - needle jet ④
 - starter jet ⑤
 - pilot jet ⑥
 - air adjusting screw ⑦ (Except for CAN)
Bends/damage/wear → Replace.
Obstruction → Clean.
Blow out the jets with compressed air.



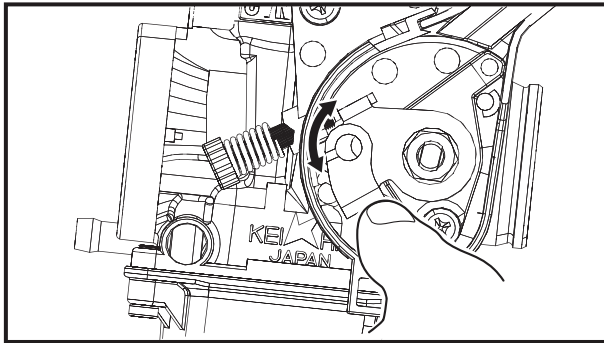
8. Check:

- fuel hoses
Cracks/damage/wear → Replace.
Obstruction → Clean.
Blow out the hoses with compressed air.



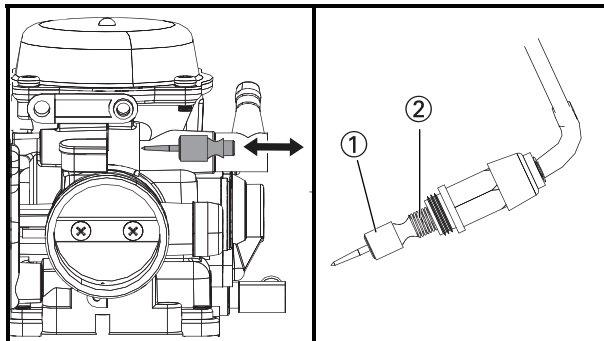
9. Check:

- piston valve movement
Insert the piston valve into the carburetor body and move it up and down.
Tightness → Replace the piston valve.



10. Check:

- throttle valve movement
Sticks → Replace.



11. Check:

- choke valve movement
Sticks → Replace.

12. Check:

- starter plunger ①
- starter plunger spring ②
Bends/cracks/damage → Replace.



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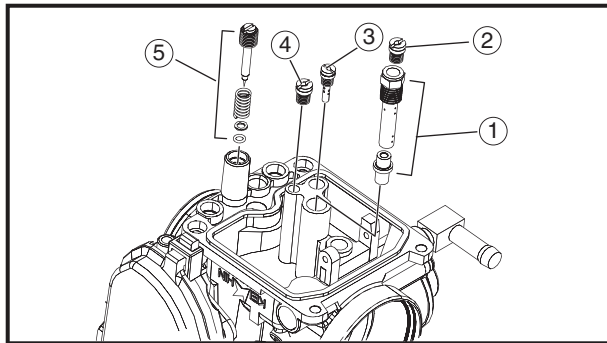
ASSEMBLING THE CARBURETOR

TIP

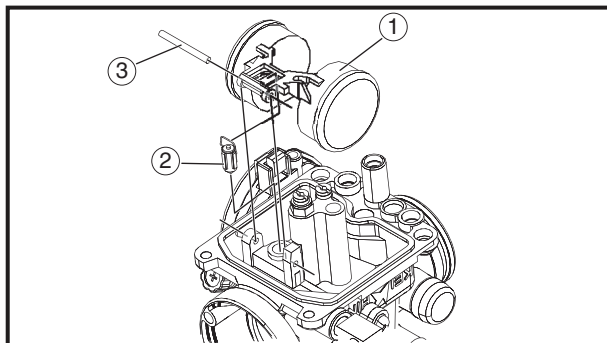
Before assembling the carburetor, make sure to turn out the pilot air screw the same number of times, as noted before disassembly, from the seated position to the set position.

NOTICE

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

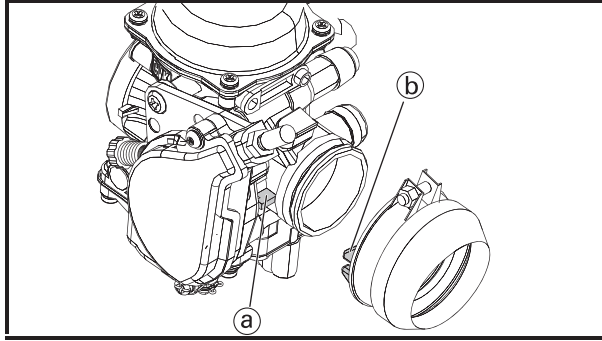


1. Install:
 - needle jet ①
 - main jet ②
 - pilot jet ③
 - starter jet ④
 - air adjusting screw ⑤



2. Install:
 - float ①
 - needle valve ②
 - float pin ③

3. Install:
 - float chamber
 - piston valve
 - jet needle
 - piston valve spring
 - vacuum chamber cover



INSTALLING THE CARBURETOR

1. Install:
 - carburetor

TIP

Align the projection (a) on the carburetor with the slot (b) in the carburetor joint.

2. Install:
 - throttle cable
 - throttle cable cover
3. Adjust:
 - engine idling speed



Engine idling speed
1,600 ~ 1,800r/min

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

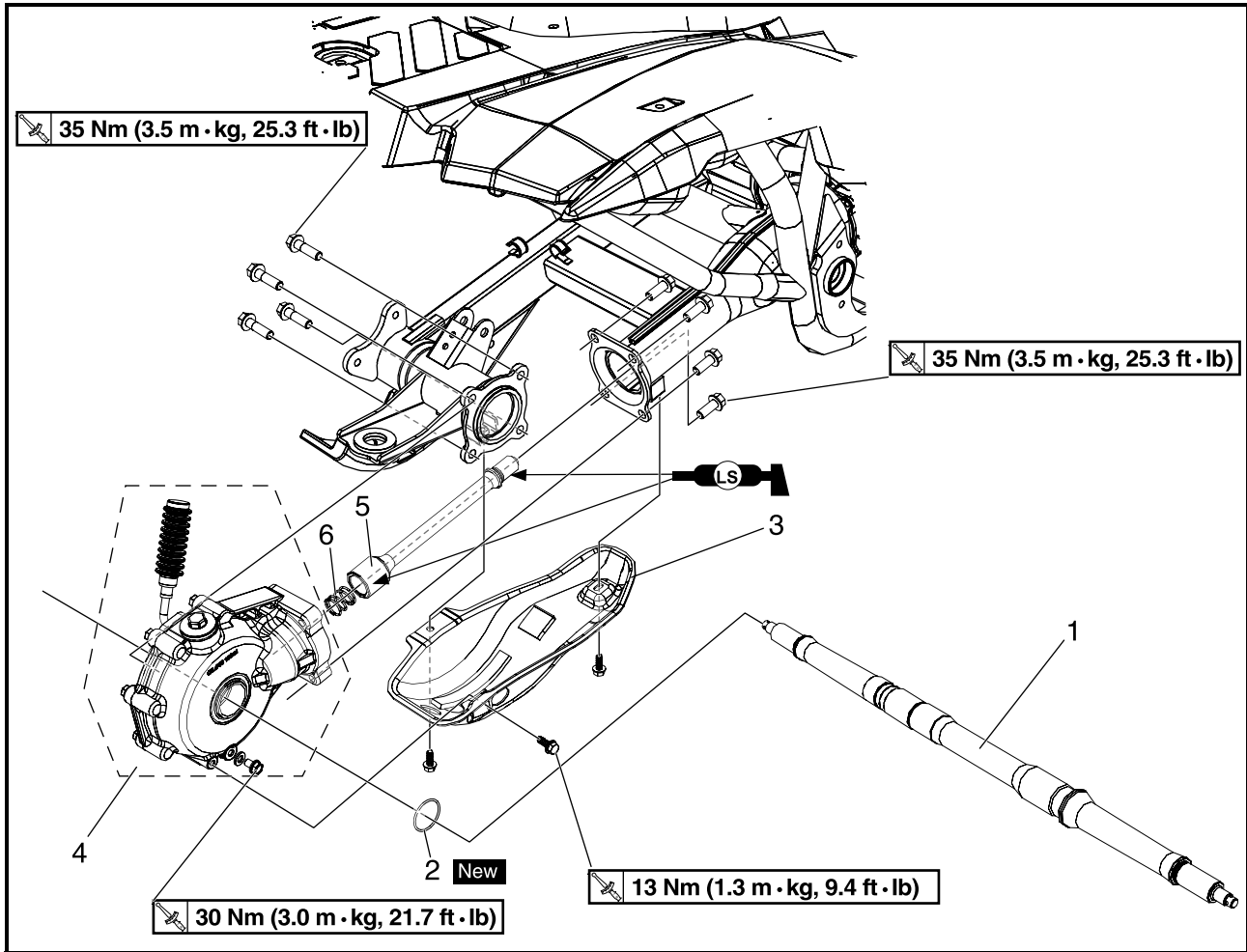
4. Adjust:
 - throttle cable free play



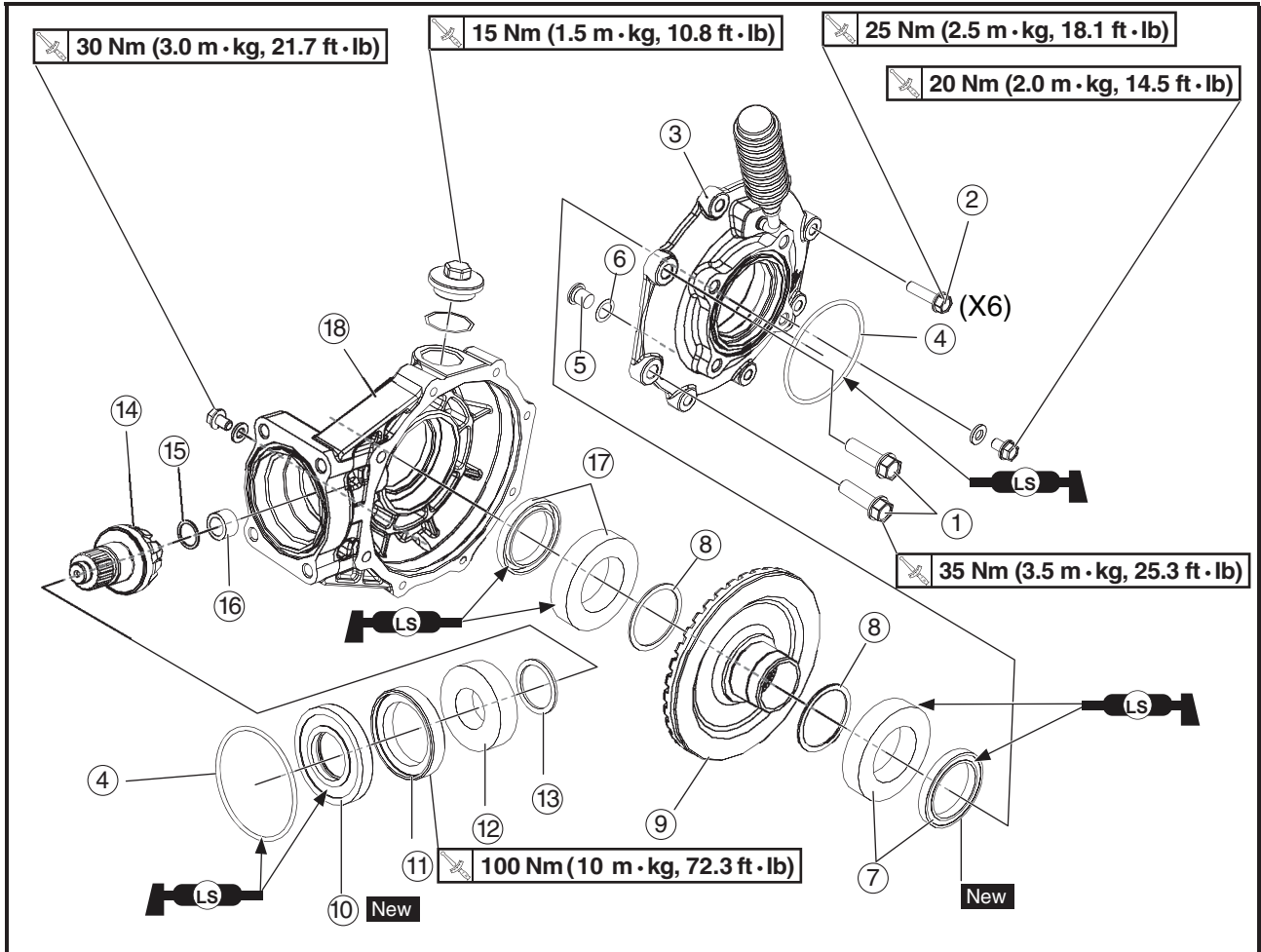
Throttle cable free play (at the flange of the throttle grip)
5 ~ 10 mm (0.20 ~ 0.39 in)

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

REAR AXLE/FINAL DRIVE GEAR AND DRIVE SHAFT

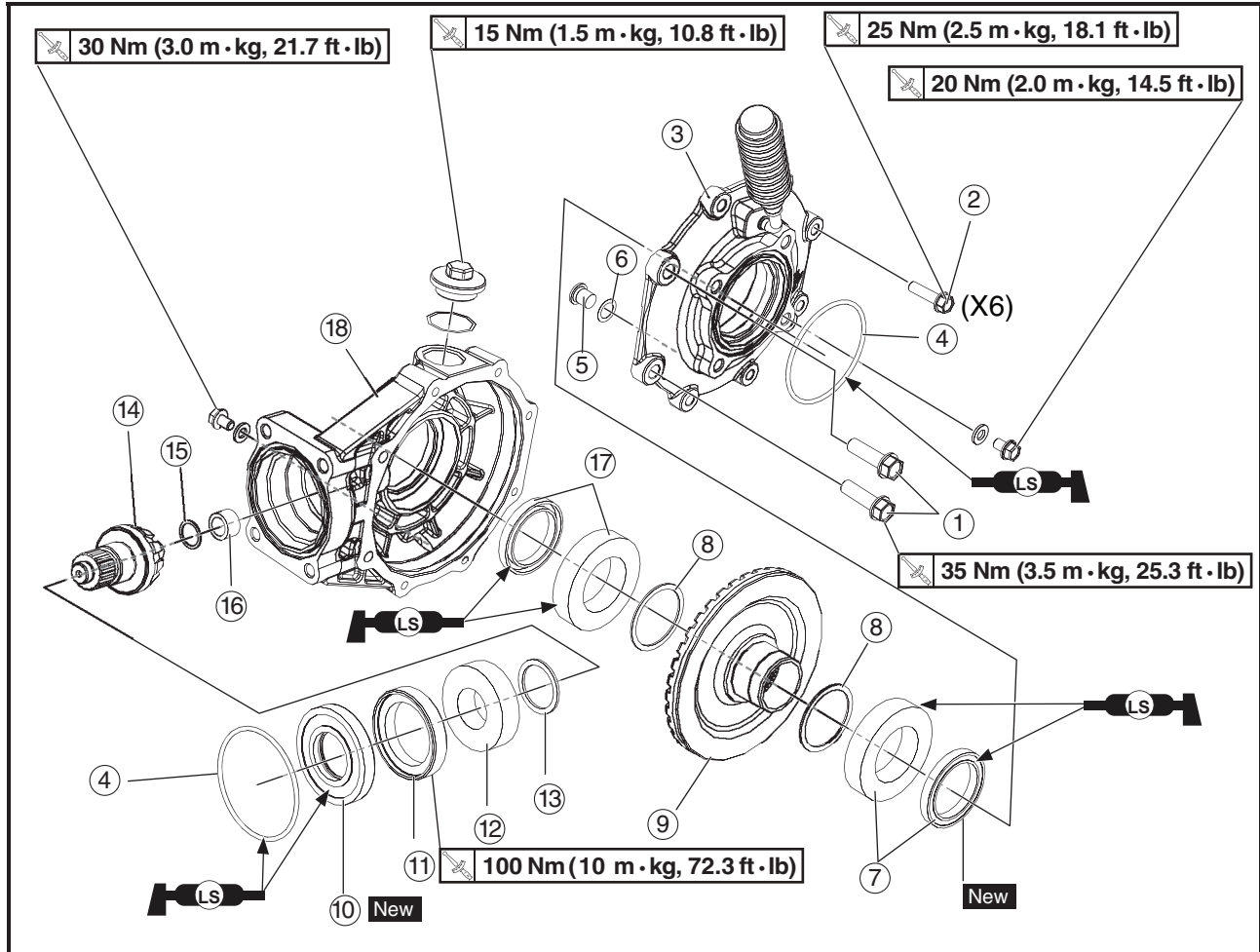


Order	Job/Part	Q'ty	Remarks
	Rear axle, final drive gear assembly and drive shaft removal		Remove the parts in the order below.
	Final gear oil		Drain.
	Rear wheel hubs/brake disc		Refer to "FRONT AND REAR WHEELS" in CHAPTER 8.
1	Rear axle	1	Disconnect. } Refer to "REMOVING THE REAR AXLE".
2	O-ring	1	
3	Axle gear under protect	1	
4	Final drive gear case	1	
5	Drive shaft	1	
6	Drive shaft spring	1	
			For installation, reverse the removal procedure.

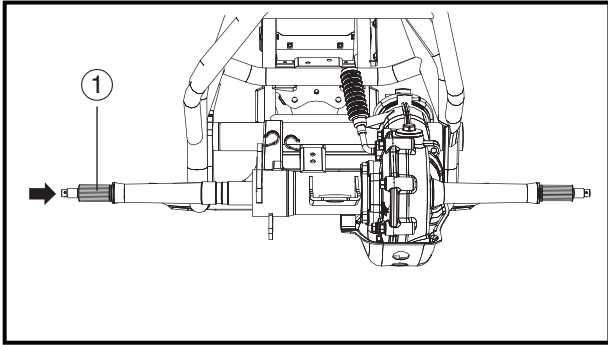


Order	Job/Part	Q'ty	Remarks
	Final drive gear disassembly		Disassemble the parts in the order below.
1	Bolt	2	TIP _____ Working in a crisscross pattern, loosen each bolt 1/4 of a turn. After all the bolts are loosened, remove them.
2	Bolt	6	
3	Final drive gear case cover (L)	1	
4	O-ring	2	
5	Ring gear stopper	1	
6	Ring gear stopper shim	1	
7	Oil seal/bearing	1/1	
8	Ring gear shim (L/R)	2	
9	Ring gear	1	

REAR AXLE/FINAL DRIVE GEAR AND DRIVE SHAFT



Order	Job/Part	Q'ty	Remarks
10	Oil seal	1	Refer to "DISASSEMBLING THE FINAL DRIVE GEAR" AND "ASSEMBLING THE FINAL DRIVE GEAR".
11	Bearing retainer	1	
12	Bearing	1	
13	Final drive pinion gear shim	1	
14	Final drive pinion gear	1	
15	Final drive pinion gear stopper	1	
16	Bearing	1	
17	Bearing/oil seal	1/1	Refer to "REMOVING THE FINAL DRIVE ROLLER BEARING" AND "ASSEMBLING THE FINAL DRIVE ROLLER BEARING"
18	Final gear case cover (R)	1	
			For assembly, reverse the disassembly procedure.

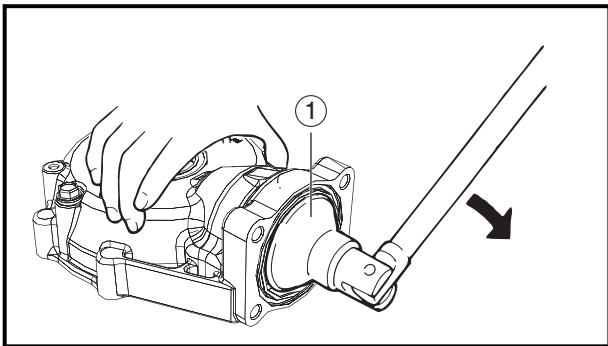
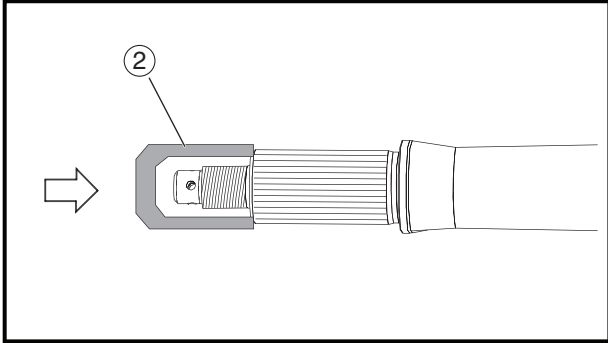


REMOVING THE REAR AXLE

- 1.Remove:
- Rear axle ① (with dust seal)
 - O-ring

NOTICE

- Never directly tap the axle end with a hammer, since this will result in damage to the axle thread and spline.
- Attach a suitable socket ② on the axle end and tap it with a soft hammer. Pull out the rear axle to the right.



DISASSEMBLING THE FINAL DRIVE GEAR

- 1.Remove:
- Bearing retainer (final drive pinion gear)

TIP

Use a bearing retainer wrench ① .



Bearing retainer wrench:
P/N. YM-04050, 90890-04050

NOTICE

The final drive shaft bearing retainer has left-handed threads. To loosen the retainer, turn it clockwise.

2.Remove:

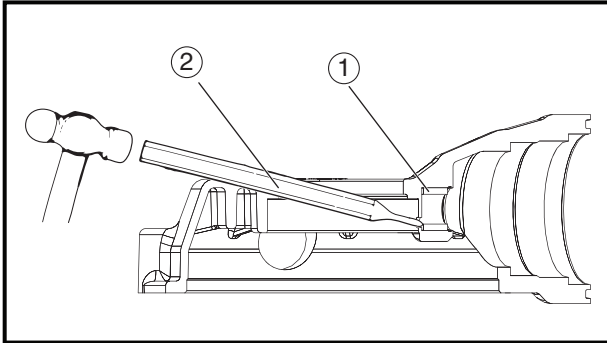
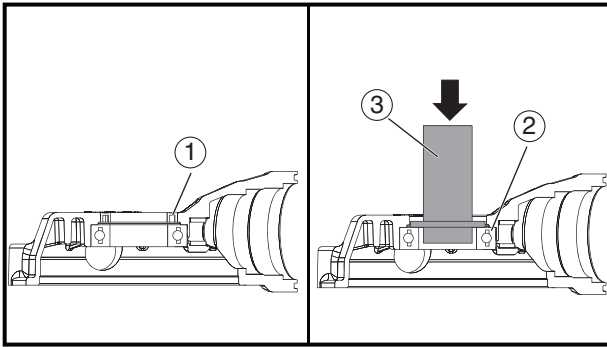
- Final drive pinion gear assembly
With a soft hammer, lightly tap on the final drive pinion gear end.

NOTICE

Removal of the final drive pinion gear should only be performed if gear replacement is necessary.

⚠ WARNING

Always use new bearings and races.



REMOVING THE FINAL DRIVE ROLLER BEARING

1.Remove:

- Oil seal (1)
- Roller bearing (ring gear) (2)
Use a suitable press tool (3) and an appropriate support for the main housing.

2.Remove:

- Roller bearing (final drive pinion gear) (1)

Removal steps:

- Heat the main housing only to 150 °C (302 °F).
- Remove the roller bearing outer race with an appropriately shaped punch (2).
- Remove the inner race from the final drive pinion gear.

TIP

The removal of the final drive pinion gear roller bearing is difficult and seldom necessary.

ASSEMBLING THE FINAL DRIVE ROLLER BEARING

1.Install:

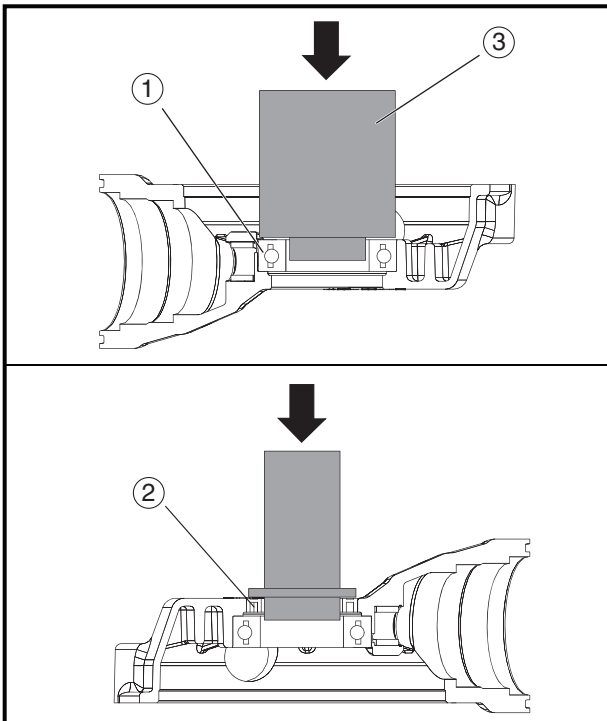
- Roller bearing (final drive pinion gear) **New**

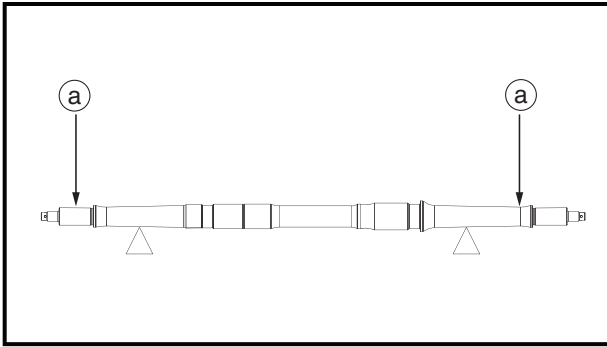
Installation steps:

- Heat the main housing only to 150 °C (302 °F).
- Install the roller bearing outer race using the proper adapter.
- Install the inner race onto the drive pinion gear.

2.Install:

- Oil seal (1) **New**
- Roller bearing (2)
Use a suitable press tool (3) and a press to install the above components into the main housing.





INSTALLING THE REAR AXLE

1. Check:

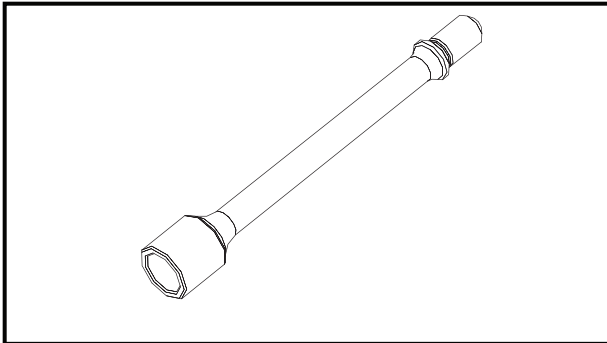
- Rear axle runout (a)
Out of specification → Replace.

⚠ WARNING

Do not attempt to straighten a bent axle.



**Rear axle runout limit:
1.5 mm (0.06 in)**

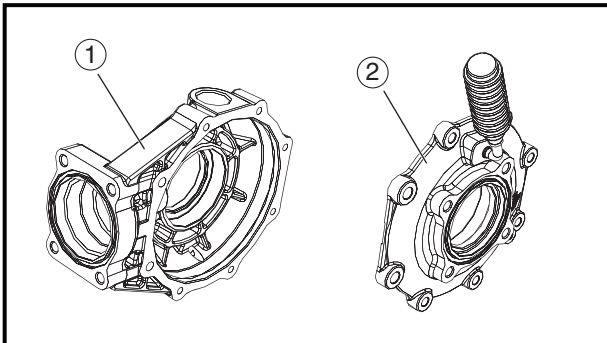


INSTALLING THE DRIVE SHAFT

1. Check:

- Drive shaft (splines)

Wear/damage → Replace.



CHECKING THE FINAL DRIVE GEAR

1. Check:

- Final gear case (1)
- Bearing housing (ring gear) (2)
Cracks/damage → Replace.

TIP

When the final gear case and/or the ring gear bearing housing are replaced, be sure to adjust the shim of the final drive pinion gear and/or ring gear.

2. Check:

- Gear teeth
Pitting/galling/wear → Replace the drive pinion gear and ring gear as a set.
- Oil seals
- O-rings
Damage → Replace.

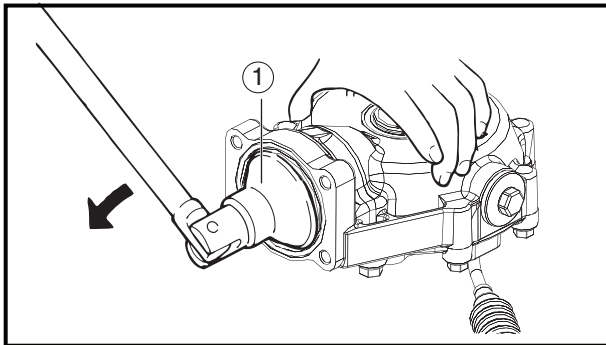


3. Check:

- Bearings
Damage → Replace.

TIP


- Reusing roller bearings is acceptable, but Yamaha recommends installing new ones. Do not reuse the oil seal.
- When the final drive pinion gear and/or ring gear are replaced, be sure to adjust the shim of the final drive pinion gear and/or ring gear.



ASSEMBLING THE FINAL DRIVE GEAR

1. Install:

- Drive pinion gear (with shim(s) and bearing)
(proper shim size as calculated)
- Bearing retainer (drive pinion gear)

 **100 Nm (10.0 m • kg, 72 ft • lb)**

Use a bearing retainer wrench ① .

NOTICE

- Always use a new bearing.
- The final drive shaft bearing retainer has left-hand threads. Turn the retainer counterclockwise to tighten it.



**Bearing retainer wrench:
P/N. YM-04050, 90890-04050**

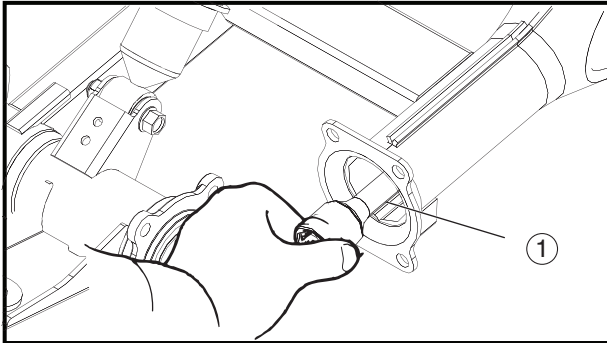


INSTALLING THE FINAL DRIVE GEAR

1. Lubricate:

- Drive shaft
- Coupling gear
- O-ring
- Oil seal
- Bearing


	Lithium-soap base grease
-----------------------------------------------------------------------------------	---------------------------------

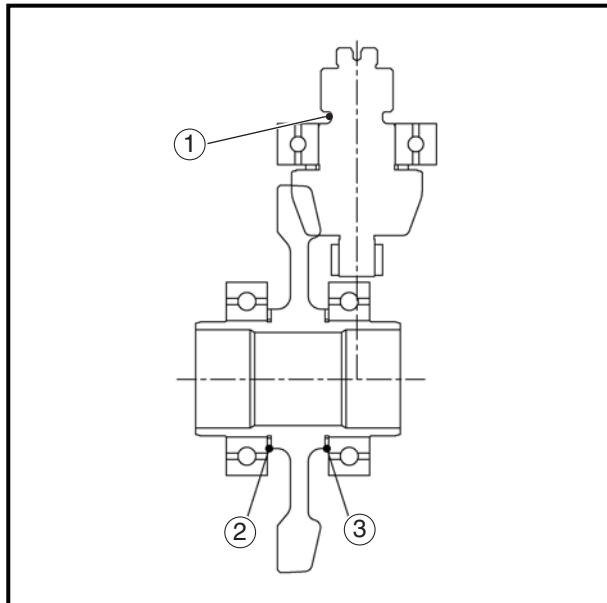


2. Install:

- Drive shaft ①
(to the universal joint)

3. Install:

- Final drive gear
- Bolts  **35 Nm (3.5 m • kg, 25.3 ft • lb)**



ADJUSTING THE BACKLASH

1. Install:

- Final drive pinion gear shim ①

TIP _____

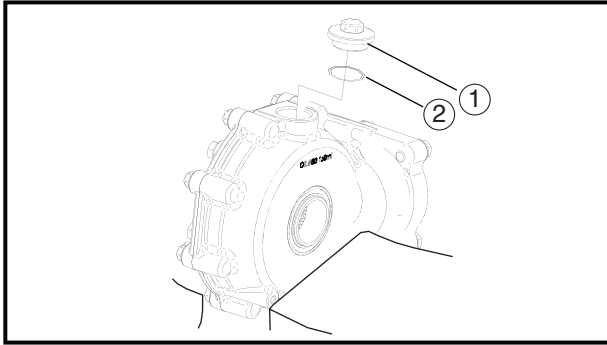
Use only shims 2.00 mm (0.08 in) thick.

2. Install:

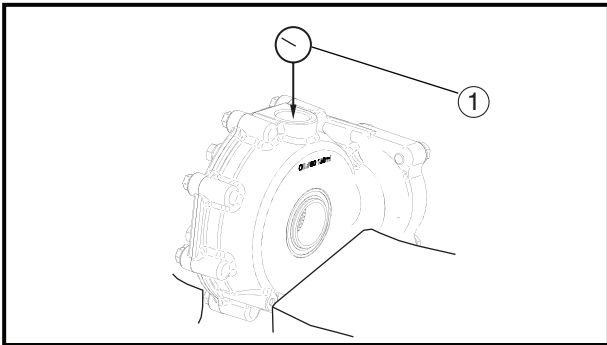
- Left ring gear shim ②
- Right ring gear shim ③

TIP _____

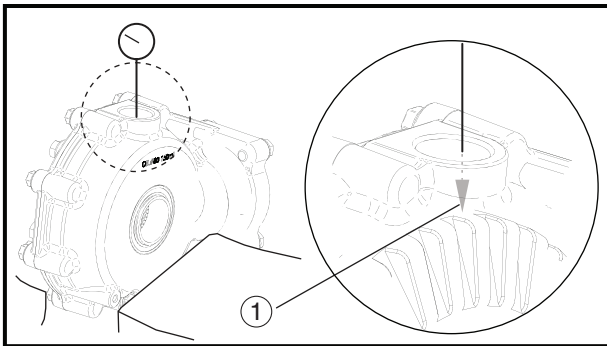
Use only shims 1.50 mm (0.06 in) thick.



- 3.Remove:
- Final drive gear case filling bolt (1)
 - O-ring (2)



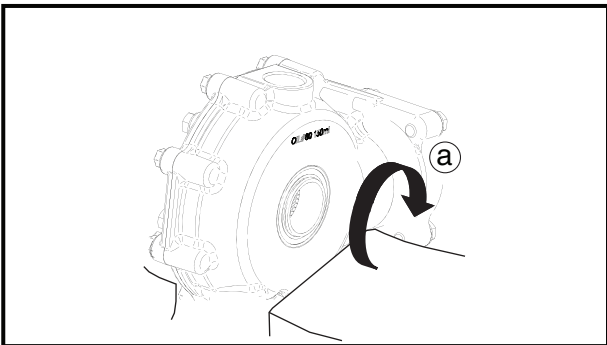
- 4.Install:
- Dial indicator (1)
(on the ring gear through the filling hole)



- 5.Measure:
- Backlash

TIP

Install the dial indicator onto the tip of the ring gear (1). Slightly rotate it back and forth from engagement to engagement to read the backlash.



- 6.Remove:
- Dial indicator
- 7.Rotate:
- Ring gear
(120° in direction (a))

- 8.Re-install:
- Dial indicator

- 9.Measure:
- Backlash

TIP

Repeat this procedure three times. Average the three measurements. Replace the shims using the table given on page 7-10.



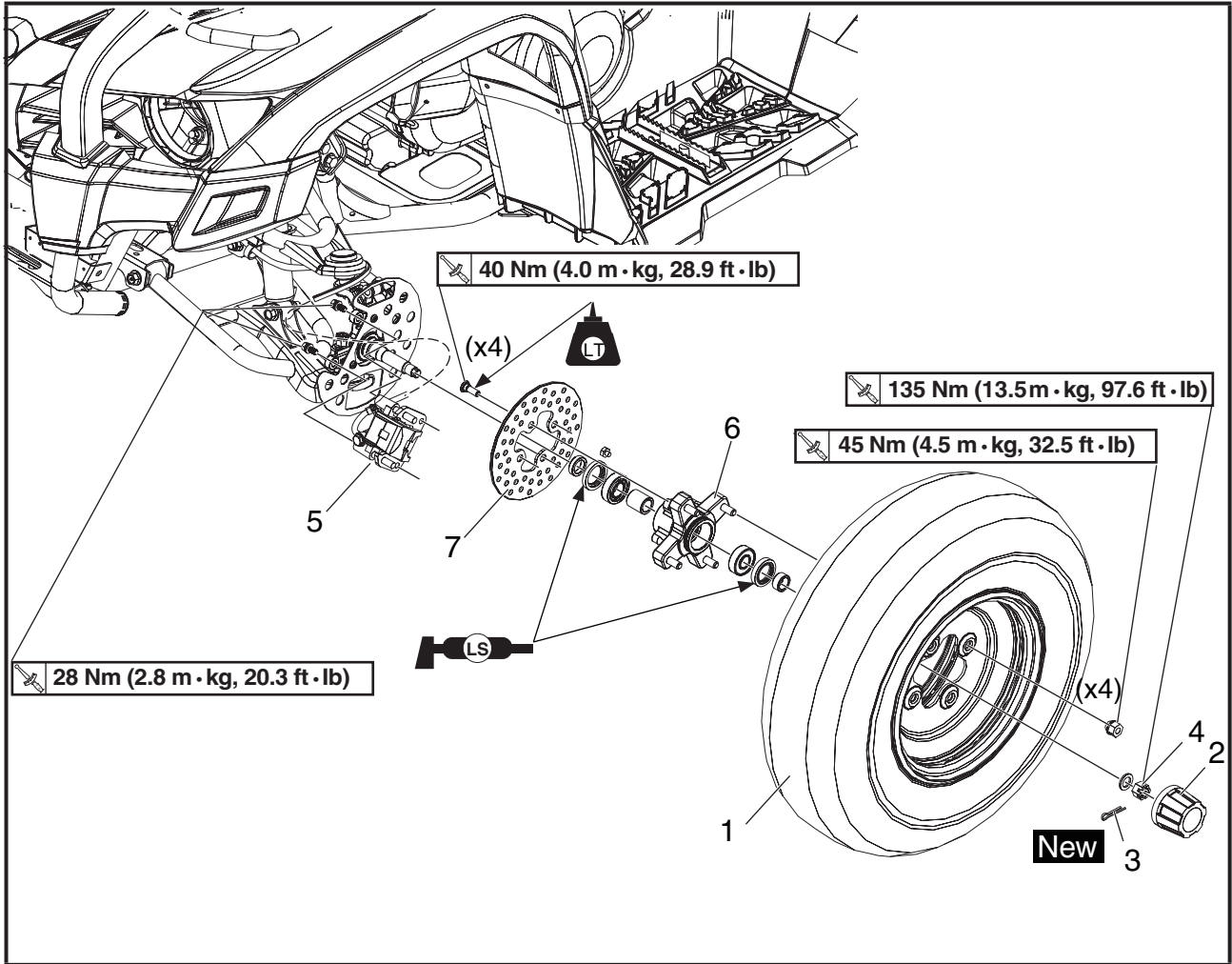
Size Avg.	Name	Ring gear shim (L)	Ring gear shim (R)
0.15~0.28 mm		1.5 mm	1.5 mm
Avg.>0.25 mm		1.55 mm	1.45 mm
Avg.<0.15 mm		1.45 mm	1.55 mm



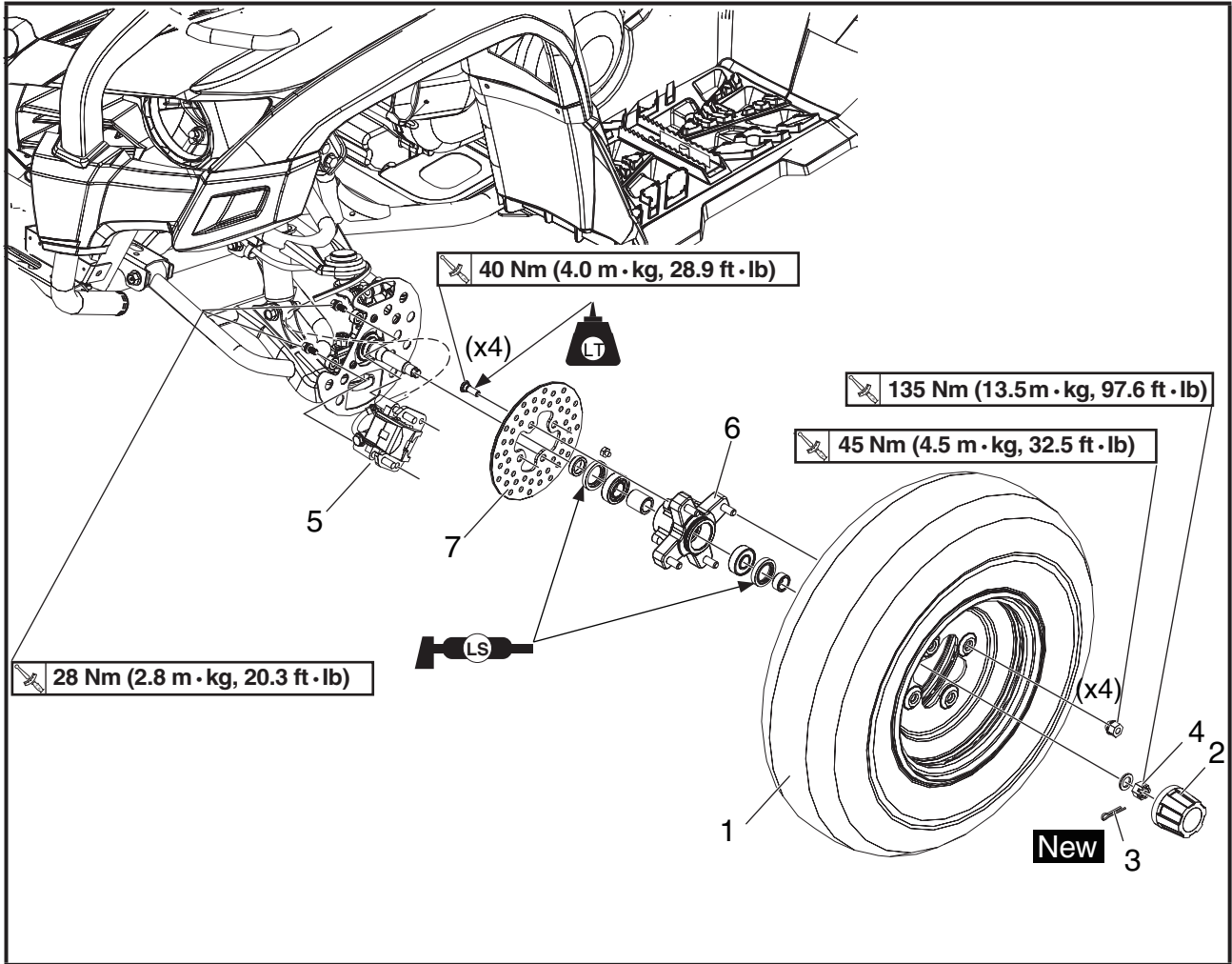
CHASSIS

FRONT AND REAR WHEELS

FRONT WHEELS



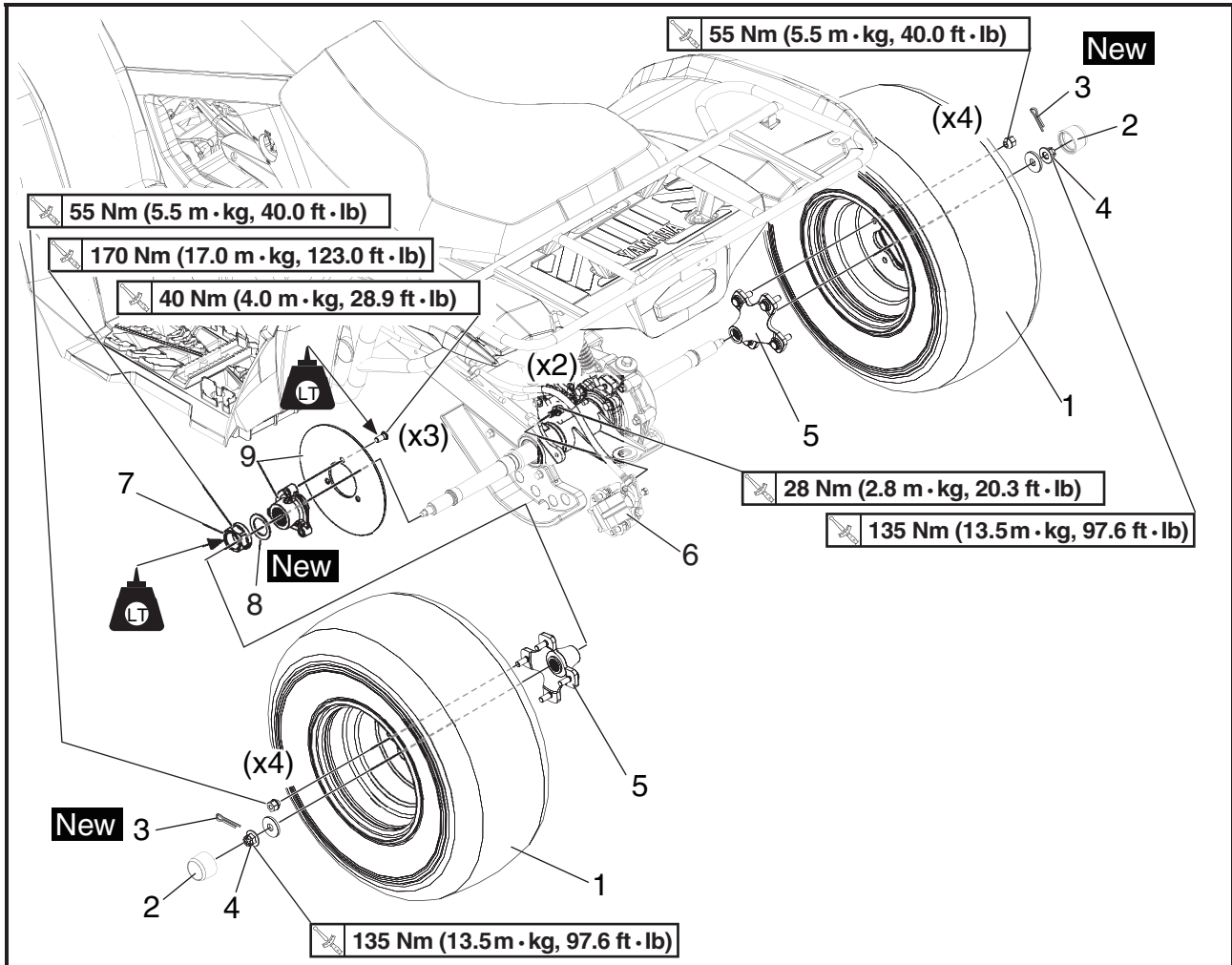
Order	Job/Part	Q'ty	Remarks
	Removing the front wheels		Remove the parts in the order listed. Place the machine on a level surface. ⚠ WARNING _____ Securely support the machine so there is no danger of it falling over.
1	Front wheel	1	The following procedure applies to both of the front wheels. Refer to "INSTALLING THE FRONT WHEELS". Refer to "INSTALLING THE WHEEL HUBS".
2	Rubber cap	1	
3	Cotter pin	1	
4	Axle nut	1	



Order	Job/Part	Q'ty	Remarks
5	Brake caliper assembly	1	TIP _____ Do not squeeze the brake lever when the brake caliper is off of the brake discs as the brake pads will be forced shut.
6	Wheel hub	1	Refer to "INSTALLING THE WHEEL HUB BEARINGS".
7	Brake disc	1	Refer to "INSTALLING FRONT BRAKE DISCS". For installation, reverse the removal procedure.



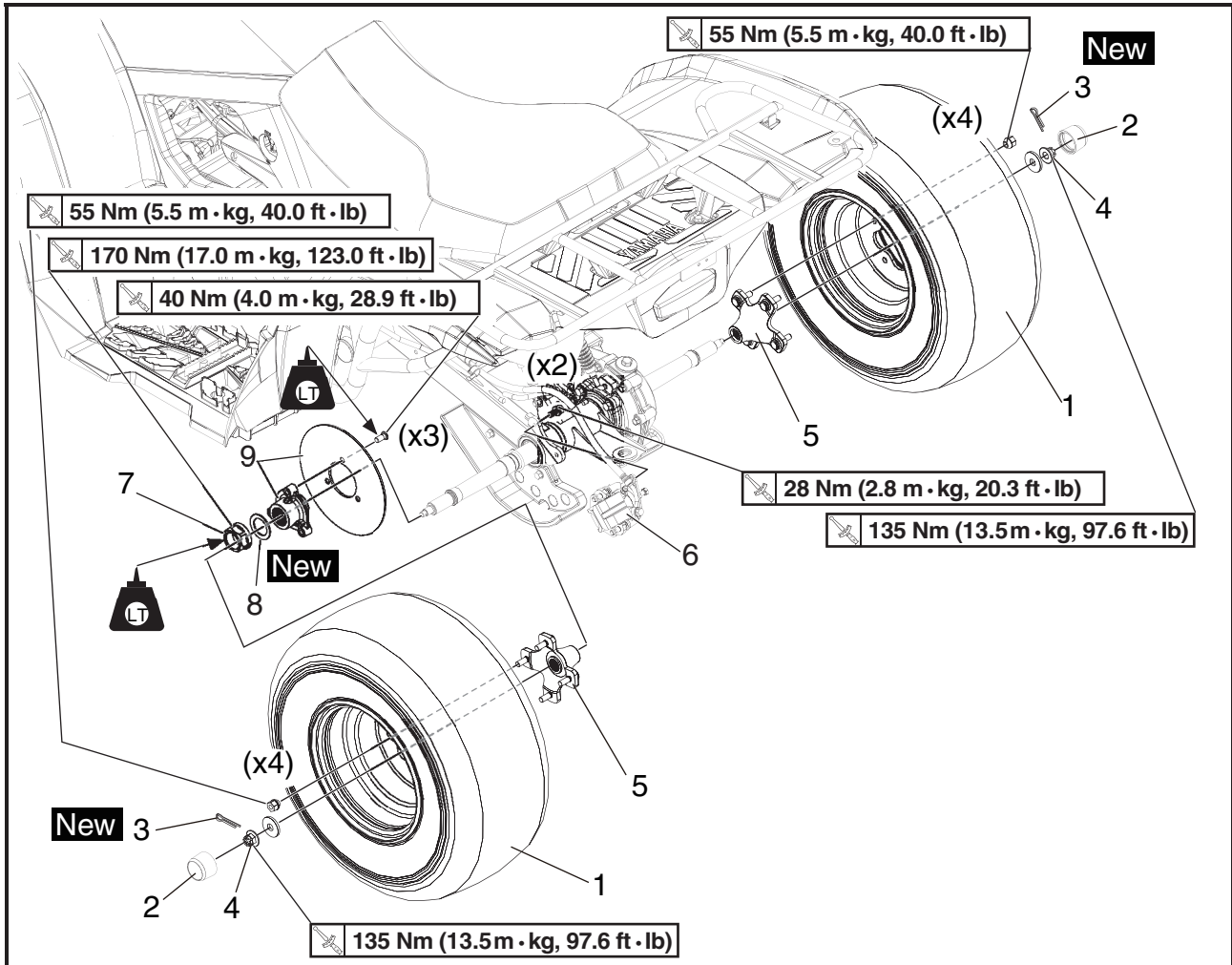
REAR WHEELS



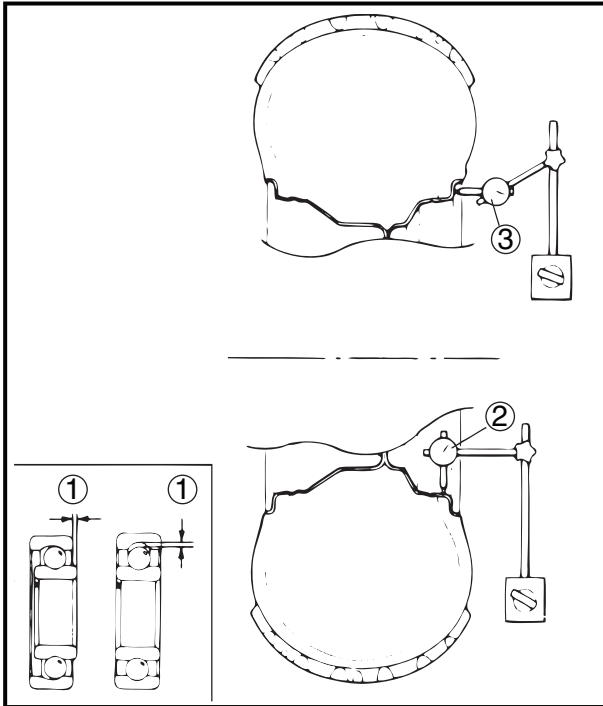
Order	Job/Part	Q'ty	Remarks
	Removing the rear wheels		Remove the parts in the order listed. Place the machine on a level surface. ⚠ WARNING _____ Securely support the machine so there is no danger of it falling over.
			The following procedure applies to both of the rear wheels.
1	Rear wheel	2	Refer to "INSTALLING THE REAR WHEELS". Refer to "INSTALLING THE WHEEL HUBS".
2	Rubber cap	2	
3	Cotter pin	2	
4	Axle nut	2	
5	Shaft connector	2	



REAR WHEELS



Order	Job/Part	Q'ty	Remarks
6	Brake caliper	1	TIP _____ Do not squeeze the brake lever when the brake caliper is off of the brake discs as the brake pads will be forced shut.
7	Nut	1	Refer to "INSTALLING THE REAR BRAKE DISC".
8	Conical spring washer	1	
9	Brake disc/brake disc bracket	1/1	
			For installation, reverse the removal procedure.



CHECKING THE WHEELS

The following procedure applies to both of the front and rear wheels.

1. Check:
 - wheel
2. Measure:
 - wheel runout

Over the specified limit → Replace the wheel or check the wheel bearing play ①.

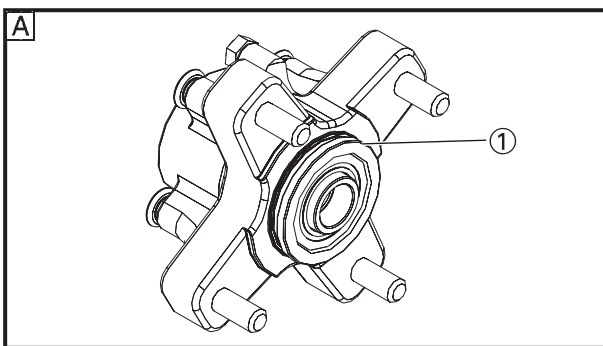
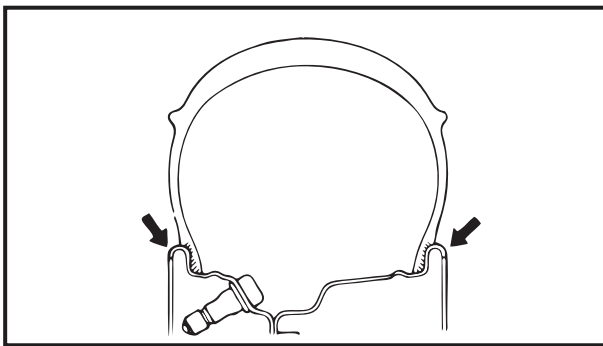
Wheel runout limit
Radial ②: 2.0 mm (0.08 in)
Lateral ③: 2.0 mm (0.08 in)

3. Check:
 - wheel balance

Out of balance → Adjust.

⚠ WARNING

After replacing the tire, ride conservatively to allow the tire to be properly seated in the rim. Failure to do so may cause an accident resulting in machine damage and possible operator injury.



CHECKING THE WHEEL HUBS

The following procedure applies to both of the front and rear wheel hubs.

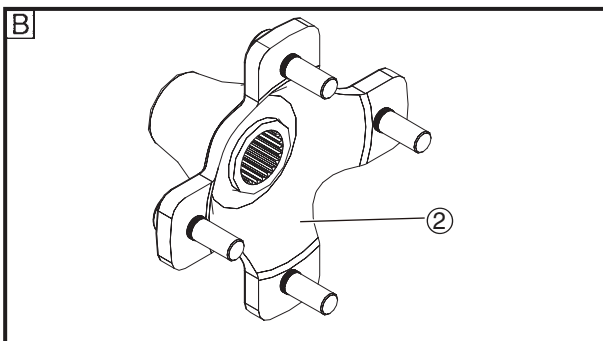
1. Check:
 - wheel hub ①

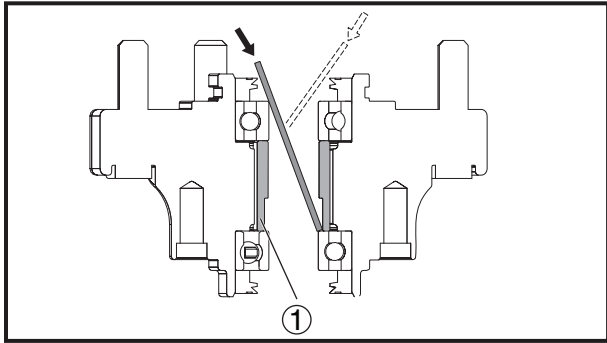
Cracks/damage → Replace.

 - splines (wheel hub) ②

Wear/damage → Replace the wheel hub.

- A** Front
- B** Rear





2. Check:

- wheel bearings
Wheel hub play/ wheel turns roughly → Replace.



- a. Clean wheel hub exterior.
- b. Drive bearing out by pushing spacer aside and tapping around perimeter of bearing inner race. Use soft metal drift punch and hammer. The spacer ① “floats” between bearings. Remove both bearings as described.

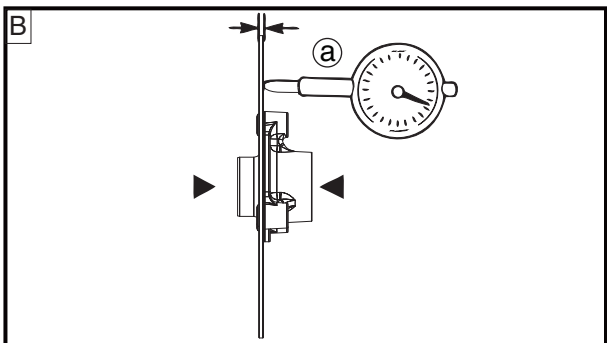
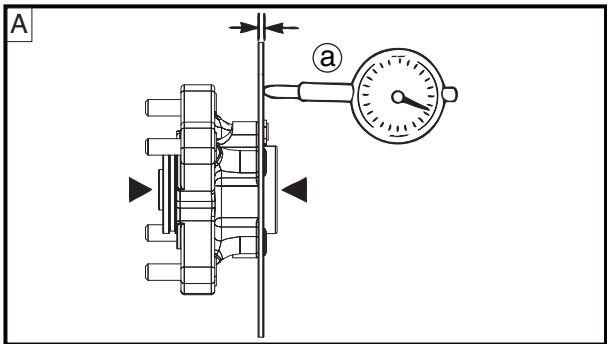
⚠ WARNING

Eye protection is recommended when using striking tools.

- c. To install the wheel bearings, reverse the above sequence. Use a socket that matches outside diameter of bearing outer race to drive in bearing.

NOTICE

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



CHECKING THE BRAKE DISCS

1. Check:
 - brake discs
Galling/damage → Replace.
2. Measure:
 - brake disc deflection
Out of specification → Replace.

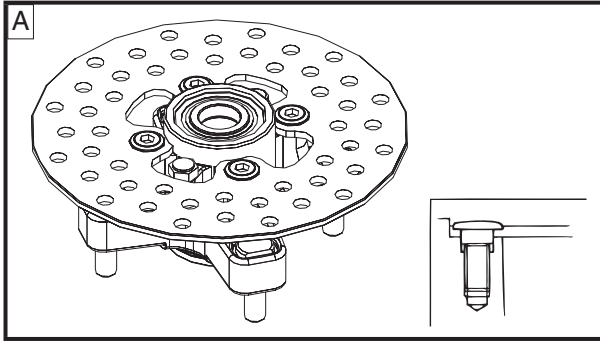
A Front

B Rear

	Brake disc maximum deflection Front: 0.15 mm (0.006 in) Rear: 0.15 mm (0.006 in)
--	-----------------------------------------------------------------------------------------------

- brake disc thickness (a)
Out of specification → Replace.

	Brake disc minimum thickness Front: 3.0 mm (0.12 in) Rear: 3.0 mm (0.12 in)
--	------------------------------------------------------------------------------------------



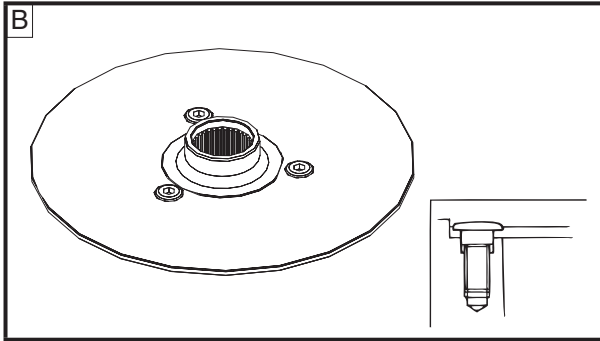
INSTALLING THE BRAKE DISCS

1. Install:
 - brake discs

TIP

Install the brake disc with its spot-faced side facing the bolt heads.

- A Front
- B Rear

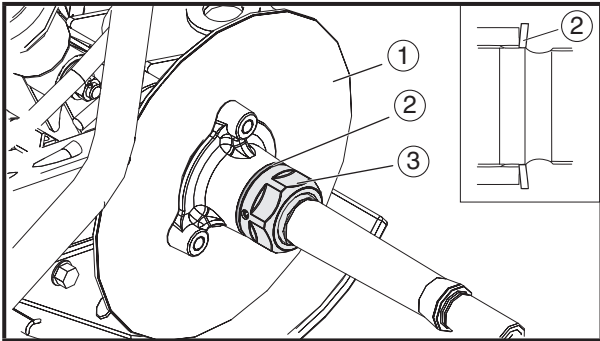


INSTALLING THE REAR BRAKE DISC ON THE REAR AXLE

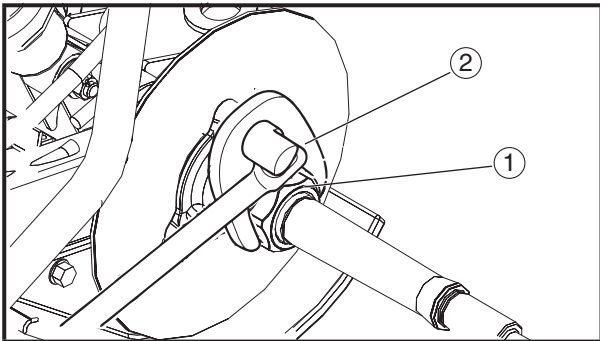
1. Install:
 - rear brake disc ①
 - conical spring washer ②

TIP

Install the conical spring washer with the convex side of the washer facing inward as shown.



- nut ③



2. Tighten:
 - nut ①

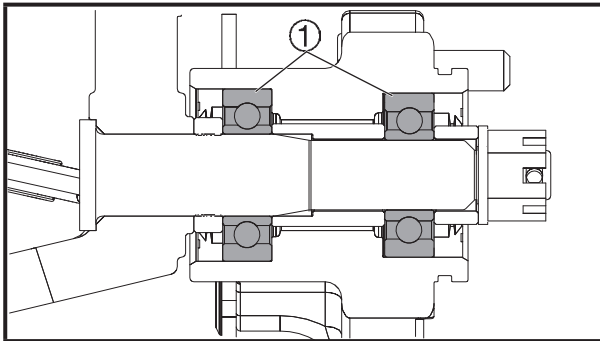
Tighten the nut with axle nut wrench 46 or axle nut wrench (46 mm) ② to specification while holding the rear axle.

170 Nm (17.0m·kg, 123 ft·lb)



Axle nut wrench 46
90890-01498

Axle nut wrench (46 mm)
YM-37134

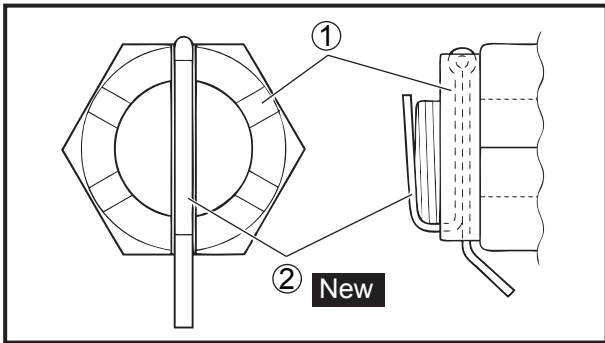


INSTALLING THE FRONT WHEEL HUB BEARINGS

1. Install:
 - bearings ①

TIP

Face the oil seal side of the bearing inward.



INSTALLING THE WHEEL HUBS

The following procedure applies to both of the front and rear wheel hubs.

1. Install:
 - axle nut ①

Front wheel hub:

80 Nm (8.0 m · kg, 57.9 ft · lb)

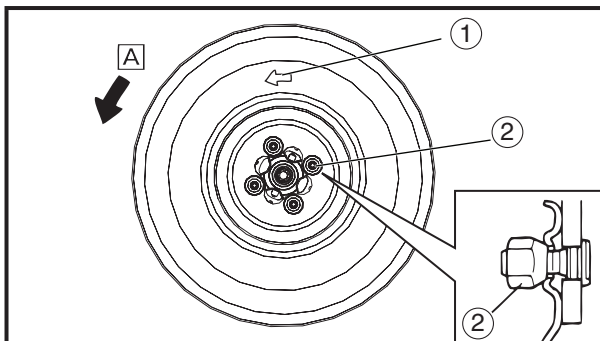
Rear wheel hub:

135 Nm (13.5 m · kg, 97.6 ft · lb)

- cotter pin ② **New**

TIP

- Do not loosen the axle nut after torquing it. If the axle nut groove is not aligned with the cotter pin hole, align the groove with the hole by tightening the axle nut.
- Bend the longer cotter pin up.



INSTALLING THE WHEELS

1. Install:
 - wheels

TIP

The arrow mark ① on the must point in the direction of rotation **A** of the wheel.

2. Tighten:

- nuts ②

Front wheel nuts:

45 Nm (4.5 m · kg, 32.5 ft · lb)

Rear wheel nuts:

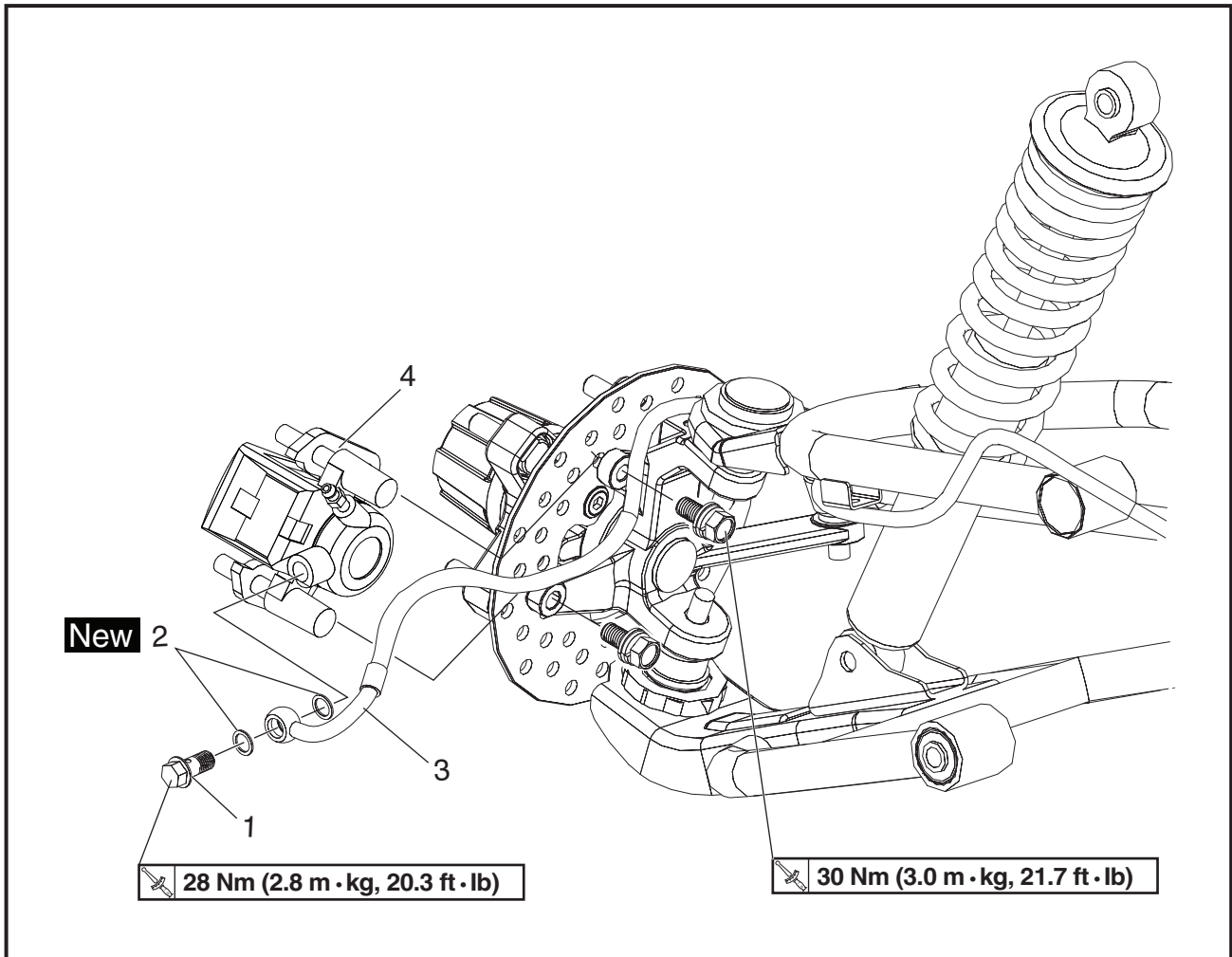
55 Nm (5.5 m · kg, 40.0 ft · lb)

⚠ WARNING

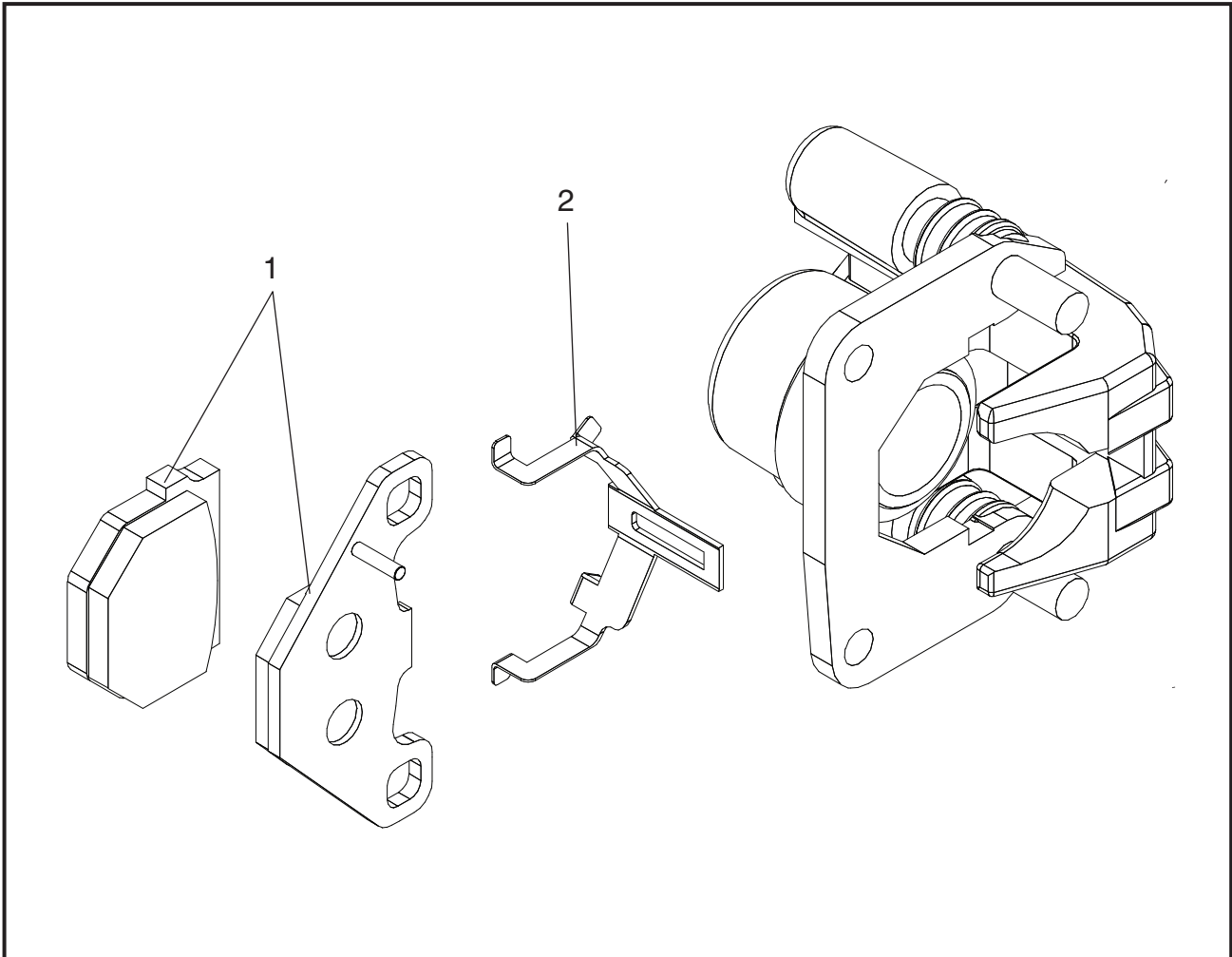
Tapered wheel nuts ② are used for both the front and rear wheels. Install each nut with its tapered side towards the wheel.

FRONT AND REAR BRAKES

FRONT BRAKE CALIPER



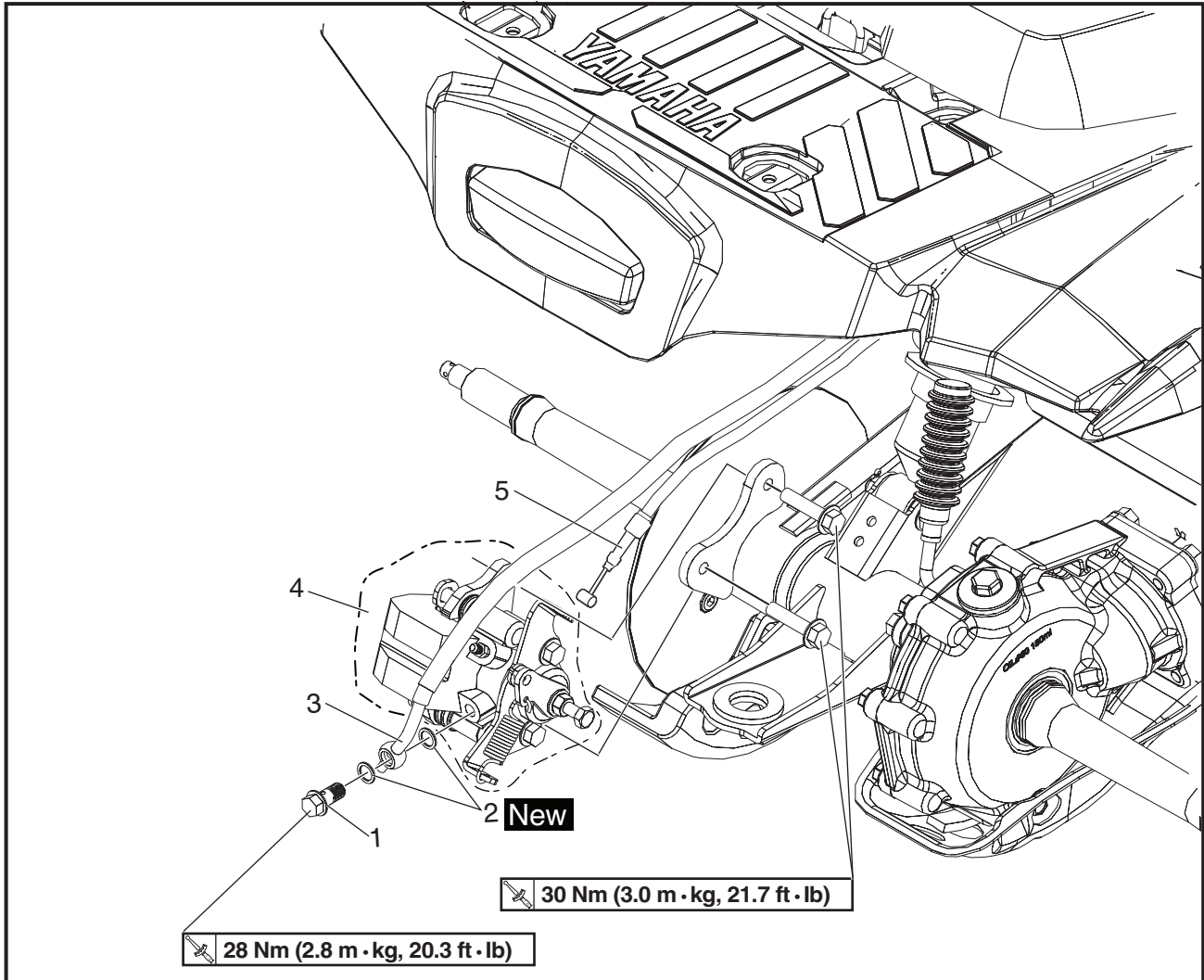
Order	Job/Part	Q'ty	Remarks
	Removing the front brake caliper		Remove the parts in the order listed.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
1	Union bolt	1	Disconnect. } Refer to "INSTALLING THE REAR BRAKE CALIPER".
2	Copper washer	2	
3	Brake hose	1	
4	Brake caliper assembly	1	
			For installation, reverse the removal procedure



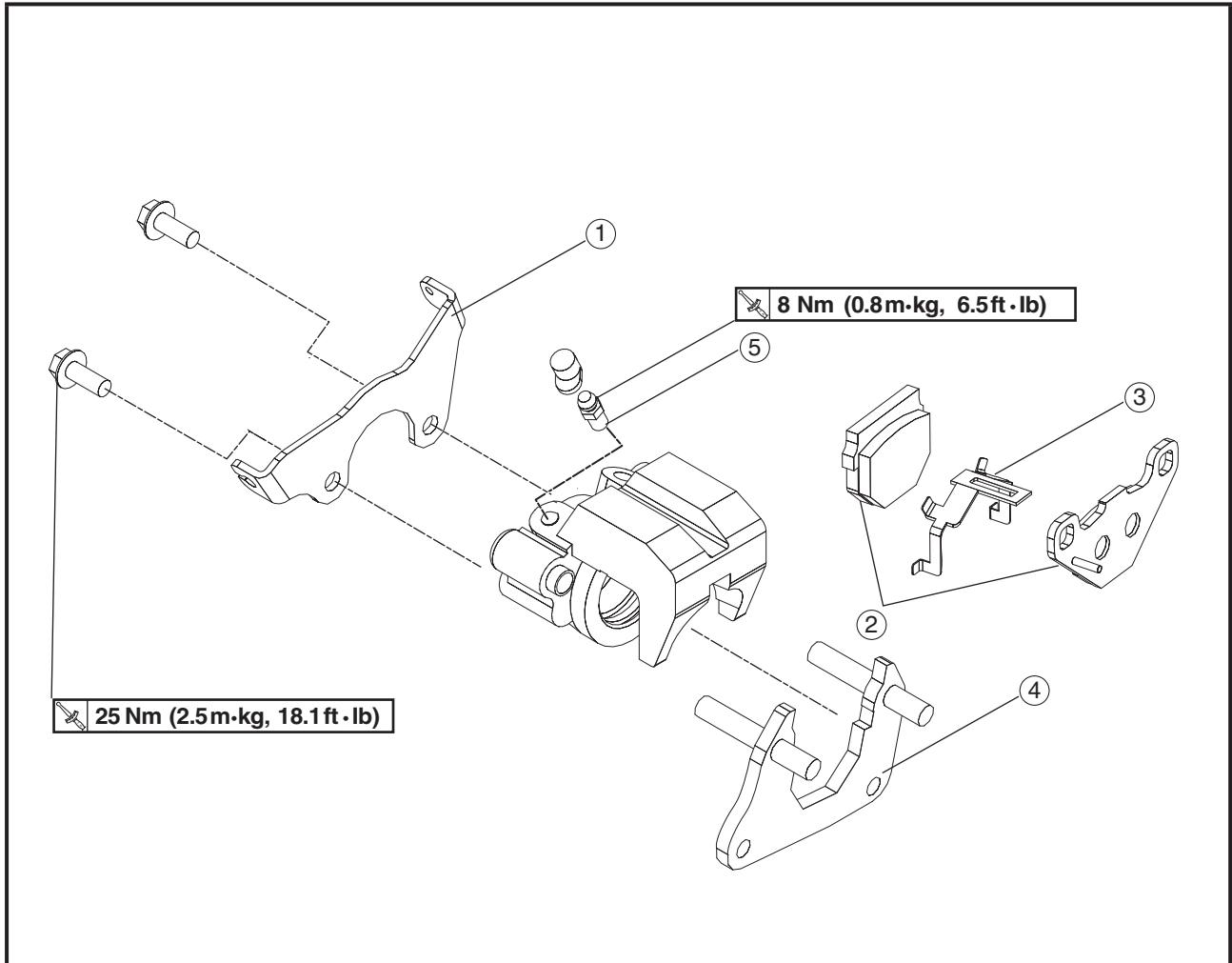
Order	Job/Part	Q'ty	Remarks
	Removing the front brake pads		Remove the parts in the order listed.
1	Brake pad	2	
2	Brake pad spring	1	
			For installation, reverse the removal procedure.



REAR BRAKE CALIPER



Order	Job/Part	Q'ty	Remarks
	Removing the rear brake caliper		Remove the parts in the order listed.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
1	Union bolt	1	Disconnect. } Refer to "INSTALLING THE REAR BRAKE CALIPER".
2	Copper washer	2	
3	Brake hose	1	
4	Brake caliper assembly	1	
5	Parking brake cable	1	
			Refer to "REMOVING THE PARKING BRAKE CABLE".
			For installation, reverse the removal procedure.



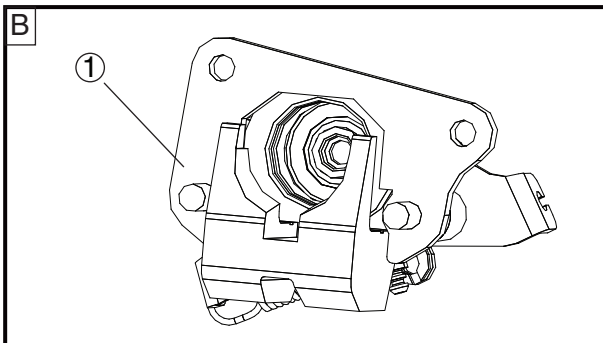
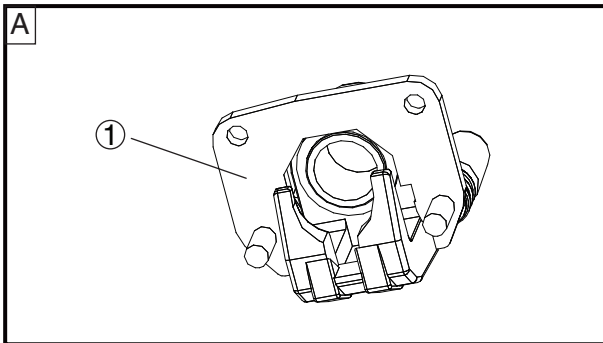
Order	Job/Part	Q'ty	Remarks
	Disassembling the rear brake caliper		Remove the parts in the order listed.
1	Adjusting bolt	1	
2	Brake pad	2	
3	Brake pad spring	1	
4	Caliper bracket	1	
5	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

REMOVING THE PARKING BRAKE CABLE

1. Loosen:
 - nut
 - adjusting bolt
2. Disconnect:
 - parking brake cable (from parking brake lever)
3. Disconnect:
 - parking brake cable (from rear brake)

CHECKING THE BRAKE CALIPER

Recommended brake component replacement schedule	
Brake pads	As required
Caliper ass'y	Every two years
Brake hoses	Every four years
Brake fluid	Replace when brakes are disassembled.

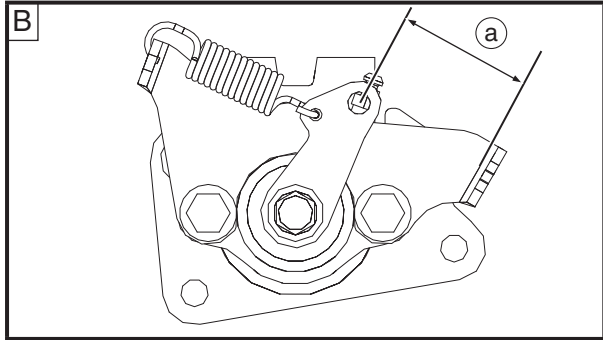


1. Check:
 - brake caliper body ①
Cracks/damage → Replace.
 - brake fluid delivery passage (brake caliper body)
Blockage → Blow out with compressed air.

⚠ WARNING

Replace the caliper piston seal and dust seal whenever the brake caliper is disassembled.

- A Front brake caliper
- B Rear brake caliper

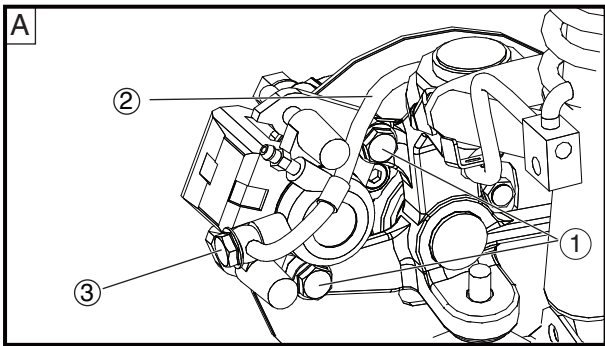


2. Check:

- parking brake arm to parking brake bracket distance (a)
Out of specification → Adjust.

	<p>Parking brake arm to parking brake bracket distance 63.0 mm (2.48 in)</p>
--	-----------------------------------------------------------------------------------------

B Rear brake caliper



INSTALLING THE BRAKE CALIPER

1. Install:

- brake caliper assembly
- brake caliper mounting bolts ①

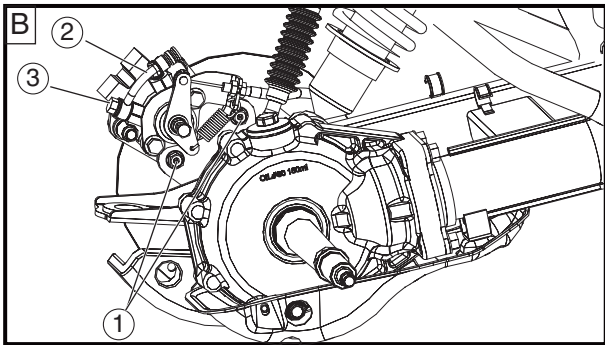
	<p>Brake caliper mounting bolt 28 Nm (2.8 m•kg, 20.3 ft•lb)</p>
--	----------------------------------------------------------------------------

- brake hose ②
- copper washers **New**
- union bolt ③

	<p>Union bolt 28 Nm (2.8 m•kg, 20.3 ft•lb)</p>
--	-----------------------------------------------------------

⚠ WARNING

Proper brake hose routing is essential to insure safe machine operation. Refer to “CABLE ROUTING” in chapter 2.



A Front

B Rear

2. Fill:

- brake reservoir

	<p>Recommended brake fluid DOT 4</p>
--	-------------------------------------------------

NOTICE

Brake fluid may damage painted surfaces or plastic parts. Always clean up spilled brake fluid immediately.

**⚠ WARNING**

- Use only the designated quality brake fluid: other brake fluids may deteriorate the rubber seals, causing leakage and poor brake performance.
- Refill with the same type of brake fluid: mixing brake fluids may result in a harmful chemical reaction and lead to poor brake performance.
- Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the brake fluid and may result in vapor lock.

3. Air bleed:
 - brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.
4. Check:
 - brake fluid level
Brake fluid level is below the “LOWER” level line → Add the recommended brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.
5. Adjust:
 - parking brake cable end length
Refer to “ADJUSTING THE PARKING BRAKE” in chapter 3.

NOTICE

Disc brake components rarely require disassembly.

DO NOT:

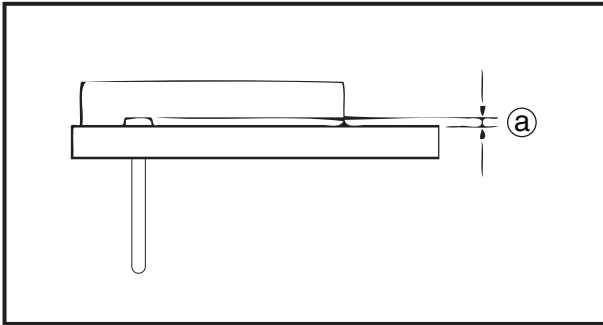
- disassemble components unless absolutely necessary;
- use solvents on internal brake components;
- use spent brake fluid for cleaning; (use only clean brake fluid)
- allow brake fluid to come in contact with the eyes, as this may cause eye injury;
- splash brake fluid onto painted surfaces or plastic parts, as this may cause damage;
- disconnect any hydraulic connection, as this would require the entire brake system to be disassembled, drained, cleaned, properly filled and bled after reassembly.



REPLACING THE FRONT BRAKE PADS

TIP

It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.



1. Remove:
 - brake pads
- Ⓐ wear limit

Brake pad wear limit Ⓐ 1.0 mm (0.04 in)

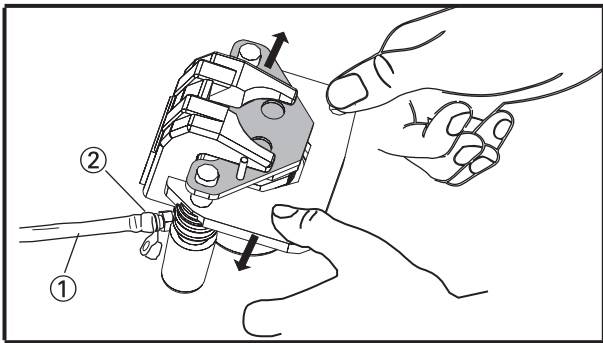
TIP

Replace the brake pads as a set if either is found to be worn to the wear limit.

2. Install:
 - brake pads
 - brake pad spring

TIP

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



- a. Connect a suitable hose ① tightly to the brake caliper bleed screw ②. Put the other end of this hose into an open container.
- b. Loosen the brake caliper bleed screw and, using a finger, push the caliper piston into the brake caliper.
- c. Tighten the brake caliper bleed screw.

7 Nm (0.7 m·kg, 5.1 ft·lb)

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

3. Install:
 - brake caliper
 - brake caliper mounting bolts

Brake caliper mounting bolt 28 Nm (2.8 m·kg, 20.3 ft·lb)

4. Check:
 - brake fluid level
Refer to “CHECKING THE FRONT BRAKE FLUID LEVEL” in chapter 3.

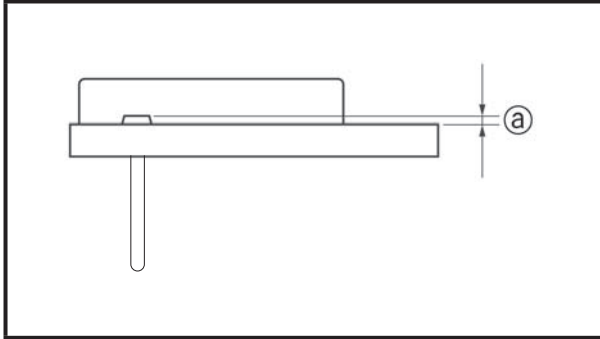
5. Check:
 - brake lever or brake pedal operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.



REPLACING THE REAR BRAKE PADS

TIP

It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.



- Remove:
 - brake pads
- (a) wear limit

Brake pad wear limit (a) 1.0 mm (0.04 in)

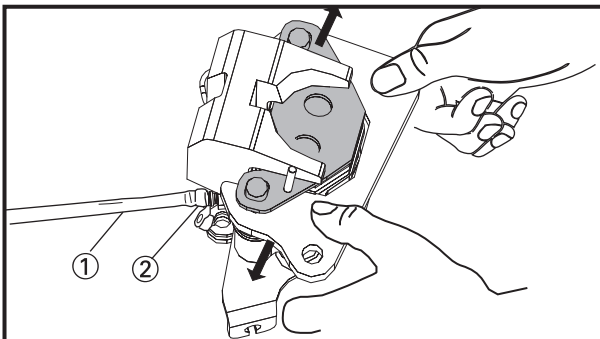
TIP

Replace the brake pads as a set if either is found to be worn to the wear limit.

- Install:
 - brake pads
 - brake pad spring

TIP

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



- Connect a suitable hose ① tightly to the brake caliper bleed screw ②. Put the other end of this hose into an open container.
- Loosen the brake caliper bleed screw and, using a finger, push the caliper piston into the brake caliper.
- Tighten the brake caliper bleed screw.

7 Nm (0.7 m·kg, 5.1 ft·lb)

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

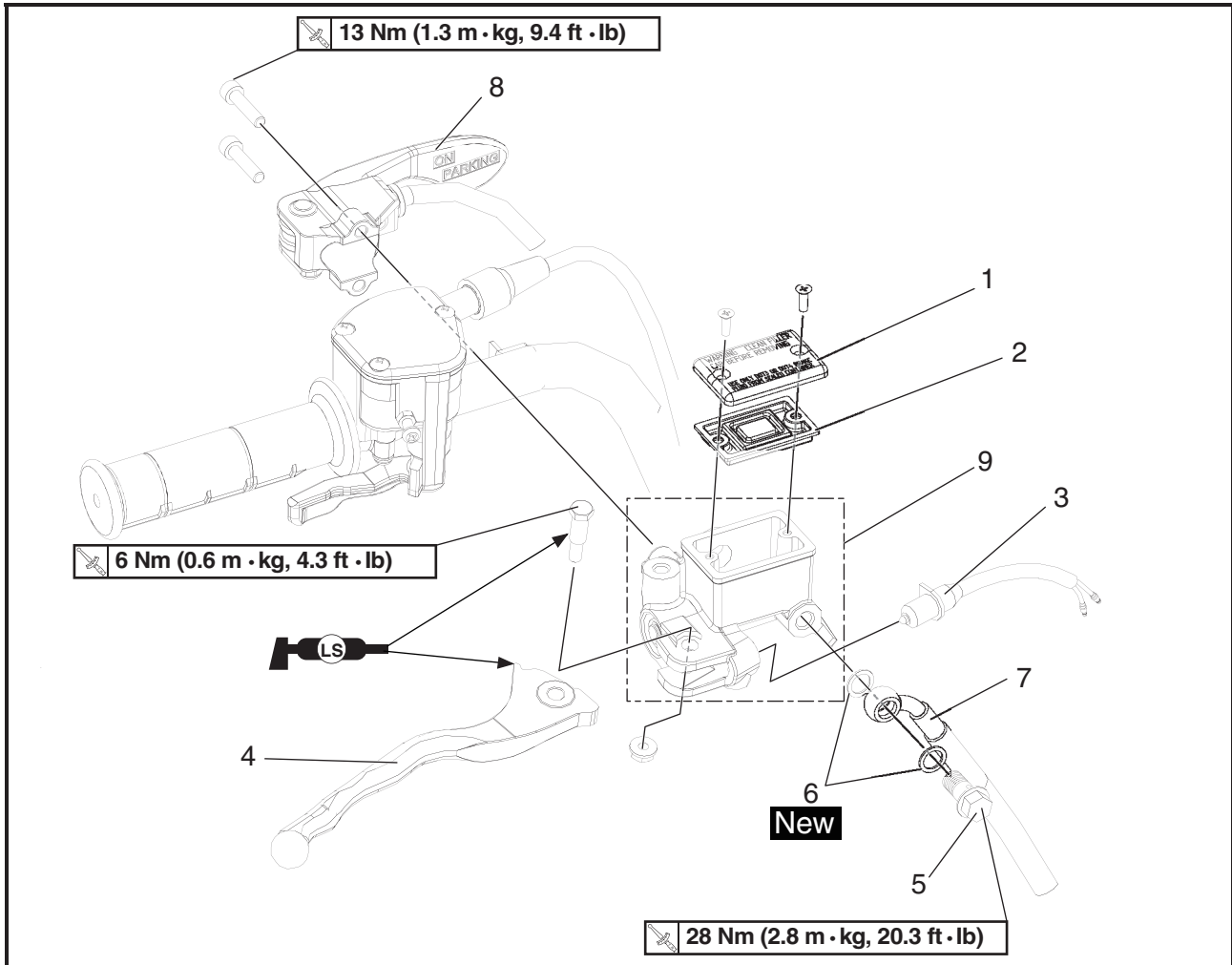
- Install:
 - brake caliper
 - brake caliper mounting bolts

Brake caliper mounting bolt 28 Nm (2.8 m·kg, 20.3 ft·lb)

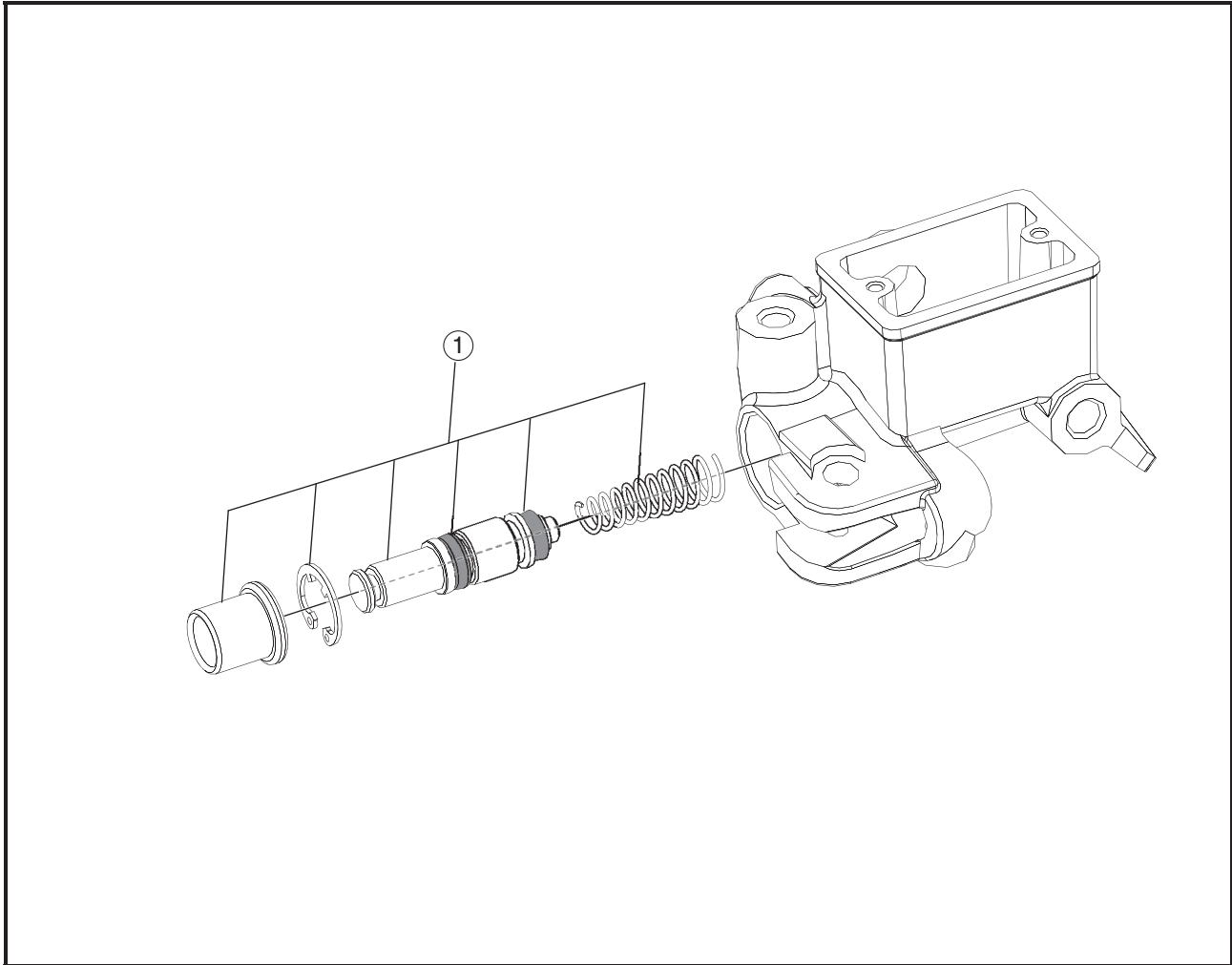
- Check:
 - brake fluid level
Refer to "CHECKING THE REAR BRAKE FLUID LEVEL" in chapter 3.
- Check:
 - brake lever or brake pedal operation
Soft or spongy feeling → Bleed the brake system.
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.



FRONT BRAKE MASTER CYLINDER



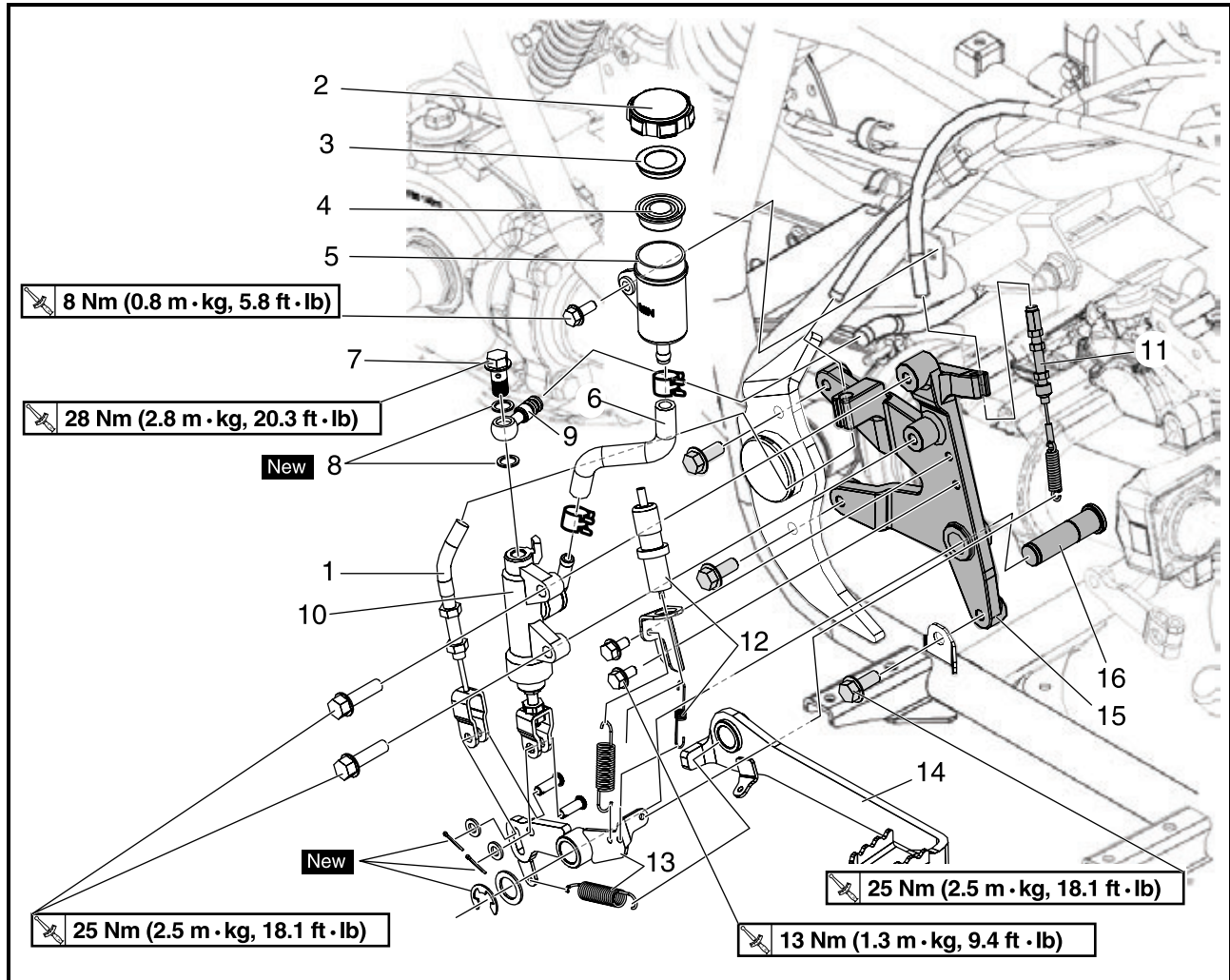
Order	Job/Part	Q'ty	Remarks
	Removing the front brake master cylinder		Remove the parts in the order listed.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
1	Brake fluid reservoir cap	1	
2	Brake fluid reservoir diaphragm	1	
3	Front brake light switch	1	
4	Brake lever	1	
5	Union bolt	1	
6	Copper washer	2	
7	Brake hose	1	Disconnect. } Refer to "INSTALLING THE FRONT BRAKE MASTER CYLINDER".
8	Parking brake lever	1	
9	Brake master cylinder	1	
			For installation, reverse the removal procedure.



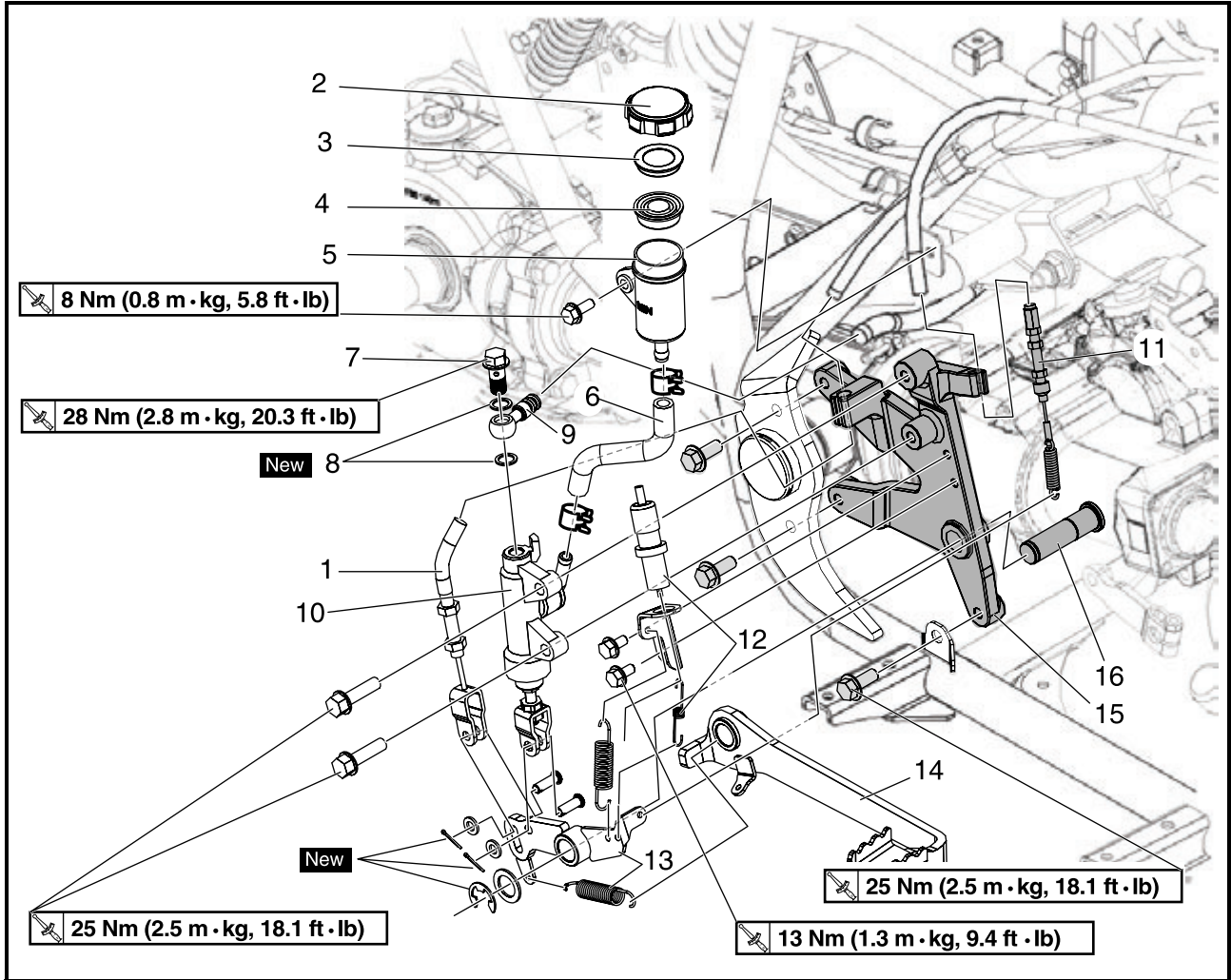
Order	Job/Part	Q'ty	Remarks
1	<p>Disassembling the front brake master cylinder</p> <p>Brake master cylinder kit</p>	1	<p>Remove the parts in the order listed.</p> <p>For assembly, reverse the disassembly procedure.</p>



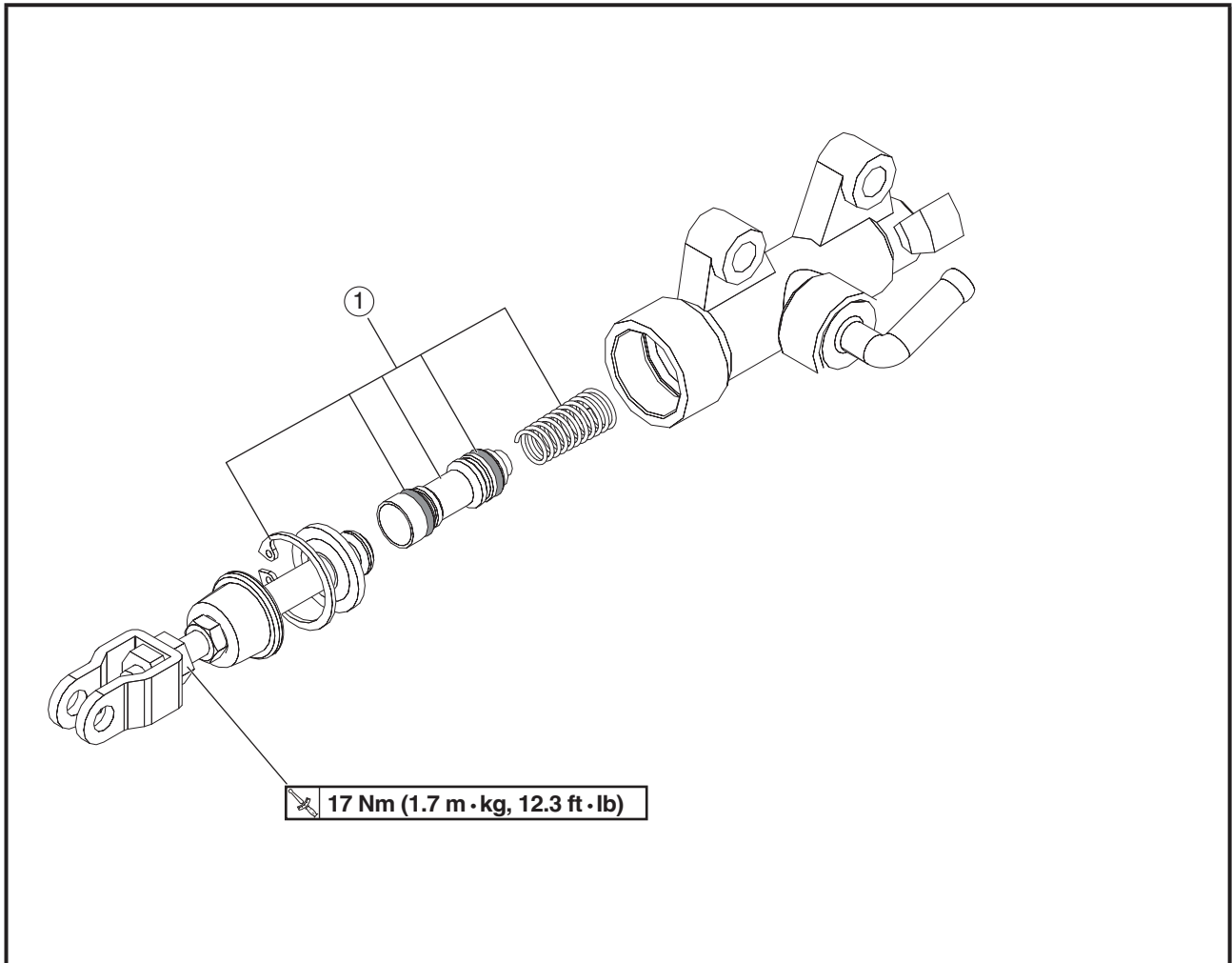
REAR BRAKE MASTER CYLINDER



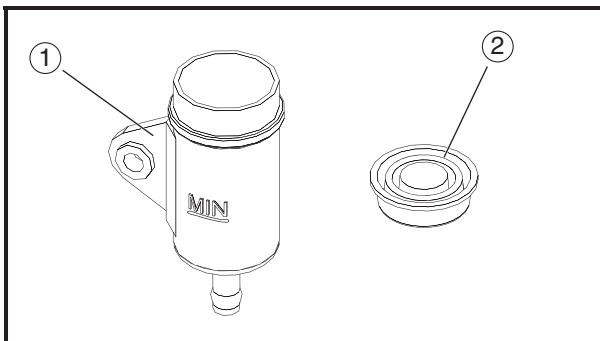
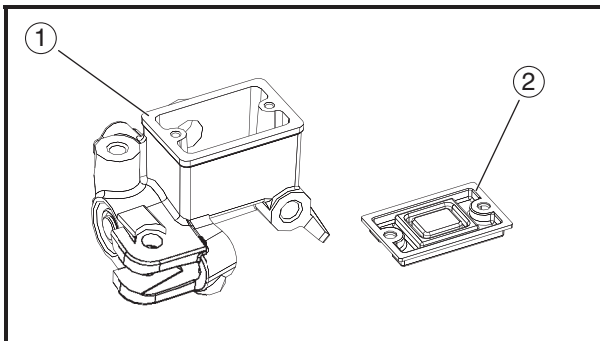
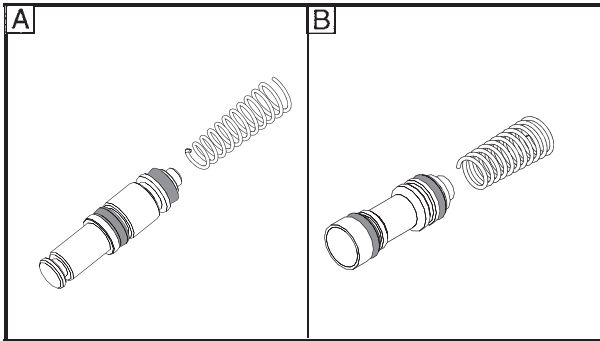
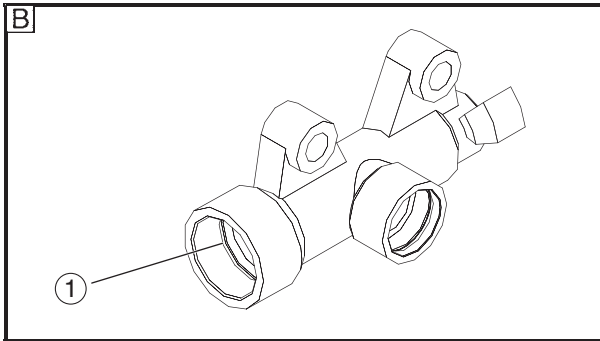
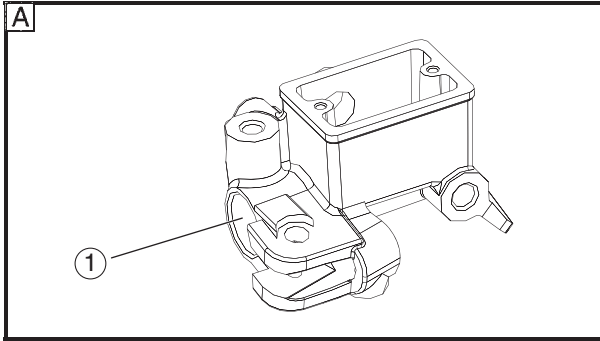
Order	Job/Part	Q'ty	Remarks
	Removing the rear brake master cylinder		Remove the parts in the order listed.
	Right foot protector		Refer to "SEAT, FENDERS AND FUEL TANK" in chapter 3.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
1	Rear brake cable	1	
2	Brake fluid reservoir cap	1	
3	Brake fluid reservoir diaphragm holder	1	
4	Brake fluid reservoir diaphragm	1	
5	Brake fluid reservoir	1	
6	Brake fluid reservoir hose	1	



Order	Job/Part	Q'ty	Remarks
7	Union bolt	1	Disconnect. } Refer to "INSTALLING THE REAR BRAKE MASTER CYLINDER".
8	Copper washer	2	
9	Brake hose	1	
10	Brake master cylinder	1	
11	Control cable	1	
12	Rear brake light switch/spring	1/1/1	
13	Brake master cylinder arm/spring	1/2	
14	Brake pedal	1	
15	Master cylinder holder	1	For installation, reverse the removal procedure.
16	Axle fixed	1	



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



EBS00413

CHECKING THE MASTER CYLINDERS

1. Check:

- brake master cylinder ①
Wear/scratches → Replace the brake master cylinder assembly.
- brake master cylinder body
Cracks/damage → Replace.
- brake fluid delivery passage (brake master cylinder body)
Blockage → Blow out with compressed air.

- A** Front
- B** Rear

2. Check:

- brake master cylinder kit
Scratches/wear/damage → Replace as a set.

- A** Front
- B** Rear

3. Check:

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

4. Check:

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



ASSEMBLING THE FRONT BRAKE MASTER CYLINDER

⚠ WARNING

- All internal brake components should be cleaned and lubricated with new brake fluid only before installation.



**Recommended brake fluid
DOT 4**

- Whenever a master cylinder is disassembled, replace the piston seals and dust seals.

ASSEMBLING THE REAR BRAKE MASTER CYLINDER

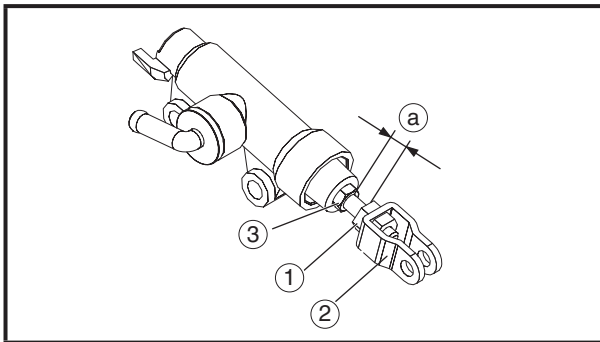
⚠ WARNING

- All internal brake components should be cleaned and lubricated with new brake fluid only before installation.



**Recommended brake fluid
DOT 4**

- Whenever a master cylinder is disassembled, replace the piston seals and dust seals.



1. Install:
 - brake master cylinder kit
 - nut ①
 - joint ②

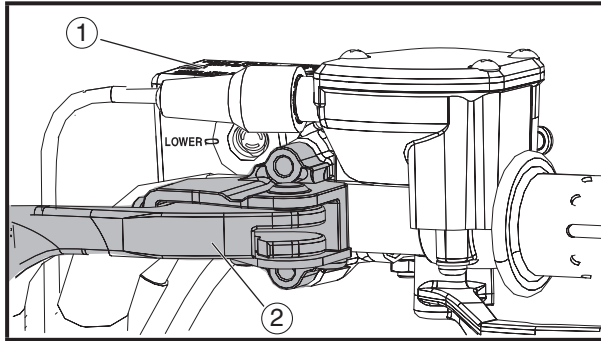
TIP

Turn the adjusting bolt ③ until the clearance ④ is within the specified limits when install the joint ②.

Clearance
5.2 ~ 6.2 mm (0.20 ~ 0.24 in)

2. Tighten:
 - nut ①

Nut
17 Nm (1.7 m•kg, 13 ft•lb)



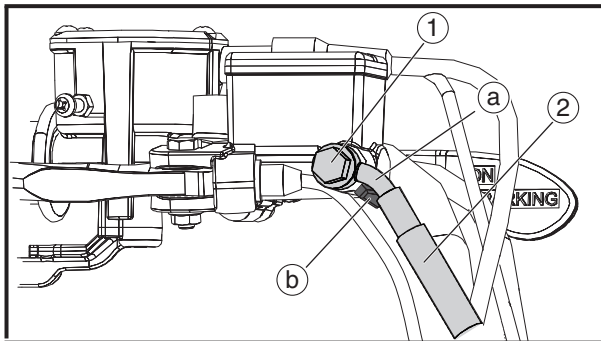
INSTALLING THE FRONT BRAKE MASTER CYLINDER

1. Install:
 - brake master cylinder ①
 - parking brake lever ②

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

TIP

- The parking brake lever installing, please refer to “INSTALLING THE PARKING BRAKE LEVER”.
- Install the brake master cylinder so that the gaps between the brake master cylinder and the parking brake lever are equal.



2. Install:
 - copper washers **New**
 - brake hose ②
 - union bolt ①

Union bolt 28 Nm (2.8 m•kg, 20.3 ft•lb)

NOTICE

When installing the brake hose onto the brake master cylinder, make sure the brake pipe ① touches the projection ② as shown.

TIP

- Tighten the union bolt while holding the brake hose as shown.
- Turn the handlebar to the left and to the right to check that the brake hose does not touch other parts (throttle cable, wire harness, leads, etc.). Correct if necessary.

⚠ WARNING

Proper brake hose routing is essential to insure safe machine operation. Refer to “CABLE ROUTING” in chapter 2.



3. Fill:
 - brake fluid reservoir



Recommended brake fluid
DOT 4

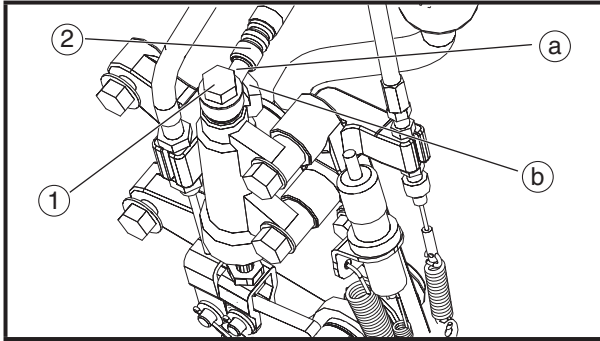
NOTICE

Brake fluid may damage painted surfaces or plastic parts. Always clean up spilled brake fluid immediately.

⚠ WARNING

- Use only the designated quality brake fluid: other brake fluids may deteriorate the rubber seals, causing leakage and poor brake performance.
- Refill with the same type of brake fluid: mixing brake fluids may result in a harmful reaction and lead to poor brake performance.
- Be careful that water does not enter the brake master cylinder when refilling. Water will significantly lower the boiling point of the brake fluid and may result in vapor lock.

4. Air bleed:
 - brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.
5. Check:
 - brake fluid level
Brake fluid level is under the “LOWER” level line → Add the recommended brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.



INSTALLING THE REAR BRAKE MASTER CYLINDER

1. Install:
 - copper washers **New**
 - brake hose ①
 - union bolt ②

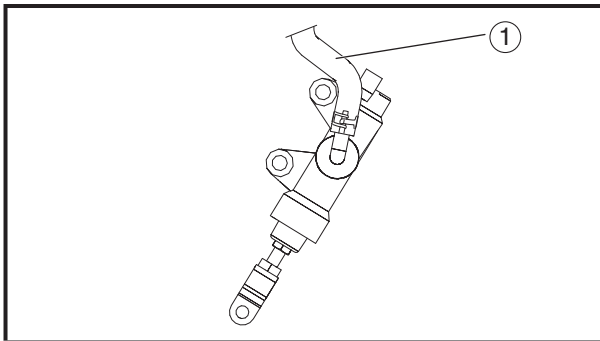
	Union bolt 28 Nm (2.8 m•kg, 20.3 ft•lb)
--	--------------------------------------------

NOTICE

When installing the brake hose onto the brake master cylinder, make sure the brake pipe ① touches the projection ② as shown.

⚠ WARNING

Proper brake hose routing is essential to insure safe machine operation. Refer to “CABLE ROUTING” in chapter 2.



2. Install:
 - brake fluid reservoir hose ①
3. Fill:
 - brake fluid reservoir

	Recommended brake fluid DOT 4
--	----------------------------------

NOTICE

Brake fluid may damage painted surfaces or plastic parts. Always clean up spilled brake fluid immediately.

**⚠ WARNING**

- Use only the designated quality brake fluid: other brake fluids may deteriorate the rubber seals, causing leakage and poor brake performance.
- Refill with the same type of brake fluid: mixing brake fluids may result in a harmful chemical reaction and lead to poor brake performance.
- Be careful that water does not enter the brake master cylinder when refilling. Water will significantly lower the boiling point of the brake fluid and may result in vapor lock.

4. Air bleed:

- brake system

Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

5. Check:

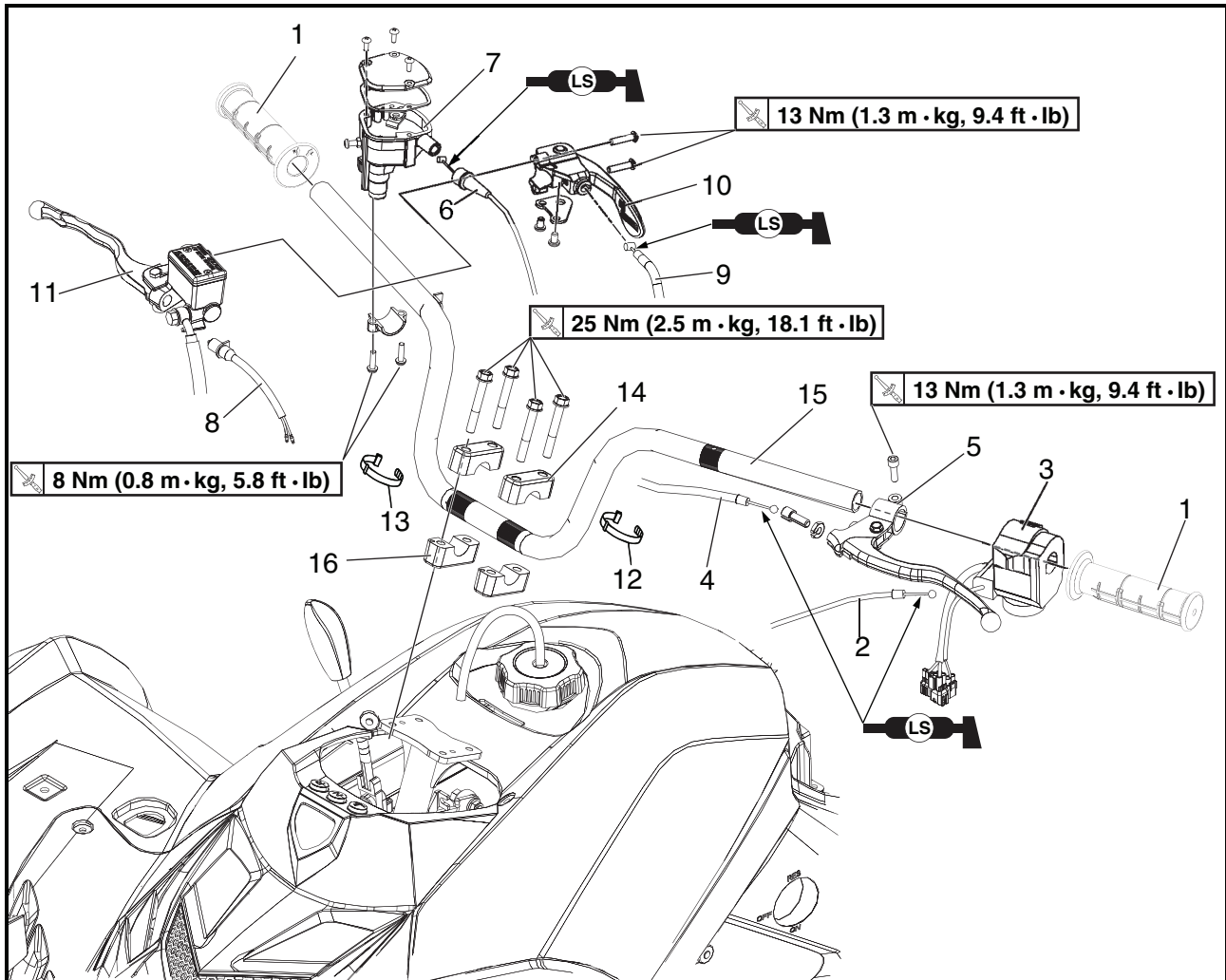
- brake fluid level

Brake fluid level is under the “LOWER” level line → Add the recommended brake fluid to the proper level.

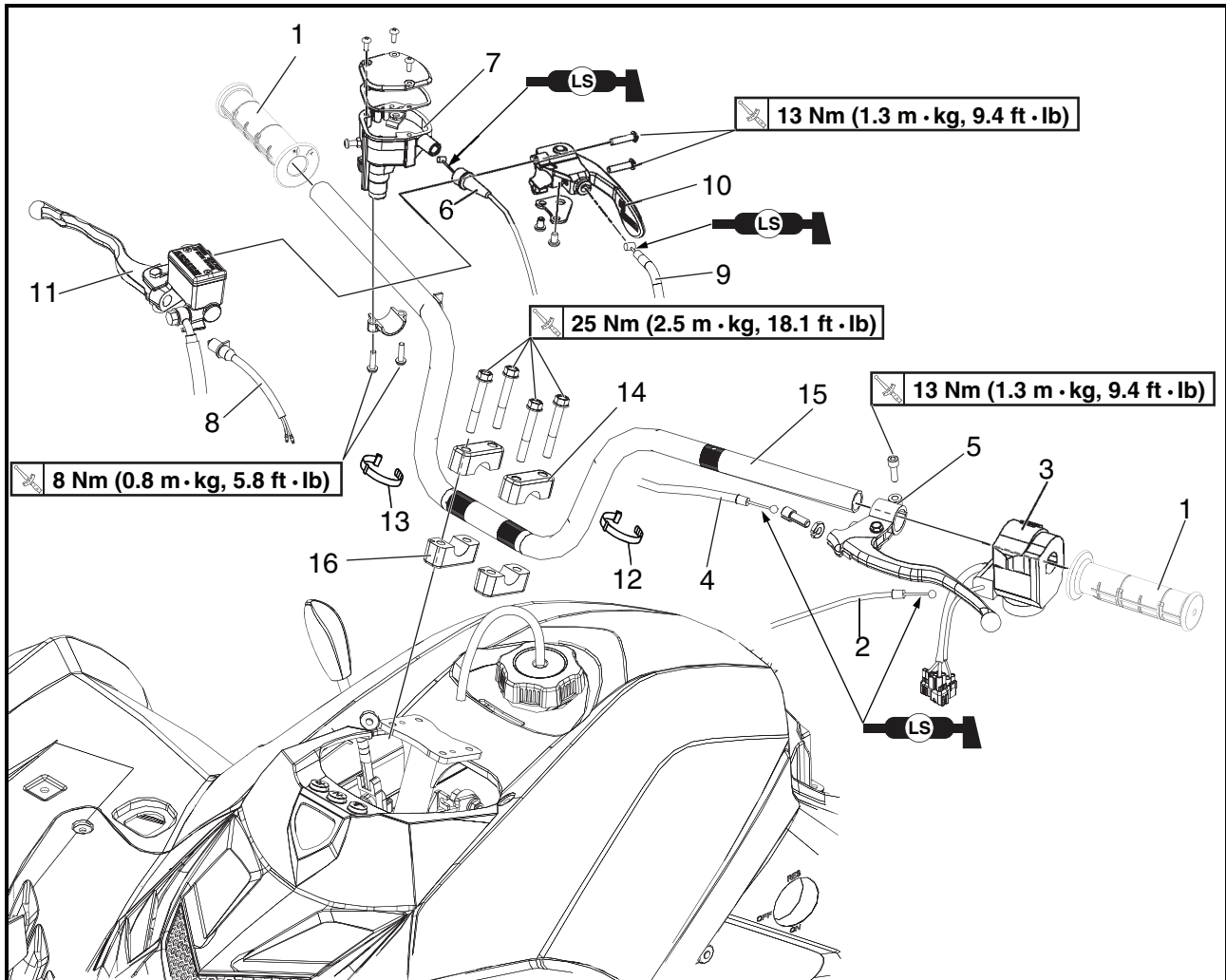
Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

STEERING SYSTEM

HANDLEBAR



Order	Job/Part	Q'ty	Remarks
	Removing the handlebar		
	Handlebar cover		Remove the parts in the order listed. Refer to "SEAT, FENDERS AND FUEL TANK" in chapter 3.
1	Handlebar grip	2	Refer to "REMOVING THE HANDLEBAR GRIPS" and "INSTALLING THE HANDLEBAR GRIPS".
2	Choke cable	1	
3	Handlebar switch	1	
4	Rear brake cable	2	
5	Rear brake lever assembly	1	Refer to "INSTALLING THE REAR BRAKE LEVER ASSEMBLY".
6	Throttle cable	1	
7	Throttle lever assembly	1	Refer to "INSTALLING THE THROTTLE LEVER ASSEMBLY".



Order	Job/Part	Q'ty	Remarks
8	Front brake switch	1	
9	Parking brake cable	1	
10	Parking brake lever	1	Refer to "INSTALLING THE FRONT BRAKE LEVER ASSEMBLY" and "INSTALLING THE PARKING BRAKE LEVER".
11	Front brake master cylinder	1	
12	Plastic band	1	Fasten the choke cable and handlebar switch lead.
13	Plastic band	1	Fasten the front brake switch.
14	Upper handlebar holder	1	Refer to "INSTALLING THE HANDLEBAR".
15	Handlebar	1	
16	Lower handlebar holder	1	
			For installation, reverse the removal procedure.

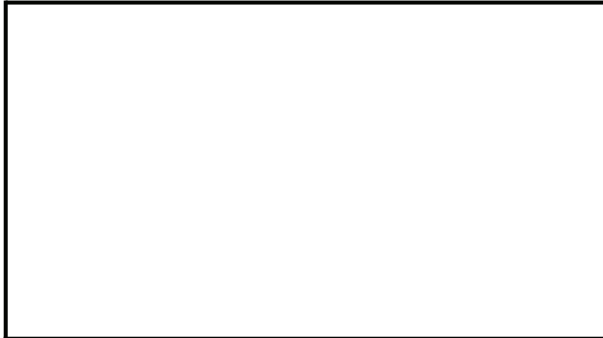
**REMOVING THE HANDLEBAR GRIPS**

1. Remove:

- handlebar grips ①

TIP

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

**REMOVING THE REAR BRAKE SWITCH**

1. Remove:

- rear brake switch ①

TIP

Push the fastener when removing the rear brake switch out of the rear brake lever holder.

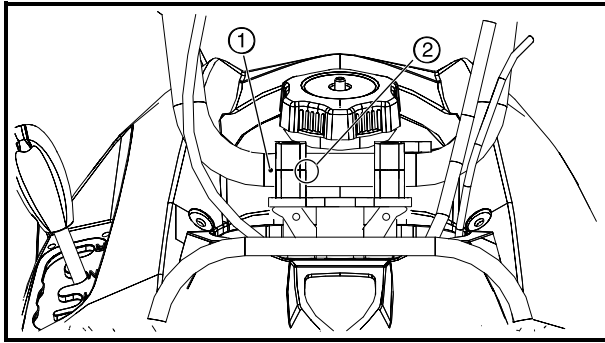
**CHECKING THE HANDLEBAR**

1. Check:

- handlebar ①
Bends/cracks/damage → Replace.

⚠ WARNING

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



INSTALLING THE HANDLEBAR

1. Install:
- handlebar
 - upper handlebar holders

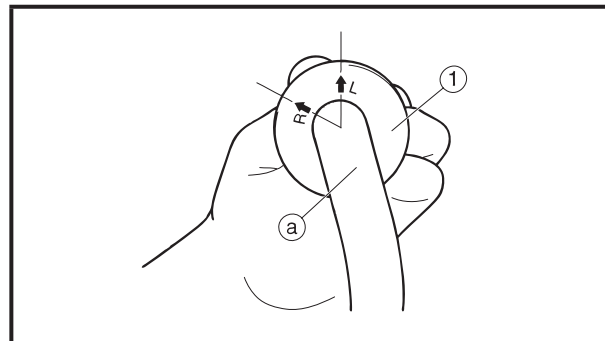
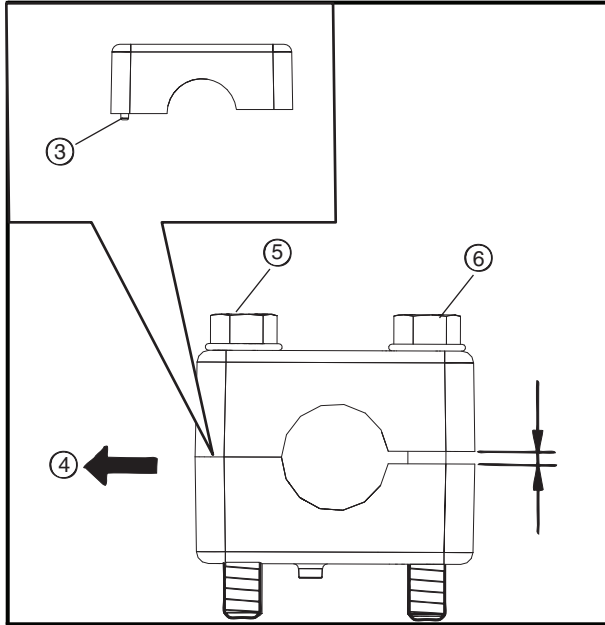
25 Nm (2.5 m · kg, 18.1 ft · lb)

TIP

- Install the handlebar, please align the punch mark ① and the gap at handlebar holder ② .
- The upper handlebar holders should be installed with the flange ③ forward ④ .

NOTICE

First tighten the bolt ⑤ on the rear side of the handlebar holder, and then tighten the bolt ⑥ on the front side.

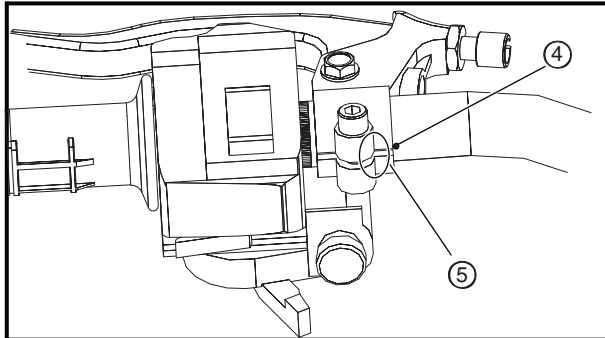
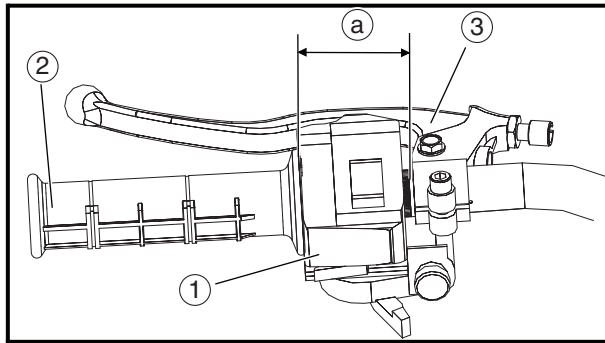


INSTALLING THE HANDLEBAR GRIPS

1. Install:
- rear brake lever
 - handlebar grips ①

TIP

- Before installing the handlebar grips, please placing the rear brake lever.
- Before applying the adhesive, wipe off grease or oil on the handlebar surface (a) with a lacquer thinner.
- Install the handlebar grips so that the “L” arrow on the left grip and “R” arrow on the right grip are placed vertically.



INSTALLING THE REAR BRAKE LEVER

1. Install:
 - handlebar switch
 - rear brake lever

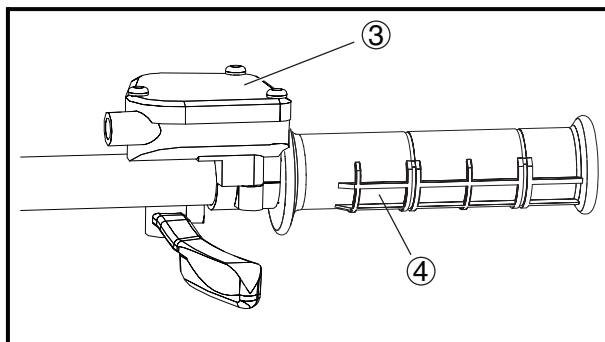
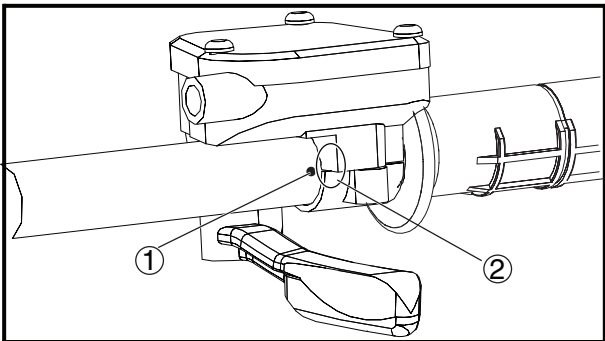
TIP

- Installing the rear brake lever, make sure the handlebar switch ①, handlebar grip ②, and rear brake lever ③ are in the positions shown in the illustration.
- Install the rear brake lever, please align the punch mark ④ and the gap ⑤ at rear brake lever holder.
- ⑤ 65 ~ 66 mm (2.56 ~ 2.60 in)

<p>Rear brake lever 13 Nm (1.3 m•kg, 9.4 ft•lb)</p>

2. Adjust:
 - rear brake lever

Refer to “ADJUSTING THE REAR BRAKE LEVER” in chapter 3.



INSTALLING THROTTLE LEVER ASSEMBLY

1. Install:
 - throttle lever assembly

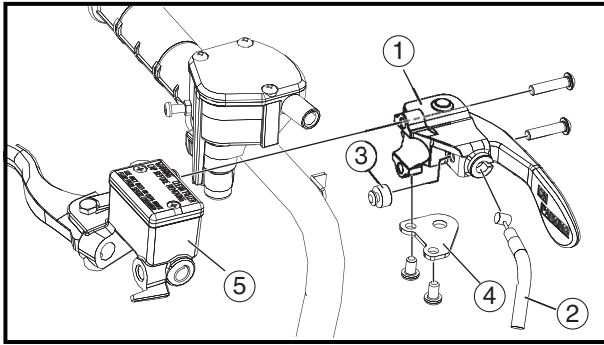
TIP

- Installing the throttle lever assembly, please align the punch mark ① and the gap ② at the throttle lever assembly.
- Installing the throttle lever assembly, make sure the clearance the throttle lever assembly ③ and handlebar grip ④.

<p>Throttle lever assembly 8 Nm (0.8 m•kg, 5.8 ft•lb)</p>

2. Adjust:
 - throttle lever free play

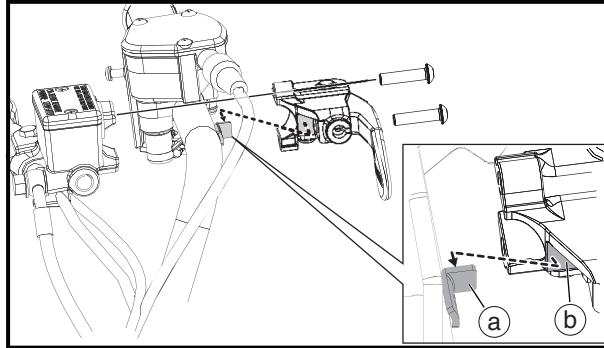
Refer to “ADJUSTING THE THROTTLE LEVER FREE PLAY” in chapter 3.



INSTALLING THE PARKING BRAKE LEVER

1. Install:

- parking brake lever ①
- parking brake cable ②
- damper ③
- parking brake lever plate ④
- Brake master cylinder ⑤



TIP

Align the holder plate (a) on the handlebar with the align position (b) of the parking brake lever.

Throttle lever assembly 13 Nm (1.3 m•kg, 9.4 ft•lb)

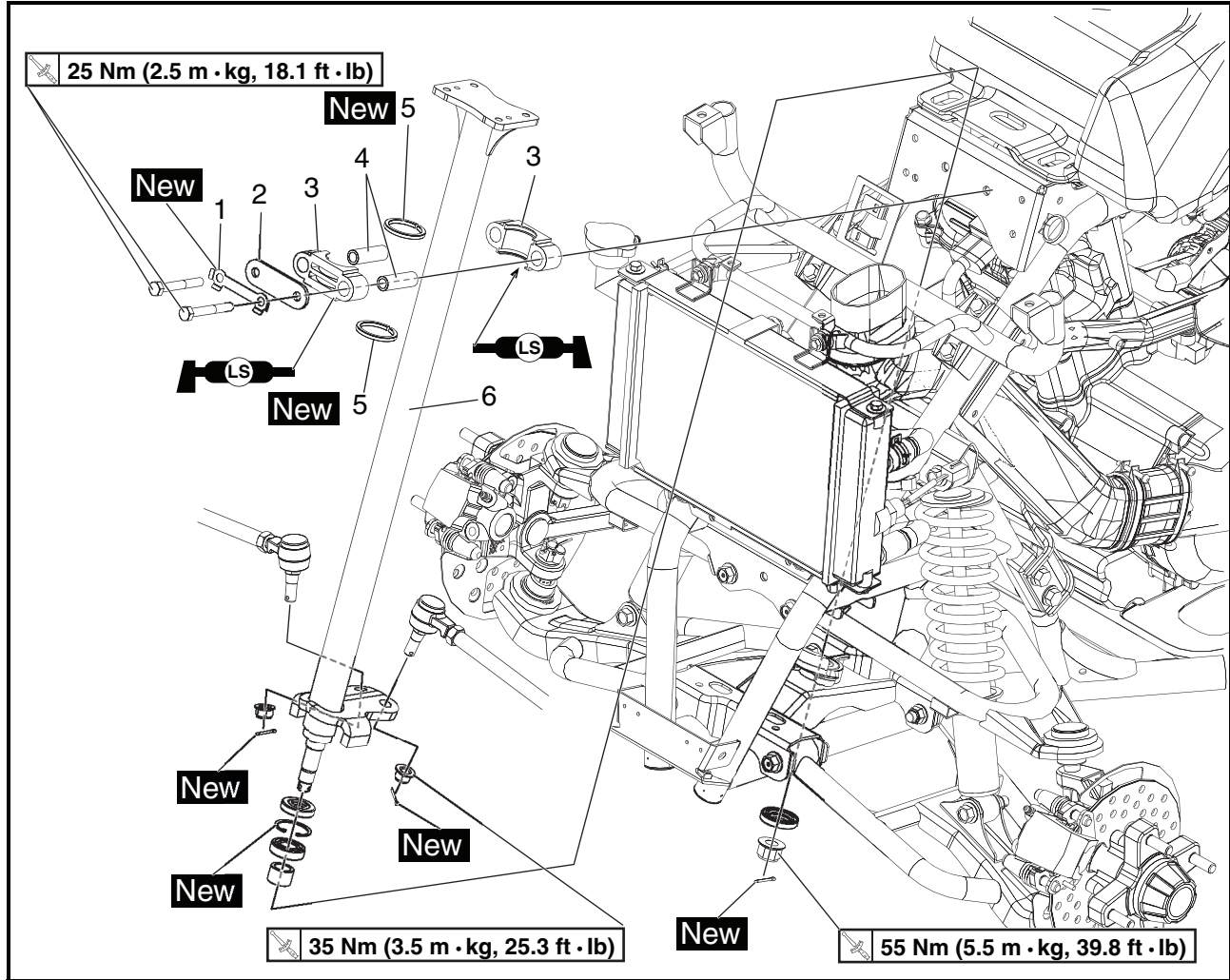
2. Adjust:

- parking brake
Refer to “ADJUSTING THE PARKING BRAKE” in chapter 3.

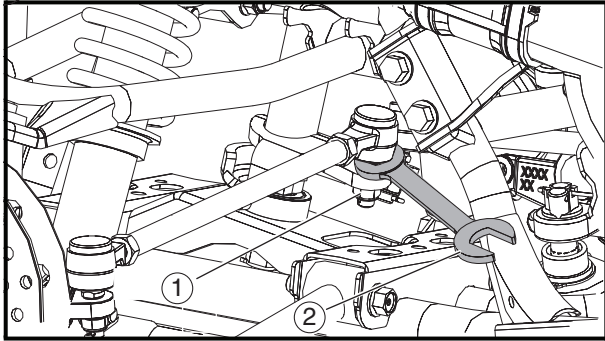


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STEERING STEM



Order	Job/Part	Q'ty	Remarks
	Removing the steering stem		
	Front fender		Remove the parts in the order listed. Refer to "SEAT, FENDERS AND FUEL TANK" in chapter 3.
	Handlebar		Refer to "HANDLEBAR".
1	Lock washer	1	Refer to "INSTALLING THE LOCK WASHER".
2	Bracket	1	
3	Steering stem bushing	2	
4	Collar	2	
5	Oil seal	2	
6	Steering stem	1	Refer to "INSTALLING THE STEERING STEM".
			For installation, reverse the removal procedure.

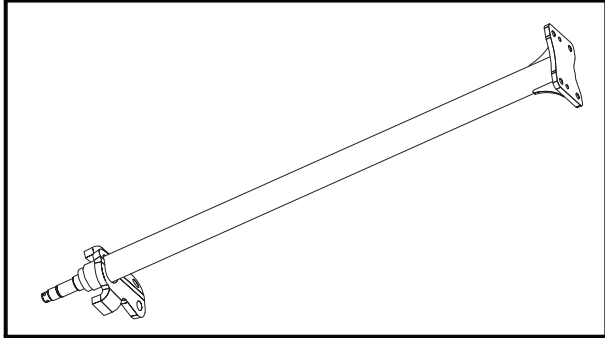


REMOVING THE STEERING STEM

1. Remove:
 - steering stem

TIP

When loosening each tie-rod end nut ①, hold the tie-rod ball joint with a 14-mm wrench ②.

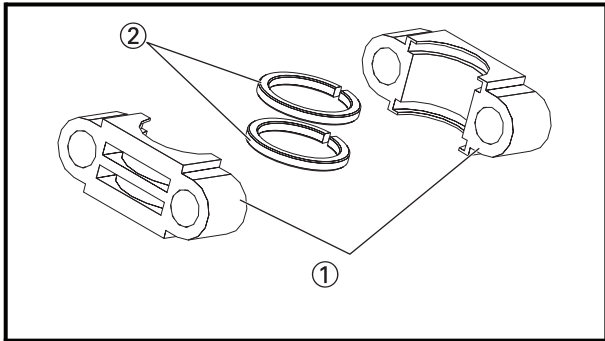


CHECKING THE STEERING STEM

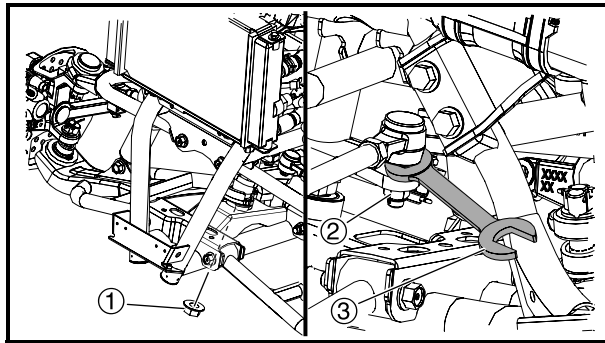
1. Check:
 - steering stem
 Bends → Replace.

⚠ WARNING

Do not attempt to straighten a bent stem; this may dangerously weaken the stem.




2. Check:
 - steering stem bushings ①
 - oil seal ②
 Wear/damage → Replace.




INSTALLING THE STEERING STEM

1. Tighten:

- steering stem nut ①

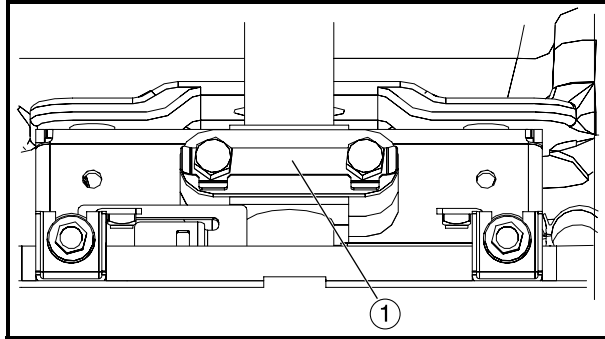
 55 Nm (5.5 m·kg, 39.8 ft·lb)

- tie-rod end nut ②

 35 Nm (3.5 m·kg, 25.3 ft·lb)

TIP

When tightening each tie-rod end nut ②, hold the tie-rod ball joint with a 14-mm wrench ③.




INSTALLING THE LOCK WASHER

1. Install:

- lock washer ① **New**

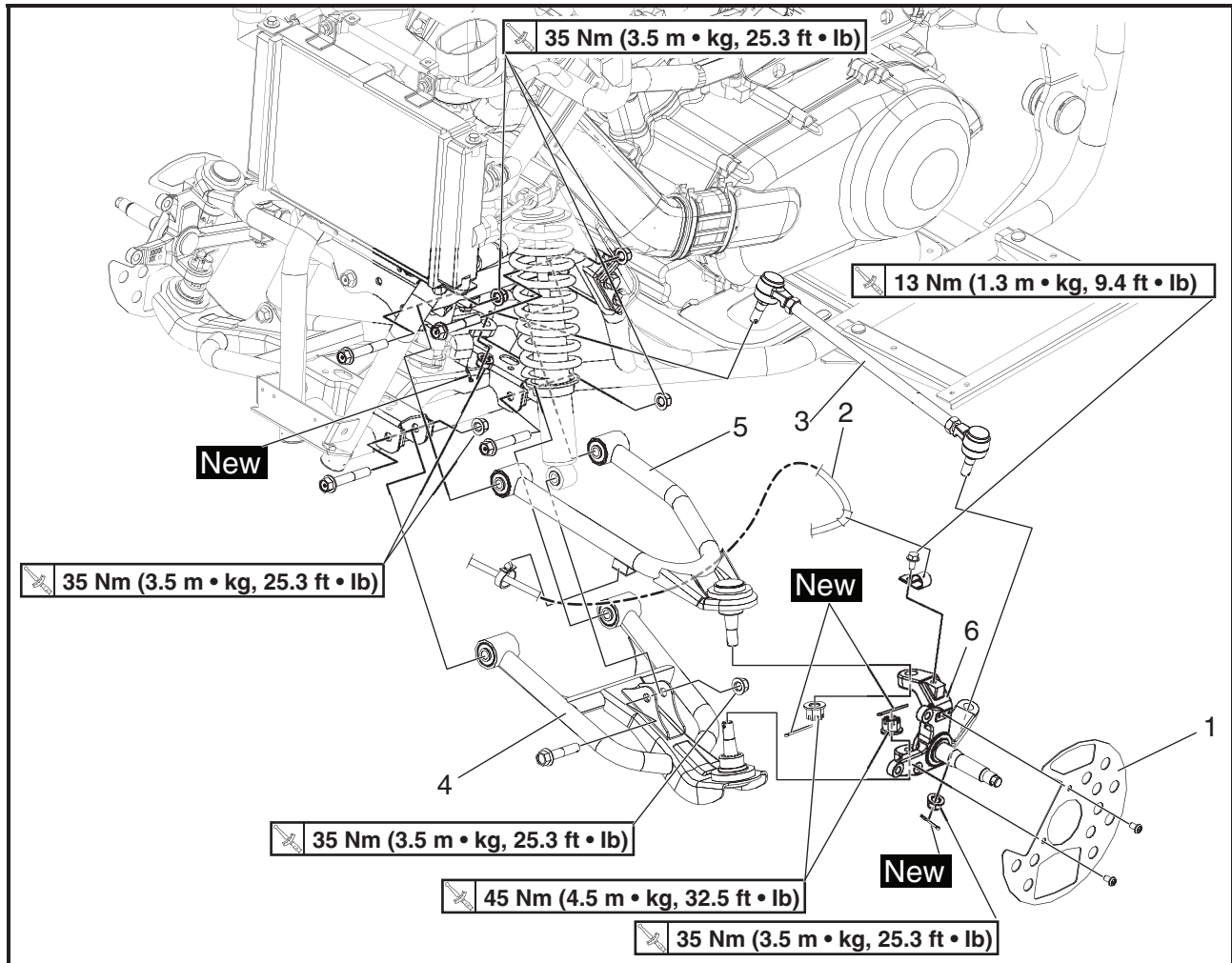
- bolts

 25 Nm (2.5 m·kg, 18.1 ft·lb)

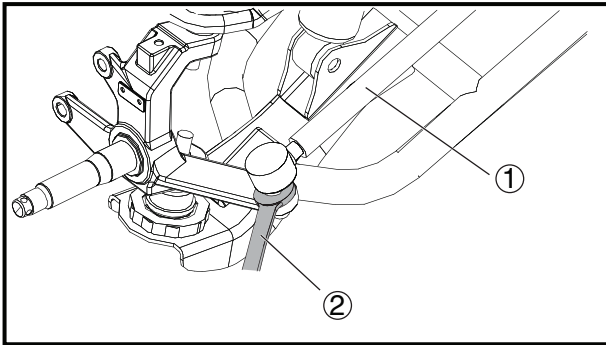
2. Bend the lock washer tab along a flat side of the bolt.



TIE-RODS AND STEERING KNUCKLES



Order	Job/Part	Q'ty	Remarks
	Removing the tie-rods and steering knuckles		Remove the parts in the order listed.
	Front brakes		The following procedure applies to both of the tie-rods and steering knuckles. Refer to "FRONT BRAKES".
1	Brake disc guard	1	
2	Front brake hose	1	
3	Tie-rod	1	Refer to "INSTALLING THE TIE-RODS".
4	Lower front arm	1	
5	Upper front arm	1	
6	Steering knuckle	1	Refer to "REMOVING THE STEERING KNUCKLES". For installation, reverse the removal procedure.



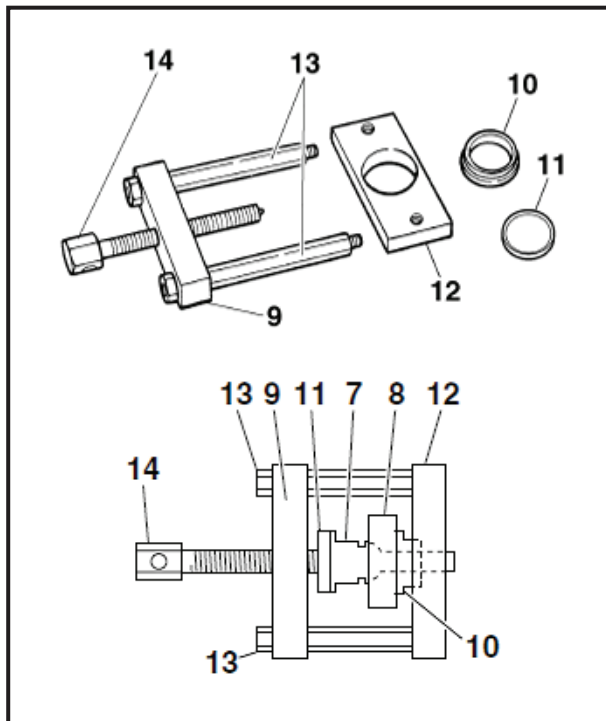
REMOVING THE TIE-RODS

The following procedure applies to both of the tie-rods.

1. Remove:
 - tie-rod ①

TIP

When removing the tie-rod, hold each tie-rod ball joint with a 14-mm wrench ② and then loosen the tie-rod end nut.



REMOVING THE STEERING KNUCKLES

The following procedure applies to both of the steering knuckles.

1. Remove:
 - steering knuckles

TIP

- Attach the ball joint remover/attachment set/short set and new ball joint (with rubber boot and retaining ring) “7” to the steering knuckle “8”.
- Always use a new ball joint set.
- Do not tap or damage the top of the ball joint.



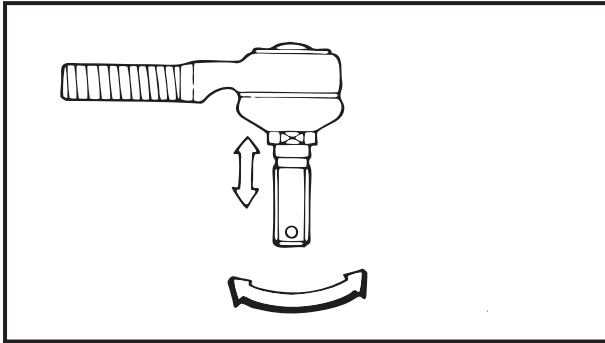
Ball joint remover
90890-01474

Ball joint remover attachment set
90890-01480

Ball joint adapter set
YM-01480

Ball joint remover short shaft set
90890-01514
YM-01514

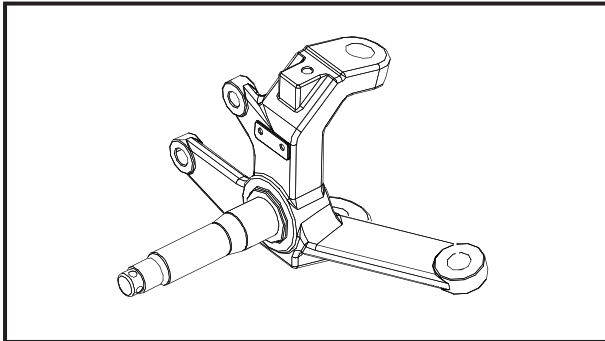
9	Body	90890-01474 YM-01474
10	Installer spacer	90890-01480 YM-01480
11	Installer washer	
12	Base	
13	Guide bolt	90890-01514 YM-01514
14	Short bolt	



CHECKING THE TIE-RODS

The following procedure applies to both of the tie-rods.

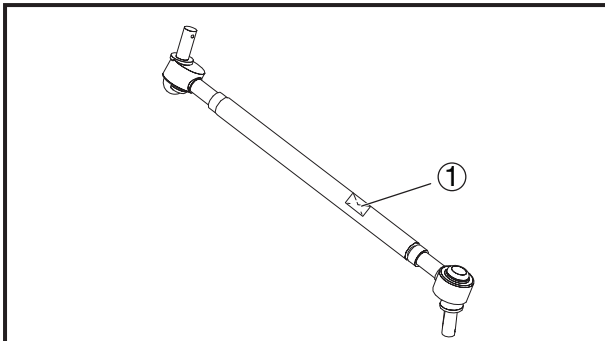
1. Check:
 - tie-rod free play and movement
Free play → Replace the tie-rod end.
Turns roughly → Replace the tie-rod end.
2. Check:
 - tie-rod
Bends/damage → Replace.



CHECKING THE STEERING KNUCKLES

The following procedure applies to both of the steering knuckles.

1. Check:
 - steering knuckle
Damage/pitting → Replace.



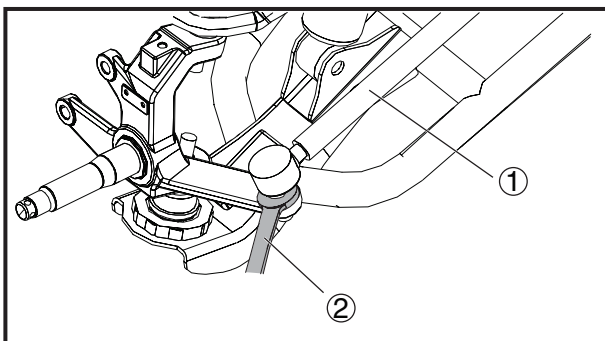
INSTALLING THE TIE-RODS

The following procedure applies to both of the tie-rods.

1. Install:
 - tie-rod 35 Nm (3.5 m · kg, 25.3 ft · lb)

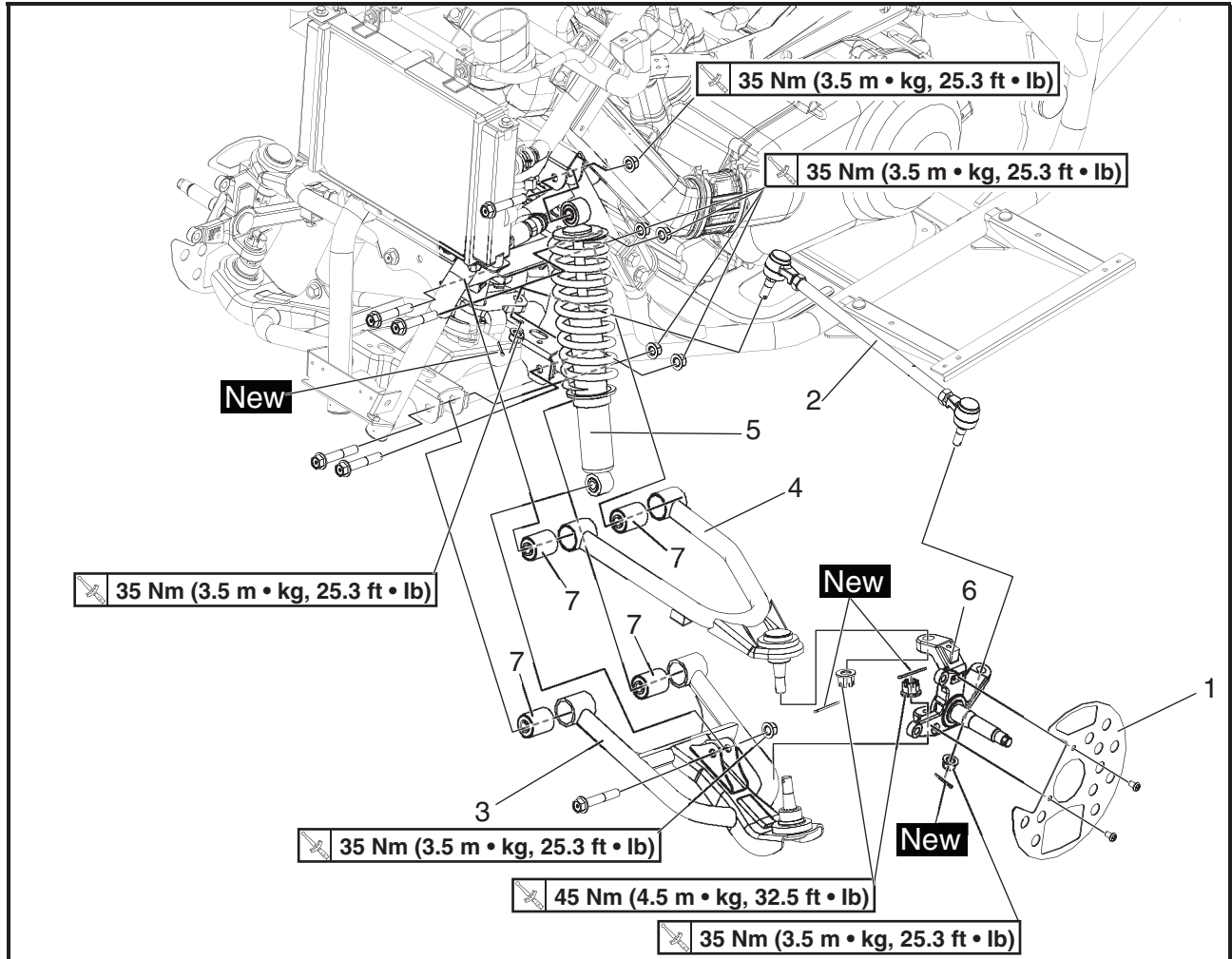
TIP

- The tie-rod side which must be installed on the outside has grooves ①.
- When installing the tie-rod, hold each tie-rod ball joint with a 14-mm wrench ② and then tighten the tie-rod end nut.

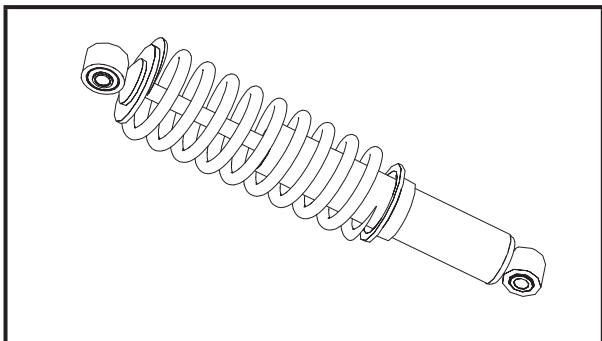
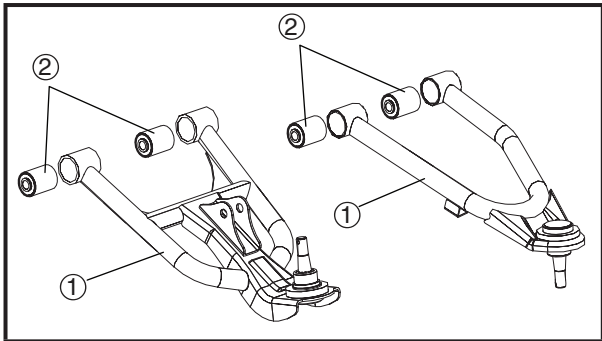
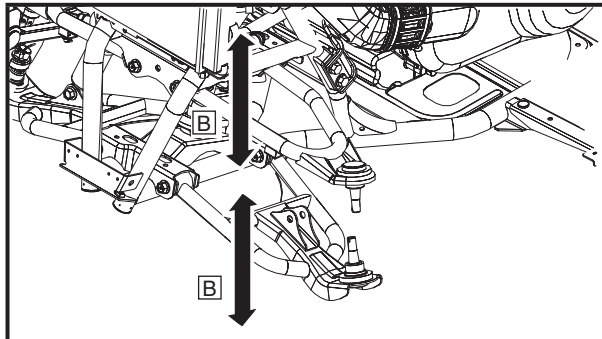
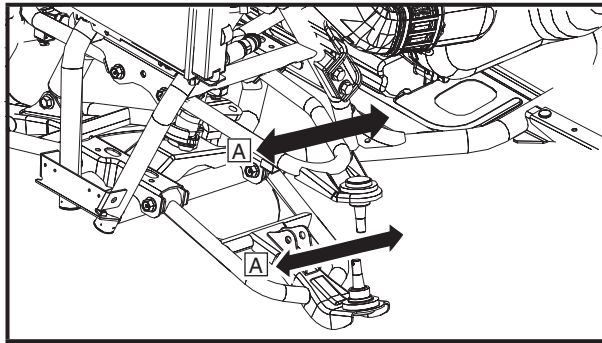


2. Adjust:
 - toe-in
Refer to “ADJUSTING THE TOE-IN” in chapter 3.

FRONT ARMS AND FRONT SHOCK ABSORBER ASSEMBLIES



Order	Job/Part	Q'ty	Remarks
	Removing the tie-rods and steering knuckles		Remove the parts in the order listed.
	Front brakes		The following procedure applies to both of the tie-rods and steering knuckles. Refer to "FRONT BRAKES".
1	Brake disc guard	1	Disconnect. Refer to "REMOVING THE FRONT ARMS" and "INSTALLING THE FRONT ARMS".
2	Tie-rod	1	
3	Lower front arm	1	
4	Upper front arm	1	
5	Front shock absorber	1	
6	Steering knuckle	1	
7	Bush	4	
			For installation, reverse the removal procedure.



REMOVING THE FRONT ARMS

1. Check:
 - front arm free play
 - a. Check the front arm side play **A** by moving it from side to side.
If side play is noticeable, check the bushings.
 - b. Check the front arm vertical movement **B** by moving it up and down.
If the vertical movement is tight or rough, or if there is binding, check the bushings.
2. Remove:
 - front arm

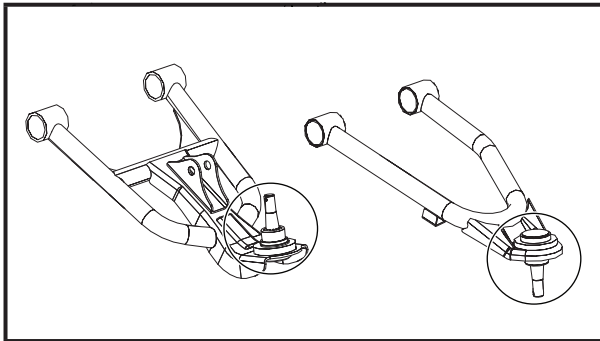
CHECKING THE FRONT ARMS

1. Check:
 - front arms **1**
Bends/damage → Replace.
2. Check:
 - bushes **2**
Wear/damage → Replace.

CHECKING THE FRONT SHOCK ABSORBERS

The following procedure applies to both of the front shock absorber assemblies.

1. Check:
 - shock absorber
Oil leaks → Replace the front shock absorber assembly.
 - shock absorber rod
Bends/damage → Replace the front shock absorber assembly.
 - spring
Fatigue → Replace the front shock absorber assembly.
Move the spring up and down.

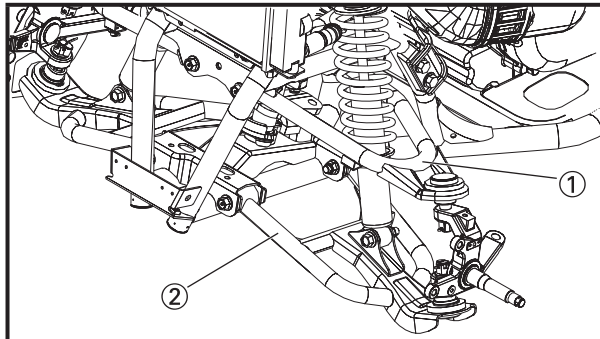


EBS00472

CHECKING THE BALL JOINTS

The following procedure applies to both of the front arm ball joints.

1. Check:
 - ball joint
Damage/pitting → Replace the front arm.
Free play → Replace the front arm.
Turns roughly → Replace the front arm.



EBS00473

INSTALLING THE FRONT ARMS

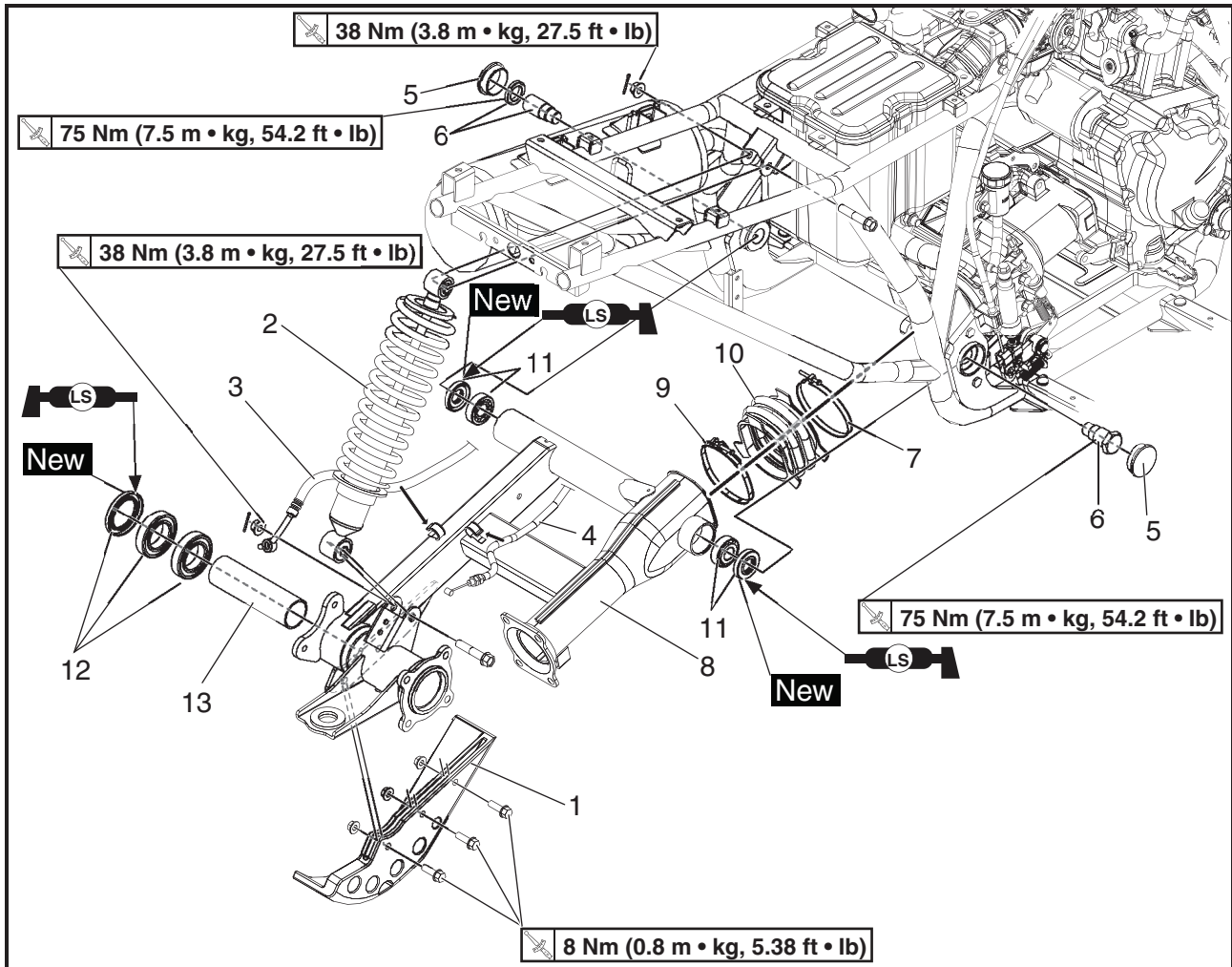
The following procedure applies to both of the front arms.

1. Install:
 - upper front arm ①
 - lower front arm ②

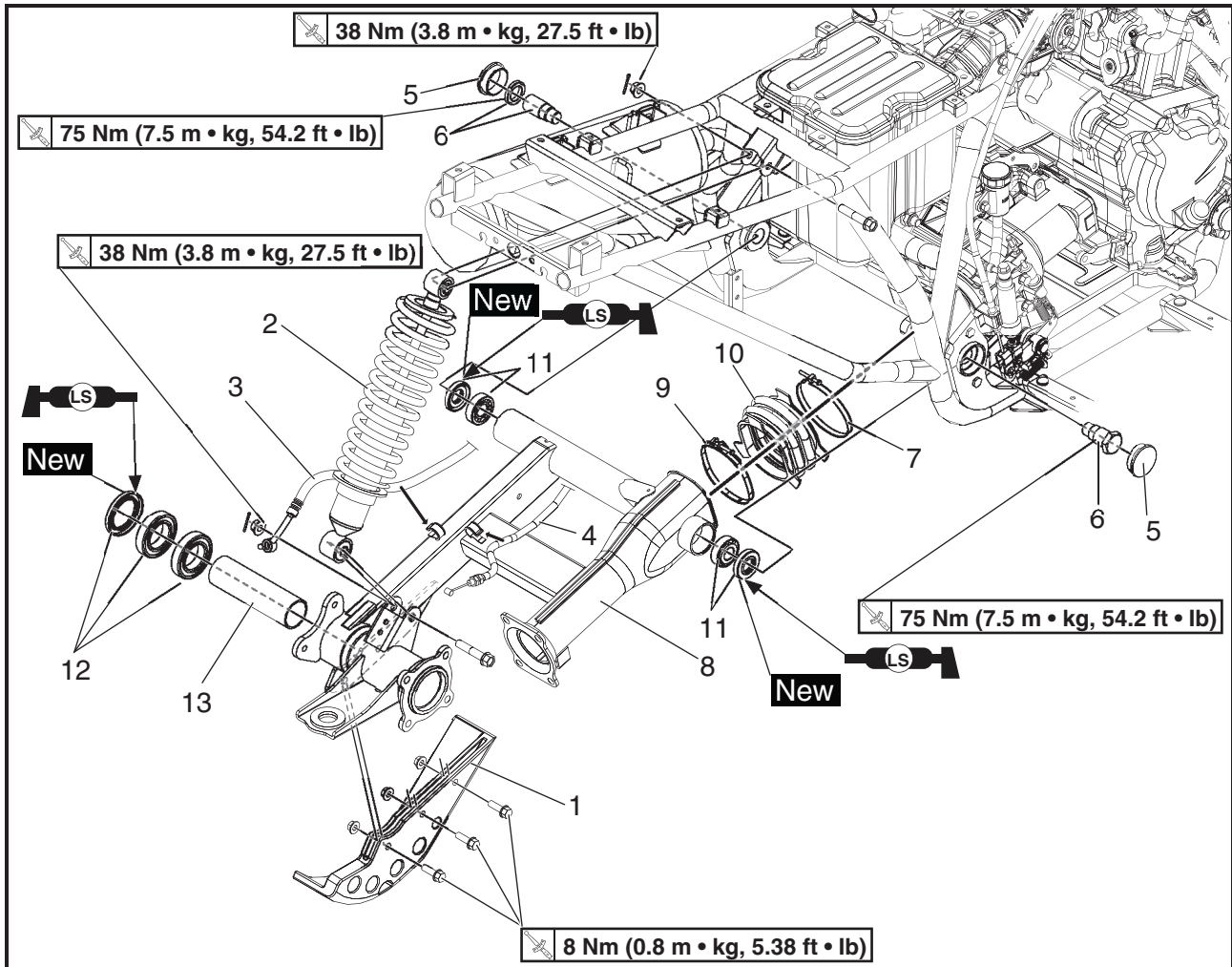
Front arm (upper, lower) 35 Nm (3.5 m•kg, 25.3 ft•lb)



REAR SHOCK ABSORBER AND SWINGARM



Order	Job/Part	Q'ty	Remarks
	Removing the rear shock absorber and swingarm		Remove the parts in the order listed.
1	Brake disc protect	1	
2	Rear shock absorber	1	
3	Rear brake hose	1	
4	Parking brake cable	1	
5	Plug	2	
6	Swing ram bolt(R)/swing ram bolt(L)/nut	1/1/1	
7	Metal clamp A	1	
8	Swingarm	1	
9	Metal clamp B	1	
10	Rubber boot	1	



Order	Job/Part	Q'ty	Remarks
11	Bearing A/oil seal A	2/2	For installation, reverse the removal procedure.
12	Bearing B/oil seal B	2/1	
13	Bearing spacer	1	

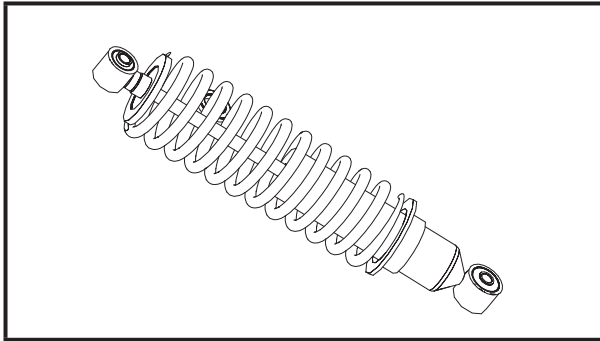


REMOVING THE REAR SHOCK ABSORBER

1. Remove:
 - rear shock absorber lower bolt
 - rear shock absorber upper bolt

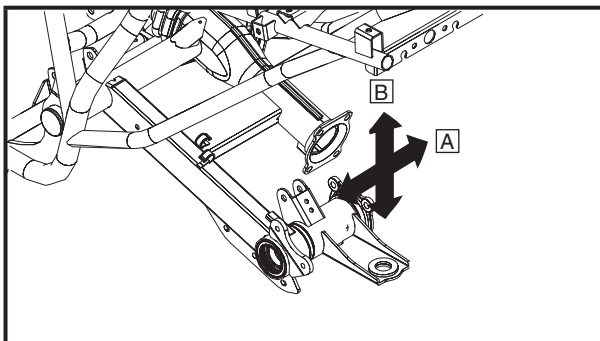
TIP

While removing the rear shock absorber lower bolt, hold the swingarm so that it does not drop down.



CHECKING THE REAR SHOCK ABSORBER

1. Check:
 - shock absorber
 - Oil leaks → Replace the rear shock absorber assembly.
 - shock absorber rod
 - Bends/damage → Replace the rear shock absorber assembly.
 - spring
 - Fatigue → Replace the rear shock absorber assembly.
 - Move the spring up and down.



REMOVING THE SWINGARM

1. Check:
 - swingarm free play
- a. Check the tightening torque of the pivot shaft bolt (R) and nut (L).

75 Nm (7.5 m · kg, 54.2 ft · lb)

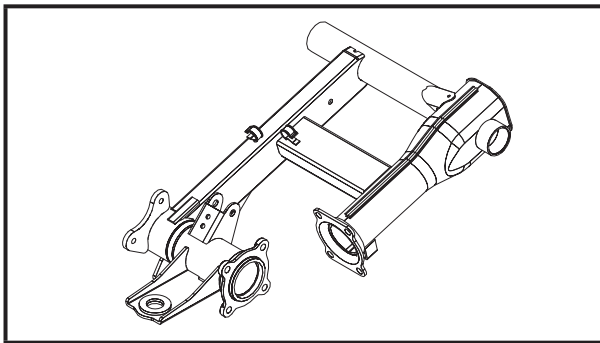
	<p>Swingarm free play limit (at the end of the swingarm) 1.0 mm (0.04 in)</p>
--	----------------------------------------------------------------------------------------------

- b. Check the swingarm side play **A** by moving it from side to side.
If side play is noticeable, check the spacer, bearings and frame pivot.



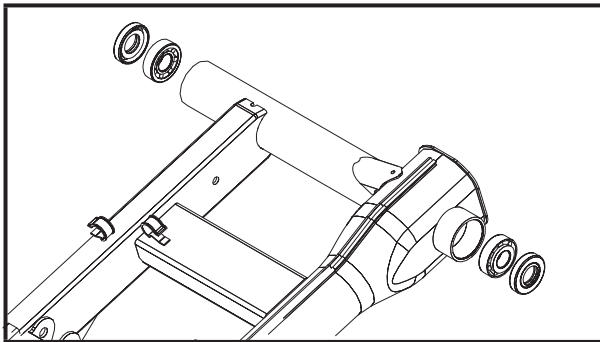
- c. Check the swingarm vertical movement by moving it up and down.
If vertical movement is tight or rough, or if there is binding, check the spacer, bearings and frame pivot.

2. Remove:
- plug
 - swing arm nut
 - swing ram left bolt
 - swing ram right bolt
 - swingarm

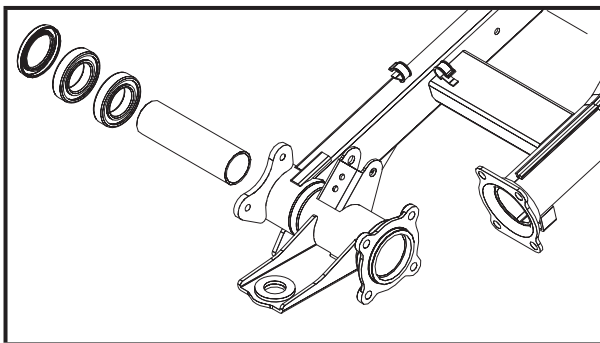


CHECKING THE SWINGARM

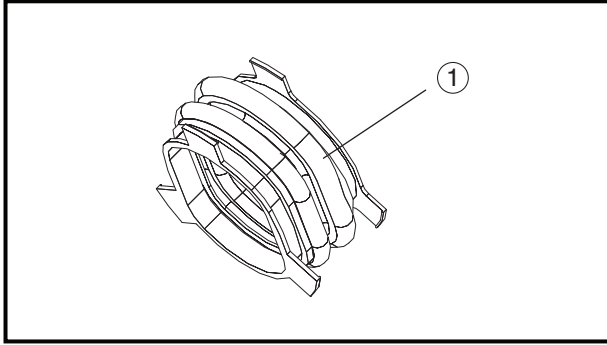
1. Check:
- swingarm
Bends/cracks/damage → Replace.



2. Check:
- oil seals
 - bearings
swingarm play/ swingarm turns roughly → Replace.

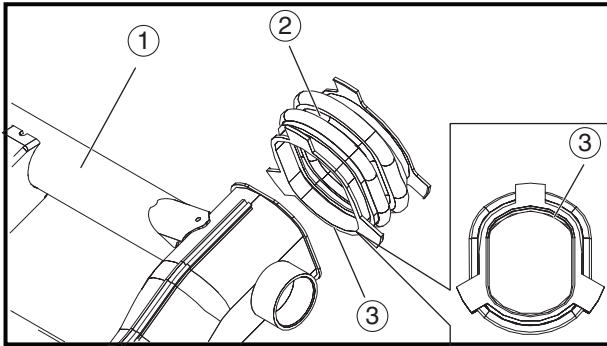


3. Check:
- oil seal
 - bearings
Wheel hub play/ wheel turns roughly → Replace.



CHECKING THE RUBBER BOOT

1. Check:
 - Rubber boot ①
 - Damage → Replace.

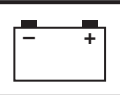


INSTALLING THE RUBBER BOOT

1. Apply:
 - Adhesive (for rubber)
 - (to the swingarm ①)
2. Install:
 - Rubber boot ②

TIP

Be sure to position the rubber boot so that the ellipsoid ③ towards the swingarm.

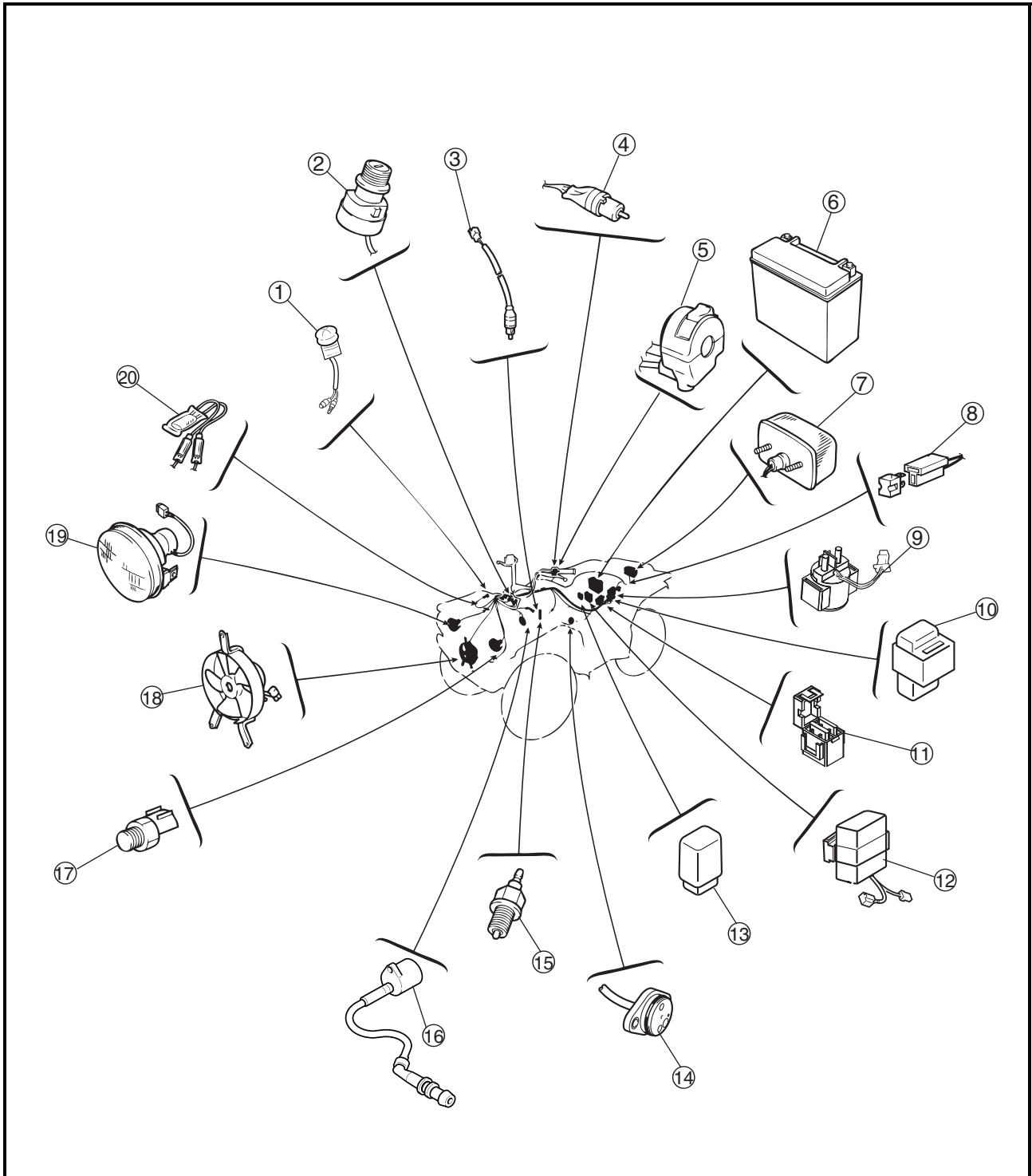


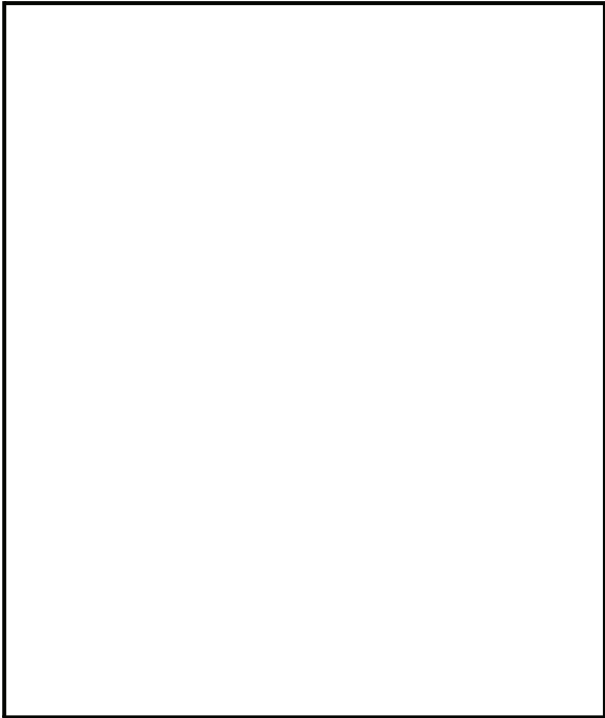
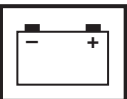
EBS00500

ELECTRICAL

ELECTRICAL COMPONENTS

- | | | | |
|---------------------------|---------------------------|------------------------|-------------------------|
| ① Indicator light | ⑦ Indicator light | ⑬ Headlight relay | ⑰ Headlight |
| ② Main switch | ⑧ Diode | ⑭ Gear position switch | ⑱ Circuit breaker (fan) |
| ③ Rear brake switch | ⑨ Starter relay | ⑮ Thermo unit | |
| ④ Front brake switch | ⑩ C.D.I. unit | ⑯ Ignition coil | |
| ⑤ Handlebar switch (left) | ⑪ Fuse box | ⑰ Thermo switch | |
| ⑥ Battery | ⑫ Shift gear control unit | ⑱ Fan motor | |





EBS01028

CHECKING SWITCH CONTINUITY

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

NOTICE

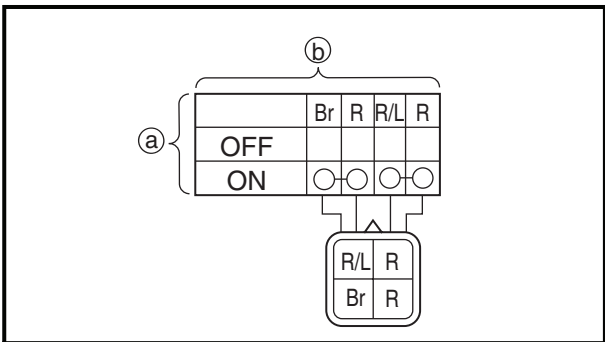
Never insert the tester probes into the coupler terminal slots ① . Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.



**Pocket tester
P/N. YU-03112-C, 90890-03112**

TIP

- Before checking for continuity, set the pocket tester to “0” and to the “Ω x 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.

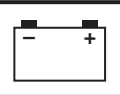
The switch positions ① are shown in the far left column and the switch lead colors ② are shown in the top row in the switch illustration.

TIP

“○—○” 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 brown and red/blue and red when the switch is set to “ON”.



EBS01029

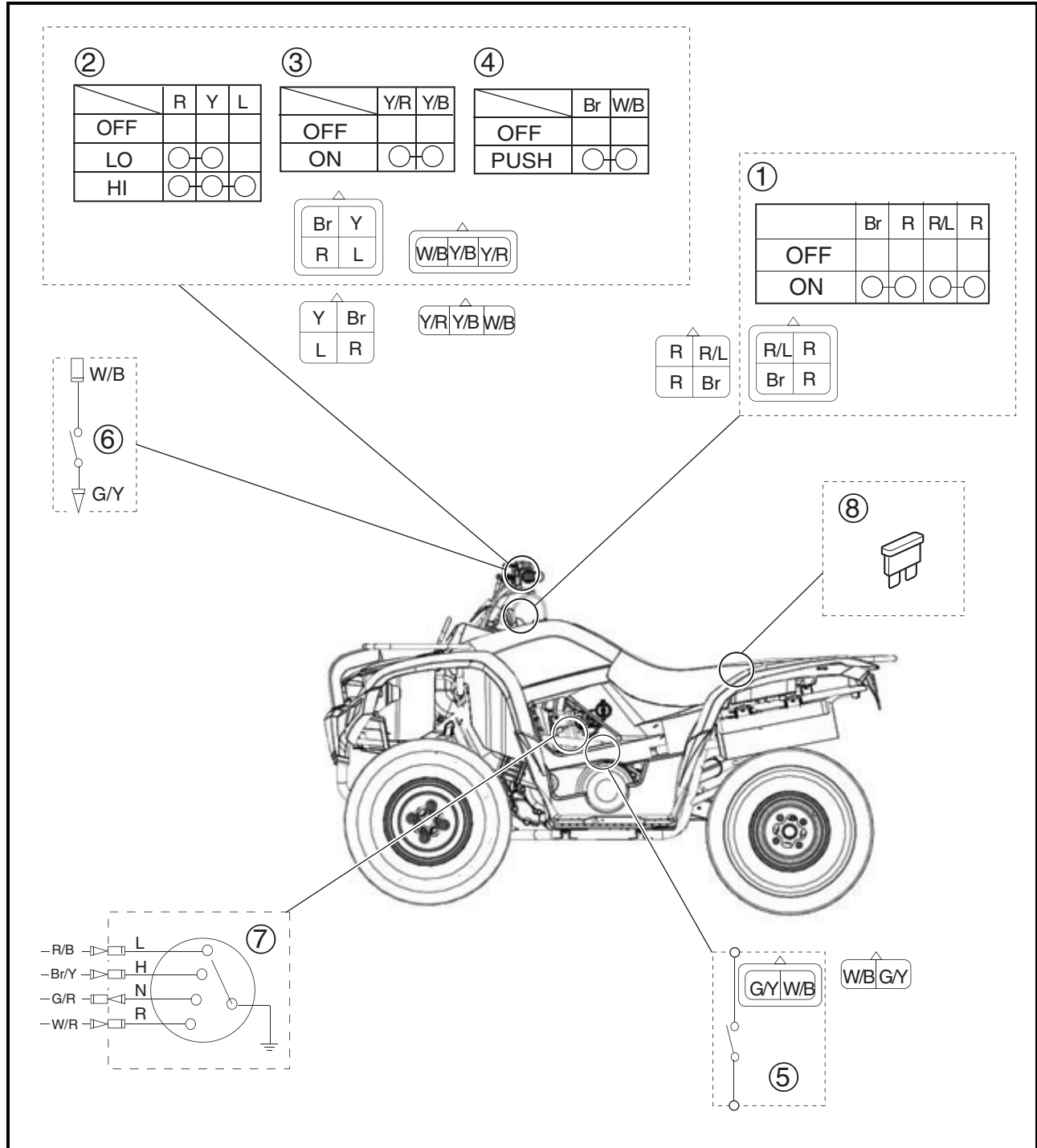
CHECKING THE SWITCHES

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

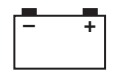
Damage/wear → Repair or replace.

Improperly connected → Properly connect.

Incorrect continuity reading → Replace the switch.



- ① Main switch
- ② Dimmer switch
- ③ Start switch
- ④ Engine stop switch
- ⑤ Rear brake light switch
- ⑥ Front brake light switch
- ⑦ Gear position switch
- ⑧ Fuse



EBS01030

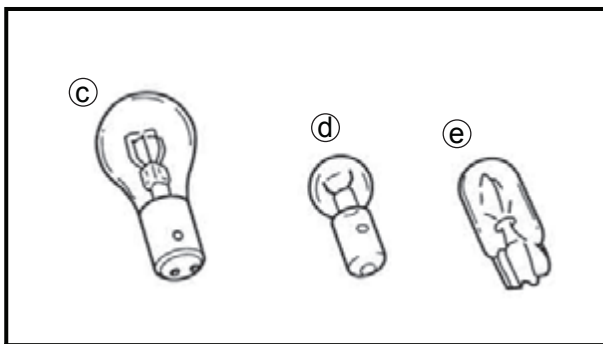
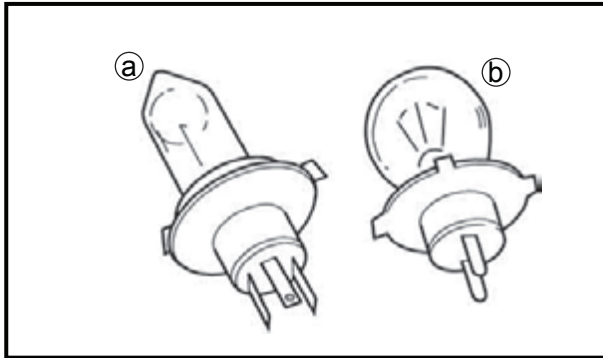
CHECKING THE BULBS AND BULB SOCKETS

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

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

Improperly connected → Properly connect.

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



TYPES OF BULBS

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

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

CHECKING THE CONDITION OF THE BULBS

The following procedure applies to all of the bulbs.

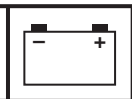
1. Remove:
 - bulb

⚠ WARNING

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

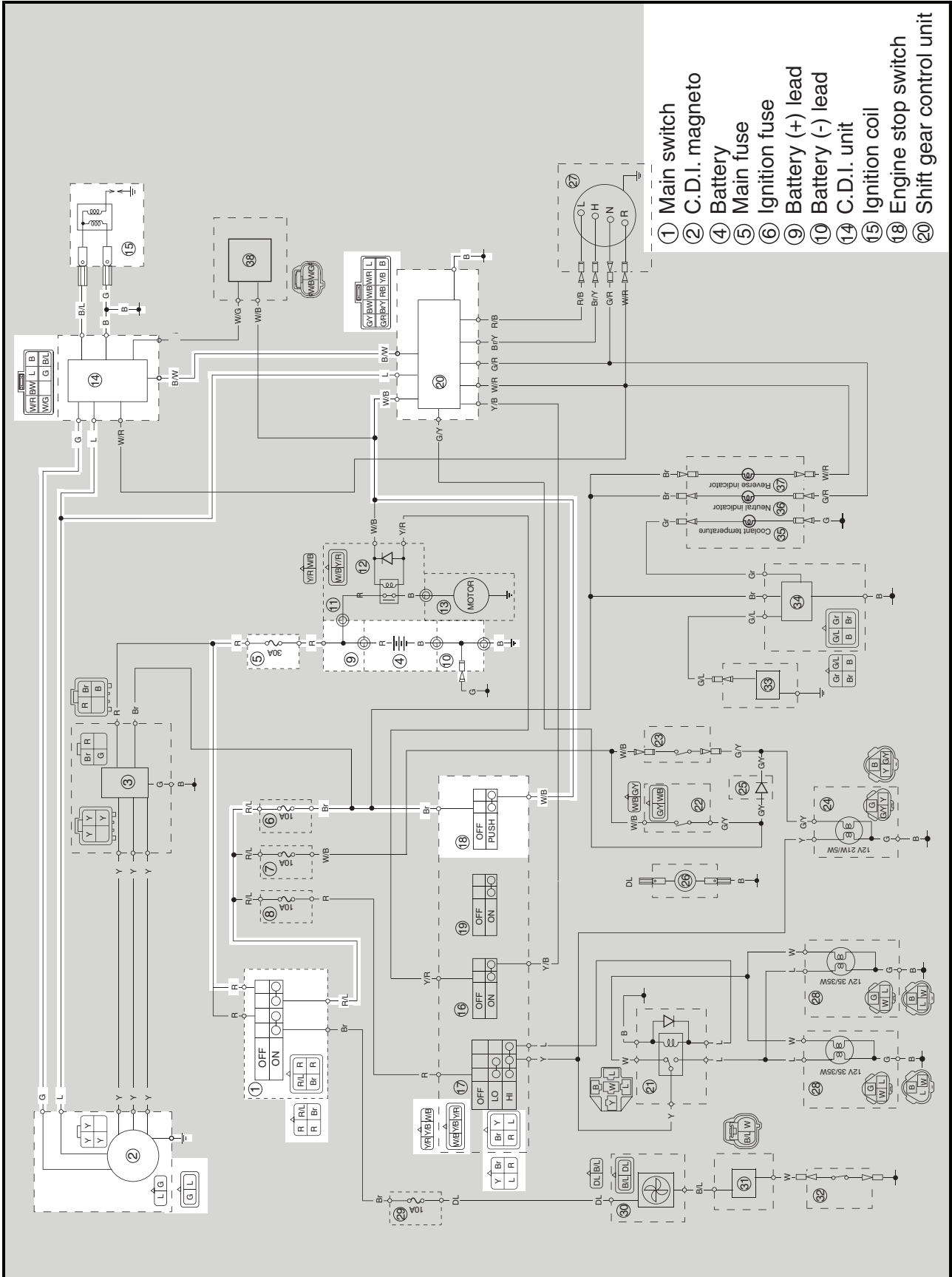
NOTICE

- Be sure to hold the socket firmly when removing the bulb. Never pull the lead, otherwise it may be pulled out of the terminal in the coupler.
- Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb, and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.



EBS00503

**IGNITION SYSTEM
CIRCUIT DIAGRAM**



- ① Main switch
- ② C.D.I. magneto
- ④ Battery
- ⑤ Main fuse
- ⑥ Ignition fuse
- ⑨ Battery (+) lead
- ⑩ Battery (-) lead
- ⑭ C.D.I. unit
- ⑮ Ignition coil
- ⑰ Engine stop switch
- ⑳ Shift gear control unit



EBS01045

TROUBLESHOOTING

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

Check:

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

TIP

- Before troubleshooting, remove the following part(s):
 1. seat
 2. front fender
 3. fuel tank
- Troubleshoot with the following special tool(s).



Dynamic spark tester
P/N. YM-34487
Ignition checker
P/N. 90890-06754
Pocket tester
P/N. YU-03112-C, 90890-03112

EBS01032

1. Spark plug

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



Standard spark plug
CR8E (NGK)
Spark plug gap
0.7 ~ 0.8 mm (0.028 ~ 0.031 in)

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

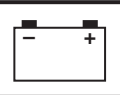


YES



NO

Re-gap or replace the spark plug.



EBS01034

EBS01036

2. Ignition spark gap

- Disconnect the spark plug cap from the spark plug.
- Connect the ignition dynamic spark tester
 - ① as shown.
 - ② Spark plug cap
 - ③ Spark plug
- Set the main switch to "ON" .
- Measure the ignition spark gap @ .
- Crank the engine by pushing the starter switch and gradually increase the spark gap until a misfire occurs.



 **Minimum ignition spark gap**
6 mm (0.24 in)

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

↓ NO

↓ YES

The ignition system is OK.

3. Spark plug cap resistance

- Remove the spark plug cap from the spark plug lead.
- Connect the pocket tester ("Ω × 1k" range) to the spark plug cap as shown.



- Measure the spark plug cap resistance.



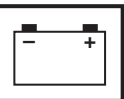
Spark plug cap resistance
5 kΩ at 20 °C (68 °F)

- Is the spark plug cap OK?

↓ YES

↓ NO

Replace the spark plug cap.

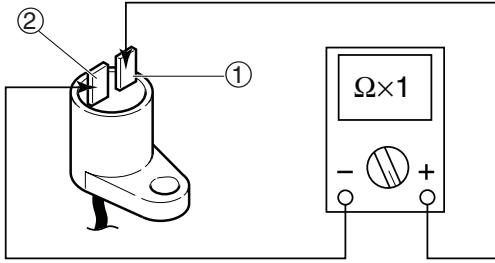


EBS01038

4. Ignition coil resistance

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

Positive tester probe → black terminal ①
 Negative tester probe → green terminal ②



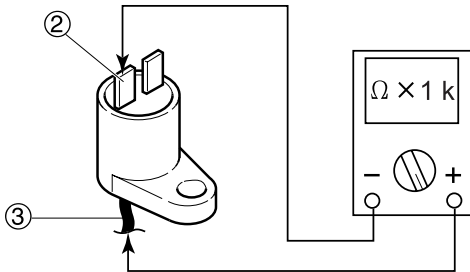
- Measure the primary coil resistance.



Primary coil resistance
 0.19 ~ 0.23 Ω at 20 °C (68 °F)

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

Positive tester probe → spark plug lead ③
 Negative tester probe → green terminal ②



- Measure the secondary coil resistance.



Secondary coil resistance
 2.79 ~ 3.41 k Ω at 20 °C (68 °F)

- Is the ignition coil OK?

↓ YES

↓ NO

Replace the ignition coil.

EBS01041

5. Main switch

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

↓ YES

↓ NO

Replace the main switch.

EBS01042

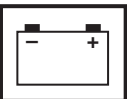
6. Engine stop switches

- Check the engine stop switches for continuity. Refer to "CHECKING THE SWITCHES".
- Are the engine stop switches OK?

↓ YES

↓ NO

Replace the handlebar switch or engine stop switch (frame).



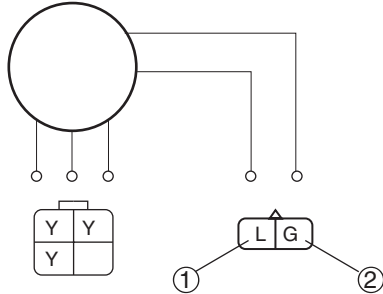
EBS01040

7. Pickup coil resistance

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

Positive tester probe → blue terminal ①

Negative tester probe → green terminal ②



- Measure the pickup coil resistance.



Pickup coil resistance

96 ~ 144 Ω at 20 °C (68 °F)
(between white/red and white/blue)

- Is the pickup coil OK?



Replace the pickup coil/stator assembly.

EBS01047

8. Wiring

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



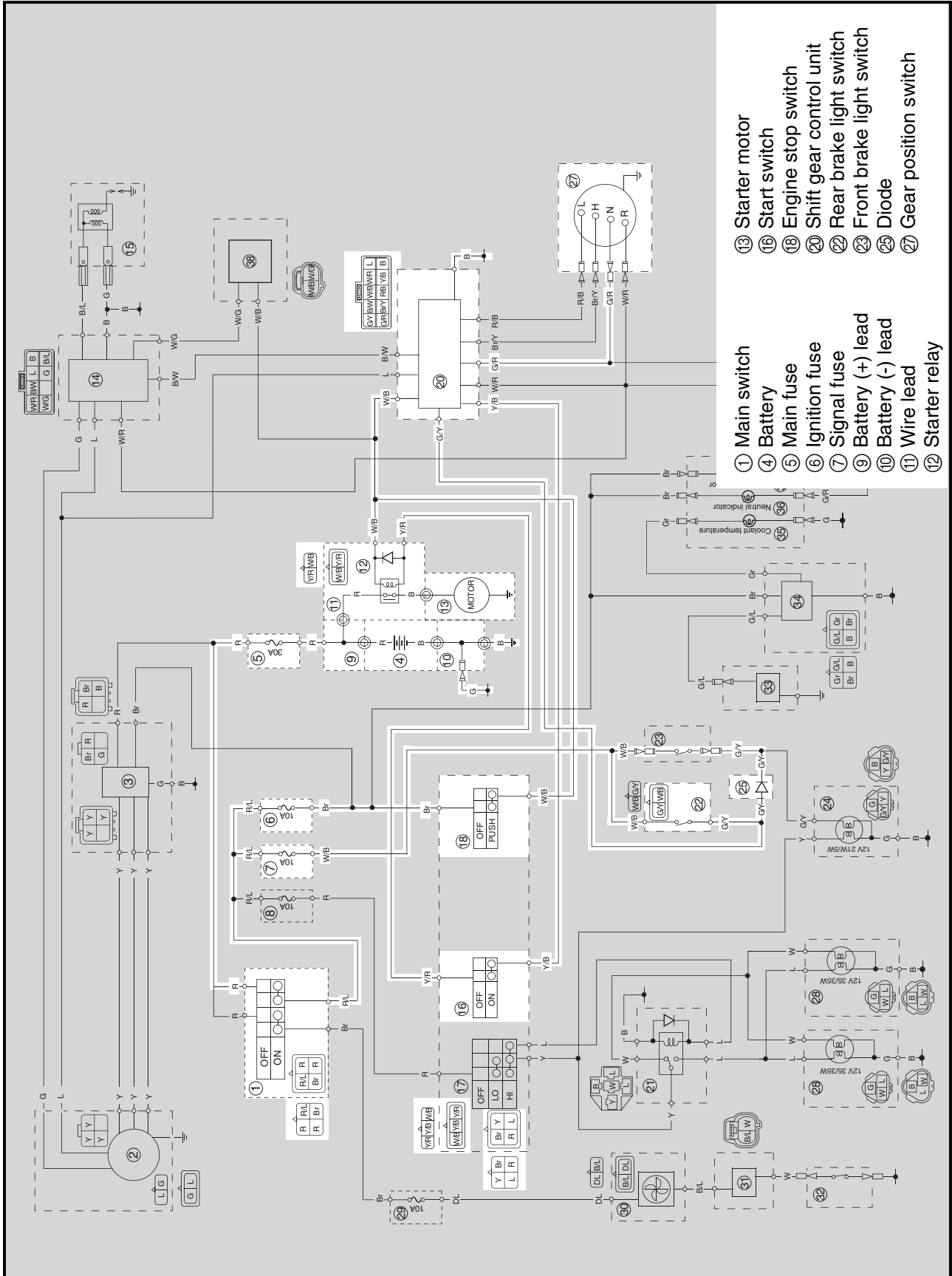
Replace the C.D.I. unit.

Properly connect or repair the ignition system's wiring.

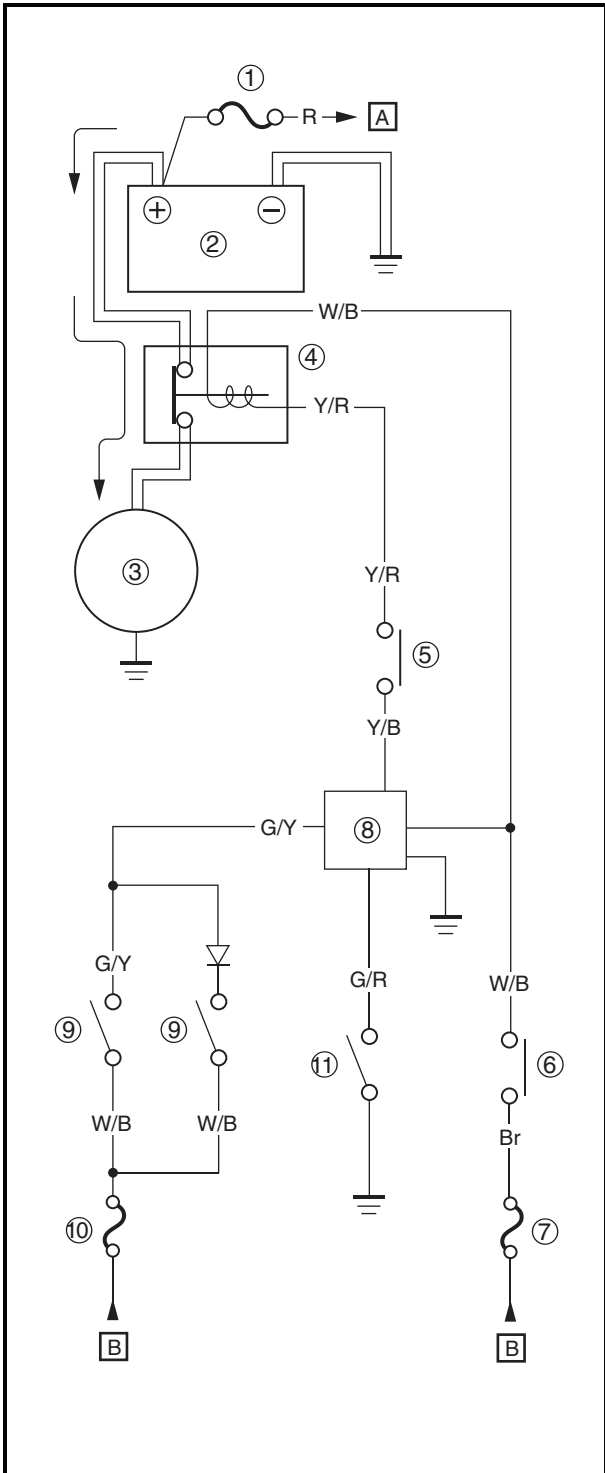
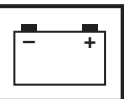


EBS00506

**ELECTRIC STARTING SYSTEM
CIRCUIT DIAGRAM**



- ① Main switch
- ④ Battery
- ⑤ Main fuse
- ⑥ Ignition fuse
- ⑦ Signal fuse
- ⑨ Battery (+) lead
- ⑩ Battery (-) lead
- ⑪ Wire lead
- ⑫ Starter relay
- ⑬ Starter motor
- ⑮ Start switch
- ⑰ Engine stop switch
- ⑲ Shift gear control unit
- ⑳ Rear brake light switch
- ㉑ Front brake light switch
- ㉒ Diode
- ㉔ Gear position switch



EBS00507

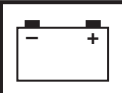
STARTING CIRCUIT OPERATION

The starting circuit on this model consists of the starter motor, starter relay, engine stop switch, rear brake switch, Shift gear control unit, neutral switch. If the main switch is on and the engine stop switch is in the RUN position, the starter motor can be operated only if:

- The transmission is in neutral (the neutral switch is closed).
- You pull in the rear brake lever (the rear brake switch is ON).

- ① Main fuse
- ② Battery
- ③ Starter motor
- ④ Starter relay
- ⑤ Start switch
- ⑥ Engine stop switch
- ⑦ Ignition fuse
- ⑧ Shift gear control unit
- ⑨ Rear brake switch
- ⑩ Signal fuse
- ⑪ Neutral switch

- ⓐ TO MAIN SWITCH
- ⓑ FROM MAIN SWITCH



EBS01050

TROUBLESHOOTING

The starter motor fails to turn.

Check:

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

TIP

- Before troubleshooting, remove the following part(s):
 1. seat
 2. front fender panel
 3. fuel tank cover
 4. side cover
- Troubleshoot with the following special tool(s).

	<p>Pocket tester P/N. YU-03112-C, 90890-03112</p>
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EBS01043

<p>1. Main fuse</p> <ul style="list-style-type: none"> • Check the main fuse for continuity. Refer to “CHECKING THE SWITCHES”. • Is the mainfuse OK?



Replace the fuse.

EBS01044

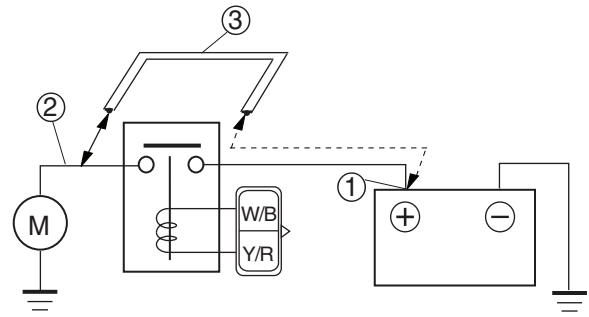
<p>2. Battery</p> <ul style="list-style-type: none"> • Check the condition of the battery. Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3. 		
<table border="1"> <tr> <td style="text-align: center;"></td> <td> <p>Minimum open-circuit voltage 12.0 V or more at 20°C (68°F)</p> </td> </tr> </table>		<p>Minimum open-circuit voltage 12.0 V or more at 20°C (68°F)</p>
	<p>Minimum open-circuit voltage 12.0 V or more at 20°C (68°F)</p>	
<ul style="list-style-type: none"> • Is the battery OK? 		



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

EBS01051

<p>3. Starter motor</p> <ul style="list-style-type: none"> • Connect the positive battery terminal ① and starter motor lead ② with a jumper lead ③.

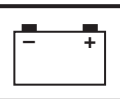


<p>WARNING</p> <ul style="list-style-type: none"> • A wire that is used as a jumper lead must have at least the same capacity or more as that of the battery lead, otherwise the jumper lead may burn. • This check is likely to produce sparks, therefore make sure nothing flammable is in the vicinity.

<ul style="list-style-type: none"> • Does the starter motor turn?



Repair or replace the starter motor.



EBS01054

4. Starter relay

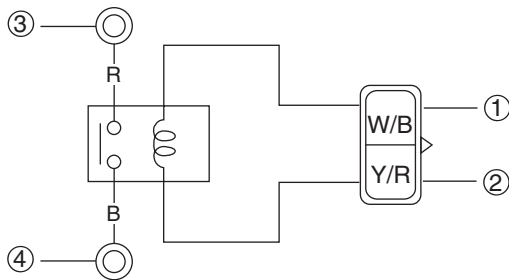
- Disconnect the starter relay coupler from the coupler.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the starter relay coupler as shown.

Positive battery terminal → white/black ①

Negative battery terminal → yellow/red ②

Positive tester probe → red ③

Negative tester probe → red ④



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

↓ YES

↓ NO

Replace the starter relay.

EBS01041

5. Main switch

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

↓ YES

↓ NO

Replace the main switch.

EBS01046

6. Rear brake switch

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

↓ YES

↓ NO

Replace the rear brake switch.

EBS01057

7. Start switch

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

↓ YES

↓ NO

Replace the handle-bar switch.

EBS01042

8. Engine stop switch

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

↓ YES

↓ NO

Replace the handle-bar switch.

EBS01059

9. Wiring

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

↓ YES

↓ NO

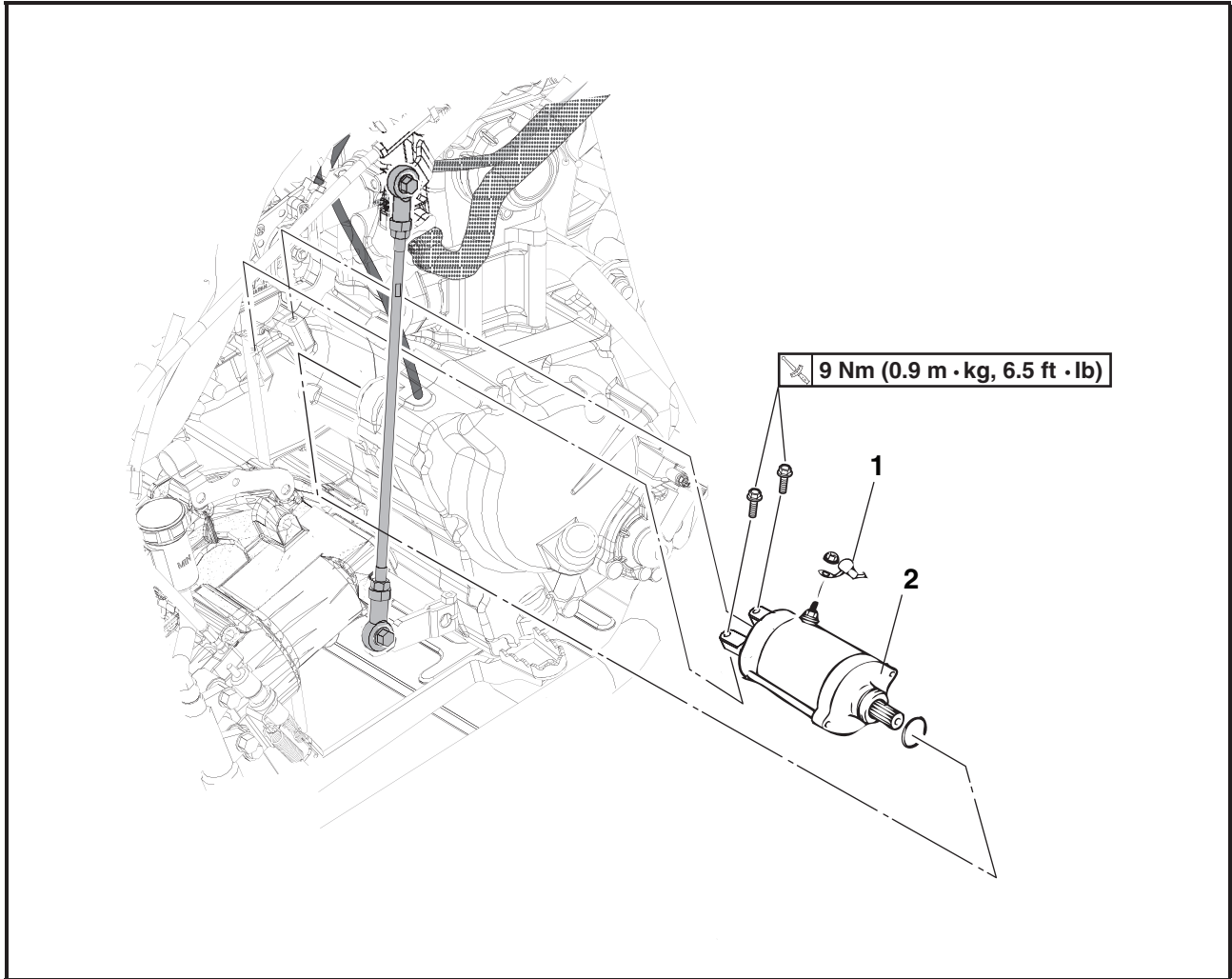
The starting system circuit is OK.

Properly connect or repair the starting system's wiring.

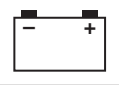


EBS01061

STARTER MOTOR

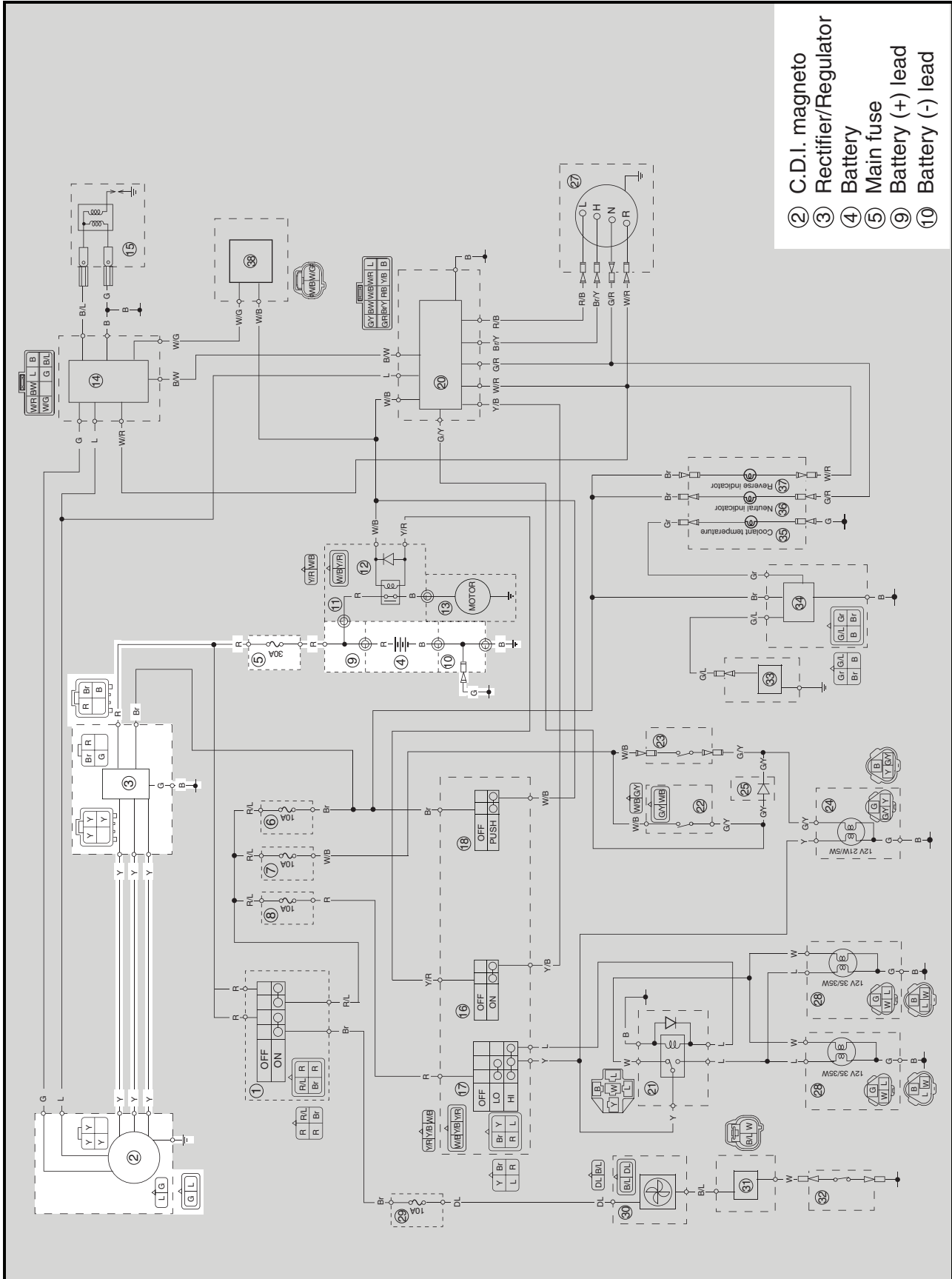


Order	Job/Part	Q'ty	Remarks
	Removing the starter motor		
	Exhaust pipe		Remove the parts in the order listed. Refer to "ENGINE REMOVAL" in chapter 4.
1	Starter motor lead	1	
2	Starter motor	1	
			For installation, reverse the removal procedure.

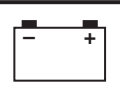


EBS00516

**CHARGING SYSTEM
CIRCUIT DIAGRAM**



- ② C.D.I. magneto
- ③ Rectifier/Regulator
- ④ Battery
- ⑤ Main fuse
- ⑥ Battery (+) lead
- ⑦ Battery (-) lead



EBS01065

TROUBLESHOOTING

The battery is not being charged.

Check:

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

TIP

- Before troubleshooting, remove the following part(s):
 1. seat
 2. front fender
- Troubleshoot with the following special tool(s).

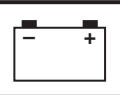
	<p>Inductive tachometer P/N. YU-8036-A</p> <p>Engine tachometer P/N. 90890-03113</p> <p>Pocket tester P/N. YU-03112-C, 90890-03112</p>
--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------

EBS01043

<p>1. Main fuse</p> <ul style="list-style-type: none"> • Check the main fuse for continuity. Refer to “CHECKING THE FUSE” in chapter 3. • Is the main fuse OK?
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> YES </div> <div style="text-align: center;"> NO </div> </div>
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> Replace the fuse. </div>

EBS01044

<p>2. Battery</p> <ul style="list-style-type: none"> • Check the condition of the battery. Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3. 		
<table border="1"> <tr> <td style="text-align: center;"> </td> <td> <p>Minimum open-circuit voltage 12.0 V or more at 20°C (68°F)</p> </td> </tr> </table>		<p>Minimum open-circuit voltage 12.0 V or more at 20°C (68°F)</p>
	<p>Minimum open-circuit voltage 12.0 V or more at 20°C (68°F)</p>	
<ul style="list-style-type: none"> • Is the battery OK? 		
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> YES </div> <div style="text-align: center;"> NO </div> </div>		
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> <ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery. </div>		

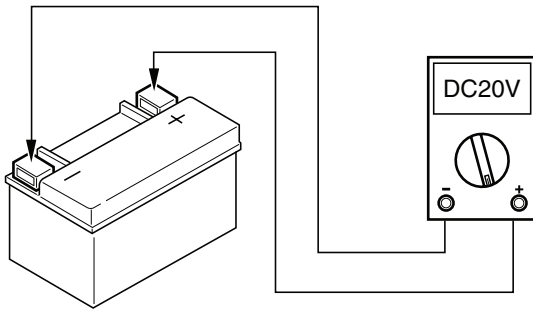


EBS01066

3. Charging voltage

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

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



- Start the engine and let it run at approximately 5,000 r/min.
- Measure the charging voltage.



Charging voltage
 14 V at 5,000 r/min

TIP
 Make sure the battery is fully charged.

- Is the charging voltage within specification?

NO

YES

The charging circuit is OK.

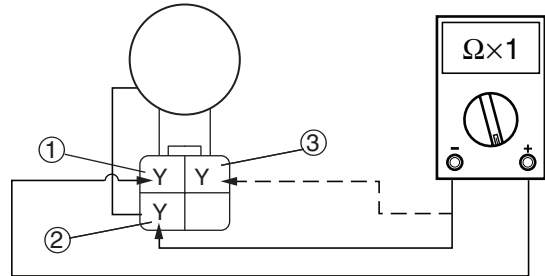
EBS01100

4. Charging coil resistance

- Disconnect the C.D.I. magneto coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the charging coils.

Positive tester probe → yellow terminal ①
 Negative tester probe → yellow terminal ②

Positive tester probe → yellow terminal ①
 Negative tester probe → yellow terminal ③



- Measure the charging coil resistance.



Charging coil resistance
 0.20 ~ 0.40 Ω at 20 °C (68 °F)
 (between yellow and yellow)

YES

NO

Replace the rectifier/regulator.

Replace the pickup coil/stator assembly.

5. Wiring

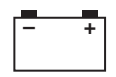
- Check the entire charging system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the charging system's wiring properly connected and without defects?

YES

NO

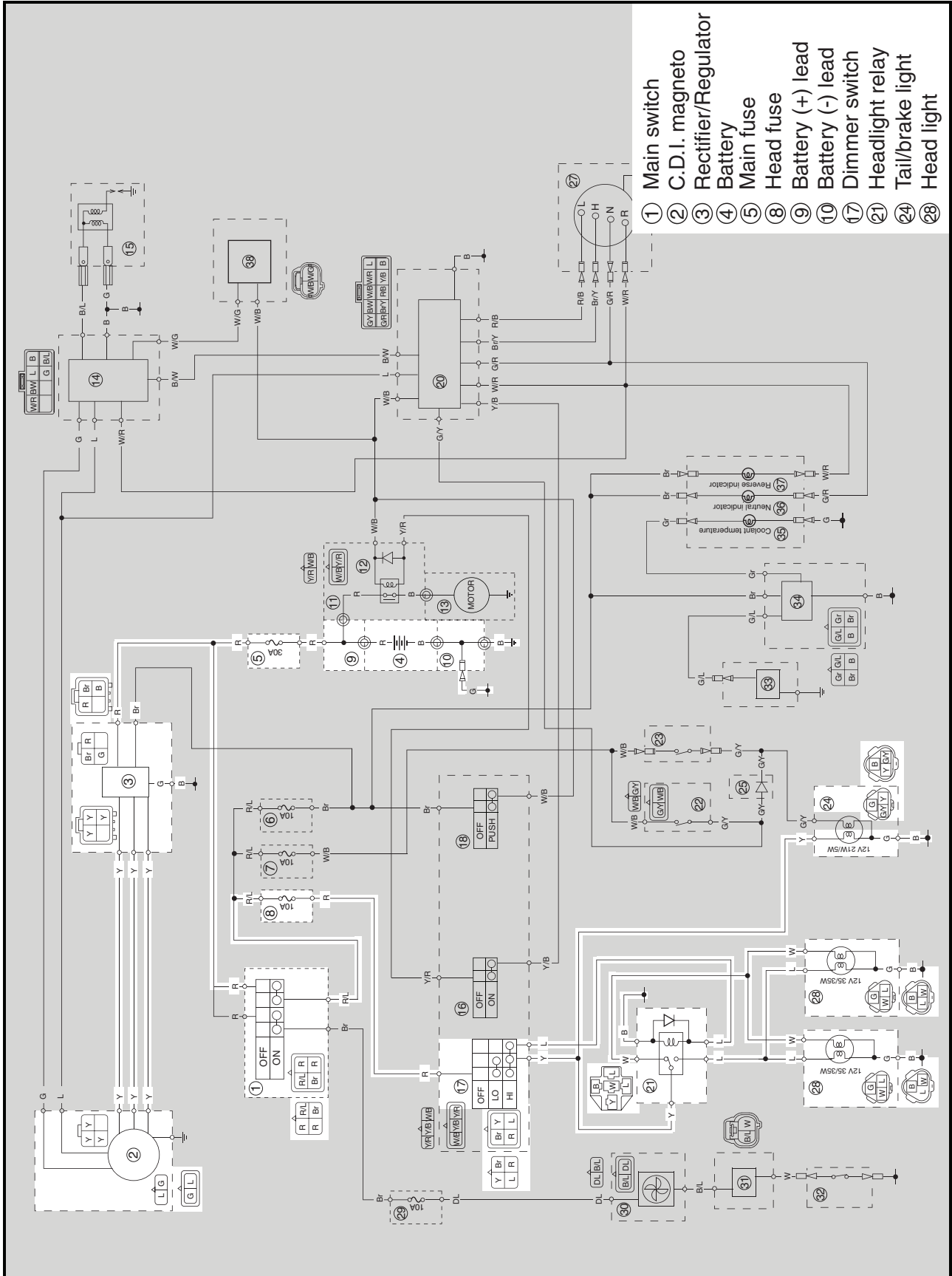
Replace the rectifier/regulator.

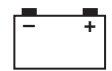
Replace the diode and properly connect or repair the charging system's wiring.



EBS00518

LIGHTING SYSTEM
CIRCUIT DIAGRAM





EBS01067

TROUBLESHOOTING

Any of the following fail to light: headlight, tail/brake light.

Check:

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

TIP

- Before troubleshooting, remove the following part(s):
 1. seat
 2. front fender
- Troubleshoot with the following special tool(s).



Pocket tester
P/N. YU-03112-C, 90890-03112

EAS00783

1. Light switch

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

↓ YES

↓ NO

Replace the handle-bar switch.

EBS01100

2. Charging coil resistance

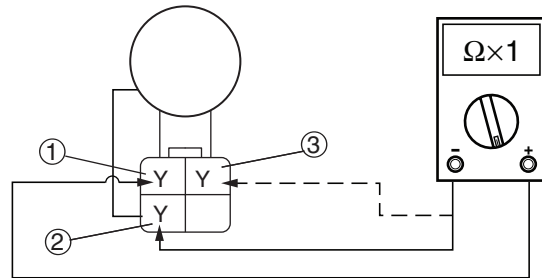
- Disconnect the C.D.I. magneto coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the charging coils.

Positive tester probe → yellow terminal ①

Negative tester probe → yellow terminal ②

Positive tester probe → yellow terminal ①

Negative tester probe → yellow terminal ③



- Measure the charging coil resistance.



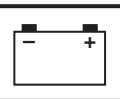
Charging coil resistance
0.20 ~ 0.40 Ω at 20 °C (68 °F)
(between yellow and yellow)

↓ YES

↓ NO

Replace the rectifier/regulator.

Replace the pickup coil/stator assembly.



EBS01069

3. Wiring

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



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

Properly connect or repair the lighting system's wiring.

EBS01070

CHECKING THE LIGHTING SYSTEM

1. The headlights fail to come on.

1. Headlight bulb and socket

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



Replace the headlight bulb, socket or both.

2. Voltage

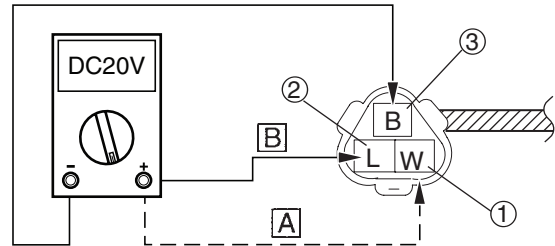
- Connect the pocket tester (AC 20 V) to the headlight couplers as shown.

- [A] When the light switch is set to "LO"
- [B] When the light switch is set to "HI"

Headlight coupler (wire harness side)

Headlight

- Positive tester probe → white ① or yellow ②
- Negative tester probe → black ③

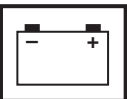


- Set the main switch to "ON".
- Start the engine.
- Set the light switch to "LO" or "HI".
- Measure the voltage (AC 12 V) of white ① or yellow ② on the headlight coupler (wire harness side).
- Is the voltage within specification?



This circuit is OK.

Replace the rectifier/regulator.



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

1. Tail/brake light bulb and bulb socket

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



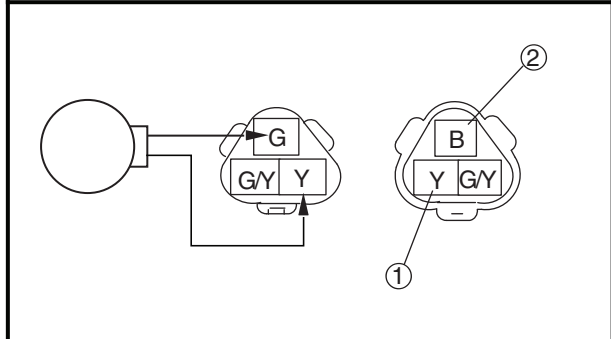
Replace the tail/brake light bulb, socket or both.

2. Voltage

- Connect the pocket tester (AC 20 V) to the tail/brake light coupler as shown.

Tail/brake light coupler (wire harness side)

Tail/brake light
Positive tester probe → **yellow** ①
Negative tester probe → **black** ②



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



This circuit is OK.

Replace the rectifier/regulator.



EB806010

TROUBLESHOOTING

Any of the following fail to light: indicator light, brake light.

Check:

1. Fuse (main, ignition, signal)
2. Battery
3. Main switch
4. wiring connections
(of the entire charging system)

TIP

- Before troubleshooting, remove the following part(s):
 1. seat
 2. fuse box
 3. front fender
- Troubleshoot with the following special tool(s).



Pocket tester
P/N. YU-03112-C, 90890-03112

EAS00783

1. Fuse (main, ignition, signal)

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

↓ YES

↓ NO

Replace the fuse.

EBS01044

2. Battery

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



**Minimum open-circuit voltage
12.0 V or more at 20°C (68°F)**

- Is the battery OK?

↓ YES

↓ NO

- Clean the battery terminals.
- Recharge or replace the battery.

EBS01041

3. Main switch

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

↓ YES

↓ NO

Replace the main switch.

EBS01074

4. Wiring

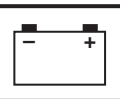
- Check the entire signal system’s wiring. Refer to “CIRCUIT DIAGRAM”.
- Is the signal system’s wiring properly connected and without defects?

↓ YES

↓ NO

Check the condition of each of the signaling system’s circuits. Refer to “CHECKING THE SIGNALING SYSTEM”.

Properly connect or repair the signaling system’s wiring.



EBS01075

CHECKING THE SIGNALING SYSTEM

EBS01076

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

1. Tail/brake light bulb and bulb socket

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

2. Brake light switches

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



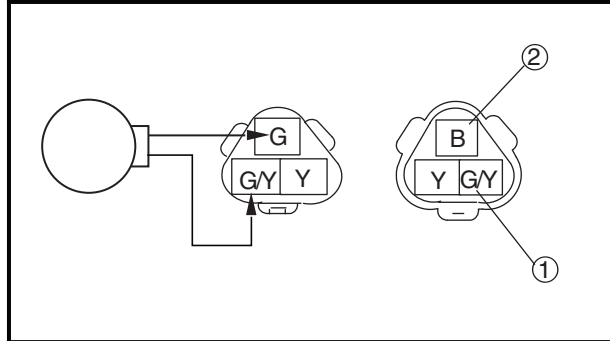
Replace the brake light switch.

3. Voltage

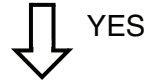
- Connect the pocket tester (AC 20 V) to the tail/brake light coupler as shown.

Tail/brake light coupler (wire harness side)

Tail/brake light
Positive tester probe → yellow ①
Negative tester probe → black ②



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



This circuit is OK.

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

EBS01077

2. The neutral indicator light fails to come on.

1. Neutral indicator light bulb and socket

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



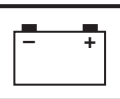
Replace the neutral indicator light bulb, socket or both.

2. Gear position switch

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



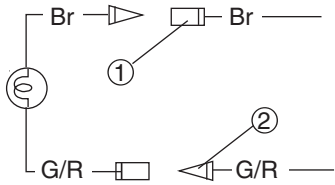
Replace the gear position switch.



3. Voltage

- Connect the pocket tester (AC 20 V) to the neutral light coupler as shown.

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



- Set the main switch to "ON".
- Measure the voltage (DC 12 V).
- Is the voltage within specification?

↓ YES

This circuit is OK.

↓ NO

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

3. The reverse indicator light fails to come on.

1. Reversel indicator light bulb and socket

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

↓ YES

Replace the reverse indicator light bulb, socket or both.

↓ NO

2. Gear position switch

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

↓ YES

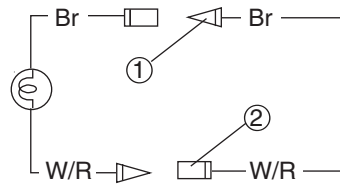
↓ NO

Replace the gear position switch.

3. Voltage

- Connect the pocket tester (AC 20 V) to the treverse light coupler as shown.

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



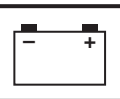
- Set the main switch to "ON".
- Set the gear position to " R ".
- Measure the voltage (DC 12 V).
- Is the voltage within specification?

↓ YES

This circuit is OK.

↓ NO

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



EBS01076

4. The coolant temperature warning light does not come on when the start switch is pushed on.

1. Coolant temperature warning light bulb and socket.

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



Replace the coolant temperature warning light controller.

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

5. The coolant temperature warning light does not come on when the temperature is high (more than 117~123 °C (242.6 ~ 253.4 °F)).

1. Coolant temperature warning light bulb and socket.

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



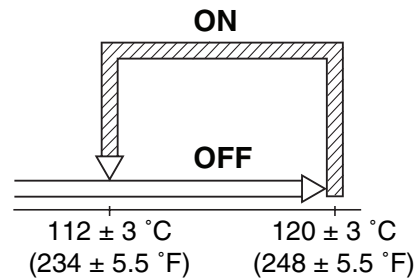
Replace the coolant temperature warning light bulb, socket or both.

2. Thermo unit

- Remove the thermo unit from the cylinder head.
- Connect the pocket tester ($\Omega \times 1$) to the thermo unit ①.
- Immerse the thermo unit in coolant ②.
- Place a thermometer ③ in the coolant.
- Slowly heat the coolant, then let it cool down to the specified temperature.
- Measure the thermo unit resistance the temperatures indicated below.

Test step	Water temperature	Resistance Ω
	Thermo unit	
1	50 °C (122 °F)	134~149
2	80 °C (176 °F)	47~57
3	100 °C (212 °F)	26~29
4	120 °C (248 °F)	14~17

Tests : Heating phase



WARNING

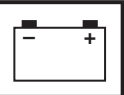
- Handle the thermo unit with special care.
- Never subject the thermo unit to strong shocks. If the thermo unit is dropped, replace it.

Thermo unit
11 Nm (1.1 m • kg, 8.0 ft • lb)

• Does the thermo unit operate properly as described above?



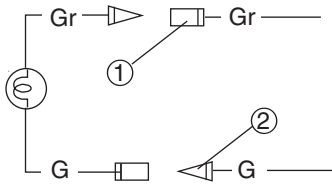
Replace the thermo unit.



3. Voltage

- Connect the pocket tester (AC 20 V) to the indicator light connector (wire harness side) as shown.

Positive tester probe → gray ①
Negative tester probe → green ②



- Set the main switch to “ON”.
- Measure the voltage (12 V) of gray ① and green ② at the indicator light coupler.
- Is the voltage within specification?

↓ YES

↓ NO

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

6. Start switch

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

↓ YES

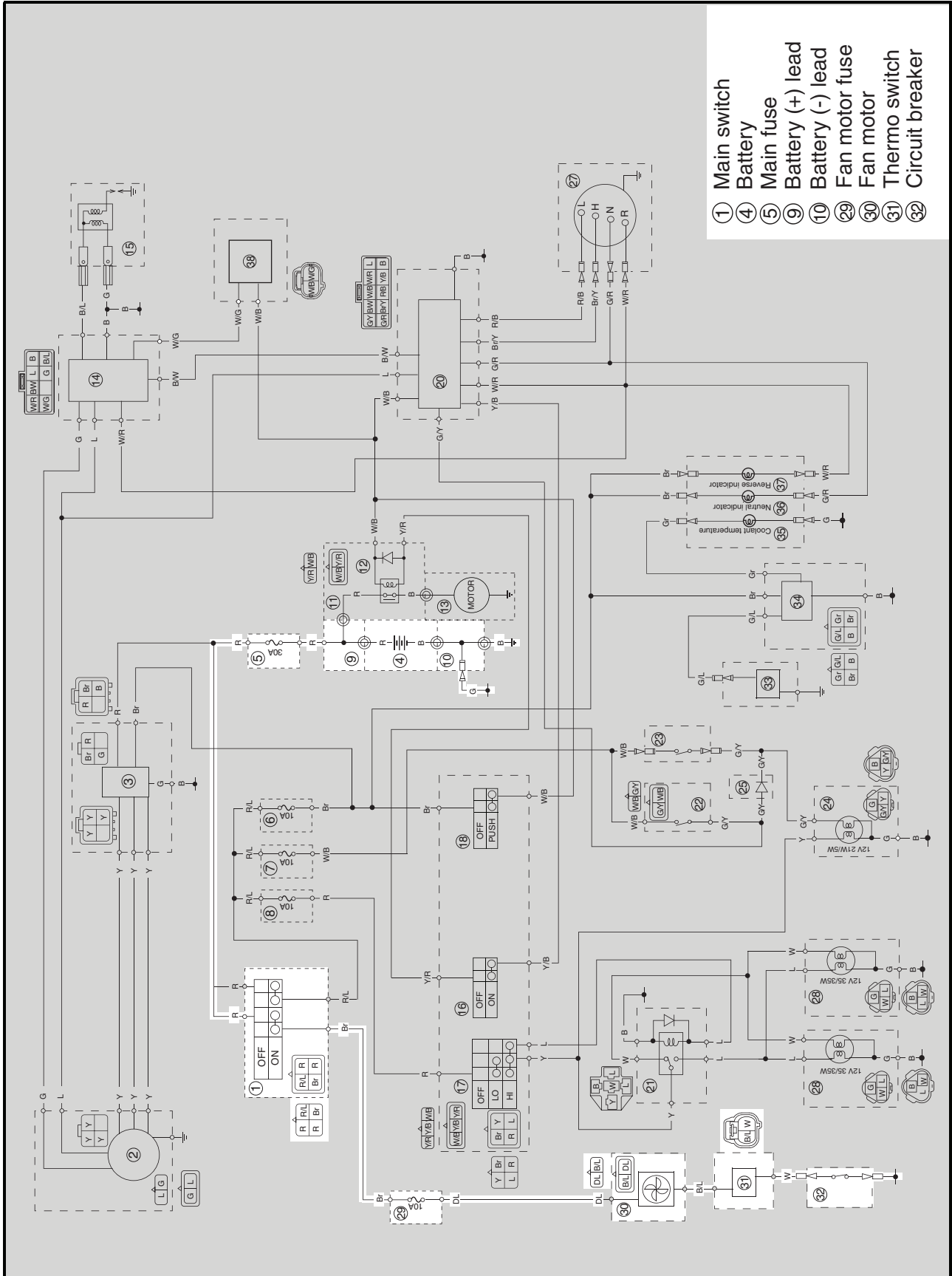
↓ NO

Replace the start switch.

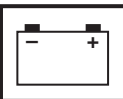


EBS00532

**COOLING SYSTEM
CIRCUIT DIAGRAM**



- ① Main switch
- ④ Battery
- ⑤ Main fuse
- ⑨ Battery (+) lead
- ⑩ Battery (-) lead
- ⑲ Fan motor fuse
- ⑳ Fan motor
- ㉑ Thermo switch
- ㉒ Circuit breaker



EBS01085

TROUBLESHOOTING

The radiator fan motor fails to turn.

Check:

1. fuse
2. battery
3. main switch
4. radiator fan motor
5. circuit breaker (fan motor)
6. thermo switch
7. wiring connections
(of the entire charging system)

TIP

- Before troubleshooting, remove the following part(s):
 1. seat
 2. right side covers
 3. front fender
- Troubleshoot with the following special tool(s).



Pocket tester
P/N. YU-03112-C, 90890-03112

EBS01043

1. Fuse

- Check the fuse for continuity. Refer to “CHECKING THE SWITCHES”.
- Are the fuse OK?

↓ YES

↓ NO

Replace the fuse.

EBS01044

2. Battery

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



Minimum open-circuit voltage
12.0 V or more at 20°C (68°F)

- Is the battery OK?

↓ YES

↓ NO

- Clean the battery terminals.
- Recharge or replace the battery.

EBS01041

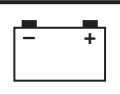
3. Main switch

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

↓ YES

↓ NO

Replace the main switch.

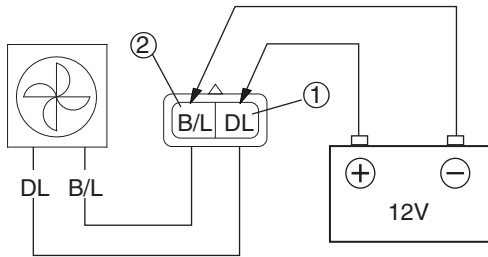


EBS01086

4. Radiator fan motor

- Disconnect the radiator fan motor coupler from the wire harness.
- Connect the battery (DC 12 V) as shown.

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



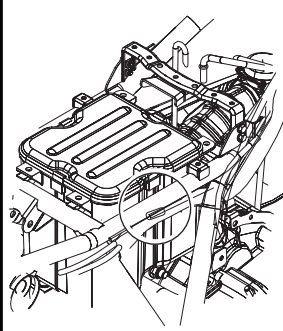
- Does the radiator fan motor turn?



The radiator fan motor is faulty and must be repaired.

5. Circuit breaker (fan motor)

- Remove the circuit breaker from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the circuit breaker.



Circuit breaker resistance
Zero Ω at 20 °C (68 °F)



Replace the circuit breaker.

EBS01088

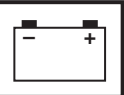
6. Thermo switch

- Remove the thermo switch from the radiator.
- Connect the pocket tester ($\Omega \times 1$) to the thermo switch ① as shown.
- Immerse the thermo switch in a container filled with coolant ②.
- Place a thermometer ③ in the coolant.
- Slowly heat the coolant, then let it cool down to the specified temperature.
- Check the thermo switch for continuity at the temperatures indicated below.

Test step	Coolant temperature	Continuity
	Thermo switch	
1	Less than $98 \pm 3^\circ\text{C}$ ($208.4 \pm 5.4^\circ\text{F}$)	NO
2	More than $98 \pm 3^\circ\text{C}$ ($208.4 \pm 5.4^\circ\text{F}$)	YES
3*	More than $92 \pm 3^\circ\text{C}$ ($197.6 \pm 5.4^\circ\text{F}$)	YES
4*	Less than $92 \pm 3^\circ\text{C}$. ($197.6 \pm 5.4^\circ\text{F}$)	NO


Steps 1 & 2: Heating phase

Steps 3* & 4*: Cooling phase

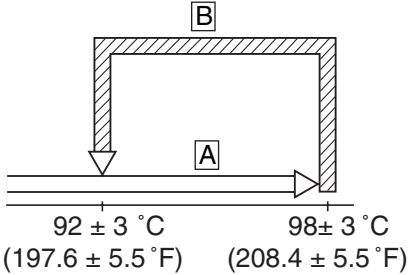


⚠ WARNING

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

 **Thermo switch**
28 Nm (2.8 m · kg, 20 ft · lb)

A The thermo switch circuit is open and the radiator fan is off.
B The thermo switch circuit is closed and the radiator fan is on.



• Does the thermo switch operate properly as described above?



Replace the thermo switch.

EBS01090

7. Wiring

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



This circuit is OK.

Properly connect or repair the cooling system's wiring.

TROUBLESHOOTING**TIP**

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

STARTING FAILURE/HARD STARTING**FUEL SYSTEM****Fuel tank**

- Empty
- Clogged fuel filter
- Clogged fuel strainer
- Clogged fuel breather hose
- Deteriorated or contaminated fuel

Fuel cock

- Clogged fuel hose

Carburetor

- Deteriorated or contaminated fuel
- Clogged pilot jet
- Clogged pilot air passage
- Sucked-in air
- Deformed float
- Worn needle valve
- Improperly sealed valve seat
- Improperly adjusted fuel level
- Improperly set pilot jet
- Clogged starter jet
- Choke valve malfunction

Air filter

- Clogged air filter element

ELECTRICAL SYSTEM**Spark plug**

- Improper plug gap
- Worn electrodes
- Wire between terminals broken
- Improper heat range
- Faulty spark plug cap

Ignition coil

- Broken or shorted primary/secondary
- Faulty spark plug lead
- Broken body

C.D.I. system

- Faulty C.D.I. unit
- Faulty pickup coil
- Faulty lighting coil
- Faulty charging coil
- Broken woodruff key

Switches and wiring

- Faulty main switch
- Faulty engine stop switch
- Broken or shorted wiring
- Faulty gear position switch
- Loose connections
- Faulty start switch

Starter motor

- Faulty starter motor
- Faulty starter relay

Battery

- Faulty battery
- Discharged battery

COMPRESSION SYSTEM

Cylinder and cylinder head

- Loose spark plug
- Loose cylinder head or cylinder
- Broken cylinder head gasket
- Broken cylinder gasket
- Worn, damaged or seized cylinder

Valve and camshaft

- Improperly sealed valve
- Improperly contacted valve and valve seat
- Improper valve timing
- Broken valve spring
- Seized camshaft

Piston and piston rings

- Improperly installed piston ring
- Worn, fatigued or broken piston ring
- Seized piston ring
- Seized or damaged piston

Crankcase and crankshaft

- Improperly seated crankcase
- Seized crankshaft

Valve train

- Improperly adjusted valve clearance
- Improperly adjusted valve timing

EBS00538

POOR IDLE SPEED PERFORMANCE

POOR IDLE SPEED PERFORMANCE

Carburetor

- Improperly returned choke
- Loose or clogged pilot jet
- Loose or clogged pilot air jet
- Improperly adjusted idle speed (throttle stop screw)
- Improper throttle cable play
- Flooded carburetor

Intake manifold

- Loosen carburetor joint

Electrical system

- Faulty battery
- Faulty C.D.I. unit
- Faulty pickup coil
- Faulty ignition coil

Valve train

- Improperly adjusted valve clearance

Air filter

- Clogged air filter element
- Loosen air filter joint

EBS00539

POOR MEDIUM AND HIGH-SPEED PERFORMANCE

POOR MEDIUM AND HIGH-SPEED PERFORMANCE

Refer to “STARTING FAILURE/HARD STARTING” and “POOR IDLE SPEED PERFORMANCE—Valve train”.

Carburetor

- Improper jet needle clip position
- Improperly adjusted fuel level
- Clogged or loose main jet
- Deteriorated or contaminated fuel

Air filter

- Clogged air filter element

EBS00541

FAULTY GEAR SHIFTING

HARD SHIFTING

Refer to “CLUTCH DRAGGING”.

SHIFT PEDAL DOES NOT MOVE

Shift shaft

- Bent shift shaft

Shift drum and shift forks

- Groove jammed with impurities
- Seized shift fork
- Bent shift fork guide bar

JUMPS OUT GEAR

Shift shaft

- Improperly adjusted shift lever position
- Improperly returned stopper lever

Shift forks

- Worn shift fork

Transmission

- Seized transmission gear
- Jammed impurities
- Incorrectly assembled transmission

Shift guide

- Broken shift guide

Shift drum

- Improper thrust play
- Worn shift drum groove

Transmission

- Worn gear dog

EAS00853

FAULTY CLUTCH

ENGINE OPERATES BUT VEHICLE WILL NOT MOVE

V-belt

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

Primary pulley cam and primary pulley slider

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

Clutch spring(s)

- Damaged clutch spring

Transmission gears

- Damaged transmission gear

CLUTCH SLIPPING

Clutch shoe springs

- Damaged, loose or worn clutch shoe spring

Clutch shoes

- Damaged or worn clutch shoe

Primary sliding sheave

- Seized primary sliding sheave

POOR STARTING PERFORMANCE

V-belt

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

Primary sliding sheave

- Faulty operation
- Worn pin groove
- Worn pin

Clutch shoes

- Bent, damaged or worn clutch shoe

POOR SPEED PERFORMANCE

V-belt

- Oil or grease on the V-belt

Primary pulley weight(s)

- Faulty operation
- Worn primary pulley weight

Primary fixed sheave

- Worn primary fixed sheave

Primary sliding sheave

- Worn primary sliding sheave

Secondary fixed sheave

- Seized primary sliding sheave

Secondary sliding sheave

- Worn secondary sliding sheave



EBS00547

OVERHEATING

OVERHEATING

Ignition system

- Improper spark plug gap
- Improper spark plug heat range
- Faulty C.D.I. unit

Fuel system

- Improper carburetor main jet (improper setting)
- Improper fuel level
- Clogged air filter element

Compression system

- Heavy carbon deposit

Engine oil

- Improper oil level
- Improper oil viscosity
- Inferior oil quality

Brake

- Brake drag

Cooling system

- Low coolant level
- Clogged or damaged radiator
- Damaged or faulty water pump
- Faulty fan motor
- Faulty thermo switch

EBS00550

FAULTY BRAKE

POOR BRAKING EFFECT

Front drum brake

- Worn brake pads
- Worn disc
- Air in brake fluid
- Leaking brake fluid
- Faulty master cylinder kit cup
- Faulty caliper kit seal
- Loose union bolt
- Broken brake hose and pipe
- Oily or greasy disc/brake pads
- Improper brake fluid level

EBS00551

SHOCK ABSORBER MALFUNCTION

MALFUNCTION

- Bent or damaged damper rod
- Damaged oil seal lip
- Fatigued shock absorber spring
- Leaking oil or gas

EBS00552

UNSTABLE HANDLING

UNSTABLE HANDLING

Handlebar

- Improperly installed or bent

Steering

- Incorrect toe-in
- Bent steering stem
- Improperly installed steering stem
- Damaged bearing or bearing race
- Bent tie-rods
- Deformed steering knuckles

Tires

- Uneven tire pressures on both sides
- Incorrect tire pressure
- Uneven tire wear

Wheels

- Deformed wheel
- Loose bearing
- Bent or loose wheel axle
- Excessive wheel runout

Frame

- Bent
- Damaged frame

Swingarm

- Worn bearing or bushing
- Bent or damaged

EBS00553

LIGHTING SYSTEM

HEADLIGHT DOES NOT COME ON

- Improper bulb
- Too many electric accessories
- Hard charging (broken stator coil and/or faulty rectifier/regulator)
- Incorrect connection
- Improperly grounded
- Poor contacts (main or light switch)
- Bulb life expired

TAIL/BRAKE LIGHT DOES NOT LIGHT

- Wrong tail/brake light bulb
- Too many electric accessories
- Hard charging (broken stator coil and/or faulty rectifier/regulator)
- Incorrect connection
- Improperly grounded
- Poor contacts (main or light switch)
- Burnt-out tail/brake light bulb

BULB BURNT OUT

- Improper bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded
- Faulty main and/or light switch
- Bulb life expired

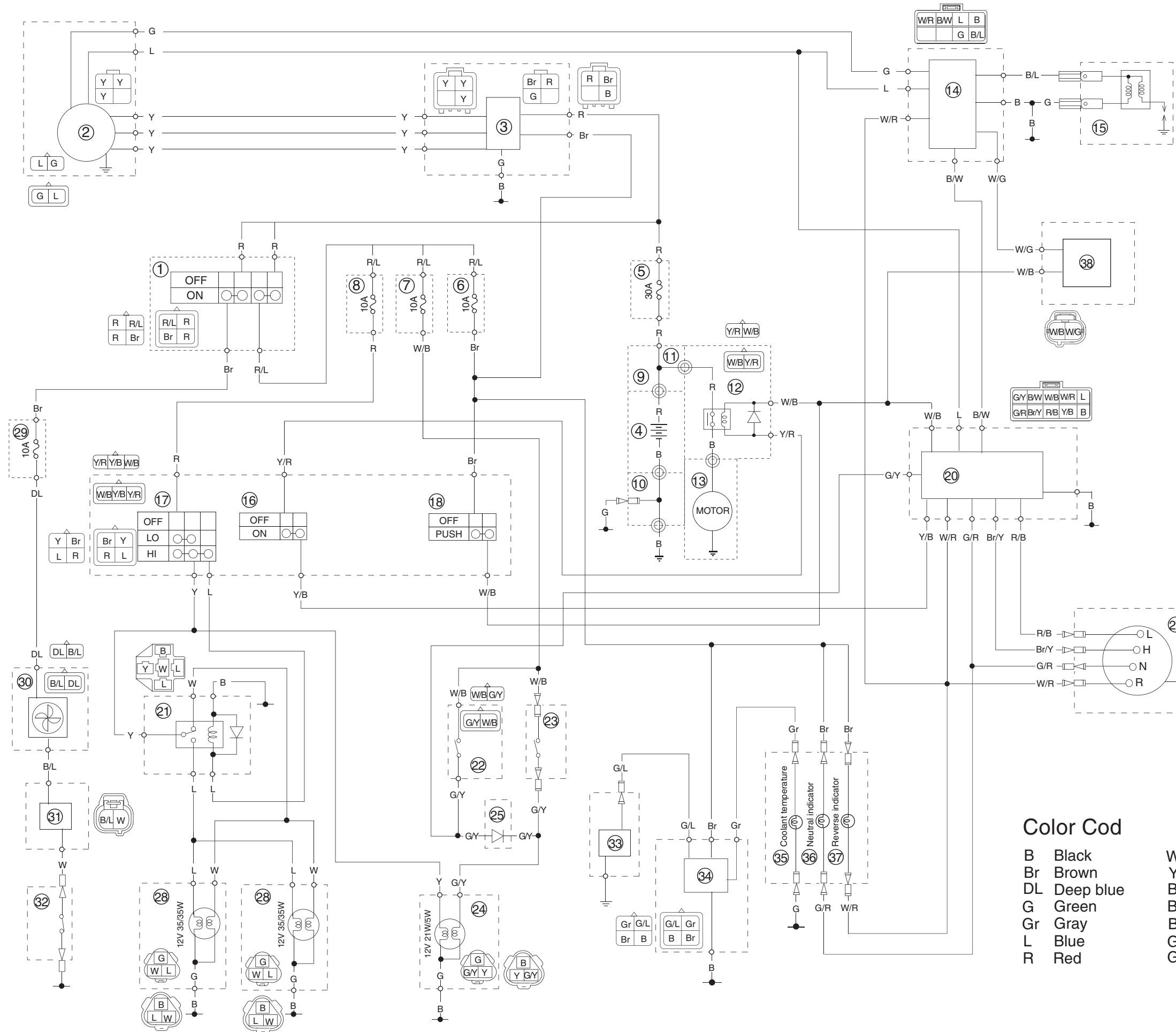
TAIL/BRAKE LIGHT BULB BURNT OUT

- Wrong tail/brake light bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded
- Faulty main and/or light switch
- Incorrectly adjusted rear brake light switch
- Tail/brake light bulb life expired



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YFM30GB WIRING DIAGRAM



- ① Main switch
- ② C.D.I. magneto
- ③ Rectifier/Regulator
- ④ Battery
- ⑤ Main fuse
- ⑥ Ignition fuse
- ⑦ Signal fuse
- ⑧ Head fuse
- ⑨ Battery (+) lead
- ⑩ Battery (-) lead
- ⑪ Wire lead
- ⑫ Starter relay
- ⑬ Starter motor
- ⑭ C.D.I. unit
- ⑮ Ignition coil
- ⑯ Start switch
- ⑰ Dimmer switch
- ⑱ Engine stop switch
- ⑲ Shift gear control unit
- ⑳ Headlight relay
- ㉑ Rear brake light switch
- ㉒ Front brake light switch
- ㉓ Tail/brake light
- ㉔ Diode
- ㉕ Gear position switch
- ㉖ Head light
- ㉗ Fan motor fuse
- ㉘ Fan motor
- ㉙ Thermo switch
- ㉚ Circuit breaker
- ㉛ Thermo unit
- ㉜ Controller comp., water temp. light
- ㉝ Coolant temperature
- ㉞ Neutral indicator
- ㉟ Reverse indicator
- ㊱ Neutral indicator
- ㊲ Reverse indicator
- ㊳ A.I.C.V. solenoid

Color Cod

B	Black	W	White	G/Y	Green/Yellow
Br	Brown	Y	Yellow	R/B	Red/Black
DL	Deep blue	B/L	Black/Blue	R/L	Red/Blue
G	Green	B/W	Black/White	W/B	White/Black
Gr	Gray	Br/Y	Brown/Yellow	W/R	White/Red
L	Blue	G/L	Green/Blue	Y/B	Yellow/Black
R	Red	G/W	Green/White	Y/R	Yellow/Red