

SERVICE MANUAL

YFM250RX



YFM250RX
SERVICE MANUAL
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NOTICE

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.

NOTE: _

Designs and specifications are subject to change without notice.

EBS00003

IMPORTANT INFORMATION

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

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

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

machine.

CAUTION:

A CAUTION indicates special precautions that must be taken to avoid dam-

age to the machine.

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

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.

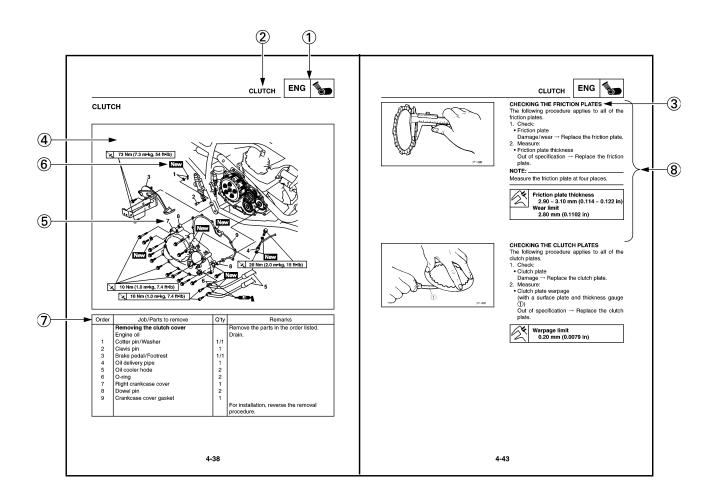
2nd title ②: This title indicates the section of the chapter and only appears on the first page of each section. It is located in the upper left corner of the page.

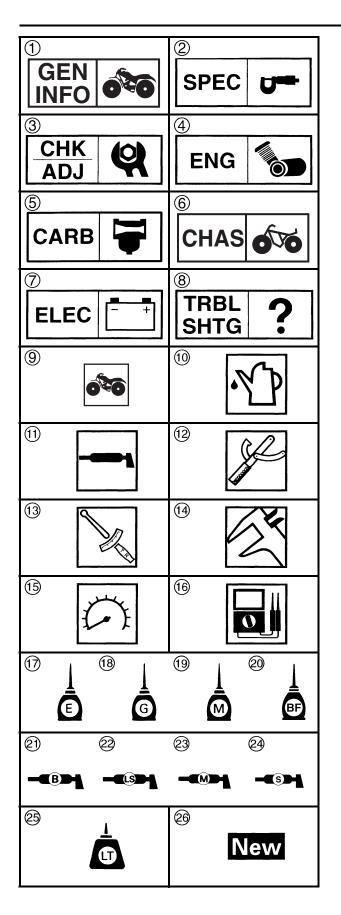
3rd title ③: This title indicates a sub-section that is followed by step-by-step procedures accompanied by corresponding illustrations.

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.





SYMBOLS

The following symbols are not relevant to every machine.

Symbols ① to ⑧ indicate the subject of each chapter.

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

Symbols 9 to 6 indicate the following

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

Symbols 7 to 9 in the exploded diagrams indicate the types of lubricants and lubrication points.

- (17) Apply engine oil
- 18 Apply gear oil
- (19) Apply molybdenum disulfide oil
- 20 Apply brake fluid
- 21) Apply wheel bearing grease
- 2 Apply lithium-soap-based grease
- 23 Apply molybdenum disulfide grease
- 24 Apply silicone 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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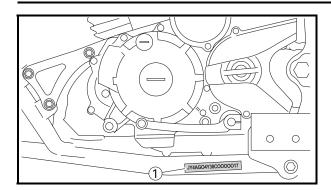
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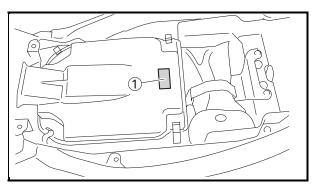
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MACHINE IDENTIFICATION







FBS0000

GENERAL INFORMATION MACHINE IDENTIFICATION

EBS00010

VEHICLE IDENTIFICATION NUMBER

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

EBS0001

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".
- 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.
- 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.

EBS00014

REPLACEMENT PARTS

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

EBS00015

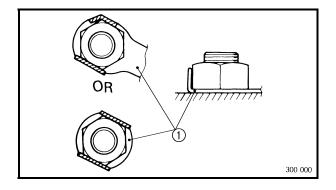
GASKETS, OIL SEALS AND O-RINGS

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



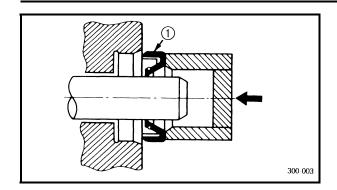
LOCK WASHERS/PLATES AND COTTER PINS

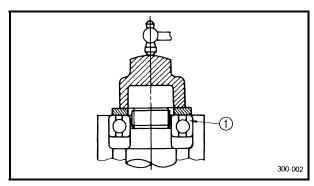
After removal, replace all lock washers/plates
① and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.

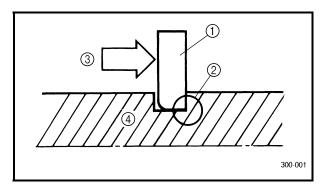


IMPORTANT INFORMATION









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BEARINGS AND OIL SEALS

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

(1) Oil seal

CAUTION:

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

1 Bearing

EBS00018

CIRCLIPS

Before reassembly, check all circlips carefully and replace damaged or distorted circlips.

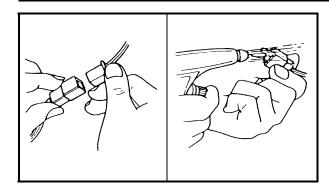
Always replace piston pin clips after one use.

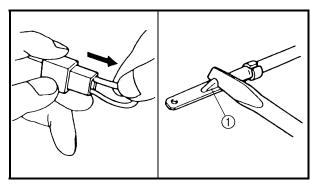
When installing a circlip ①, make sure the sharp-edged corner ② is positioned opposite the thrust ③ that the circlip receives.

④ Shaft

IMPORTANT INFORMATION







EBS00019

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 \rightarrow Dry with an air blower. Rust/stains \rightarrow Connect and disconnect several times.

- 3. Check:
 - all connections
 Loose connection → Connect properly.

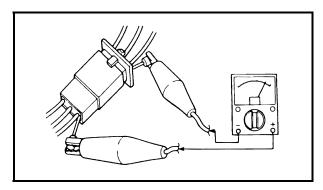
NOTF:

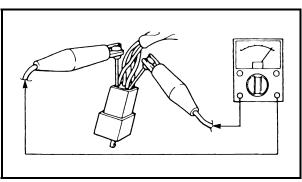
If the pin ① on the terminal is flattened, bend it up.

- 4. Connect:
 - lead
 - coupler
 - connector

NOTE: _

Make sure all connections are tight.





5. Check:

• continuity (with the pocket tester)



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

NOTE: _

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



EBS00021

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
90890-01083 YU-01083-1	Slide hummer bolt Slide hummer bolt 6 mm This tool is used to remove the rocker arm shaft.	M6×P1.0
90890-01084 YU-01083-3	Weight This tool is used to remove the rocker arm shaft.	90890-01084 98.5 YU-01083-3
90890-01135 YU-01135-B	Crankcase separating tool Crankcase separator This tool is used to separate the crankcase.	YU-01135-B M5×P0.80 M6×P1.25 M6×P1.00
90890-01268 YU-01268	Ring nut wrench Spanner wrench This tool is used to adjusting the front shock absorbers.	R22
90890-01274 YU-90058	Crankshaft installer pot Installing pot These tools are used to install the crankshaft.	90890-01274 YU-90058/YU-90059
90890-01275 YU-90060	Crankshaft installer bolt Bolt This tool is used to install the crankshaft.	M14×P1.5



Tool No.	Tool name/Function	Illustration
Adapter 90890-01383 YU-90062	Adapter (M10) Adapter #2	M10×P1.25
	This tool is used to install the crankshaft.	<u>M1447F 1.57</u>
90890-01288	Spacer This tool is used to install the crankshaft.	35
90890-01304 YU-01304	Piston pin puller set Piston pin puller	90890-01304 YU-01304 YU-01304
	This tool is used to remove the piston pin.	
90890-01311 YM-A5970	Tappet adjusting tool Six piece tappet set This tool is necessary for adjusting the valve clearance.	90-01311 YM-08035-A
90890-01362 YU-33270-B	Flywheel puller Heavy duty puller This tool is used to remove the AC magneto rotor.	
90890-01359	Bolt (M8 \times 80 mm) This tool is used to remove the AC magneto rotor.	80
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.	



Tool No.	Tool name/Function	Illustration
90890-03081 YU-33223	Compression gauge Engine compression tester This tool is needed to measure the engine compression.	
90890-04082	Extension This tool is needed to measure engine compression.	73
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.	031 M6×P1.0
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.	Ø26
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 (φ6) Valve guide remover (6.0 mm) This tool is needed to remove and install the valve guides.	



Tool No.	Tool name/Function	Illustration
90890-04065 YM-04065-A	Valve guide installer (φ6) Valve guide installer (6.0 mm)	
	This tool is needed to install the valve guides.	
90890-04066 YM-04066	Valve guide reamer (φ6) Valve guide reamer (6.0 mm)	
	This tool is needed to rebore the new valve guides.	
90890-04101 YM-A8998	Valve lapper Valve lapping tool	014
	This tool is needed to remove and install the valve lifters.	· Chief
90890-06588	PTT wrench 46	
	This tool is needed to loosen or tighten the rear axle nut.	
	Axle nut wrench (46 mm)	
YM-37134		
	This tool is needed to loosen or tighten the rear axle nut.	
90890-06754 YM-34487	Ignition checker Opama pet-4000 spark checker	
1101-04-407	This instrument is necessary for checking the ignition system components.	
	Digital tachometer	
90890-06760 YU-39951-B		
	This tool is needed for observing engine rpm.	
90890-85505	Yamaha bond No. 1215 (Three Bond No. 1215 [®])	
	This bond is used on crankcase mating surfaces, etc.	

SPEC U

EBS01001

SPECIFICATIONS

GENERAL SPECIFICATIONS

Item	Standard
Model code	4D31
	4D35
	4D39
Dimensions	
Overall length	1,625 mm (64.0 in)
Overall width	1,070 mm (42.1 in)
Overall height	1,040 mm (40.9 in)
Seat height	730 mm (28.7 in)
Wheelbase	1,110 mm (43.7 in)
Minimum ground clearance	100 mm (3.94 in)
Minimum turning radius	2,900 mm (114.2 in)
Basic weight	
With oil and full fuel tank	150 kg (331 lb)
Engine	
Engine type	Air-cooled 4-stroke, SOHC
Cylinder arrangement	Forward-inclined single cylinder
Displacement	249 cm ³ (15.19 cu in)
Bore × stroke	74.0 × 58.0 mm (2.91 × 2.28 in)
Compression ratio	9.5 : 1
Engine idle speed	1,500 ~ 1,600 r/min
Intake vacuum	34 kPa (255 mmHg, 10.0 inHg)
Oil temperature	55 ~ 65 °C
Standard compression pressure (at sea level)	1,100 kPa (11.2 kg/cm ² , 160 psi)/720 r/min
Starting system	Electric starter
Lubrication system	Wet sump
Oil type or grade	
Engine oil	YAMALUBE4, SAE 5W-30 or SAE 10W-30 or
0° 10° 30° 50° 70° 90° 110° 130°F	SAE 20W-40
	API service, SG type or higher, JASO standard
YAMALUBE 4 (20W-40) or SAE 20W-40	MA
YAMALUBE 4 (10W-30) or SAE 10W-30	
YAMALUBE 4-CW (5W-30) or SAE 5W-30	
-20° -10° 0° 10° 20° 30° 40° 50°C	
Oil capacity	
Engine oil	1 05 L (1 10 lmp at 1 20 LIC at)
Periodic oil change	1.25 L (1.10 lmp qt, 1.32 US qt)
With oil filter replacement	1.35 L (1.19 Imp qt, 1.43 US qt)
Total amount	1.60 L (1.41 Imp qt, 1.69 US qt)
Air filter	Wet type element

GENERAL SPECIFICATIONS



Item		Standard
Fuel		
Туре		Unleaded gasoline only
Fuel tank capacity		9.0 L (1.97 Imp gal, 2.37 US gal)
Fuel reserve amount		1.0 L (0.22 Imp gal, 0.26 US gal)
		1.0 L (0.22 IIII) gai, 0.20 00 gai)
Carburetor		BSR29 × 1
Type/quantity Manufacturer		MIKUNI
		WIROW
Spark plug		DD7EA/NOV
Type/manufacturer		DR7EA/NGK
Spark plug gap		0.6 ~ 0.7 mm (0.024 ~ 0.028 in)
Clutch type		Wet, multiple-disc
Transmission		
Primary reduction system		Spur gear
Primary reduction ratio		76/22 (3.455)
Secondary reduction system		Chain drive
Secondary reduction ratio		38/14 (2.714)
Transmission type		Constant mesh, 5-speed
Operation		Left foot operation
Gear ratio		07/40 (0.040)
1st gear		37/13 (2.846)
2nd gear		33/18 (1.833)
3rd gear		29/21 (1.381)
4th gear		27/24 (1.125)
5th gear		28/29 (0.966)
Chassis		Ota al tark a france a
Frame type		Steel tube frame
Caster angle		6°
Camber angle		-1.5° 14.8°
Kingpin angle Trail		
Tread (STD)	front	23.0 mm (0.91 in) 826 mm (32.52 in)
l lieau (STD)	rear	824 mm (32.44 in)
Toe-in (with tires touching the gro		9 ~ 19 mm (0.35 ~ 0.75 in)
Tire	a.i.a,	0.70 111
Type		Tubeless
Type Size	front	AT20 × 7-10
GIZE	rear	AT19 × 10-9
Manufacturer	front	DUNLOP
Manufaturei	rear	DUNLOP
Туре	front	KT201
1,700	rear	KT205A
Tire pressure (cold tire)		
Maximum load*		100 kg (220 lb)
Off-road riding	front	27.5 kPa (0.28 kg/cm ² , 4.0 psi)
	rear	27.5 kPa (0.28 kg/cm ² , 4.0 psi)
*Load in total weight of cargo, ride		
accessories		

GENERAL SPECIFICATIONS



Item		Standard
Brake		
Front brake	type	Dual disc brake
	operation	Right hand operation
Rear brake	type	Single disc brake
	operation	Right foot operation
Suspension		
Front suspension		Double wishbone
Rear suspension		Swingarm
Shock absorber		
Front shock absorber		Coil spring/oil damper
Rear shock absorber		Coil spring/gas-oil damper
Wheel travel		
Front wheel travel		190 mm (7.48 in)
Rear wheel travel		200 mm (7.87 in)
Electrical		
Ignition system		DC-CDI
Generator system		AC magneto
Battery type		YTZ7S
Battery capacity		12 V 6.0 Ah
Headlight type		Krypton bulb
Bulb voltage/wattage × quant	ity	
Headlight		12 V 30 W/30 W × 2
Tail/brake light		12 V 5 W/21 W × 1 (4D31)
		12 V 0.5 W/3.9 W × 1 (4D35, 4D39)
Indicator lights		
Neutral		12 V 1.7 W × 1



FBS01003

Item	Standard	Limit
Cylinder head Volume Warp limit *	20.50 ~ 21.50 cm ³ (1.25 ~ 1.31 cu.in)	0.05 mm (0.0020 in)
Cylinder Bore size	74.000 ~ 74.016 mm (2.9134 ~ 2.9140 in)	74.100 mm (2.9173 in)
Camshaft Drive method Camshaft lobe dimensions	Chain drive (Right)	•••
Intake "A"	36.890 ~ 36.990 mm (1.4524 ~ 1.4563 in) 30.111 ~ 30.211 mm (1.1855 ~ 1.1894 in)	36.790 mm (1.4484 in) 30.011 mm
Exhaust "A"	36.891 ~ 36.991 mm (1.4524 ~ 1.4563 in) 30.092 ~ 30.192 mm (1.1847 ~ 1.1887 in)	(1.1815 in) 36.791 mm (1.4485 in) 29.992 mm
Camshaft runout limit	•••	(1.1808 in) 0.03 mm (0.0012 in)
Timing chain Timing chain type/No. of links Timing chain adjustment method	DID SCR-0404 SV/104 Automatic	•••
Rocker arm/rocker arm shaft Rocker arm inside diameter Rocker arm shaft outside diameter Rocker-arm-to-rocker-arm-shaft clearance	12.000 ~ 12.018 mm (0.4724 ~ 0.4731 in) 11.981 ~ 11.991 mm (0.4717 ~ 0.4721 in) 0.009 ~ 0.037 mm (0.0004 ~ 0.0015 in)	12.036 mm (0.4739 in) 11.950 mm (0.4705 in)

Item		Standard	Limit
Valve, valve seat, valve g	uide		
Valve clearance (cold)	IN	0.05 ~ 0.10 mm (0.0020 ~ 0.0039 in)	•••
,	EX	0.10 ~ 0.15 mm (0.0039 ~ 0.0059 in)	•••
Valve dimensions		,	'
		1.	
1.1			\ .
		B	
A —			1
Head Diameter	Face	Width Seat Width Ma	gin Thickness
"A" head diameter	IN	33.90 ~ 34.10 mm (1.3346 ~ 1.3425 in)	•••
	EX	28.40 ~ 28.60 mm (1.1181 ~ 1.1260 in)	•••
"B" face width	IN	2.26 mm (0.0890 in)	•••
	EX	2.26 mm (0.0890 in)	•••
"C" seat width	IN	0.90 ~ 1.10 mm (0.0354 ~ 0.0433 in)	1.6 mm
			(0.06 in)
	EX	0.90 ~ 1.10 mm (0.0354 ~ 0.0433 in)	1.6 mm
			(0.06 in)
"D" margin thickness	IN	0.80 ~ 1.20 mm (0.0315 ~ 0.0472 in)	•••
	EX	0.80 ~ 1.20 mm (0.0315 ~ 0.0472 in)	•••
Stem outside diameter	IN	5.975 ~ 5.990 mm (0.2352 ~ 0.2358 in)	5.945 mm
			(0.234 in)
	EX	5.960 ~ 5.975 mm (0.2346 ~ 0.2352 in)	5.930 mm
	18.1	0.000 0.010 (0.0000 0.0007:)	(0.233 in)
Guide inside diameter	IN	6.000 ~ 6.012 mm (0.2362 ~ 0.2367 in)	6.050 mm
	EX	6 000 6 010 mm (0 0060 0 0067 in)	(0.238 in) 6.050 mm
		6.000 ~ 6.012 mm (0.2362 ~ 0.2367 in)	(0.238 in)
Stem-to-guide clearance	IN	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.080 mm
Sterri-to-guide clearance	IIN	0.010 ~ 0.037 11111 (0.0004 ~ 0.0013 111)	(0.003 in)
	EX	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)	0.100 mm
	L/\	0.020 0.002 mm (0.0010 × 0.0020 m)	(0.004 in)
Valve stem runout		•••	0.01 mm
			(0.0004 in)
Valve seat width	IN	0.90 ~ 1.10 mm (0.0354 ~ 0.0433 in)	1.6 mm
		(2.320)	(0.06 in)
	EX	0.90 ~ 1.10 mm (0.0354 ~ 0.0433 in)	1.6 mm
		,	(0.06 in)
	<i>a</i> \		
	₩ 🔥		
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Item		Standard	Limit
Valve spring			
Inner spring			
Free length	IN	36.17 mm (1.42 in)	34.36 mm
			(1.35 in)
	EX	36.17 mm (1.42 in)	34.36 mm
			(1.35 in)
Installed length		00.50 (4.00:)	
(valve closed)	IN	30.50 mm (1.20 in)	•••
Coning voto I/1	EX	30.50 mm (1.20 in)	•••
Spring rate K1 K2	IN IN	14.70 N/mm (1.50 kg/mm, 83.94 lb/in)	•••
	EX	19.00 N/mm (1.94 kg/mm, 108.49 lb/in) 14.70 N/mm (1.50 kg/mm, 83.94 lb/in)	•••
K2	EX	19.00 N/mm (1.94 kg/mm, 108.49 lb/in)	•••
Compressed spring force	LX	19.00 W/IIIII (1.94 kg/IIIII, 100.49 lb/III)	
(installed)	IN	75.00 ~ 91.70 N	•••
(cta.ica)		(7.65 ~ 9.35 kg, 16.86 ~ 20.62 lb)	
	EX	75.00 ~ 91.70 N	•••
		(7.65 ~ 9.35 kg, 16.86 ~ 20.62 lb)	
Tilt limit ≭	IN	•••	2.5°/1.60 mm
			(2.5°/0.063 in)
	EX	•••	2.5°/1.60 mm
	k		(2.5°/0.063 in)
	•		
7/////	7,		
'//////////	//		
Direction of winding			
(top view)	IN	Counter clockwise	•••
	EX	Counter clockwise	•••
Outer spring			
Free length	IN	36.63 mm (1.44 in)	34.80 mm
	=\((1.37 in)
	EX	36.63 mm (1.44 in)	34.80 mm
In a to Hoad I am salts			(1.37 in)
Installed length	INI	20 00 mm (1 00 in)	
(valve closed)	IN EV	32.00 mm (1.26 in)	•••
Spring rate K1	EX IN	32.00 mm (1.26 in) 30.90 N/mm (3.15 kg/mm, 176.44 lb/in)	•••
Spring rate K1 Spring rate K2	IN	40.80 N/mm (4.16 kg/mm, 232.97 lb/in)	•••
Spring rate K1	EX	30.90 N/mm (3.15 kg/mm, 176.44 lb/in)	•••
Spring rate K2	EX	40.80 N/mm (4.16 kg/mm, 232.97 lb/in)	•••
Compressed spring force	L /\	10.00 14/11111 (1.10 kg/11111, 202.07 lb/111)	
(installed)	IN	128.50 ~ 157.90 N	•••
(•	(13.10 ~ 16.10 kg, 28.89 ~ 35.50 lb)	
	EX	128.50 ~ 157.90 N	•••
		(13.10 ~ 16.10 kg, 28.89 ~ 35.50 lb)	
		, , ,	ı



Item		Standard	Limit
Tilt limit *	IN	•••	2.5°/1.60 mm
	EX	•••	(2.5°/0.063 in) 2.5°/1.60 mm
—→ -	- *		(2.5°/0.063 in)
Direction of winding			
(top view)	IN	Clockwise	•••
	EX	Clockwise	•••
Piston	200	0.010 0.005 mm (0.0004 0.0010 in)	0.15 mm
Piston to cylinder cleara	nce	0.010 ~ 0.025 mm (0.0004 ~ 0.0010 in)	(0.006 in)
Piston size "D"		73.983 ~ 73.998 mm (2.9127 ~ 2.9133 in)	•••
D	H		
Measuring point "H"		5.0 mm (0.20 in)	•••
Piston off set		0.25 mm (0.0098 in)	•••
Offset direction		Intake side	47.040
Piston pin bore inside di	ameter	17.002 ~ 17.013 mm (0.6694 ~ 0.6698 in)	17.043 mm (0.6710 in)
Piston pin outside diame	eter	16.991 ~ 17.000 mm (0.6689 ~ 0.6693 in)	16.971 mm
o.o p odlordo didirio		(0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000	(0.6681 in)
Piston-pin-to-piston-pin- clearance	bore	0.002 ~ 0.022 mm (0.0001 ~ 0.0009 in)	0.072 mm (0.0028 in)



Item	Standard	Limit
Piston rings Top ring		
B T		
Type Dimensions (B × T) End gap (installed)	Barrel 0.90 × 2.75 mm (0.035 × 0.108 in) 0.19 ~ 0.31 mm (0.007 ~ 0.012 in)	0.56 mm (0.022 in)
Side clearance	0.030 ~ 0.065 mm (0.0012 ~ 0.0026 in)	0.115 mm (0.0045 in)
2nd ring		(0.0040 111)
B		
Type Dimensions (B × T) End gap (installed)	Taper 0.80 × 2.80 mm (0.031 × 0.110 in) 0.30 ~ 0.45 mm (0.012 ~ 0.018 in)	0.80 mm (0.032 in)
Side clearance	0.020 ~ 0.055 mm (0.0008 ~ 0.0022 in)	0.115 mm (0.0045 in)
Oil ring		(0.0043 111)
B		
Dimensions (B × T) End gap (installed)	1.50 × 2.60 mm (0.059 × 0.102 in) 0.10 ~ 0.35 mm (0.004 ~ 0.014 in)	•••
Crankshaft	, , , , , , , , , , , , , , , , , , ,	
Crank width "A" Runout limit C1	69.25 ~ 69.30 mm (2.726 ~ 2.728 in)	0.03 mm
C2	•••	(0.0012 in) 0.03 mm
Big end side clearance "D"	0.350 ~ 0.650 mm (0.0138 ~ 0.0256 in)	(0.0012 in) 0.50 mm (0.0197 in)
Big end radial clearance "E"	0.010 ~ 0.025 mm (0.0004 ~ 0.0010 in)	•••



Item	Standard	Limit
Balancer		
Balancer drive method	Gear	•••
Clutch		
Friction plate 1 (inside dia.: 104.5 ~		
105.5 mm)		
Thickness	2.9 ~ 3.1 mm (0.114 ~ 0.122 in)	2.8 mm
O		(0.110 in)
Quantity	4	•••
Friction plate 2 (inside dia.: 104.5 ~ 105.5 mm)		
Thickness	2.9 ~ 3.1 mm (0.114 ~ 0.122 in)	2.8 mm
THICKIESS	2.5 % 0.1 11111 (0.114 % 0.122 111)	(0.110 in)
Quantity	2	•••
Clutch plate		
Thickness	1.5 ~ 1.7 mm (0.059 ~ 0.067 in)	•••
Quantity	5	•••
Max. warpage	•••	0.2 mm
		(0.0079 in)
Clutch spring	47.0 (4.00:)	45.4
Free length	47.8 mm (1.88 in)	45.4 mm
Quantity	5	(1.79 in)
Clutch release method	Inner push, cam push	•••
Push rod 2 bending limit	•••	0.1 mm
1 don red 2 donaing in in		(0.004 in)
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	0.16	
Shifter type	Shift drum and guide bar	0.05
Max. shift fork guide bar bending		0.05 mm
A : u dilha u a il avva da	From sin filter sil on anninglant sil	(0.002 in)
Air filter oil grade	Foam air filter oil or equivalent oil	



Item		Standard	Limit
Carburetor			
I. D. mark		4D31 00	•••
Main jet	(M.J)	#133.8	•••
Main air jet	(M.A.J)	#140	•••
Jet needle	(J.N)	5DH66-1	•••
Needle jet	(N.J)	P-0M	•••
Pilot air jet 1	(P.A.J.1)	#85	•••
Pilot air jet 2	(P.A.J.2)	#170	•••
Pilot outlet	(P.O)	ø0.9	•••
Pilot jet	(P.J)	#25	•••
Bypass 1	(B.P.1)	ø0.8	•••
Bypass 2	(B.P.2)	ø0.8	•••
Bypass 3	(B.P.3)	ø0.8	•••
Valve seat size	(V.S)	ø2.0	•••
Starter jet 1	(G.S.1)	#55	•••
Starter jet 2	(G.S.2)	#0.5	•••
Throttle valve size	(THV)	#100	•••
Float height	(F.H)	13.0 mm (0.51 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)	0.23 mm (0.0091 in)
Outer-rotor-to-oil-pump-housing		0.100 ~ 0.151 mm (0.0039 ~ 0.0059 in)	0.22 mm ²
clearance Oil-pump-housing-to-inner-and-outer- rotor clearance		0.04 ~ 0.09 mm (0.0016 ~ 0.0035 in)	(0.0087 in) 0.16 mm (0.0063 in)
Oil pressure (hot) Pressure check location		3.0 kPa, 0.03 kg/cm ² , 0.44 psi/1550 r/min HEAD CYLINDER	•••

CHASSIS SPECIFICATIONS

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FBS01003

CHASSIS SPECIFICATIONS

Item		Standard	Limit
Front suspension Shock absorber travel Spring free length Spring rate Spring stroke Optional spring		90.7 mm (3.57 in) 248.5 mm (9.78 in) 23.0 N/mm (2.34 kg/mm, 131.26 lb/in) 0.0 ~ 90.7 mm (0.0 ~ 3.57 in) No	•••
Rear suspension Shock absorber assembly tr Spring free length Spring rate Stroke Optional spring	avel	87.0 mm (3.43 in) 240.5 mm (9.47 in) 54.0 N/mm (5.50 kg/mm, 308.18 lb/in) 0 ~ 87.0 mm (0 ~ 3.43 in) No	•••
	radial axial	•••	1.0 mm (0.04 in) 1.0 mm (0.04 in)
Rear axle Rear axle runout		•••	1.5 mm (0.06 in)
	radial lateral	Panel wheel 10 × 5.5 AT Aluminum ••••	2.0 mm (0.08 in) 2.0 mm (0.08 in)
	radial lateral	Panel wheel 9 × 8.5 AT Aluminum ••••	2.0 mm (0.08 in) 2.0 mm (0.08 in)
Drive chain Type/manufacturer Link quantity Drive chain slack Maximum 15-links section		520V/DAIDO 91 45.0 ~ 55.0 mm (1.77 ~ 2.17 in) 239.3 mm (9.42 in)	•••

CHASSIS SPECIFICATIONS



Item	Standard	Limit
Front disc brake		
Type	Dual	•••
Disc outside diameter × thickness	161.0 × 3.5 mm (6.34 × 0.14 in)	3.0 mm
Bloo datalas diameter / imonifect	101.0 × 0.0 mm (0.01 × 0.11 m)	(0.12 in)
Brake disk maximum deflection		0.15 mm
Drane dien maximum deneeden		(0.006 in)
Pad thickness inner	4.4 mm (0.17 in)	1.5 mm
r dd thiothrood hinor		(0.06 in)
Pad thickness outer	4.5 mm (0.18 in)	1.5 mm
Tad tribitiood outer	1.0 11111 (0.10 111)	(0.06 in)
Master cylinder inside diameter	12.7 mm (0.50 in)	•••
Caliper cylinder inside diameter	27 mm (1.06 in)	•••
Brake fluid type	DOT 4	•••
Rear disc brake	2011	
	Cinale	•••
Type Disc outside diameter × thickness	Single	
Disc outside diameter × thickness	200.0 × 4.0 mm (7.87 × 0.16 in)	3.5 mm
Dualsa dials manyimas na dafla atian		(0.14 in)
Brake disk maximum deflection		0.15 mm
Dod thistopes in the	4.0 (0.47 in)	(0.006 in)
Pad thickness inner	4.2 mm (0.17 in)	1.0 mm
Dod thistogram output	4.0 (0.47 in)	(0.04 in)
Pad thickness outer	4.2 mm (0.17 in)	1.0 mm
	10.7 (0.50:)	(0.04 in)
Master cylinder inside diameter	12.7 mm (0.50 in)	•••
Caliper cylinder inside diameter	33.96 mm (1.34 in)	•••
Brake fluid type	DOT 4	•••
Lever and pedal		
Brake lever free play	0 mm (0 in)	•••
Brake pedal position (top of the brake	40.0 mm (1.57 in)	•••
pedal to top of the frame)		
Parking brake cable end length	64 ~ 68 mm (2.52 ~ 2.68 in)	•••
Clutch lever free play (lever end)	5 ~ 10 mm (0.20 ~ 0.39 in)	•••
Throttle lever free play	2 ~ 4 mm (0.08 ~ 0.16 in)	•••
Speed limiter length	Less than 12 mm (0.47 in)	•••
Shift pedal height	15.2 mm (0.60 in)	•••



ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
Voltage	12 V	•••
Ignition system Ignition timing (B.T.D.C.) Advanced timing (B.T.D.C.) Advancer type	10.0°/1,550 r/min 24.4°/5,000 r/min Digital type	•••
CDI CDI unit model/manufacturer Pickup coil resistance/color Ignition coil	4D3/YAMAHA 248 ~ 372 Ω at 20°C (68°F) red–white	•••
Model/manufacturer Minimum ignition spark gap Primary winding resistance Secondary winding resistance	2JN/YAMAHA 6.0 mm (0.24 in) 0.18 ~ 0.28 Ω at 20°C (68°F) 6.32 ~ 9.48 k Ω at 20°C (68°F)	•••
Spark plug cap Material Resistance	Resin 10.0 kΩ	
Charging system Type Model/manufacturer Nominal output Charging coil resistance/color	AC magneto F5XT/YAMAHA 14 V 190 W at 5,000 r/min 0.688 ~ 1.032 Ω at 20°C (68°F) white—white	•••
Rectifier/regulator Type Model/manufacturer No load regulated voltage (DC) Rectifier capacity (DC) Withstand voltage	Semi conductor-short circuit SH640E-11/SHINDENGEN 14.1 ~ 14.9 V 14.0 A 200.0 V	•••
Battery Specific gravity	1.310	
Electric starter system Type	Constant mesh type	•••
Starter motor Model/manufacturer Output Armature coil resistance Brush overall length	4D3/YAMAHA 0.40 kW 0.013 ~ 0.015 Ω at 20°C (68°F) 10.0 mm (0.39 in)	3.5 mm (0.14 in)
Spring force Commutator diameter Mica undercut	5.52 ~ 8.28 N (563 ~ 844 gf, 19.85 ~ 29.78 oz) 22.0 mm (0.87 in) 1.5 mm (0.06 in)	21.0 mm (0.83 in)

ELECTRICAL SPECIFICATIONS



Item	Standard	Limit
Starter relay Model/manufacturer Amperage rating Coil winding resistance	A4616-051/JIDECO 180 A 4.18 ~ 4.62 Ω	•••
Headlight relay Headlight relay Model/manufacturer Coil resistance	G8HN-1C4T-DJ-Y52/OMRON 94.5 Ω ~ 115.5 Ω	•••
Circuit breaker Type Amperage for individual circuit Fuse Reserve	Fuse 15 A × 1 15 A × 1	•••

SPEC U

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TIGHTENING TORQUES ENGINE TIGHTENING TORQUES

Part to be tightened	Part	Thread	Q'ty	Tight	Tightening torque		Remarks
Tart to be tightened	name	size	G ty	Nm	m•kg	ft•lb	riemarks
Cylinder head (upper)	Bolt	M8	4	24	2.4	18	— [E]
					NOTE		
Cylinder head	Bolt	M8	2	20	2.0	15	
Camshaft lock plate	Bolt	M6	2	8	0.8	5.9	⊣ (
Cylinder head side cover (1 and 2)	Bolt	M55	2	18	1.8	13	
Cylinder head side cover 3	Bolt	M6	2	10	1.0	7.4	
Cylinder head breather plate	Bolt	M6	2	10	1.0	7.4	⊣ (10
Spark plug		M12	1	18	1.8	13	
Cylinder head stud bolt	Stud bolt	M8	2	15	1.5	11	
Oil gallery bolt	Bolt	M6	1	7	0.7	5.2	
Carburetor joint	Bolt	M6	2	10	1.0	7.4	
Plate, 2	Bolt	M6	2	12	1.2	8.9	
Cylinder	Bolt	M6	2	10	1.0	7.4	
Left crankcase cover	Bolt	M6	9	10	1.0	7.4	
Pickup coil rotor	Bolt	M10	1	60	6.0	44	
Balancer weight gear	Nut	M12	1	55	5.5	41	Use a lock
l.,							washer.
Valve clearance adjusting locknut	Nut	M6	2	14	1.4	10	
Camshaft sprocket	Bolt	M10	1	60	6.0	44	
Timing chain tensioner	Bolt	M6	2	10	1.0	7.4	
Timing chain tensioner cap bolt	Bolt	M6	1	8	0.8	5.9	
Timing chain guide (intake side)	Bolt	M6	2	8	0.8	5.9	⊣ ©
Oil filter element cover	Bolt	M6	3	10	1.0	7.4	
Oil delivery pipe	Union bolt	M10	1	20	2.0	15	
Oil delivery pipe and cylinder	Union bolt	M8	1	17	1.7	13	
Oil pump assembly	Screw	M6	3	6	0.6	4.4	⊣ (5)
Carburetor joint clamp screw (front)	Screw	M4	2	4	0.4	3.0	
Carburetor joint clamp screw (rear)	Screw	M4	1	4	0.4	3.0	
Exhaust pipe nut	Nut	M8	2	18	1.8	13	
Muffler joint	Bolt	M8	1	20	2.0	15	
Muffler	Bolt	M8	2	34	3.4	25	
Left crankcase cover	Bolt	M5	1	7	0.7	5.2	⊣ ©
Right crankcase cover	Bolt	M6	13	10	1.0	7.4	
Crankcase	Bolt	M6	12	10	1.0	7.4	
Oil drain bolt	Bolt	M12	1	20	2.0	15	
Ground lead, clutch cable holder	Bolt	M6	1	10	1.0	7.4	
Neutral switch lead clamp	Bolt	M6	1	10	1.0	7.4	
Starter idle gear cover	Bolt	M6	3	10	1.0	7.4	
Starter clutch	Bolt	M8	3	30	3.0	22	⊣ ©
Primary drive gear nut	Nut	M16	1	80	8.0	59	Use a lock
							washer.

TIGHTENING TORQUES



Part to be tightened	Part	Thread	d Q'ty	Tight	ening to	orque	Remarks	
Fait to be lightened	name	ame size		Nm	m•kg	ft•lb	nemarks	
Clutch boss nut	Nut	M16	1	75	7.5	55	Use a lock	
							washer.	
Clutch spring	Screw	M6	5	8	0.8	5.9		
Push lever adjusting screw locknut	Nut	M6	1	8	0.8	5.9		
Push lever shaft	Bolt	M8	1	12	1.2	8.9		
Chain case cover	Bolt	M10	2	10	1.0	7.4		
Drive sprocket nut	Nut	M18	1	110	11.0	81	Use a lock	
							washer.	
Stopper lever	Bolt	M6	1	10	1.0	7.4	-1 (t)	
Shift pedal	Bolt	M6	1	10	1.0	7.4		
Neutral switch	_	M10	1	20	2.0	15		
Starter motor	Bolt	M6	2	10	1.0	7.4		
Stator coil	Bolt	M6	3	10	1.0	7.4	-1 (0	
Pickup coil	Bolt	M6	2	10	1.0	7.4	-10	

NOTE: __

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

TIGHTENING TORQUES

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CHASSIS TIGHTENING TORQUES

Dout to be tightened	Thursd size	Tight	ening to	orque	Damada
Part to be tightened	Thread size	Nm	m•kg	ft•lb	Remarks
Engine upper stay and frame	M8	33	3.3	24	
Engine upper stay and engine	M10	66	6.6	49	
Engine lower stay and engine	M10	40	4.0	30	
Engine and frame	M10	66	6.6	49	
Engine lower stay and frame	M8	33	3.3	24	
Swingarm pivot shaft and frame	M14	100	10	74	
Rear shock absorber and frame	M12	55	5.5	41	
Rear shock absorber locknut	M20	42	4.2	31	
Rear axle pinch bolt	M8	21	2.1	15	
Front shock absorber and frame	M10	48	4.8	35	
Front shock absorber and lower front arm	M10	48	4.8	35	
Upper front arm and frame	M10	45	4.5	33	
Lower front arm and frame	M10	45	4.5	33	
Steering stem and frame	M10	35	3.5	26	
Steering stem bushing and frame	M8	23	2.3	17	Use a lock
					washer.
Steering stem and handlebar holder	M8	20	2.0	15	
Tie-rod end and locknut	M10	15	1.5	11	
Steering knuckle and front wheel hub	M14	70	7.0	52	
Steering knuckle and front arm (upper and	M10	25	2.5	18	
lower)					
Steering knuckle and tie-rod ball joint	M10	25	2.5	18	
Steering stem and tie-rod ball joint	M10	25	2.5	18	
Fuel tank and fuel cock	M6	4	0.4	3.0	
Fuel tank and frame	M6	7	0.7	5.2	
Front wheel and front wheel hub	M10	45	4.5	33	
Steering knuckle and front brake caliper bracket	M8	28	2.8	21	
Front brake disc and front wheel hub	M8	28	2.8	21	- (0
Rear axle and rear wheel hub	M14	120	12	89	
Rear brake caliper and brake caliper bracket	M8	34	3.4	25	
Rear wheel and rear wheel hub	M10	45	4.5	33	
Driven sprocket and sprocket bracket	M10	55	5.5	41	
Front brake pipe nut	M10	19	1.9	14	
Front brake master cylinder and handlebar	M6	7	0.7	5.2	
Clutch lever holder and handlebar	M5	4	0.4	3.0	
Parking brake assembly and clutch lever holder	M6	7	0.7	5.2	

TIGHTENING TORQUES



Part to be tightened	Thread size	Tight	ening to	Remarks	
Fait to be tightened	Tilleau Size	Nm	m•kg	ft•lb	nemarks
Front brake master cylinder and brake lever	M6	6	0.6	4.4	- (s)-
Throttle assembly and handlebar	M5	4	0.4	3.0	
Front brake master cylinder and brake hose	M10	27	2.7	20	
Brake hose joint and frame	M6	10	1.0	7.4	
Bleed screw	M8	5	0.5	3.7	
Front brake pad retaining bolt	M10	17	1.7	13	
Front brake caliper and brake hose	M10	27	2.7	20	
Rear brake caliper retaining bolt	M8	17	1.7	13	
Parking brake case and caliper	M8	22	2.2	16	-10
Rear axle ring nut	M33	140	14	103	-10
Rear axle ring nut set bolt	M6	7	0.7	5.2	-10
Rear brake pad retaining bolt	M8	17	1.7	13	Use a lock
					washer.
Rear brake caliper and brake hose	M10	31	3.1	23	
Rear brake master cylinder and frame	M8	20	2.0	15	
Rear brake master cylinder and brake hose	M10	31	3.1	23	
Parking brake adjusting bolt and locknut	M8	15	1.5	11	
Rear brake disc and brake disc bracket	M8	28	2.8	21	-10
Rear brake fluid reservoir, cover and bracket	M6	7	0.7	5.2	
Front bumper and frame	M8	31	3.1	23	
Front fender stay and frame	M6	7	0.7	5.2	
Side cover and frame	M6	7	0.7	5.2	
Rear fender and frame	M6	7	0.7	5.2	
Rear fender, air filter case and frame	M6	7	0.7	5.2	
Rear fender and rear fender stay	M6	7	0.7	5.2	
Front fender stay and front fender	M6	7	0.7	5.2	
Rear carrier bar and frame	M8	31	3.1	23	
Footrest and frame	M10	73	7.3	54	
Foot protector stay foot protector	M6	7	0.7	5.2	
Foot protector stay foot protector	M5	6	0.6	4.4	
Foot protector stay and frame	M8	17	1.7	13	
Foot protector stay and footrest	M8	17	1.7	13	
Battery cover, air filter case and frame	M6	7	0.7	5.2	
Headlight and frame	M6	7	0.7	5.2	
Tail/brake light bracket and air filter case	M6	4	0.4	3.0	
Drive chain guide roller and frame	M8	23	2.3	17	
Engine skid plate and frame	M6	7	0.7	5.2	

HOW TO USE THE CONVERSION TABLE/ GENERAL TIGHTENING TORQUE SPECIFICATIONS

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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 \times 0.03937 = ** in

2 mm \times 0.03937 = 0.08 in

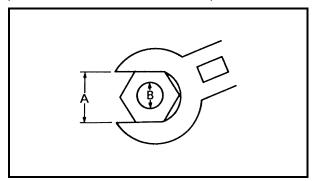
CONVERSION TABLE

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

LUBRICATION POINTS AND LUBRICANT TYPES



FBS0002

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	⊸ E
Piston pin	Ē
Piston surface	⊸ €
Boss periphery	⊸ E
Valve stems (intake and exhaust)	_@
Valve stem ends (intake and exhaust)	– ©
Rocker arm shafts (intake and exhaust)	⊸ E
Camshaft	
Valve rocker arms	
Oil pump rotors (inner and outer) and oil pump housing and shaft	Ē
Starter idler gears 1	⊸ €
Starter idler gears 2	⊸ €
Starter wheel gear	⊸ (E
Push rods	
Clutch housing (primary driven gear)	⊸ €
Push lever shaft	Ē
Push rod ball	
Drive axle	–
Main axle	→®
Transmission gears (inside and end)	⊸ @
Shift fork guide bar	⊸ E
Shift drum	⊸(E)
Shift shaft	⊸ €

LUBRICATION POINTS AND LUBRICANT TYPES

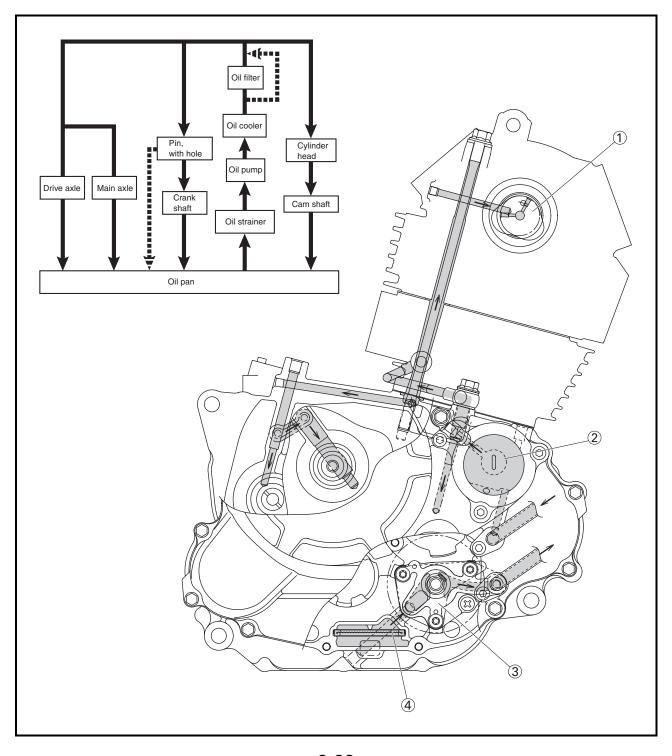


Lubrication point	Lubricant
Crankcase mating surfaces	Sealant (Three Bond No.1215 [®]) Yamaha bond No.1215
AC magneto lead grommet (AC magneto cover)	Sealant (Three Bond No.1215 [®]) Yamaha bond No.1215

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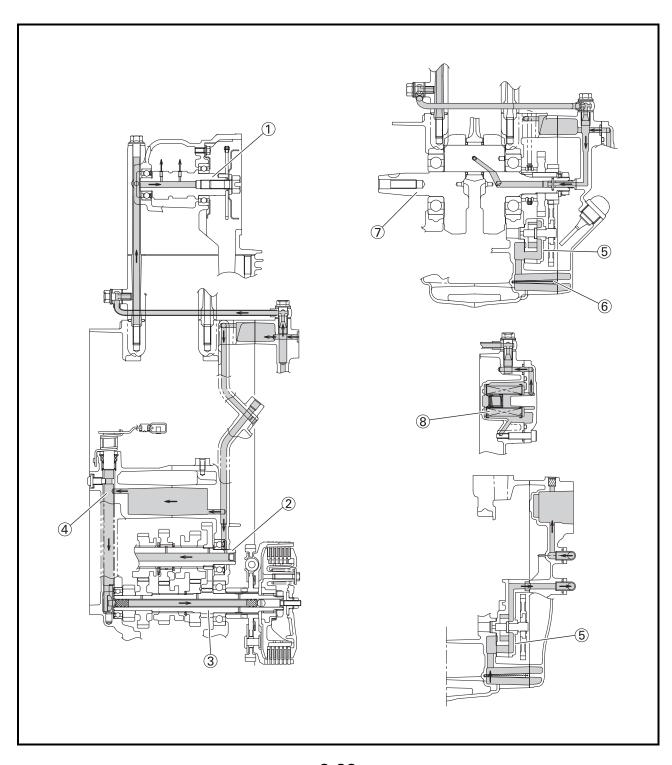
OIL FLOW DIAGRAMS

- ① Camshaft
- ② Oil filter element ③ Oil pump
- 4 Oil strainer

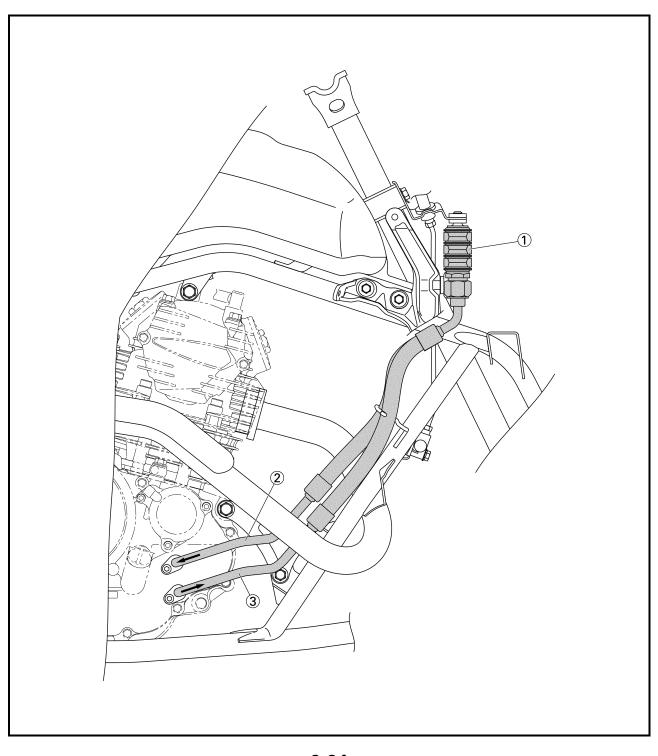


OIL FLOW DIAGRAMS

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



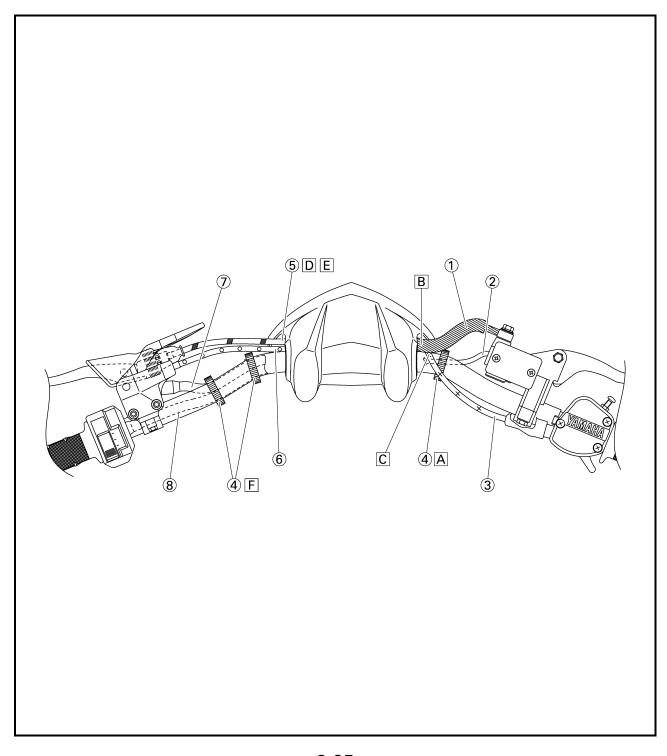
- ① Oil cooler ② Oil hose 1 ③ Oil hose 2



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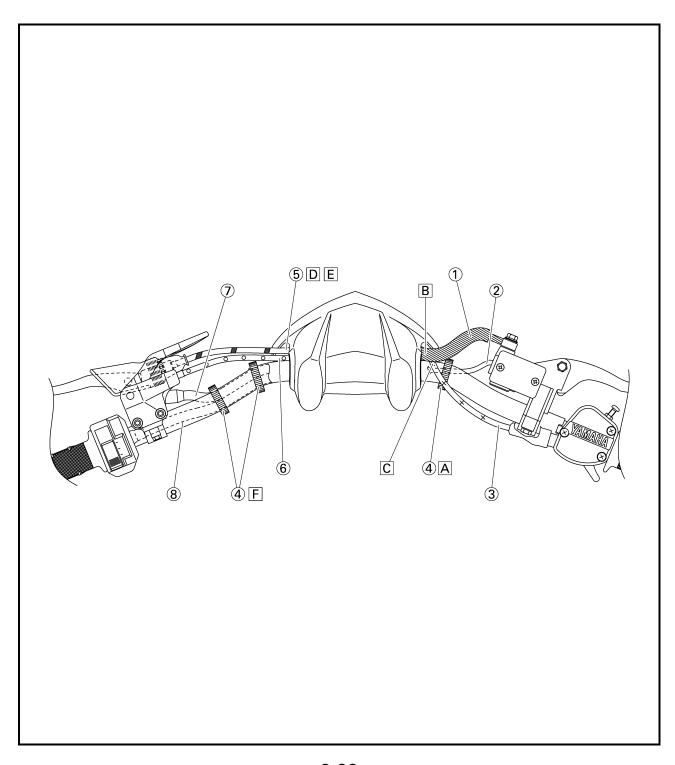
- 1 Front brake hose
- 2 Front brake flose
 3 Throttle cable
 4 Plastic band
 5 Clutch cable

- 6 Parking brake cable
 7 Clutch switch lead
- 8 Handlebar switch lead





- bends of handlebar.
- B Route the front brake hose and throttle cable through the guide of the handlebar protector.
- C Route the throttle cable under the front brake hose.
- D Route the clutch cable and parking brake cable through the guide of the handlebar protector.
- E Route the clutch cable in front of the parking brake cable.
- A Clamp the front brake light switch lead at the F Clamp the clutch switch lead and handlebar switch lead at the bends of handlebar.

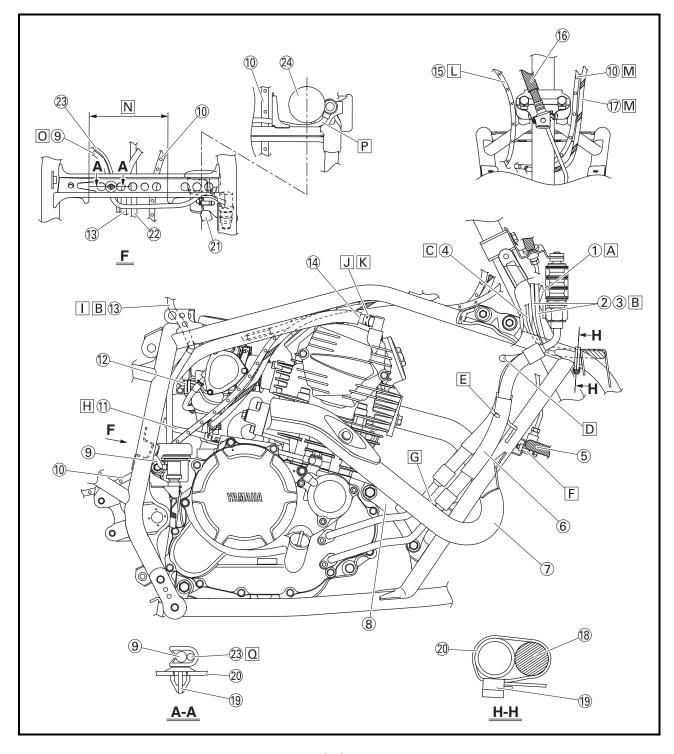




- ① Indicator light lead ② Main switch lead ③ Coupler joint
- (4) Front brake light switch lead
- 5 Front brake hose 2
- 6 Oil cooler hose 1, 2
- (7) Exhaust pipe
- 8 Engine bracket
- 9 Rear brake light switch lead
- 10 Parking brake cable
- (11) Battery negative lead

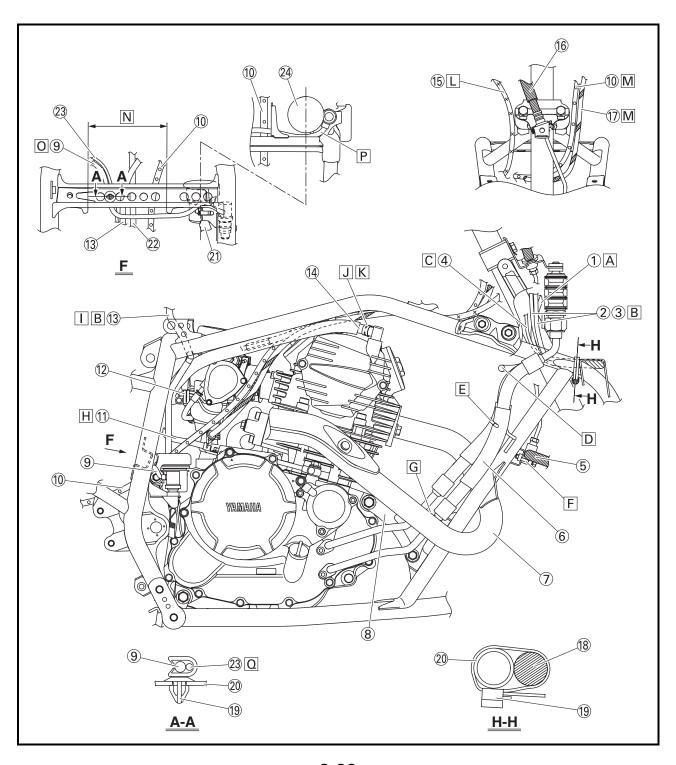
- (12) Carburetor warmer lead
- (13) Air vent hose
- (14) Air filter case breather hose
- (15) Throttle cable
- (16) Front brake hose 1
- (17) Clutch cable
- (18) Main harness
- (19) Clamp
- 20 Frame complete
- 2) Rear brake reservoir hose
- (2) Carburetor overflow hose

- 23 Neutral switch lead
- Rear brake reservoir cover



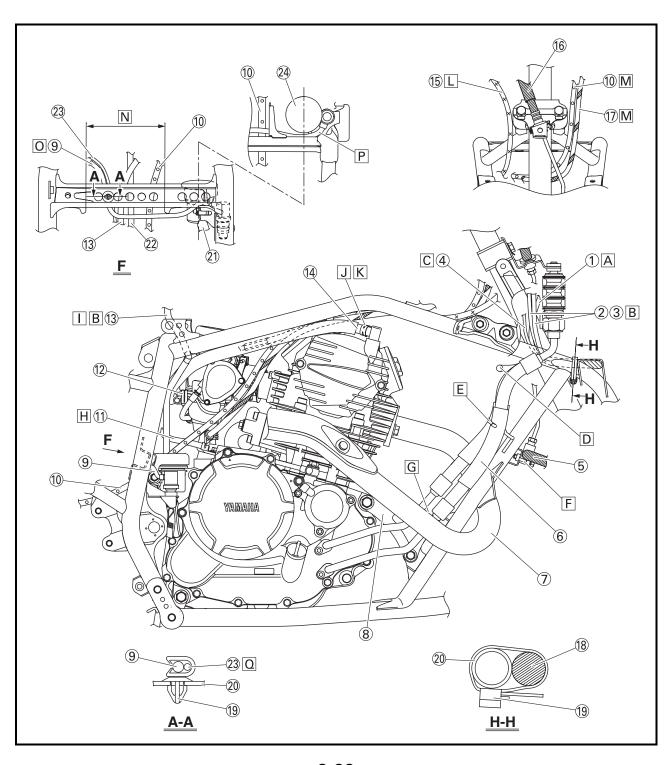


- A To the front panel
- B To the front fender
- C To the handlebar
- D To the right headlight
- E Make sure to route the oil cooler hoses 1 and 2 through the guide wire.
- F Install the front brake hose 2, making sure to face the white paint mark forward.
- G Route the oil cooler hose 1 and 2 between the exhaust pipe and the engine bracket.
- H Route the battery negative lead behind the clutch cable holder.
- Route the air vent hose through the bracket.
- J Make sure that the white paint mark on the air filter case breather hose
- K Make sure that the clip end is facing the left side of the vehicle.
- Route the throttle cable under the cross pipe and left of the steering column as shown in the illustration.

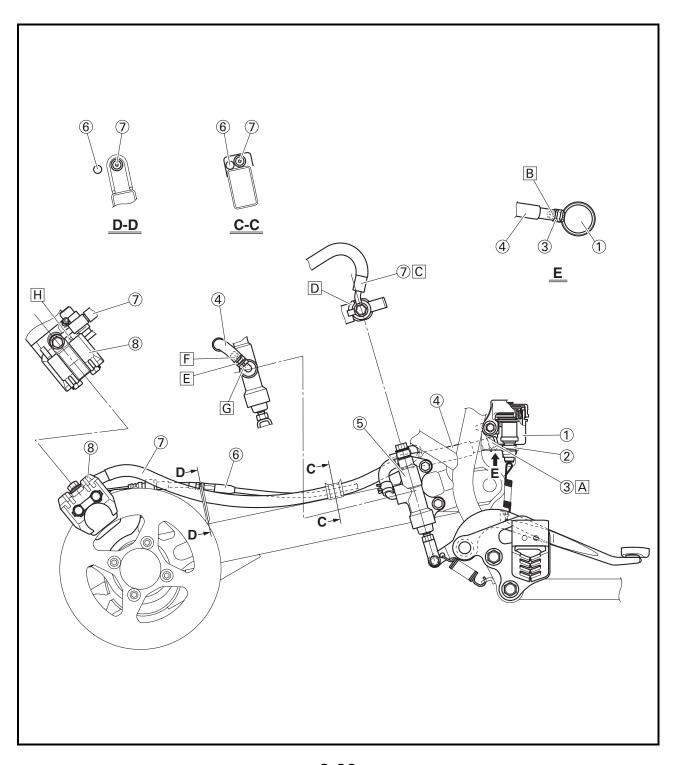




- under the cross pipe and right of the steering column as shown in the illustration.
- N Route the rear brake light switch lead, neutral switch lead, air vent hose, carburetor overflow hose and parking brake cable through the bracket.
- O Route the rear brake light switch lead under the bracket.
- P Route the rear brake light switch lead between the bracket and rear brake reservoir tank.
- M Route the parking brake cable and the clutch cable Q Route the neutral switch lead and rear brake light switch lead as shown in the illustration.

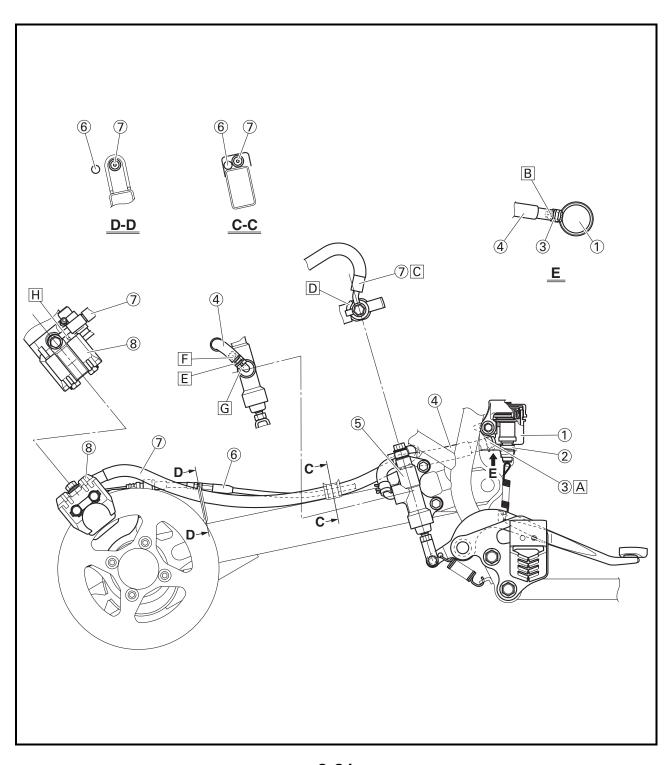


- 1 Rear brake reservoir
 2 Rear brake light switch
 3 Clip
 4 Rear brake reservoir hose
 5 Rear brake master cylinder
 6 Parking brake cable
 7 Rear brake hose
 8 Rear brake caliper





- A Make sure that the end of the clip is facing down-
- B Set the rear brake reservoir hose with the positioning yellow paint mark pointing down.
- C Install the rear brake hose in the direction shown in H When installing the rear brake hose, make sure the illustration.
- D Insert the rear brake hose until it contacts the projection.
- E Make sure that the end of the clip is facing outward.
- F Install the rear brake reservoir hose, making sure to face the white paint mark outward.
- G Insert the rear brake reservoir hose until it contacts the projection.
- that the metal part on the rear brake Inlet hose is touching the stopper of the rear caliper.

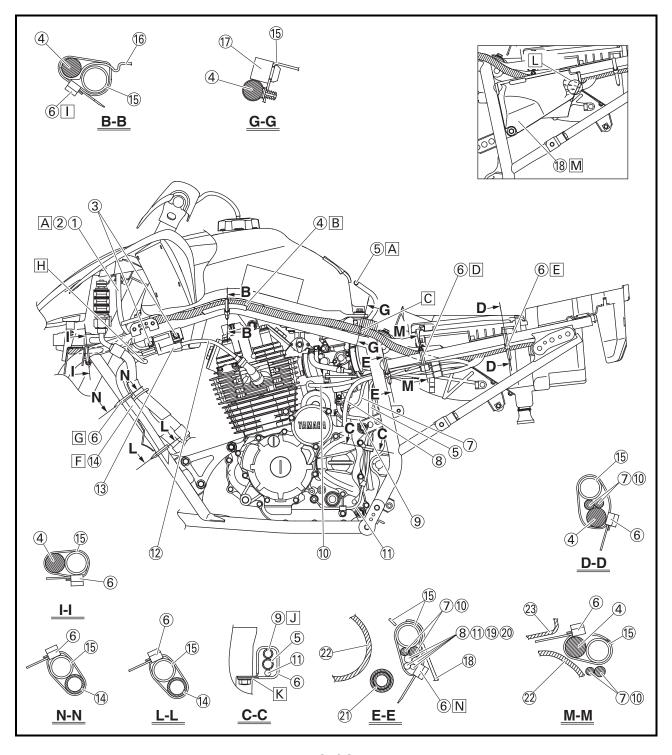




- 1 Clutch switch lead 2 Handlebar switch lead 3 Bolt
- 4 Main harness
- 5 Air vent hose 6 Clamp
- Battery negative lead
- 8 AC magneto lead
- (9) Carburetor overflow hose
- (10) Starter motor lead

- (11) Neutral switch lead
- 12 Ignition coil spark plug lead
- 13 Ignition coil
- 14 Drain hose
- 15 Frame complete
- (16) Damper plate
- (17) Seat pad
- 18 Cover
- 19 Rear brake light switch lead
- 20 Carburetor warmer lead

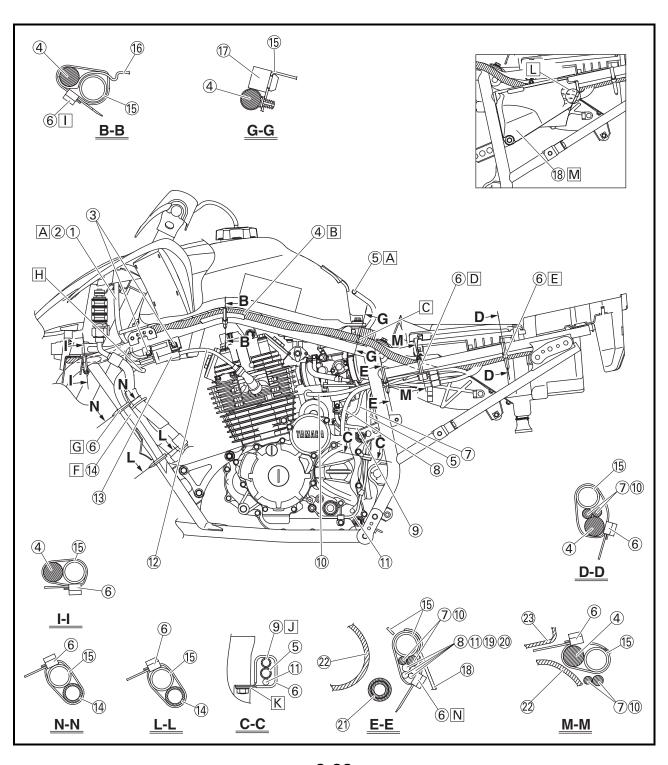
- (21) Air filter case breather hose
- 2 Air filter joint
- 23 Air filter case





- A To the front fender
- B Route the wire harness above the guide for the damper plate.
- C Fix point for wire harness
- D Clamp near the hook of the air filter.
- E Clamp near the edge of the air filter case.
- F Route the drain hose in front of the left oil cooler hose.
- G Clamp on top of the frame bracket.
- H To the left headlight
- Route the clamp through the damper plate hole.

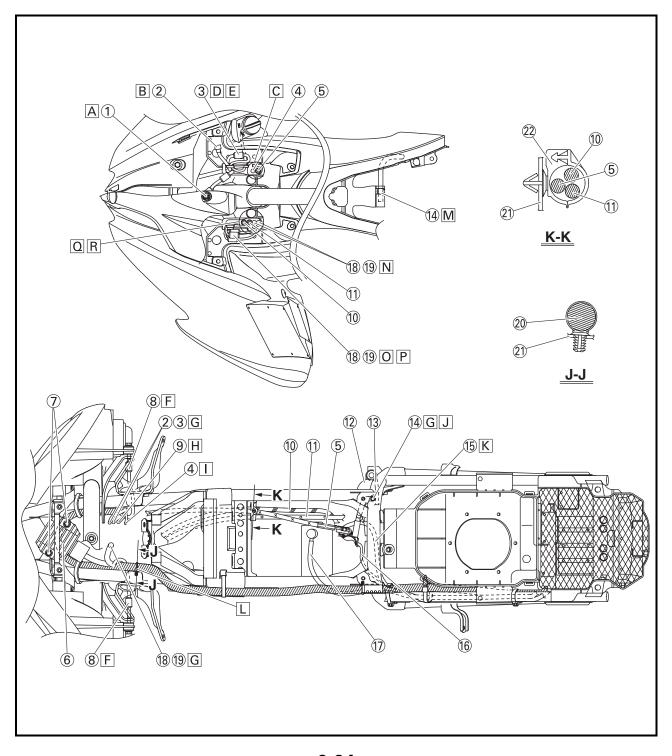
- J Route the carburetor overflow hose as shown in the illustration.
- K Fasten the clamp with the engine.
- Route the leads on the upper inside of the cover.
- M Place the couplers on the inside of the cover.
- N Route the clamp through the frame bracket.



SPEC

- 1 Indicator light
 2 Coupler joint
 3 Main switch lead
- (4) Front brake light switch lead
- 5 Throttle cable 6 Regulator
- 7 Flange bolt
- 8 Headlight lead
- 9 Indicator light lead
- (10) Clutch cable
- (1) Parking brake cable

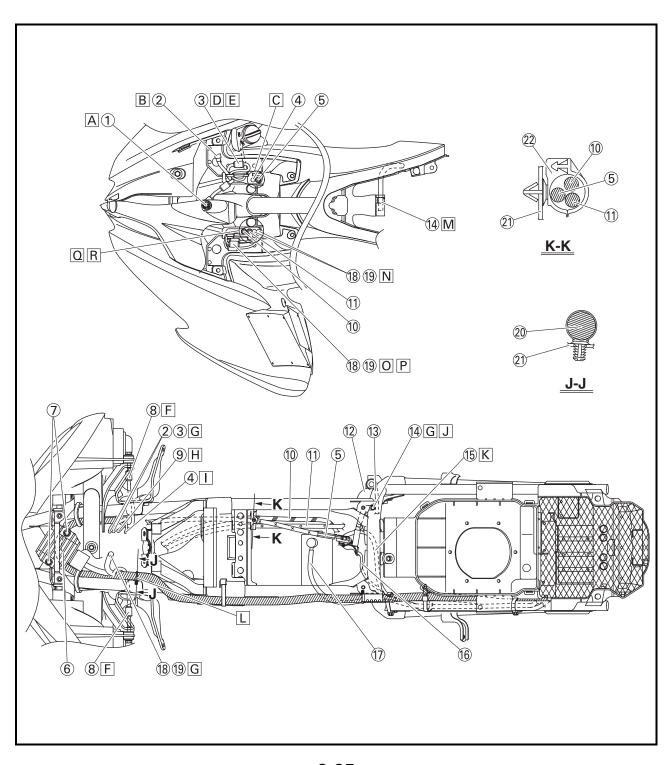
- (12) Rear brake reservoir
- (13) Rear brake light switch lead
- (14) Air vent hose
- 15 Battery negative lead
- (16) Carburetor warmer lead
- (17) Starter motor lead
- (18) Clutch switch lead
- (19) Handlebar switch lead
- 20 Main harness
- 2) Frame complete
- 22 Clamp



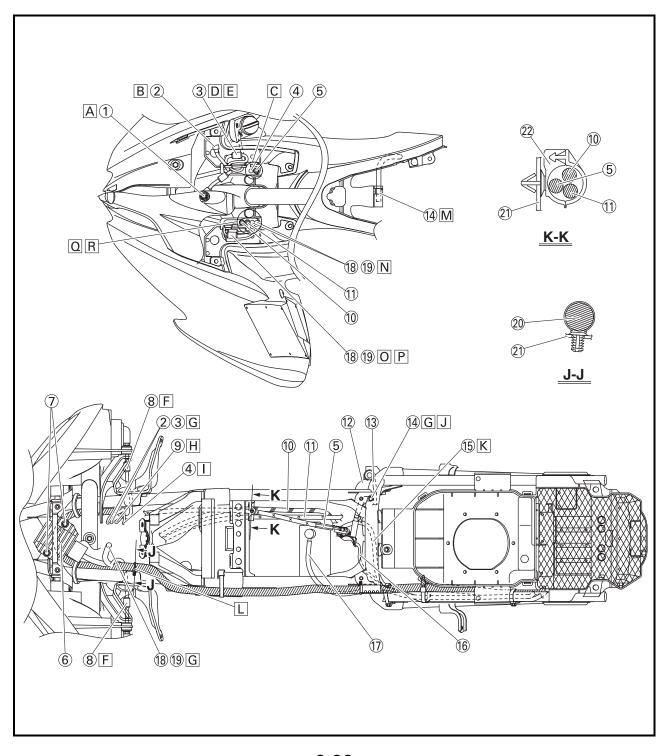


- A Install the indicator light as shown in the illustra-
- B Place the coupler joint above the front fender.
- Route the front brake light switch lead and throttle cable through the guide.
- D Connect the main switch lead on top of the front fender.
- E Route both leads from the front.
- F Route the headlight lead under the frame.
- G To the front fender
- H To the front panel

- To the handlebar
- J Route the air vent hose through the bracket.
- K Route the battery negative lead behind the clutch cable holder.
- L Fix point for wire harness
- M Insert the air vent hose into the fender.
- N Route the clutch switch lead and handlebar switch lead on the box shaped part.
- O Connect the clutch switch lead and handlebar switch lead on top of the front fender.
- P Route the wire harness from the front.



- Q Route the cables and leads through the guide of the front fender.
- Route the leads behind the clutch and parking brake cable.

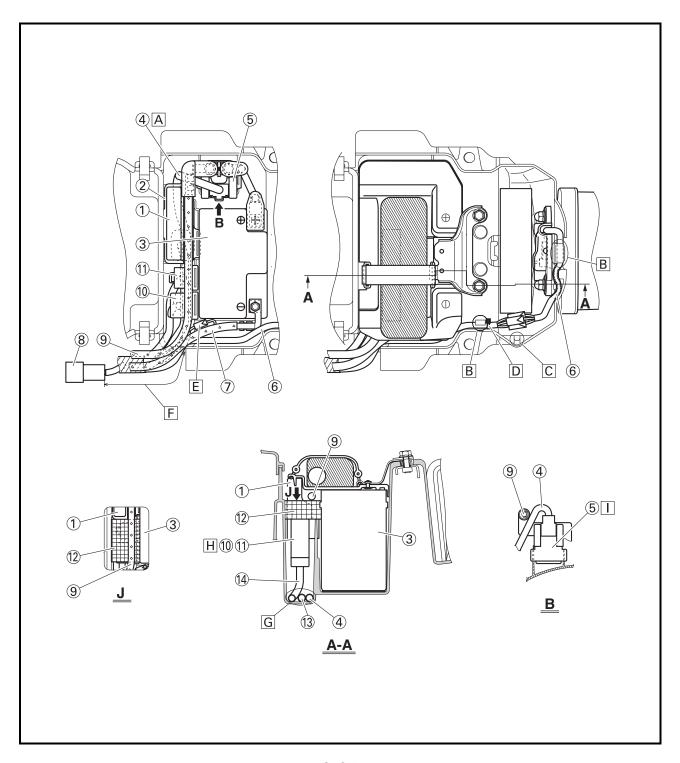




- 1 CDI unit
 2 Band
 3 Battery
 4 Starter relay lead
 5 Starter relay
 6 Taillight lead
 7 Battery negative lead
 8 AC magneto coupler
 9 Starter motor lead
 10 Headlight relay
 11 Neutral relay

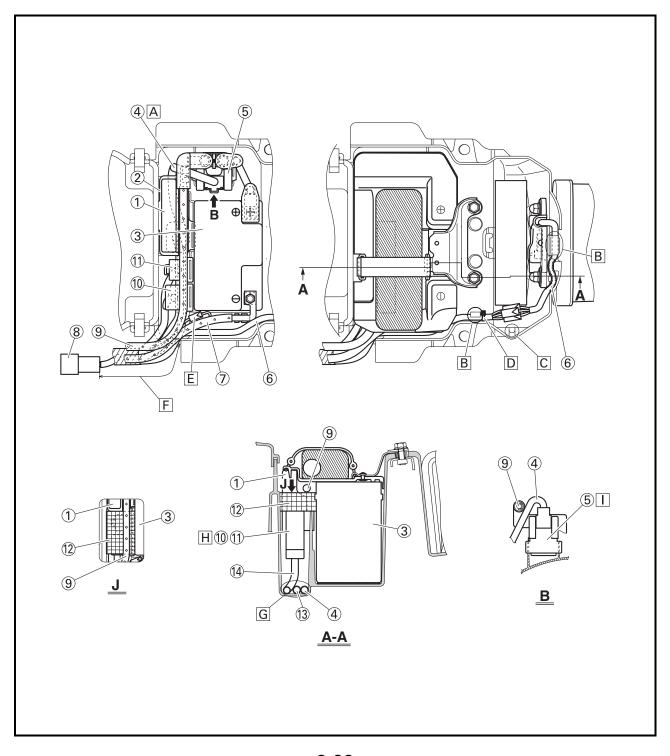
- (1) Neutral relay

- 12 Damper
- 13 CDI unit lead
- 14 Relay lead





- motor lead.
- B Clamp the taillight lead.
- C Do not clamp.
- D When clamping the wire harness, make sure that the insulator lock is behind the clamp.
- E After connecting the battery negative lead, push the sag in the box.
- A Route the starter relay lead under the starter F After connecting the taillight lead and each electric part, the length between the air filter and AC magneto coupler should be 185 mm (7.28 in) on straight line.
 - G There is no particular order in placing each lead.
 - H Insert each relay all the way into the rib on the air
 - Insert the starter relay all the way into the rib on the air filter side.



INTRODUCTION/PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

CHK ADJ



EBS00029

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

- 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.

							INITIAL		EVI	ERY
		ITEM CHECK OR MAINTENANCE JOB	Whichever	month	1	3	6	6	12	
N	0.			comes first	km (mi)	320 (200)	1300 (800)	2500 (1600)	2500 (1600)	5000 (3200)
				V	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.			V	√	√	√	√
3	*	Valves	Check valve clearance and according to the control of the con	djust if necessary		√		√	√	√
4	*	Carburetor	Check starter (choke) operatiCheck engine idling speed an				√	√	√	√
5	*	Crankcase breather system	Check breather hose for crack replace if necessary.	ks or other dama	ge, and			√	√	√
6	*	Exhaust system	Check for leakage and replace gasket(s) if necessary. Check for looseness and tighten all screw clamps and joints if necessary.					V	√	V
7		Spark arrester	Clean.					√	√	√

GENERAL MAINTENANCE AND LUBRICATION CHART





GENERAL MAINTENANCE AND LUBRICATION CHART

							INITIAL		EVI	RY
				Whichever	month	1	3	6	6	12
NC	Э.	ITEM	CHECK OR MAINTENANCE JOB	comes first	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 necessar	ry.	<u> </u>	Every 20	0 ~ 40 hou	rs (more of areas)	ften in wet	or dusty
2	*	Clutch	Check operation and adjust if	necessary.		√		√	V	V
3	*	Front brake	Check operation and correct Check fluid level and ATV for necessary.	•	d correct if	V	V	√	V	√
			Replace brake pads.				Whenev	er worn to	the limit	
4	*	Rear brake	Check operation and correct Check fluid level and ATV for necessary.		d correct if	V	V	V	√	V
			Replace brake pads.				Whenev	er worn to	the limit	
5	*	Brake hoses	 Check for cracks or other dan sary. 	nage, and replace	e if neces-		√	V	$\sqrt{}$	\checkmark
			Replace.				E,	very 4 yea	rs	
6	*	Parking brake	Check operation and adjust if	necessary.		√	√	√	√	√
7	*	Wheels	Check runout and for damage	e, and replace if n	ecessary.	√		√	√	√
8	*	Tires	Check tread depth and for da sary.Check air pressure and balan			V		V	V	V
9	*	Wheel hub bearings	Check for looseness or dama	ge, and replace if	necessary.	√		√	√	√
10	*	Swingarm pivots	 Check operation and for exce ings if necessary. Lubricate with lithium-soap-base 		place bear-			V	V	V
11	*	Upper and lower arm pivots	Lubricate with lithium-soap-ba	ased grease.				V	V	V
12		Drive chain	 Check chain slack and adjust Check rear wheel alignment a Clean and lubricate. 	•	essary.	V	V	V	√	V
13	*	Drive chain rollers	Check for wear and replace if	necessary.				V	V	√
14	*	Chassis fasteners	Make sure that all nuts, bolts, tightened.	and screws are p	oroperly	V	V	V	V	V
15	*	Shock absorber assemblies	Check operation and correct Check for oil leakage and rep	•				V	V	V
16	*	Rear suspension relay arm and connecting arm pivoting points	Check operation and correct Lubricate with lithium-soap-base	•			V	V	V	V
17	*	Steering shaft	Lubricate with lithium-soap-ba	ased grease.				V	√	V
18	*	Steering system	Check operation and repair oCheck toe-in and adjust if ned		ged.	√	√	V	V	√
19	*	Engine mount	Check for cracks or other dan sary.	nage, and replace	e if neces-			V	V	V
20		Engine oil	Change.Check ATV for oil leakage, an	d correct if neces	sary.	V		V	V	V
21		Engine oil filter element	Clean or replace if necessary	•		√		√		√
22	*	Moving parts and cables	Lubricate.				√	V	√	√
23	*	Throttle lever housing and cable	Check operation and correct Check throttle cable free play Lubricate throttle lever housing	and adjust if nec	essary.	V	V	V	V	V
24	*	Front and rear brake switches	Check operation and correct	f necessary.		√	V	V	V	√
25	*	Lights and switches	Check operation and correct Adjust headlight beams.	f necessary.		√	V	V	V	V

GENERAL MAINTENANCE AND LUBRICATION CHART



	_	_	_	
N	റ	т	F	•

- 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.

Λ	W	ΔR	NI	NG
• 1			_	

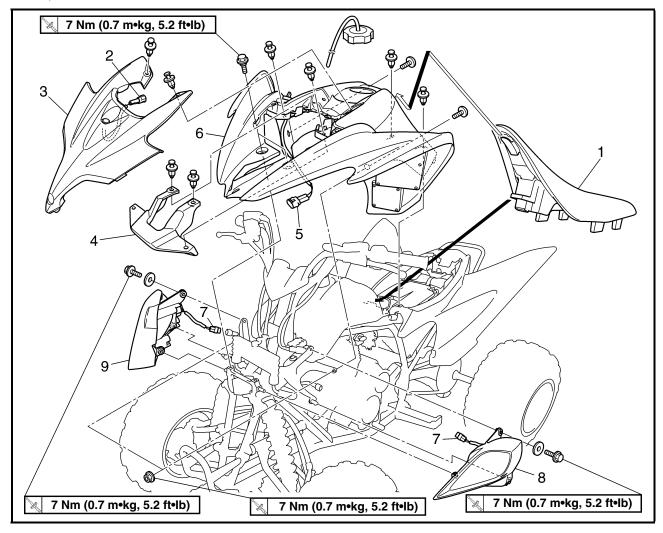
Indicates a potential hazard that could result in serious injury or death.



EBS00033

SEAT, FENDERS AND FUEL TANK

SEAT, FRONT FENDER AND HEADLIGHTS

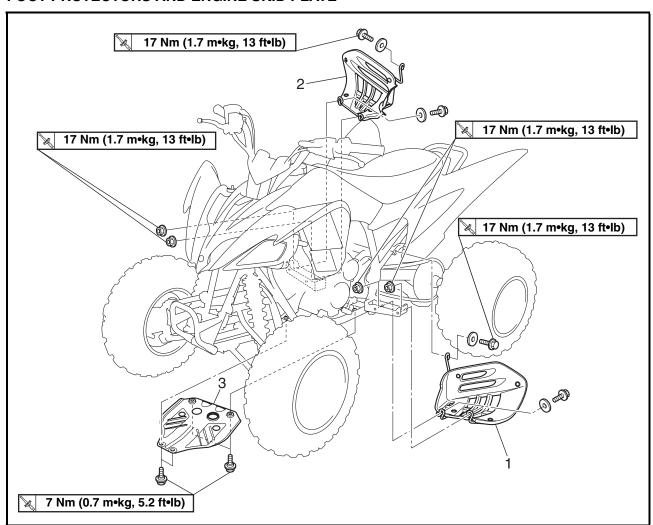


Order	Job/Part	Q'ty	Remarks
	Removing the seat, front fender and headlights	-	Remove the parts in the order listed.
1	Seat	1	NOTE:
			Pull back the seat lock lever, than pull up on the rear of the seat.
2	Indicator light coupler	1	Disconnect.
3	Front panel	1	
4	Plate	1	
5	Main switch coupler	1	Disconnect.
6	Front fender	1	
7	Headlight coupler	2	Disconnect.
8	Left headlight	1	
9	Right headlight	1	
			For installation, reverse the removal procedure.



EBS00034

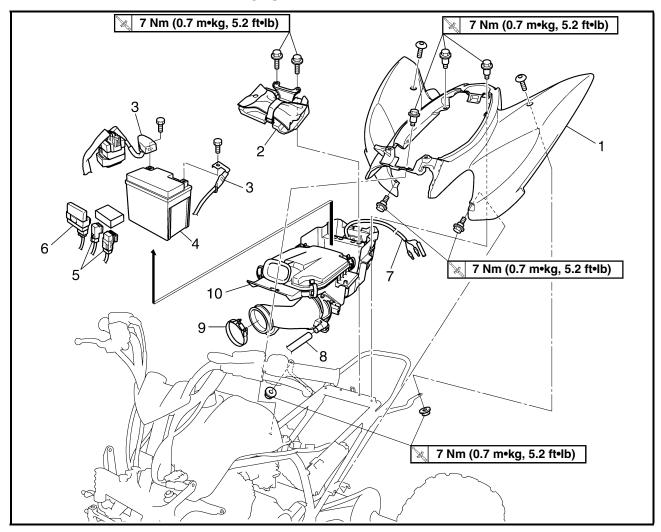
FOOT PROTECTORS AND ENGINE SKID PLATE



Order	Job/Part	Q'ty	Remarks
	Removing the foot protectors and		Remove the parts in the order listed.
	engine skid plate		
1	Left foot protector	1	
2	Right foot protector	1	
3	Engine skid plate	1	
			For installation, reverse the removal procedure.

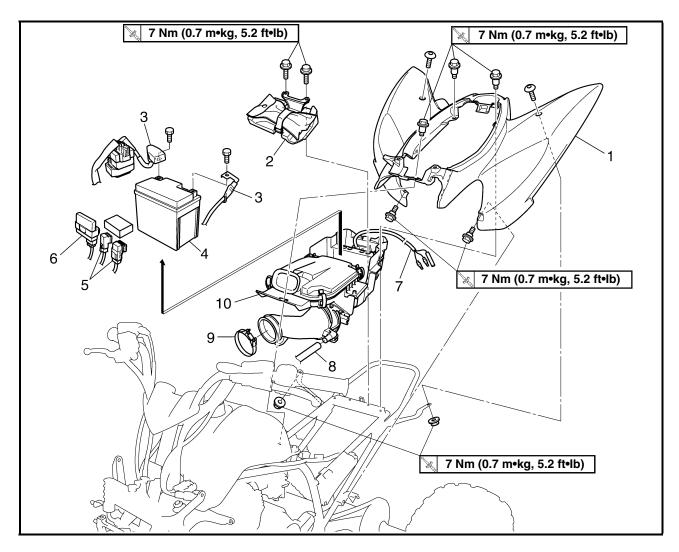
SEAT, FENDERS AND FUEL TANK

REAR FENDER AND AIR FILLTER CASE



Order	Job/Part	Q'ty	Remarks
	Removing the rear fender and air		Remove the parts in the order listed.
	fillter case		
	Seat/front fender		Refer to "SEAT, FENDERS AND FUEL TANK".
1	Rear fender	1	
2	Battery cover	1	
3	Battery lead	2	CAUTION:
			First disconnect the negative lead, then disconnect the positive lead.
4	Battery	1	
5	Relay	2	
6	CDI unit	1	
7	Tail/brake light lead	1	Disconnect.
8	Air filter case breather hose	1	Disconnect.
9	Clamp	1	Loosen.

SEAT, FENDERS AND FUEL TANK

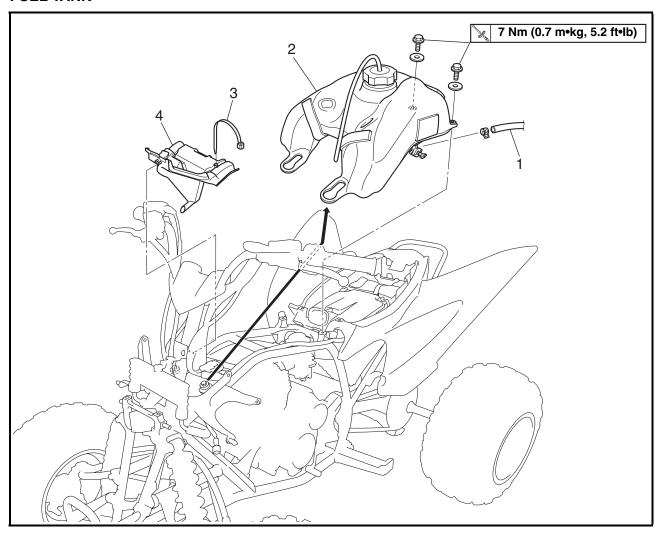


Order	Job/Part	Q'ty	Remarks
10	Air filter case	1	
			For installation, reverse the removal procedure.



EBS00042

FUEL TANK



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

ADJUSTING THE VALVE CLEARANCE



EAS00048

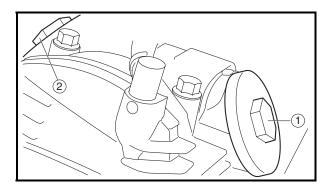
ENGINE

ADJUSTING THE VALVE CLEARANCE

The following procedure applies to all of the valves.

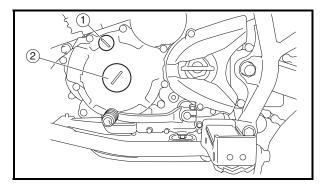
NOTE: _

- Valve clearance adjustment should be made on a cold engine, at room temperature.
- When the valve clearance is to be measured or adjusted, the piston must be at 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:

- spark plug cap
- spark plug
- cylinder head side cover 1 ①
- cylinder head side cover 2 (2)



3. Remove:

- timing mark accessing screw (1)
- crankshaft end accessing screw 2
- 4. Measure:
 - valve clearance
 Out of specification → Adjust.

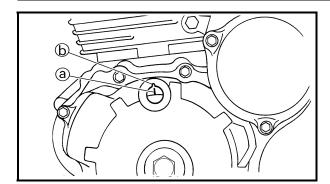


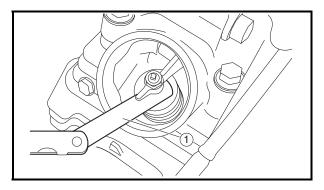
Valve clearance (cold)
Intake valve
0.05 ~ 0.10 mm
(0.0020 ~ 0.0039 in)
Exhaust valve
0.10 ~ 0.15 mm
(0.0039 ~ 0.0059 in)

ADJUSTING THE VALVE CLEARANCE









- a. Turn the crankshaft counterclockwise.
- b. When the piston is at the Top Dead Center (TDC) on the compression stroke, align the "I" mark (a) on the AC magneto rotor with the stationary pointer (b) on the crankcase cover.

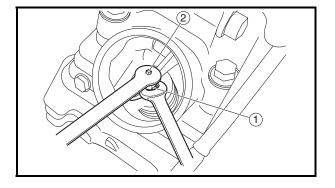
NOTE: .

Top dead center (TDC) is a point where the mark on the AC magneto rotor and the pointer on the crankcase cover match, plus at the same time, the punch mark in the camshaft sprocket and the pointer on the cylinder head match.

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
- a. Loosen the locknut (1).
- b. Insert a thickness gauge between the end of the adjusting screw and the valve stem.

c. Turn the adjusting screw ② until the specified valve clearance is obtained.



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

 Hold the adjusting screw to prevent it from moving and tighten the locknut to specification.
 14 Nm (1.4 mekg, 10 ftelb)

ADJUSTING THE VALVE CLEARANCE/ ADJUSTING THE ENGINE IDLING SPEED



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

6. Install:
• all removed parts

NOTE:

For installation, reverse the removal procedure.

EBS00051

ADJUSTING THE ENGINE IDLING SPEED

- 1. Start the engine and let it warm up for several minutes.
- 2. Attach:
 - digital tachometer (onto the ignition coil spark plug lead)



Digital tachometer 90890-06760, YU-39951-B

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

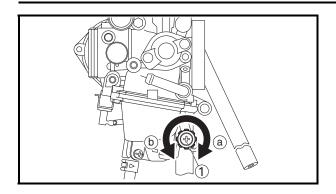


Engine idling speed 1,500 ~ 1,600 r/min

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







- 4. Adjust:
- engine idling speed

a. Turn the throttle stop screw ① in direction
② or ⑤ until the specified idling speed is obtained.

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

- 5. Remove:
 - fuel tank

NOTE: _

Slide the fuel tank.

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



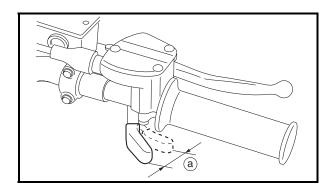
Throttle lever free play 2 ~ 4 mm (0.08 ~ 0.16 in)

EBS00052

ADJUSTING THE THROTTLE LEVER FREE PLAY

NOTE:

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.

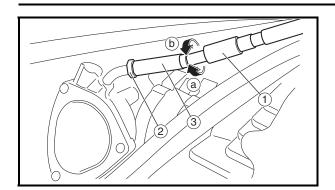


Throttle lever free play 2 ~ 4 mm (0.08 ~ 0.16 in)

ADJUSTING THE THROTTLE LEVER FREE PLAY/ ADJUSTING THE SPEED LIMITER







- 2. Adjust:
 - throttle lever free play

First step:

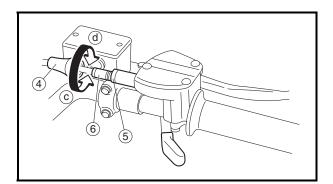
- a. Slide back the rubber cover ①.
- b. Loosen the locknut ② on the carburetor side.
- c. Turn the adjusting nut ③ in direction ⓐ or ⓑ until the correct free play is obtained.

Direction (a)	Free play is increased.
Direction (b)	Free play is decreased.

- d. Tighten the locknut.
- e. Slide the rubber cover to its original position



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



Second step:

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

Direction ©	Free play is increased.
Direction (d)	Free play is decreased.

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

A 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.

EBS00053

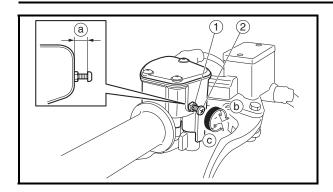
ADJUSTING THE SPEED LIMITER

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.

ADJUSTING THE SPEED LIMITER







- 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 ©	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 2 ~ 4 mm (0.08 ~ 0.16 in).

CHECKING THE SPARK PLUG

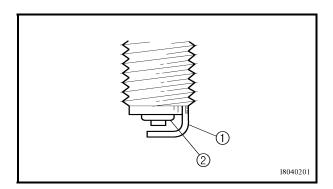


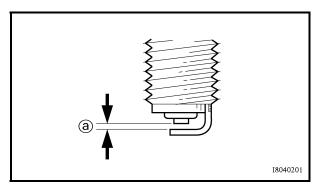
EBS00057

CHECKING THE SPARK PLUG

- 1. Disconnect:
 - spark plug cap
- 2. Remove:
 - spark plug
- 3. Check:
 - spark plug type Incorrect → Change.

Standard spark plug NGK/DR7EA





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



Spark plug gap 0.6 ~ 0.7 mm (0.024 ~ 0.028 in)

- 7. Install:
 - spark plug



Spark plug 18 Nm (1.8 m•kg, 13 ft•lb)

NOTE: _

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

- 8. Install:
 - spark plug cap

CHECKING THE IGNITION TIMING

EBS00058

CHECKING THE IGNITION TIMING

NOTE: _

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 (onto the ignition coil spark plug lead)



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

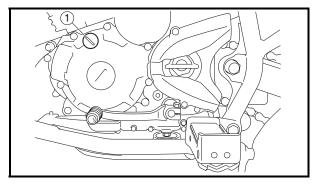
- 2. Check:
 - ignition timing

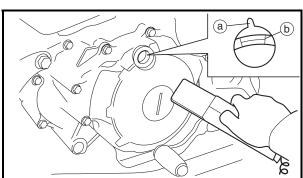
a. Warm up the engine and keep it at the specified speed.



Engine speed 1,500 ~ 1,600 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



MEASURING THE COMPRESSION PRESSURE

The following procedure applies to the cylinder.

NOTE:

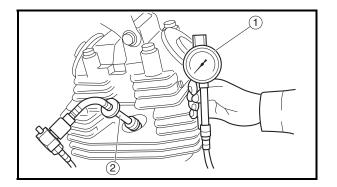
Insufficient compression pressure will result in a loss of performance.

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

ECA13340

CAUTION:

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



- 5. Install:
 - Compression gauge (1)
 - Extension (2)



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

MEASURING THE COMPRESSION PRESSURE





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



Compression pressure (standard)
1,100 kPa/720 r/min
(11.2 kgf/cm², 160 psi/720 r/min)
Compression pressure
(maximum)
1,300 kPa/720 r/min
(13.3 kgf/cm², 189 psi/720 r/min)
Compression pressure (minimum)
900 kPa/720 r/min
(9.2 kgf/cm², 131 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.

A 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 \rightarrow 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 \rightarrow Repair.			
Same as without oil	Piston, valves, cylinder head gasket or piston possibly defective → Repair.			

MEASURING THE COMPRESSION PRESSURE/ CHECKING THE ENGINE OIL LEVEL





- 7. Install:
 - Spark plug



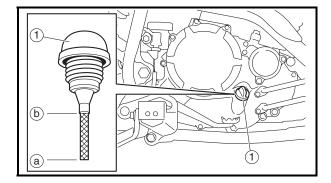
Spark plug 18 Nm (1.8 m•kg, 13 ft•lb)

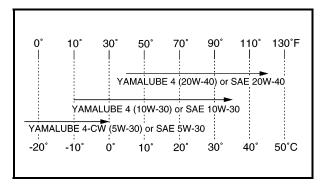
- 8. Connect:
 - Spark plug cap

EBS01101

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. Check:
 - engine oil level

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

Low oil level \rightarrow Add oil to the proper level.

NOTE: _

- Wait a few minutes until the oil settles before checking the oil level.
- Do not screw the dipstick (1) in when checking the oil level.



Recommended engine oil type YAMALUBE 4, SAE 5W-30 or SAE 10W-30 or SAE 20W-40 Recommended engine oil grade API service SG type or higher JASO standard MA

CAUTION:

- 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.

CHECKING THE ENGINE OIL LEVEL/ CHANGING THE ENGINE OIL



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

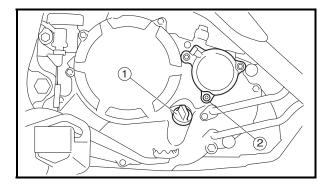
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Before checking the engine oil level, wait a few minutes until the oil has settled.

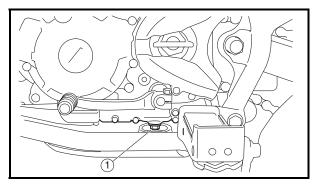
EBS0006

CHANGING THE ENGINE OIL

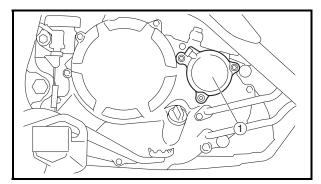
- 1. Place the machine on a level surface.
- 2. Start the engine, warm it up for several minutes, and then turn it off.
- 3. Place a container under the engine oil drain bolt.



- 4. Remove:
 - dipstick (1)
 - oil filter element drain bolt 2



- 5. Remove:
 - engine oil drain bolt (1) (along with the washer)
- 6. Drain:
 - engine oil (completely from the crankcase)



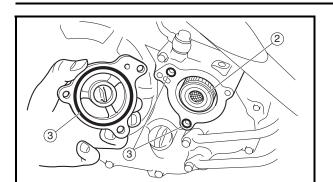
- 7. If the oil filter element is also to be replaced, perform the following procedure.
- a. Remove the oil filter element cover ① and oil filter element ②.
- b. Install new O-rings (3).
- c. Install the new oil filter element and the oil filter element cover.

🔪 10 Nm (1.0 m•kg, 7.4 ft•lb)

CHANGING THE ENGINE OIL







- 8. Install:
 - engine oil drain bolt gasket New
 - engine oil drain bolt



Engine oil drain bolt 20 Nm (2.0 m•kg, 15 ft•lb)

• oil filter element drain bolt



Oil filter element drain bolt 10 Nm (1.0 m•kg, 7.4 ft•lb)

9. Fill:

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



Periodic oil replacement
1.25 L (1.10 Imp qt, 1.32 US qt)
With oil filter element replacement
1.35 L (1.19 Imp qt, 1.43 US qt)
Engine oil quantity
Total amount
1.60 L (1.41 Imp qt, 1.69 US 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)

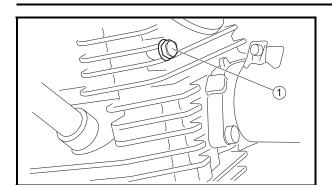
13.Check:

 engine oil level Refer to "CHECKING THE ENGINE OIL LEVEL".

CHANGING THE ENGINE OIL/ ADJUSTING THE CLUTCH CABLE





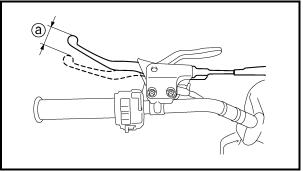


- 14.Check:
- engine oil pressure

a. Slightly loosen the oil gallery bolt ①.

- b. Start the engine and keep it idling until engine oil starts to seep from the oil gallery bolt. If no engine oil comes out after one minute, turn the engine off so that it will not seize.
- c. Check the engine oil passages, the oil filter element and the oil pump for damage or leakage. Refer to "OIL PUMP AND BLANCER WEIGHT GEAR" in chapter 4.
- d. Start the engine after solving the problem(s) and check the engine oil pressure again.
- e. Tighten the oil gallery bolt to specification.

7 Nm (0.7 m•kg, 5.2 ft•lb)



FBS0007

ADJUSTING THE CLUTCH CABLE

- 1. Check:
 - clutch lever free play (a)
 Out of specification → Adjust.



Clutch lever free play (at the clutch lever end) 5 ~ 10 mm (0.20 ~ 0.39 in)

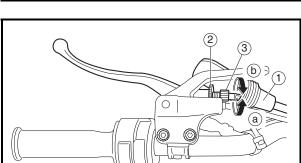
- 2. Adjust:
- clutch release lever free play

a. Slide back the lever cover (1).

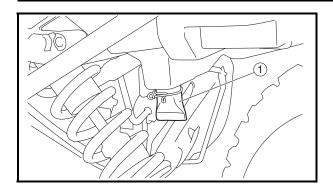
- a. Slide back the level cover
- b. Loosen the locknut ②.
- c. Turn the adjusting bolt ③ in direction ⓐ or
 b until the specified clutch cable free play is obtained.

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

- d. Tighten the locknut.
- e. Slide the rubber cover to its original position.



ADJUSTING THE CLUTCH CABLE/ CLEANING THE AIR FILTER ELEMENT



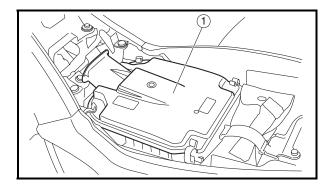
EBS00073

CLEANING THE AIR FILTER ELEMENT

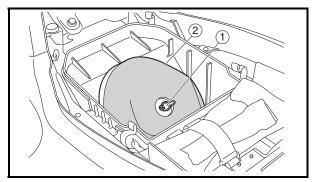
NOTE: _

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

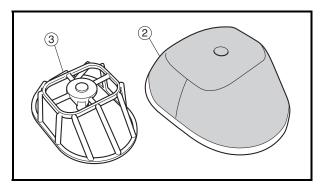


- 3. Remove:
 - wing bolt (1)
 - air filter element ②
 - air filter element frame ③



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

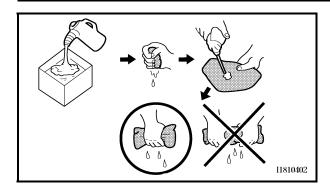
- 4. Check:
- air filter element
 Damage → Replace.



CLEANING THE AIR FILTER ELEMENT







- 5. Clean:
 - air filter element

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

A 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.

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

CAUTION:

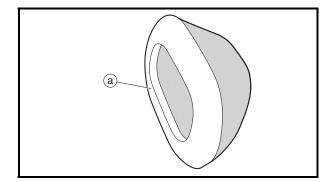
Do not twist or wring out the element. This could damage the foam material.

- c. Apply Yamaha foam air filter oil or other quality foam air filter oil (not spray type).
- d. Squeeze out the excess oil.

NOTE: __

The element should be wet but not dripping.

- 6. Install:
 - air filter element frame



- 7. Apply:
 - Lithium-soap-based grease
 On the matching surface (a) on air filter element.
- 8. Install:
 - air filter element
 - wing bolt

NOTE: _

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

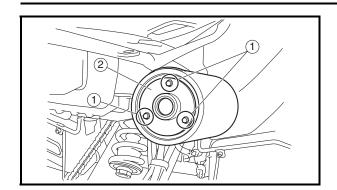
- 9. Install:
- air filter case cover
- 10.Install:
 - seat

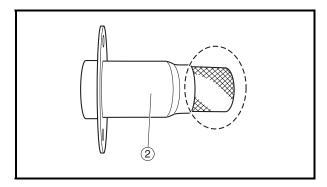
Refer to "SEAT, FENDERS AND FUEL TANK".

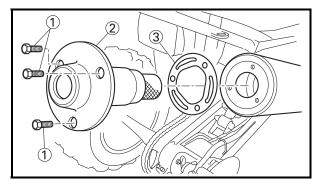
CLEANING THE AIR FILTER ELEMENT/ CLEANING THE SPARK ARRESTER











CLEANING THE SPARK ARRESTER

- 1. Clean:
 - Spark arrester

WARNING

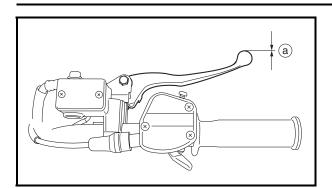
- Select a well-ventilated area free of combustible materials.
- Always let the exhaust system cool before performing this operation.
- Do not start the engine when removing the tailpipe from the muffler.
- a. Remove the bolts 1.
- b. Remove the tailpipe 2 from the muffler.
- c. Tap the tailpipe lightly 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 ③ into the muffler.

e. Install the bolts and tighten it.

ADJUSTING THE FRONT BRAKE/ADJUSTING THE BRAKE LEVER/ADJUSTING THE REAR BRAKE







EBS00080

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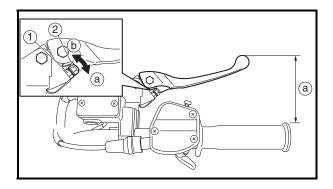
ADJUSTING THE FRONT BRAKE

- 1. Measure:
- brake lever free play ⓐ
 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 BRAKE LEVER (For adjustment type model)

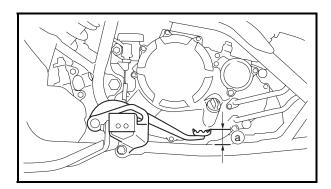
- 1. Adjust:
 - brake lever position (a)

a. While pushing the brake lever forward, loosen the locknut (1).

- b. While pushing the brake lever forward, turn the adjusting bolt ② in direction ⑤ or ⓒ until the brake lever is in the desired position
- c. Tighten the locknut.

CAUTION:

Be sure to tighten the locknut, as failing to do so will cause poor brake performance.



EBS0008

ADJUSTING THE REAR BRAKE

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

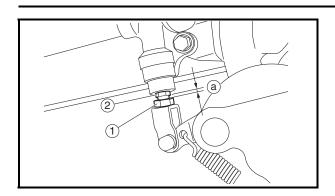


Rear brake pedal height 40.0 mm (1.57 in)

ADJUSTING THE REAR BRAKE/ ADJUSTING THE PARKING BRAKE







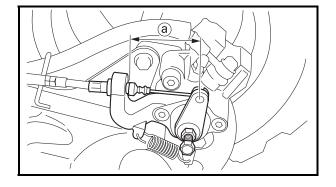
- 2. Adjust:
 - rear brake pedal height
- a. Loosen the locknut ①.
- b. Turn the adjusting bolt ② until the brake pedal height is within the specified limits.
- c. Tighten the locknut.

NOTE: _

When adjusting the brake pedal height make sure the locknut-to-adjusting bolt clearance (a) does not exceed 2.2 ~ 3.2 mm (0.09 ~ 0.13 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.



ADJUSTING THE PARKING BRAKE

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

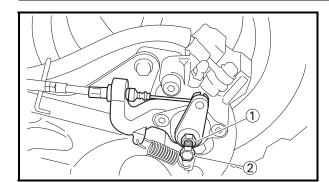


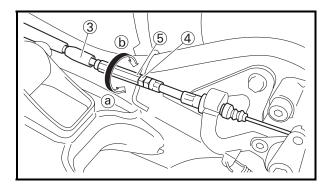
Parking brake cable end length 64 ~ 68 mm (2.52 ~ 2.68 in)

ADJUSTING THE PARKING BRAKE/ CHECKING THE BRAKE FLUID LEVEL









- 2. Adjust:
- parking brake cable end length
- a. Loosen the locknut ① and adjusting bolt ②.
- b. Slide back the rubber cover ③.
- c. Loosen the locknut 4.
- d. Turn the adjusting nut (5) in direction (a) or (b) until the specified brake cable end length is obtained.
- e. Tighten the locknut.
- f. Slowly turn the adjusting bolt clockwise until resistance is felt.
- g. Turn it 1/8 counterclockwise.
- h. Tighten the locknut ①.

16 Nm (1.6 m•kg, 11 ft•lb)

i. Slide the rubber cover to its original position.

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.

EBS00087

CHECKING THE BRAKE FLUID LEVEL

1. Place the machine on a level surface.

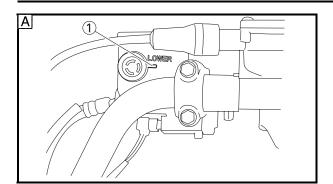
NOTE: _

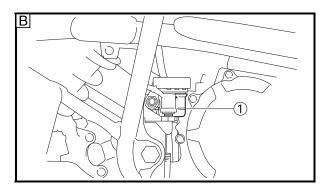
When checking the brake fluid level, make sure that the top of the brake master cylinder reservoir or brake fluid reservoir is horizontal.

CHECKING THE BRAKE FLUID LEVEL/ CHECKING THE FRONT BRAKE PADS









- 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.

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

NOTE: _

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

EBS00088

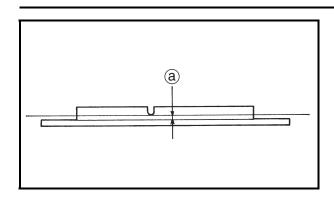
CHECKING THE FRONT BRAKE PADS

- 1. Remove:
 - front wheels Refer to "FRONT AND REAR WHEELS" in chapter 6.

CHECKING THE FRONT BRAKE PADS/ CHECKING THE REAR BRAKE PADS







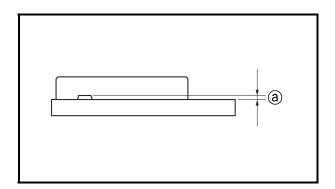
- 2. Check:
- brake pads
 Wear indicator groove almost disappeared
 a → Replace the brake pads as a set.
 Refer to "FRONT AND REAR BRAKES" in



chapter 6.

Brake pad wear limit ⓐ 1.5 mm (0.06 in)

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



FBS00089

CHECKING THE REAR BRAKE PADS

- 1. Check:
- brake pads

Wear indicators almost touch the brake disc $\textcircled{a} \rightarrow \mathsf{Replace}$ 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)

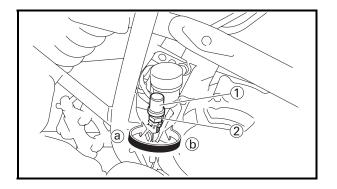
2. Operate the brake pedal.

ADJUSTING THE REAR BRAKE LIGHT SWITCH/ CHECKING THE BRAKE HOSES

ADJUSTING THE REAR BRAKE LIGHT SWITCH

NOTE: _

- The rear brake light switch is operated by movement of the brake pedal.
- •The rear brake light switch is properly adjusted when the brake light comes on just before the braking effect starts.
- 1. Check:
 - rear brake light operation timing Incorrect → Adjust.



- 2. Adjust:
 - rear brake light operation timing
- 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 ② or ⑤ until the rear brake light comes on at the proper time.

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

EBS00092

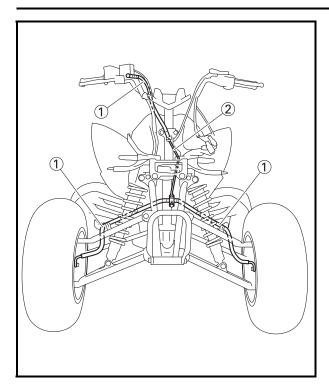
CHECKING THE BRAKE HOSES

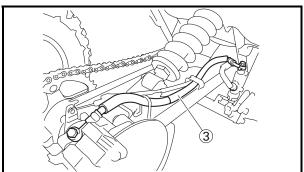
- 1. Remove:
 - seat
 - front fender
 Refer to "SEAT, FENDERS AND FUEL TANK".

CHECKING THE BRAKE HOSES/ BLEEDING THE HYDRAULIC BRAKE SYSTEM









- 2. Check:
 - front brake hoses (1)
 - front brake pipe ②
 - rear brake hose ③
 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 \rightarrow 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".

EBS00094

BLEEDING THE HYDRAULIC BRAKE SYSTEM

WARNING

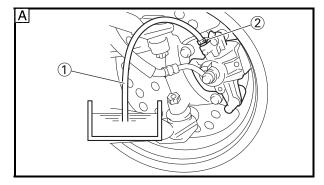
Bleed the hydraulic brake system whenever:

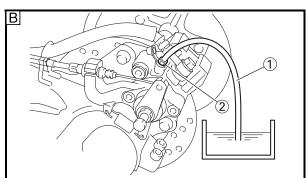
- the system is disassembled.
- a brake hose is loosened, disconnected or replaced.
- the brake fluid level is very low.
- brake operation is faulty.

BLEEDING THE HYDRAULIC BRAKE SYSTEM

NOTE: _

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





- 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.

NOTE: _

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.

BLEEDING THE HYDRAULIC BRAKE SYSTEM/ ADJUSTING THE SHIFT PEDAL



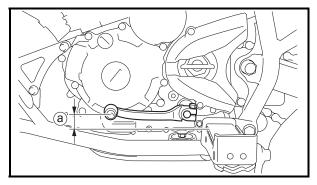
j. Tighten the bleed screw to specification.

5 Nm (0.5 m•kg, 3.7 ft•lb)

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



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



EBS00098

ADJUSTING THE SHIFT PEDAL

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



Shift pedal height 15.2 mm (0.60 in)

- 2. Adjust:
 - shift pedal position
- a. Remove the drive sprocket cover ①.
 Refer to "REAR SHOCK ABSORBER, SWINGARM AND DRIVE CHAIN" in chapter 6.
- b. Remove the bolt 2.
- c. Remove the shift pedal 3.
- d. Install the shift pedal at the correct height.

e. Tighten the bolt to specification.

10 Nm (1.0 m•kg, 7.4 ft•lb)

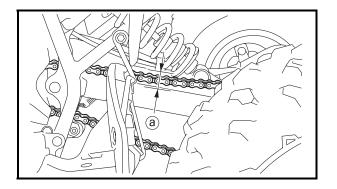
ADJUSTING THE DRIVE CHAIN SLACK

ADJUSTING THE DRIVE CHAIN SLACK NOTE:

- Measure the drive chain slack halfway between the drive axle and the rear axle.
- When checking and adjusting the drive chain slack, there should be no weight on the vehicle and all tires must be touching the ground.

CAUTION:

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



- 1. Measure:
 - drive chain slack (a)
 Out of specification → Adjust.



Drive chain slack

45 ~ 55 mm (1.77 ~ 2.17 in)

- 2. Adjust:
 - drive chain slack

NOTE: _

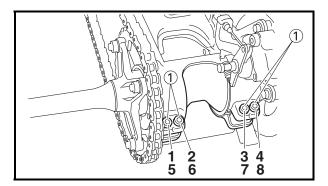
The drive chain slack is adjusted by the rotation of the rear axle hub.

- a. Loosen the rear axle pinch bolts (1).
- b. Insert a rod of a diameter of 8 mm (0.31 in) and length of 10 cm (4 in) ② in the hole ③ of rear axle hub ④.
- c. Shift the transmission into the neutral position
- d. To loosen the drive chain, push the vehicle forward and to tighten the drive chain, pull the vehicle backward.

ADJUSTING THE DRIVE CHAIN SLACK/ CHECKING THE STEERING SYSTEM







CAUTION:

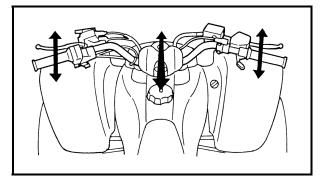
Excessive chain slack will overload the engine and other vital parts; keep the slack within the specified limits.

- e. If the chain slack cannot be adjusted, replace the sprockets and drive chain as a set
- f. Tighten the rear axle pinch bolts (1).

21 Nm (2.1 m•kg, 15 ft•lb)

NOTE: ____

- Tighten the rear axle pinch bolts ① in the proper sequence as shown.
- The chain should be cleaned and lubricated after every use of the vehicle.

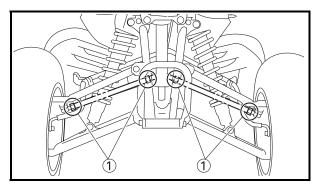


EBS0010

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 \rightarrow Replace the steering stem bushings.

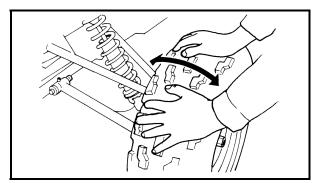


3. Check:

• 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 \rightarrow Replace the tie-rod end(s).

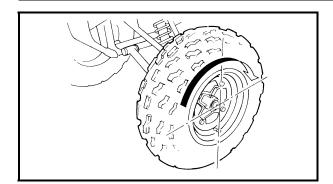


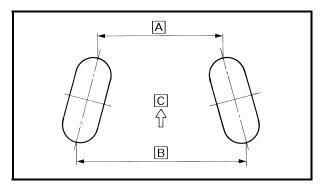
- 4. Raise the front end of the machine so that there is no weight on the front wheels.
- 5. Check:
 - ball joints and/or wheel bearings
 Move the wheels laterally back and forth.
 Excessive free play → Replace the front arms (upper and lower) and/or wheel bearings.

ADJUSTING THE TOE-IN









EBS00108

ADJUSTING THE TOE-IN

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



Toe-in

9 ~ 19 mm (0.35 ~ 0.75 in)

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.

Toe-in = \mathbb{B} – \mathbb{A}

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

C Forward

- 3. Adjust:
 - toe-in

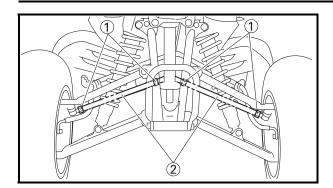
WARNING

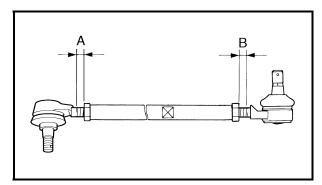
- •Be sure that both tie-rods are turned the same amount. If not, the machine will drift right or left even though the handlebar is positioned straight. This may lead to mishandling and an accident.
- · After setting the toe-in to specification, run the machine slowly for some distance with both hands 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











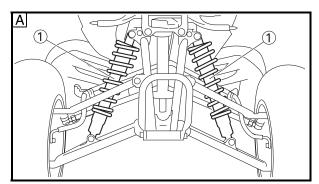
a. Mark both tie-rods ends.

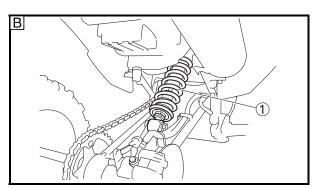
This reference point will be needed during adjustment.

- b. Loosen the locknuts (tie-rod end) ① of both tie-rods.
- c. 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.
- d. Tighten the rod end locknuts of both tierods. 15 Nm (1.5 m•kg, 11 ft•lb)

NOTE: _

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





CHECKING THE FRONT AND REAR SHOCK **ABSORBERS**

- 1. Place the machine on a level surface.
- 2. 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, SWINGARM AND DRIVE CHAIN" in chapter 6.

- 3. 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 FRONT SHOCK ABSORBERS" and "ADJUSTING THE REAR SHOCK ABSORBER".

- A Front shock absorber
- B Rear shock absorber

ADJUSTING THE FRONT SHOCK ABSORBERS

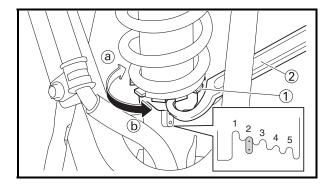


EBS00111

ADJUSTING THE FRONT SHOCK ABSORBERS

A WARNING

Always adjust the spring preload of both front shock absorbers to the same setting. Uneven adjustment can result in poor handling and loss of stability.



1. Adjust:

• spring preload

a. Turn the adjusting ring (1) in direction (a) or
b) with the spanner wrench (2).

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

Standard position: 2 Minimum position: 1 Maximum position: 5

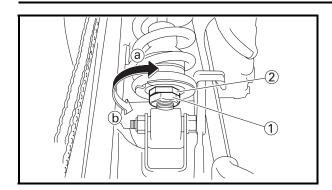


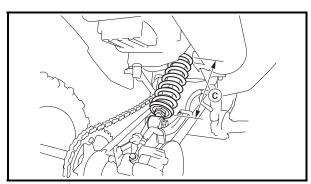
Ring nut wrench 90890-01268 Spanner wrench YU-01268

ADJUSTING THE REAR SHOCK ABSORBER









EBS00111

ADJUSTING THE REAR SHOCK ABSORBER

- 1. Adjust:
 - spring preload

a. Elevate the rear wheels by placing a suitable stand under the frame.

- b. Loosen the locknut (1).
- c. Turn the adjusting nut ② in direction ③ or ⑤.

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

Adjusting length ©

Standard: 230 mm (9.06 in) Minimum: 222 mm (8.74 in) Maximum: 234 mm (9.21 in)

NOTE: _

- •Be sure to remove all dirt and mud from around the locknut and adjusting nut before adjustment.
- The length of the spring (installed) changes 1.0 mm (0.04 in) per turn of the adjuster.

CA		1 T		N	п
	u	ш	U	IIN	

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

d. Tighten the locknut.

3 42 Nm (4.2 m•kg, 31 ft•lb)

NOTE: _

Always tighten the locknut against the adjusting nut, then torque it to specification.

CHECKING THE TIRES





EBS00114

CHECKING THE TIRES

A 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

 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	Туре
Front	DUNLOP	AT20 × 7-10	KT201
Rear	DUNLOP	AT19 × 10-9	KT205A

TIRE PRESSURE

- 1) Recommended tire pressure Front 27.5 kPa (0.28 kg/cm², 4.0 psi) Rear 27.5 kPa (0.28 kg/cm², 4.0 psi)
- Tire pressure below the minimum specification could cause the tire to dislodge from the rim under severe riding conditions.

The following are minimums: Front 24.5 kPa (0.25 kg/cm², 3.6 psi) Rear 24.5 kPa (0.25 kg/cm², 3.6 psi)

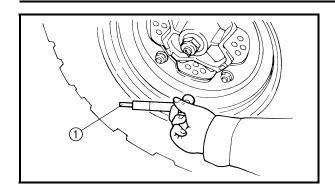
- 3) Use no more than
 Front 250 kPa (2.6 kg/cm², 36 psi)
 Rear 250 kPa (2.6 kg/cm², 36 psi)
 when seating the tire beads. Higher
 pressures may cause the tire to burst.
 Inflate the tires slowly and carefully.
 Fast inflation could cause the tire to
 burst.
- MAXIMUM LOADING LIMIT
- Vehicle load limits: 100 kg (220 lb)
 *Total weight of the cargo, rider, and accessories.

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

CHECKING THE TIRES







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

NOTE: _

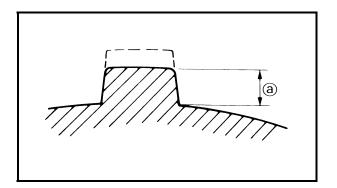
- The low-pressure tire gauge ① is included as standard equipment.
- If dust or the like is stuck to this gauge, it will not provide the correct readings. Therefore, take two measurements of the tire's pressure and use the second reading.

Cold tire pressure	Front/Rear
Standard	27.5 kPa (0.28 kg/cm ² , 4.0 psi)
Minimum	24.5 kPa (0.25 kg/cm ² , 3.6 psi)
Maximum	30.5 kPa (0.31 kg/cm ² , 4.4 psi)

A 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 (a)

Front and rear: 3.0 mm (0.12 in)

A WARNING

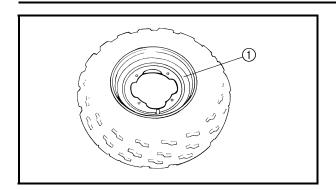
It is dangerous to ride with a worn-out tire. When tire wear is out of specification, replace the tire immediately.

CHECKING THE WHEELS/CHECKING AND **LUBRICATING THE CABLES**









EBS00116

CHECKING THE WHEELS

- 1. Check:
 - wheel (1) Damage/bends \rightarrow Replace.

NOTE: _

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 \rightarrow Replace.
- 2. Check:
 - cable operation Unsmooth operation → Lubricate or replace.



Recommended lubricant Yamaha chain and cable lube or engine oil

NOTE: _

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



EBS00118

LUBRICATING THE LEVERS AND PEDALS

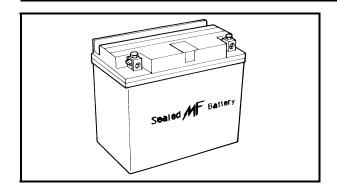
Lubricate the pivoting point and metal-to-metal moving parts of the levers and pedal.



Recommended lubricants
Brake lever
Silicone grease
Clutch lever and brake pedal
Lithium-soap-based grease

CHECKING AND CHARGING THE BATTERY





EBS00120

ELECTRICAL SYSTEM CHECKING AND CHARGING THE BATTERY

WARNING

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

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

FIRST AID IN CASE OF BODILY CONTACT: EXTERNAL

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

INTERNAL

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

CAUTION:

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

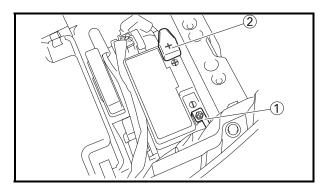
CHECKING AND CHARGING THE BATTERY

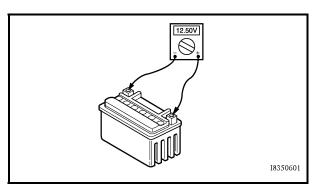


NOTE: _

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

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





Relationship between the open-circuit voltage and the charging time at 20 °C (68 °F)

12.5

12.0

11.5

Charging time (hours)

These values vary with the temperature, the condition of the battery plates, and the electrolyte level.

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

CAUTION:

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

- 3. Remove:
 - battery
- 4. Check:
 - battery charge
- Connect a pocket tester to the battery terminals.

NOTE:

- The charge state of an MF battery can be checked by measuring its open-circuit voltage (i.e., the voltage when the positive 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.

CHECKING AND CHARGING THE BATTERY



Example

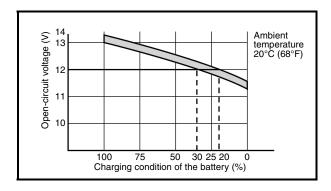
- c. Open-circuit voltage = 12.0 V
- d. Charging time = 6.5 hours
- e. Charge of the battery = 20 ~ 30%

Charging Ambient temperature 20°C (68°F)

18
20°C (68°F)

17
80 16
18
19
19
10
10
10
20
30
40
50
60
Time (minutes)

Check the open-circuit voltage.



5. Charge:

 battery (refer to the appropriate charging method illustration)

A WARNING

Do not quick charge a battery.

CAUTION:

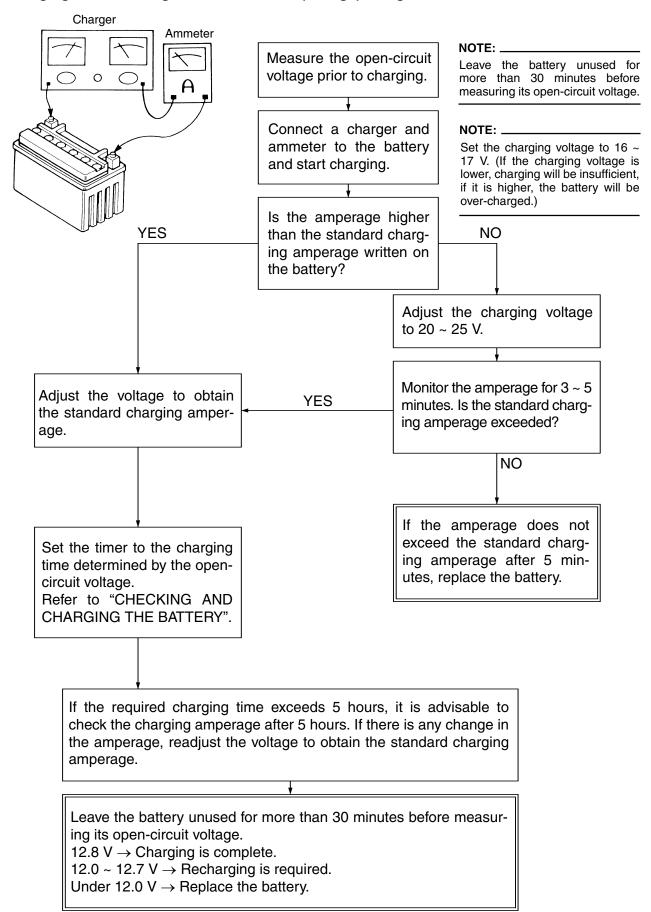
- Never remove the MF battery sealing caps.
- Do not use a high-rate battery charger since it forces a high-amperage current into the battery quickly and can cause battery overheating and battery plate damage.
- If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.
- When charging a battery, be sure to remove it from the 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 MF battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.

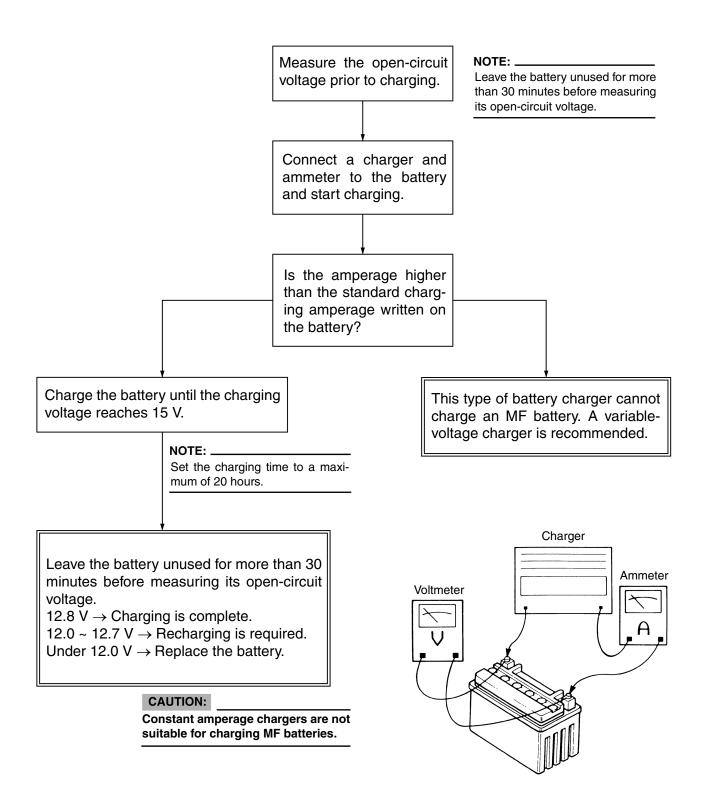


Charging method using a variable-current (voltage) charger



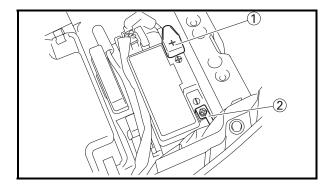


Charging method using a constant voltage charger





- 6. Install:
 - battery



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

CAUTION:

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

- 8. Check:
 - battery terminals
 Dirt → Clean with a wire brush.

 Loose connection → Connect properly.
- 9. Lubricate:
 - battery terminals



Recommended lubricant Dielectric grease

10.Install:

- battery cover
- seat Refer to "SEAT, FENDERS AND FUEL TANK".

CHECKING THE FUSES



EBS00121

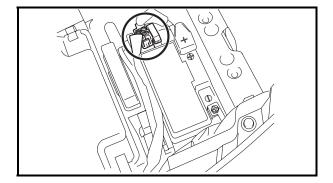
CHECKING THE FUSES

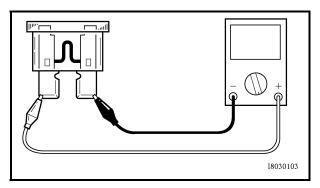
The following procedure applies to all of the fuses.

CAUTION:

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

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





- 2. Check:
 - fuse
- Connect the pocket tester to the fuse and check the continuity.

NOTE: _

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



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

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

- 3. Replace:
 - blown fuse
- a. Set the main switch to "OFF".
- b. Install a new fuse of the correct amperage.
- c. Set on the switches to verify if the electrical circuit is operational.
- d. If the fuse immediately blows again, check the electrical circuit.

CHECKING THE FUSES/ ADJUSTING THE HEADLIGHT BEAM



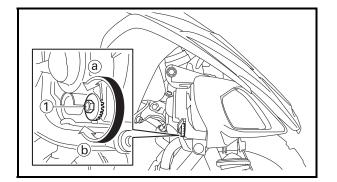


Items	Amperage rating	Q'ty	
Main	15 A	1	
Reserve	15 A	1	

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".



EBS00122

ADJUSTING THE HEADLIGHT BEAM

- 1. Adjust:
 - headlight beam (vertically)

a. Turn the adjusting bolt 1 in direction a or b.

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

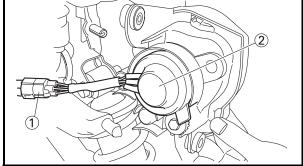
REPLACING A HEADLIGHT BULB

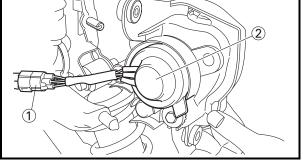


EBS00124

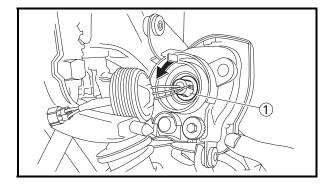
REPLACING A HEADLIGHT BULB

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





- 2. Disconnect:
 - headlight lead coupler (1)
- 3. Remove:
 - headlight bulb holder cover (2)



- 4. Remove:
 - bulb holder (1)
 - bulb

	_	_	_	
NI	n	Т		•
11	v		_	

Push the headlight bulb holder inward, turn it counterclockwise and remove the defective bulb.

A 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.

- 5. Install:
 - bulb New

Secure the new bulb with the headlight unit.

CAUTION:

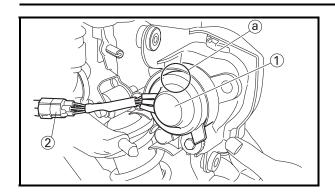
Avoid touching the glass part of the bulb. Keep it free from oil; otherwise, the transparency of the glass, life of the bulb, and luminous flux will be adversely affected. If oil gets on the bulb, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

REPLACING A HEADLIGHT BULB









- 6. Install:
 - bulb holder
 - headlight bulb holder cover 1

NOTE: _

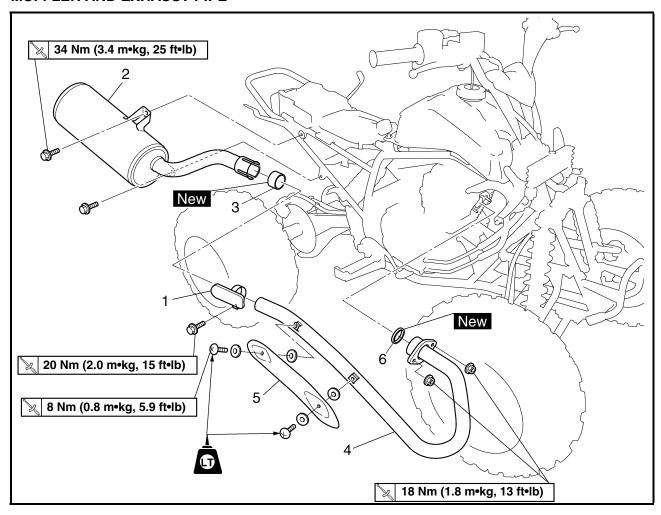
After installing the bulb holder cover, make sure that the "TOP" mark (a) is in the position shown.

- 7. Connect:
 - headlight lead coupler ②
- 8. Install:
 - headlight Refer to "SEAT, FENDERS AND FUEL TANK".

ENGINE

ENGINE REMOVAL

MUFFLER AND EXHAUST PIPE

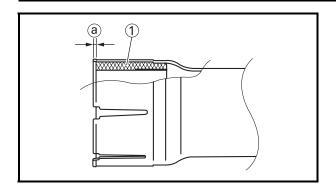


Order	Job/Parts to remove	Q'ty	Remarks
	Removing the muffler and exhaust		Remove the parts in the order listed.
	pipe		
	Seat/front panel/fender		Refer to "SEAT, FENDERS AND FUEL
			TANK" in chapter 3.
1	Clamp	1	Loosen
2	Muffler	1	
3	Gasket	1	
4	Exhaust pipe	1	
5	EXhaust pipe protector	1	
6	Gasket	1	
			For installation, reverse the removal procedure.

ENGINE REMOVAL





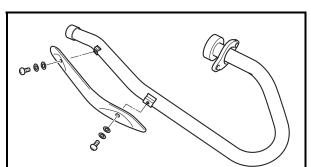


INSTALLING THE EXHAUST PIPE AND MUFFLER

- 1. Install:
 - gasket ① New (to muffler)



Installed depth of gasket ⓐ 3.5 mm (0.14 in)

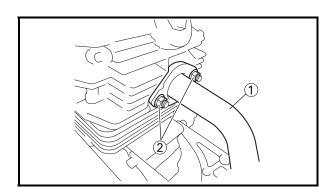


- 2. Install:
 - exhaust pipe protector
- 3. Tighten:
- exhaust pipe protector screws



Screw

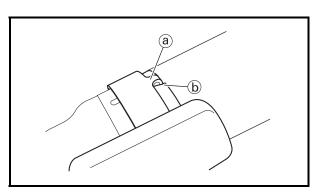
8 Nm (0.8 m•kg, 5.9 ft•lb) LOCTITE®



- 4. Install:
 - gasket New
 - exhaust pipe 1
- 5. Tighten:
 - nuts (exhaust pipe) ②



Exhaust pipe nut 18 Nm (1.8 m•kg, 13 ft•lb)



- 6. Install:
 - clamp

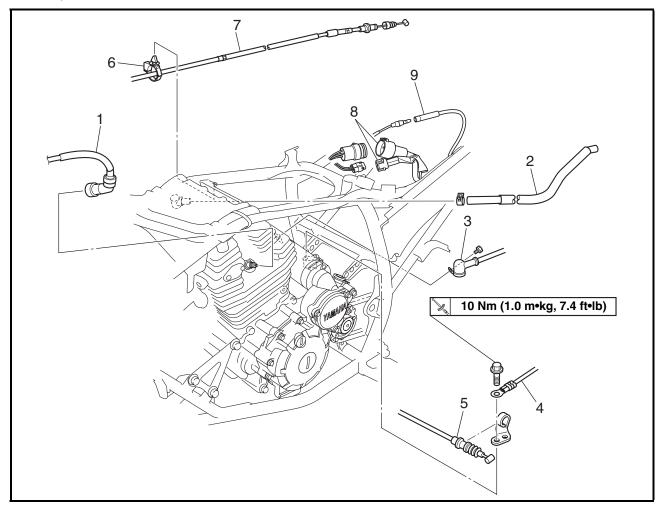
NOTE: _

Slide the clamp onto the end of the muffler and insert the projection ⓐ of the clamp into a slot ⓑ in the muffler. Tighten the clamp after installing the muffler.



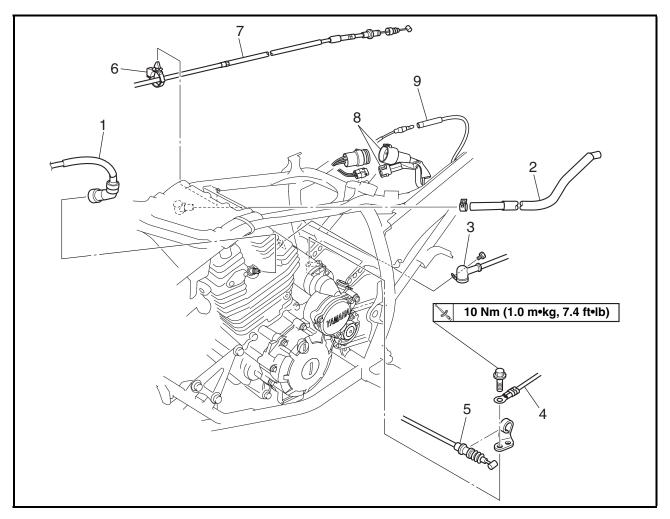


LEADS, CABLES AND HOSES



Order	Job/Parts to remove	Q'ty	Remarks
	Removing the leads, cables and		Remove the parts in the order listed.
	hoses		
	Engine oil		Drain.
	Oil cooler hose 1, 2		Refer to "CLUTCH".
	Carburetor		Refer to "CARBURETOR" in chapter 5.
	Drive sprocket/drive chain		Refer to "REAR SHOCK ABSORBER,
			SWINGARM AND DRIVE CHAIN" in
			chapter 6.
1	Ignition coil spark plug lead	1	
2	Air filter case breather hose	1	
3	Starter motor lead	1	Disconnect.
4	Battery negative lead	1	Disconnect.
5	Clutch cable	1	
6	Plastic band	1	Disconnect.
7	Parking brake cable	1	
8	AC magneto coupler	2	Disconnect.

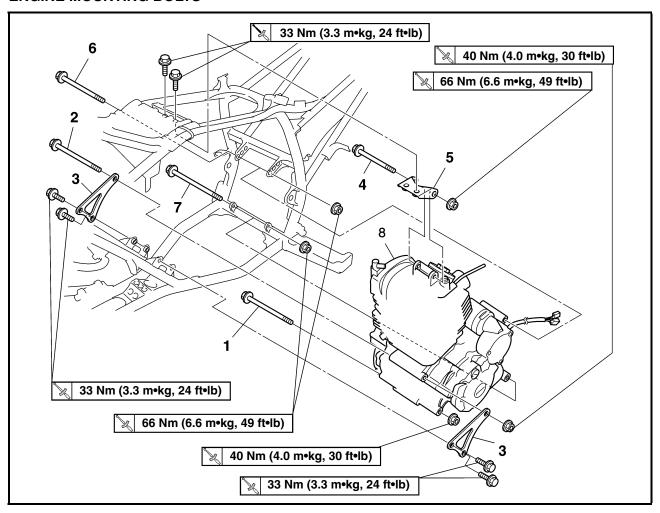




Order	Job/Parts to remove	Q'ty	Remarks
9	Neutral switch connector	1	Disconnect. For installation, reverse the removal procedure.



ENGINE MOUNTING BOLTS

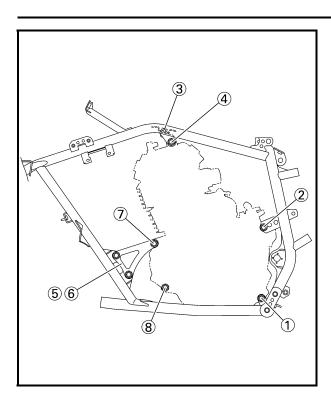


Order	Job/Parts to remove	Q'ty	Remarks
	Removing the engine mounting		Remove the parts in the order listed.
	bolts		
1	Crankcase bolt	1	
2	Engine mounting bolt (front)	1	
3	Engine bracket (left and right)	2	
4	Engine mounting bolt (upper)	1	
5	Engine bracket (upper)	1	
6	Engine mounting bolt (rear upper)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

ENGINE REMOVAL







INSTALLING THE ENGINE

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

NOTE: _

- The direction of the bolt insertion is made from the right side of the body.
- Do not fully tighten the bolts and nuts.
- 2. Install:
- Crankcase bolt (8)
- 3. Tighten:
 - Engine bracket bolts (upper side) ③
 - Engine mounting nut (rear lower side) (1)
 - Engine mounting nut (rear upper side) ②
 - Engine mounting nut (upper side) (4)
 - Engine mounting nut (front side) 7
 - Engine bracket bolts (front side)
 - Crankcase nut (8)



Engine bracket bolt (upper side) 33 Nm (3.3 m•kg, 24 ft•lb) Engine mounting nut (rear lower side)

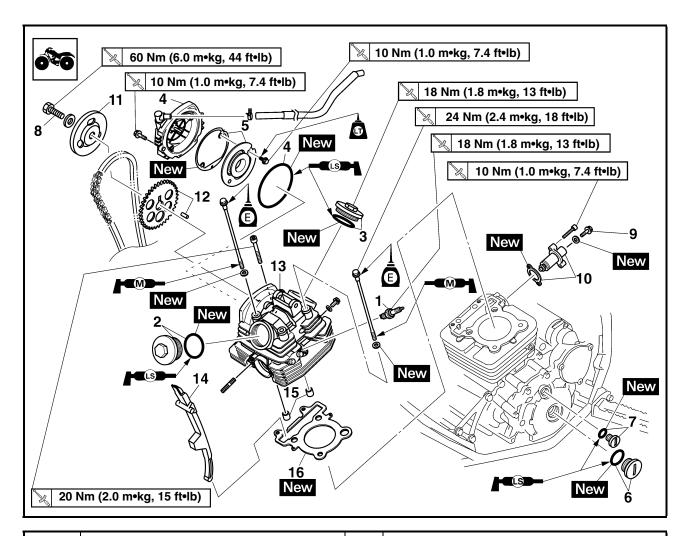
66 Nm (6.6 m•kg, 49 ft•lb) Engine mounting nut (rear upper side)

66 Nm (6.6 m•kg, 49 ft•lb)
Engine mounting nut (upper side)
66 Nm (6.6 m•kg, 49 ft•lb)
Engine mounting nut (front lower side)

40 Nm (4.0 mekg, 30 ftelb) Engine bracket bolt (M8) 33 Nm (3.3 mekg, 24 ftelb) Crankcase nut 40 Nm (4.0 mekg, 30 ftelb)

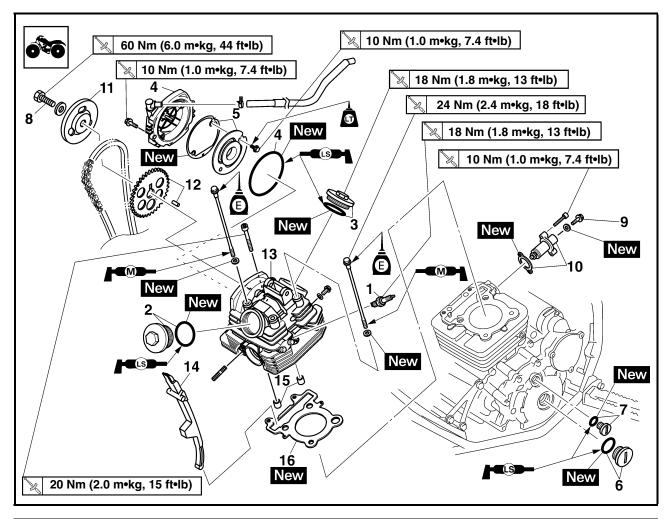






Order	Job/Parts to remove	Q'ty	Remarks
	Removing the cylinder head		
	Seat/front fender/fuel tank/fuel tank		Refer to "SEAT, FENDERS AND FUEL
	shield		TANK" in chapter 3.
	Muffler and exhaust pipe		Refer to "MUFFLER AND EXHAUST PIPE".
	Carburetor		Refer to "CARBURETOR" in chapter 5.
	Ignition coil spark plug lead		Refer to "LEADS, CABLES AND HOSES".
	Engine bracket (upper side)		Refer to "ENGINE MOUNTING BOLTS".
1	Spark plug	1	
2	Cylinder head cover 1/O-ring	1/1	
3	Cylinder head cover 2/O-ring	1/1	
4	Cylinder head cover 3/O-ring	1/1	
5	Breather pipe 1/Gasket	1/1	
6	Crankshaft end accessing screw/	1/1	
	O-ring		
7	Timing mark accessing screw/O-ring	1/1	
8	Camshaft sprocket bolt	1	Loosen.

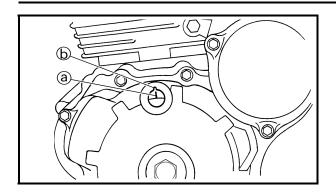




Order	Job/Parts to remove	Q'ty	Remarks
9	Cap bolt	1	Loosen.
10	Timing chain tensioner/gasket	1/1	
11	Breather pipe 2	1	
12	Camshaft sprocket/dowel pin	1/1	
13	Cylinder head	1	
14	Timing chain guide	1	
15	Dowel pin	2	
16	Cylinder head gasket	1	
			For installation, reverse the removal procedure.

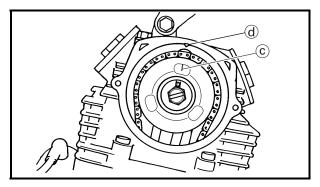






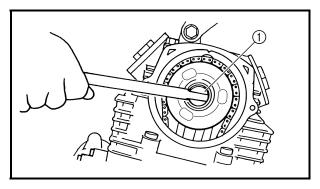
REMOVING THE CYLINDER HEAD

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

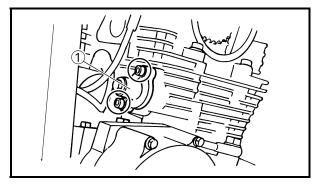


a. Turn the Pickup coil rotor counterclockwise.

b. When the piston is at TDC on the compression stroke, align the "I" mark © on the camshaft sprocket with the mark d on the cylinder head.



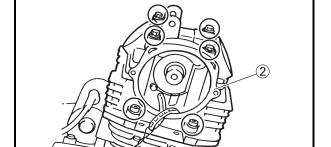
- 2. Loosen:
 - Camshaft sprocket bolt ①



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



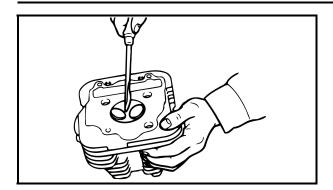
To prevent the timing chain from falling into the crankcase, fasten it with a wire.



- 4. Remove:
 - Cylinder head (2)







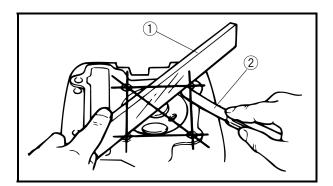
CHECKING THE CYLINDER HEAD

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

NOTE: _

Do not use a sharp instrument to avoid damaging or scratching:

- Spark plug bore threads
- Valve seats
- 2. Check:
 - Cylinder head Damage/scratches → Replace.



3. Measure:

Cylinder head warpage
 Out of specification → Resurface the cylinder head.



Warpage limit 0.05 mm (0.0020 in)

- a. Place a straightedge ① and a thickness gauge ② across the cylinder head.
- b. Measure the warpage.
- c. If the limit is exceeded, resurface the cylinder head as follows.
- d. Place a 400–600 grit wet sandpaper on the surface plate and resurface the cylinder head using a figure-eight sanding pattern.

NOTE: _____

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

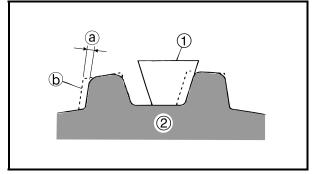


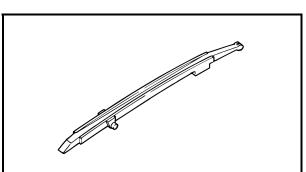


CHECKING THE TIMING CHAIN GUIDES

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

- 1. Check:
 - Timing chain
 Damage/stiffness → Replace the timing chain and camshaft sprocket and crank-shaft sprocket as a set.





2. Check:

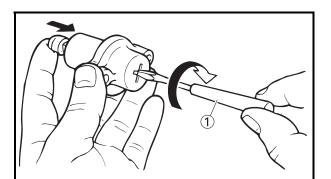
- Camshaft sprocket
 More than 1/4 tooth wear ⓐ → Replace
 the timing chain and camshaft sprocket and
 crankshaft sprocket as a set.
- (a) 1/4 tooth
- (b) Correct
- (1) Timing chain
- 2 Camshaft sprocket

3. Check:

Timing chain guide (exhaust side)



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



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

NOTE: _

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

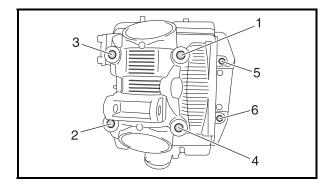


- b. Remove the screwdriver and slowly release the timing chain tensioner rod.
- c. Make sure that the timing chain tensioner rod comes out of the timing chain tensioner housing smoothly. If there is rough movement, replace the timing chain tensioner.

- 3. Check:
 - Cap bolt
 - Copper washer
 - Spring
 - One-way cam
 - Timing chain tensioner rod
 Damage/wear → Replace the defective part(s).

INSTALLING THE CYLINDER HEAD

- 1. Install:
 - Cylinder head gasket New
 - Dowel pins
- 2. Install:
 - Cvlinder head
 - Copper washers New
 - Cylinder head bolts



3. Tighten:

• Cylinder head bolts



Cylinder head bolt 226 mm (8.90 in) 24 Nm (2.4 m•kg, 18 ft•lb) Cylinder head bolt 45 mm (1.77 in) 20 Nm (2.0 m•kg, 15 ft•lb)

NOTE: _

 Apply oil to the bearing surface of (upper) cylinder head bolt.

Further, apply molybdenum disulfide grease to thread part.

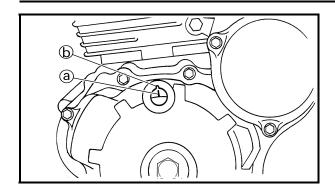
• Tighten the cylinder head bolts in the proper tightening sequence as shown.

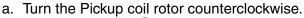
4. Install:

- Camshaft sprocket
- Dowel pin
- Timing chain









- b. Align the "I" mark (a) on the Pickup coil rotor with the stationary pointer (b) on the crankcase cover.
- c. Remove the wire from the timing chain.
- d. Install the timing chain onto the camshaft sprocket, and then install the camshaft sprocket onto the camshaft.

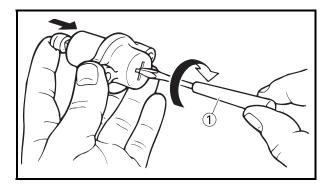
NOTE: _

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

CAUTION:

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

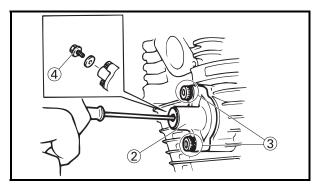
- e. Align the "I" mark © on the camshaft sprocket with the stationary pointer d on the cylinder head.
- f. While holding the camshaft, temporarily tighten the camshaft sprocket bolts.
- 5. Install:
 - Timing chain tensioner



- a. While lightly pressing the timing chain tensioner rod by hand, turn the tensioner rod fully clockwise with a thin screwdriver (1).
- b. With the timing chain tensioner rod turned all the way into the timing chain tensioner housing (with the thin screwdriver still installed), install the new gasket and the timing chain tensioner ② onto the body cylinder.
- c. Tighten the timing chain tensioner bolts ③ to the specified torque.

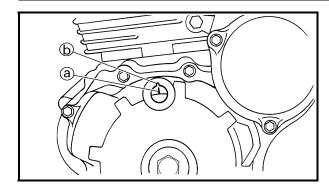
10 Nm (1.0 m•kg, 7.4 ft•lb)

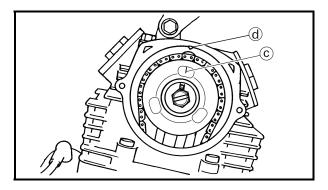
d. Remove the screwdriver, make sure that the timing chain tensioner rod releases, and then tighten the cap bolt 4 to the specified torque.











- 6. Turn:
 - Crankshaft (several turns counterclockwise)
- 7. Check:
 - "I" mark (a)

Align the "I" mark on the pickup coil rotor with the stationary pointer (b) on the crankcase cover.

• "I" mark ©

Align the "I" mark on the camshaft sprocket with the stationary pointer (d) on the cylinder head.

Out of alignment → Correct.

Refer to the installation steps above.

- 8. Tighten:
 - Camshaft sprocket bolt



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

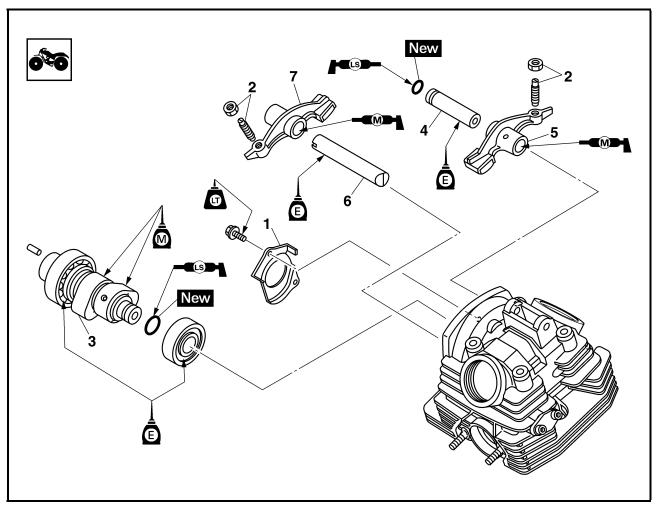
CAUTION:

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

- 9. Measure:
 - Valve clearance
 Out of specification → Adjust.
 Refer to "ADJUSTING THE VALVE CLEAR-ANCE" in chapter 3.



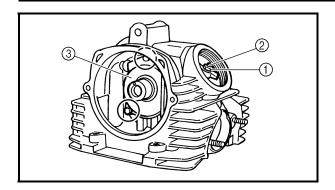




Order	Job/Parts to remove	Q'ty	Remarks
	Removing the rocker arms and cam-		Remove the parts in the order listed.
	shaft		
	Cylinder head		Refer to "CYLINDER HEAD".
1	Lock plate	1	
2	Locknut/valve clearance adjusting	2/2	
	screw		
3	Camshaft	1	
4	Intake rocker arm shaft	1	
5	Intake rocker arm	1	
6	Exhaust rocker arm shaft	1	
7	Exhaust rocker arm	1	
			For installation, reverse the removal procedure.

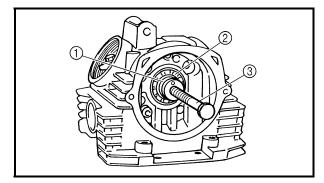






REMOVING THE ROCKER ARMS AND CAMSHAFT

- 1. Loosen:
 - Locknut (1)
 - Valve clearance adjusting screw ②
- 2. Remove:
 - Stopper plate ③

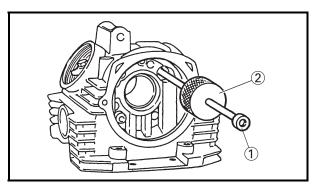


3. Remove:

- Camshaft ①
- Bearing ②

NOTE: _

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



4. Remove:

- Intake rocker arm shaft
- Exhaust rocker arm shaft
- Intake rocker arm
- Exhaust rocker arm

NOTE: _

Remove the rocker arm shafts with the slide hammer bolt (1) and weight (2).

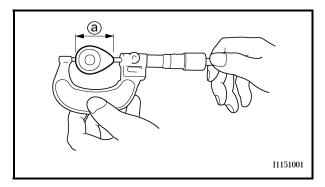


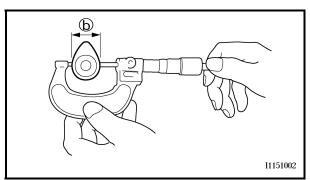
Slide hammer bolt 90890-01083 Slide hammer bolt 6 mm YU-01083-1 Weight 90890-01084, YU-01083-3



CHECKING THE CAMSHAFT

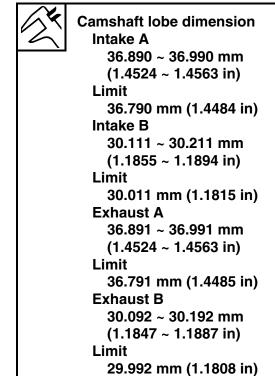
- 1. Check:
 - Bearing Damage/wear → Replace.
- 2. Check:
 - Camshaft lobes
 Blue discoloration/pitting/scratches –
 Replace the camshaft.

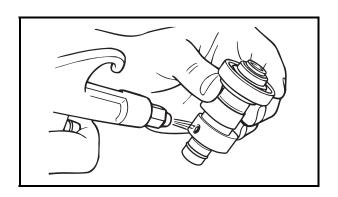




3. Measure:

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



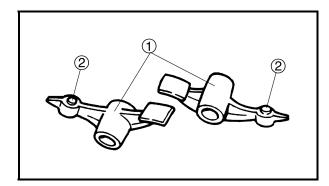


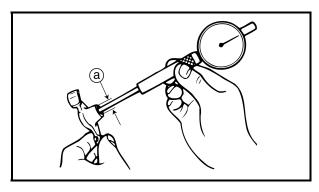
4. Check:

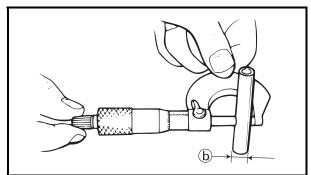
Camshaft oil passage
 Obstruction → Blow out with compressed
 air.











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 arms (1)
 - Valve clearance adjusting screws ②
 Damage/wear → Replace.
- 2. Check:
 - Rocker arm shaft Blue discoloration/excessive wear/pitting/ scratches → Replace or check the lubrication system.
- 3. Measure:
 - Rocker arm inside diameter (a)
 Out of specification → Replace.



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

- 4. Measure:
 - Rocker arm shaft outside diameter (b)
 Out of specification → Replace.



Rocker arm shaft outside diameter 11.981 ~ 11.991 mm (0.4717 ~ 0.4721 in)

....... 11.950 mm (0.4705 in)

- 5. Calculate:
 - Rocker-arm-to-rocker-arm-shaft clearance

NOTE

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

Out of specification \rightarrow Replace the defective part(s).



Rocker-arm-to-rocker-arm-shaft clearance

0.009 ~ 0.037 mm (0.0004 ~ 0.0015 in)





INSTALLING THE CAMSHAFT AND ROCKER ARMS

- 1. Lubricate:
 - Camshaft

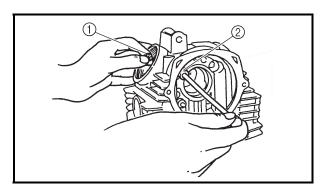


Recommended lubricant
Camshaft
Molybdenum disulfide oil
Camshaft bearing
Engine oil

- 2. Lubricate:
 - Rocker arm
 - Rocker arm shaft



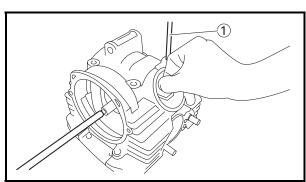
Recommended lubricant
Rocker arm
Molybdenum disulfide oil
Rocker arm shaft
Engine oil



- 3. Install:
 - Exhaust rocker arm (1)
 - Exhaust rocker arm shaft 2

NOTE: _

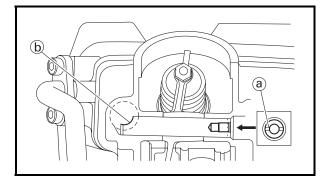
Make sure the exhaust rocker arm shaft is completely pushed into the cylinder head.



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

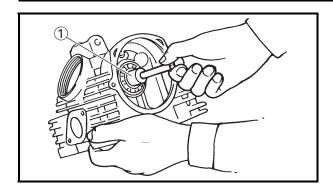
NOTE: _

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









- 5. Install:
- Camshaft 1

NOTE: __

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

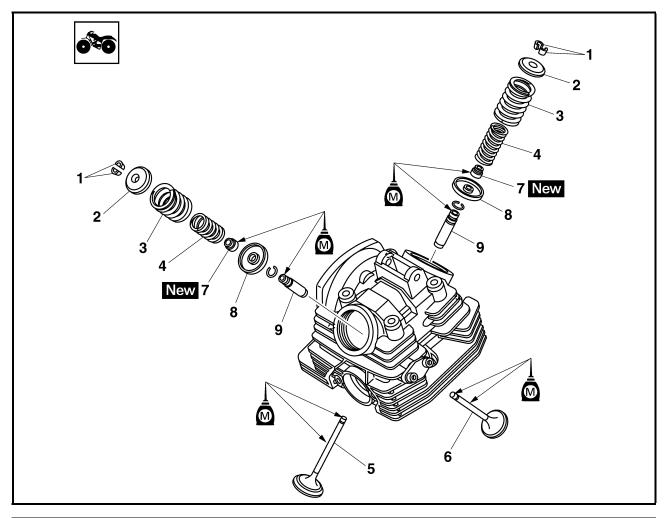
- 6. Install:
 - Lock plate
- 7. Tighten:
 - Lock plate bolts



Lock plate bolt 8 Nm (0.8 m•kg, 5.9 ft•lb) LOCTITE®







Order	Job/Parts to remove	Q'ty	Remarks
	Removing the valves and valve		Remove the parts in the order listed.
	springs		
	Cylinder head		Refer to "CYLINDER HEAD".
	Rocker arm		-Refer to "ROCKER ARM, CAMSHAFT".
	Camshaft		Trefer to TrookErrartim, Gamorial 1:
1	Valve cotter	4	
2	Valve spring retainer	2	
3	Outer valve spring	2	
4	Inner valve spring	2	
5	Intake valve	1	
6	Exhaust valve	1	
7	Valve stem seal	2	
8	Valve spring seat	2	
9	Valve guide	2	
			For installation, reverse the removal procedure.



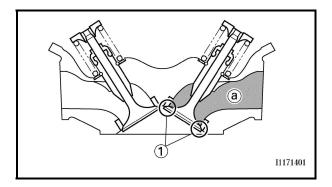


REMOVING THE VALVES

The following procedure applies to all of the valves and related components.

NOTE: _

Before removing the internal parts of the cylinder head (e.g., valves, valve springs, valve seats), make sure the valves properly seal.



1. Check:

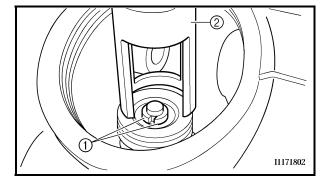
 Valve sealing Leakage at the valve seat → Check the valve face, valve seat, and valve seat width. Refer to "CHECKING THE VALVE SEATS".

a. Pour a clean solvent (a) into the intake and exhaust ports.

b. Check that the valves properly seal.

NOTE:

There should be no leakage at the valve seat (1).



2. Remove:

Valve cotters (1)

NOTE:

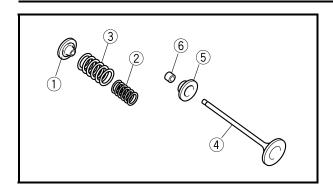
Remove the valve cotters by compressing the valve spring with the valve spring compressor and the valve spring compressor attachment ②.



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



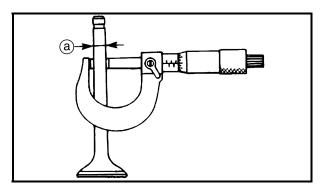


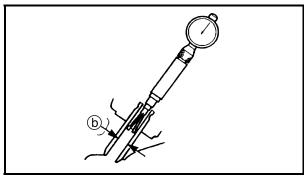


- 3. Remove:
 - Upper spring seat (1)
 - Inner valve spring (2)
 - Outer valve spring ③
 - Valve (4)
 - Lower spring seat (5)
 - Valve stem seal (6)

NOTE:

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





CHECKING THE VALVES AND VALVE GUIDES

The following procedure applies to all of the valves and valve guides.

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

Valve-stem-to-valve-guide clearance = Valve guide inside diameter (a) - Valve stem diameter (b)



Valve-stem-to-valve-guide clearance

Valve-stem-to-valve-guide clearance (intake) 0.010 ~ 0.037 mm

Limit

0.080 mm (0.003 in) Valve-stem-to-valve-guide

 $(0.0004 \sim 0.0015 in)$

clearance (exhaust) 0.025 ~ 0.052 mm

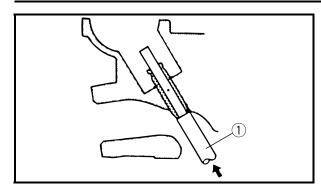
(0.0010 ~ 0.0020 in)

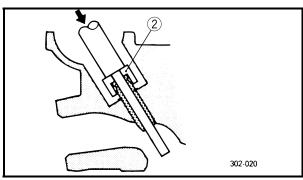
Limit

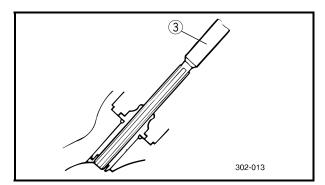
0.100 mm (0.004 in)











2. Replace:

• Valve guide

NOTE: _

To ease valve guide removal and installation, and to maintain the correct fit, heat the cylinder head to 100°C (212°F) in an oven.

a. Remove the valve guide with the valve guide remover (1).

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

NOTE: _

After replacing the valve guide, reface the valve seat.



Valve guide remover (ø6) 90890-04064

Valve guide remover (6.0 mm)

YM-04064-A

Valve guide installer (ø6)

90890-04065

Valve guide installer (6.0 mm)

YM-04065-A

Valve guide reamer (ø6)

90890-04066

Valve guide reamer (6.0 mm)

YM-04066

- 3. Eliminate:
 - Carbon deposits (from the valve face and valve seat)

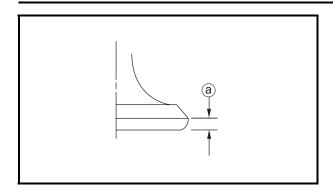
- 4. Check:
 - Valve face

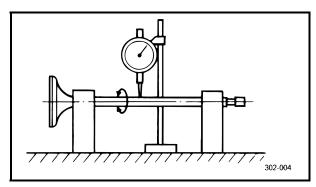
Pitting/wear \rightarrow Grind the valve face.

Valve stem end
 Mushroom shape or diameter larger than
 the body of the valve stem → Replace the
 valve.









5. Measure:

Valve margin thickness D a
 Out of specification → Replace the valve.



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

6. Measure:

Valve stem runout
 Out of specification → Replace the valve.

NOTF:

- When installing a new valve, always replace the valve guide.
- If the valve is removed or replaced, always replace the oil seal.



Valve stem runout 0.01 mm (0.0004 in)

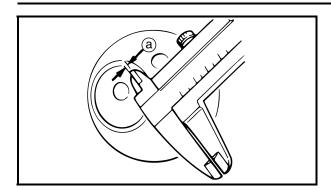
CHECKING THE VALVE SEATS

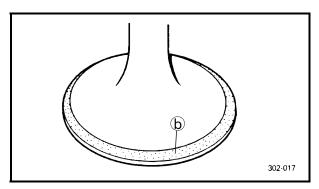
The following procedure applies to all of the valves and valve seats.

- 1. Eliminate:
 - Carbon deposits
 (from the valve face and valve seat)
- 2. Check:
 - Valve seat
 Pitting/wear → Replace the cylinder head.









- 3. Measure:
 - Valve seat width ⓐ
 Out of specification → Replace the cylinder head.



Valve seat width

Valve seat width C (intake)

0.90 ~ 1.10 mm

(0.0354 ~ 0.0433 in)

Valve seat width C (exhaust)

0.90 ~ 1.10 mm

(0.0354 ~ 0.0433 in)

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

NOTE: __

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

- 4. Lap:
 - Valve face
 - Valve seat

NOTE: _

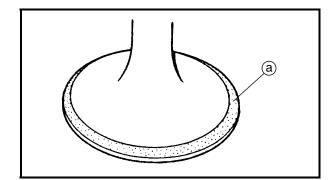
After replacing the cylinder head or replacing the valve and valve guide, the valve seat and valve face should be lapped.



Valve lapper 90890-04101 Valve lapping tool YM-A8998







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

CAUTION:

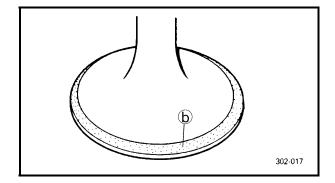
Do not let the lapping compound enter the gap between the valve stem and the valve guide.

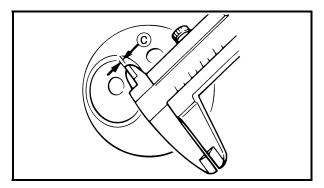
- b. Apply molybdenum disulfide oil onto the valve stem.
- c. Install the valve into the cylinder head.
- d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

NOTE: _

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

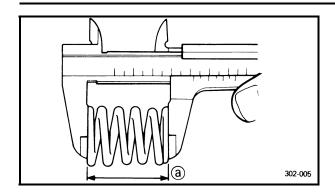
- e. Apply a fine lapping compound to the valve face and repeat the above steps.
- f. After every lapping procedure, be sure to clean off all of the lapping compound from the valve face and valve seat.
- g. Apply Mechanic's blueing dye (Dykem) (b) onto the valve face.
- h. Install the valve into the cylinder head.
- Press the valve through the valve guide and onto the valve seat to make a clear impression.
- j. Measure the valve seat width © again. If the valve seat width is out of specification, reface and lap the valve seat.











CHECKING THE VALVE SPRINGS

The following procedure applies to all of the valve springs.

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



Inner spring

Free length (intake)

36.17 mm (1.42 in) Free length (exhaust)

36.17 mm (1.42 in)

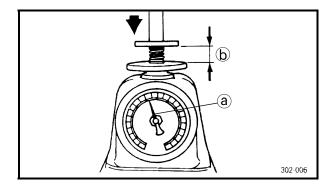
Outer spring

Free length (intake)

36.63 mm (1.44 in)

Free length (exhaust)

36.63 mm (1.44 in)



2. Measure:

- Compressed valve spring force (a) Out of specification -> Replace the valve sprina.
- (a) Compressed valve spring force
- (b) Installed length



Inner spring

Installed compression spring force (intake)

75.00 ~ 91.70 N (7.65 ~

9.35 kg) (16.86 ~ 20.62 lb) Installed compression spring

force (exhaust)

75.00 ~ 91.70 N (7.65 ~

9.35 kg) (16.86 ~ 20.62 lb) Installed length (intake)

30.50 mm (1.20 in)

Installed length (exhaust)

30.50 mm (1.20 in)

Outer spring

Installed compression spring

force (intake)

128.50 ~ 157.90 N (13.10 ~

16.10 kg) (28.89 ~ 35.50 lb)

Installed compression spring force (exhaust)

128.50 ~ 157.90 N (13.10 ~

16.10 kg) (28.89 ~ 35.50 lb)

Installed length (intake)

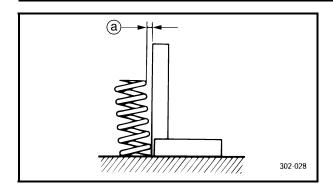
32.00 mm (1.26 in) **Installed length (exhaust)**

32.00 mm (1.26 in)

VALVES AND VALVE SPRINGS



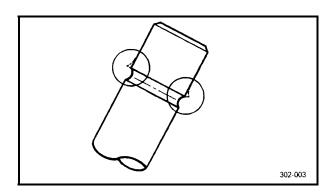


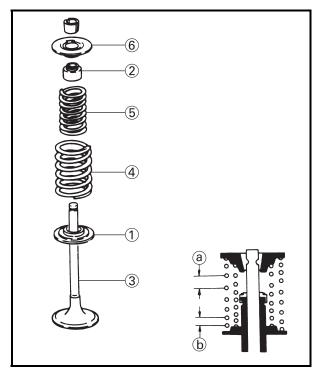


- 3. Measure:
 - Valve spring tilt (a)
 Out of specification → Replace the valve spring.



Inner spring
Spring tilt (intake)
2.5°/1.60 mm (2.5°/0.063 in)
Spring tilt (exhaust)
2.5°/1.60 mm (2.5°/0.063 in)
Outer spring
Spring tilt (intake)
2.5°/1.60 mm (2.5°/0.063 in)
Spring tilt (exhaust)
2.5°/1.60 mm (2.5°/0.063 in)





INSTALLING THE VALVES

The following procedure applies to all of the valves and related components.

- 1. Deburr:
 - Valve stem end (with an oil stone)
- 2. Lubricate:
 - Valve stem
 - Valve stem seal (with the recommended lubricant)



Recommended lubricant Molybdenum disulfide oil

- 3. Install:
 - Valve spring seat 1
 - Valve stem seal ② New
 - Valve (3)
 - Inner valve spring 4
 - Outer valve spring (5)
 - Upper spring seat 6
 (into the cylinder head)

NOTE: _

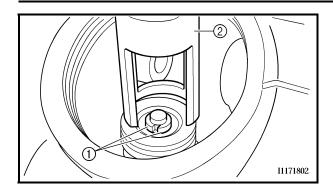
Install the valve springs with the larger pitch (a) facing up.

- (a) Larger pitch
- (b) Smaller pitch

VALVES AND VALVE SPRINGS







4. Install:

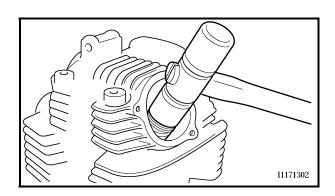
Valve cotters (1)

NOTE: __

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



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



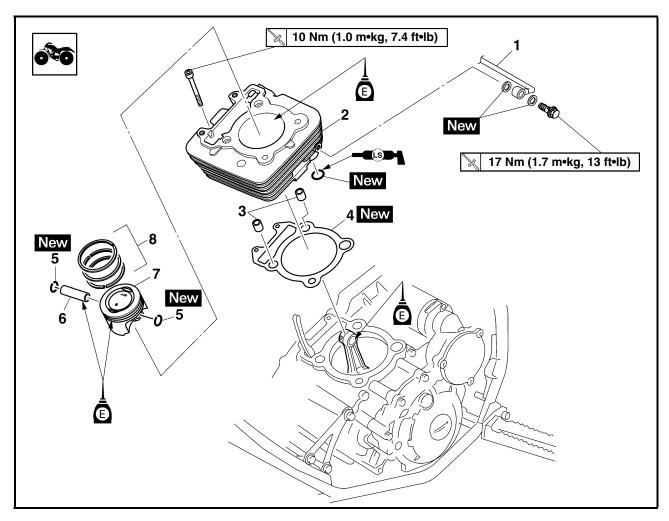
5. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a soft-face hammer.

CAUTION:

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



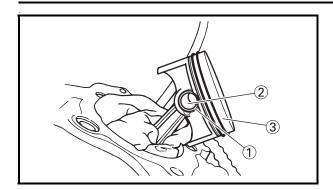


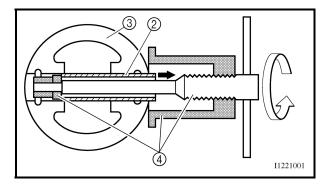


Order	Job/Parts to remove	Q'ty	Remarks
	Removing the cylinder and piston		Remove the parts in the order listed.
	Cylinder head		Refer to "CYLINDER HEAD".
1	Oil delivery pipe	1	
2	Cylinder	1	
3	Dowel pin	2	
4	Cylinder gasket	1	
5	Piston pin clip	2	
6	Piston pin	1	
7	Piston	1	
8	Piston ring set	1	
			For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









REMOVING THE PISTON

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

NOTE: _

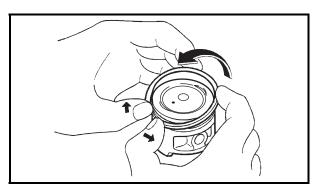
- Before removing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase.
- Before removing each piston pin, deburr the clip groove and pin hole area. If the piston pin groove is deburred and the piston pin is still difficult to remove, use the piston pin puller
 4.

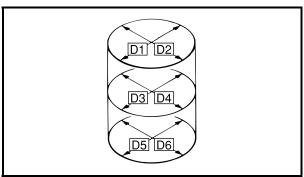


Piston pin puller set 90890-01304 Piston pin puller YU-01304

CAUTION:

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





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

NOTF:

When removing a piston ring, open the end gap with your fingers and lift the other side of the ring over the piston crown.

CHECKING THE CYLINDER AND PISTON

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

ENG



a. Measure cylinder bore "C" with the cylinder bore gauge.

NOTE: __

Measure cylinder bore "C" by taking side-toside and front-to-back measurements of the cylinder. Then, find the average of the measurements.



Bore "C" 74.000 ~ 74.016 mm (2.9134 ~ 2.9140 in) Wear limit 74.100 mm (2.9173 in)

"C" = maximum of D1 \sim D6

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



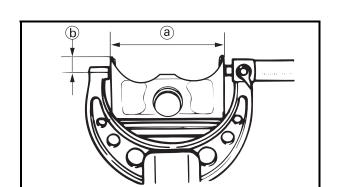
Piston size diameter "D" Standard 73.983 ~ 73.998 mm

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

(2.9127 ~ 2.9133 in)

e. Calculate the piston-to-cylinder clearance with the following formula.

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

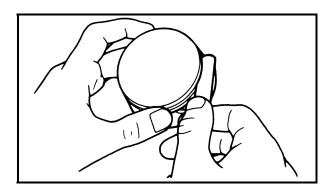






Piston-to-cylinder clearance 0.010 ~ 0.025 mm (0.0004 ~ 0.0010 in) Limit 0.15 mm (0.006 in)

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



CHECKING THE PISTON RINGS

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

NOTE: _

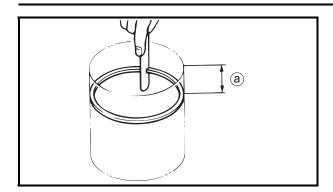
Before measuring the piston ring side clearance, eliminate any carbon deposits from the piston ring grooves and piston rings.



Piston ring
 Top ring
 Ring side clearance
 0.030 ~ 0.065 mm
 (0.0012 ~ 0.0026 in)
 Limit
 0.115 mm (0.0045 in)
 2nd ring
 Ring side clearance
 0.020 ~ 0.055 mm
 (0.0008 ~ 0.0022 in)
 Limit
 0.115 mm (0.0045 in)







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

NOTE: _

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

- (a) 40 mm (1.476 in)
- 3. Measure:
 - Piston ring end gap
 Out of specification → Replace the piston
 ring.

NOTE: __

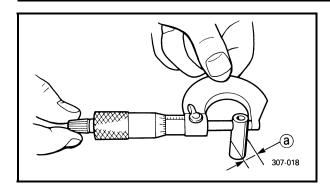
The oil ring expander spacer's end gap cannot be measured. If the oil ring rail's gap is excessive, replace all three piston rings.



Piston ring Top ring End gap (installed) 0.19 ~ 0.31 mm $(0.007 \sim 0.012 in)$ Limit 0.56 mm (0.022 in) 2nd ring End gap (installed) 0.30 ~ 0.45 mm $(0.012 \sim 0.018 in)$ Limit 0.80 mm (0.032 in) Oil ring End gap (installed) 0.10 ~ 0.35 mm $(0.004 \sim 0.014 in)$





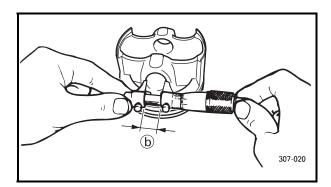


CHECKING THE PISTON PIN

- 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 16.991 ~ 17.000 mm (0.6689 ~ 0.6693 in) Limit 16.971 mm (0.6681 in)



3. Measure:

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



Piston pin bore inside diameter 17.002 ~ 17.013 mm (0.6694 ~ 0.6698 in) Limit 17.043 mm (0.6710 in)

4. Calculate:

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

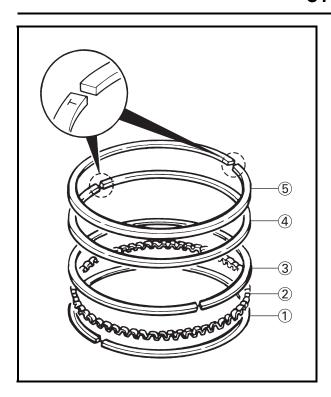
Piston-pin-to-piston-pin-bore clearance = Piston pin bore diameter (b) - Piston pin outside diameter (a)



Piston-pin-to-piston-pin-bore clearance
0.002 ~ 0.022 mm
(0.0001 ~ 0.0009 in)
Limit
0.072 mm (0.0028 in)





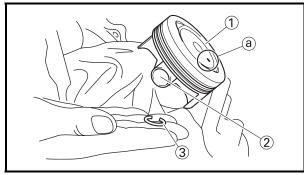


INSTALLING THE PISTON AND CYLINDER

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

NOTE: _

Be sure to install the piston rings so that the "T" marks or numbers face up.



- 2. Install:
 - Piston (1)
 - Piston pin (2)
 - Piston pin clips ③ New

NOTE: _

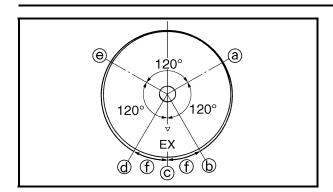
- Apply engine oil the piston pin.
- Make sure the dot (a) on the piston points towards the exhaust side of the cylinder.
- Before installing the piston pin clip, cover the crankcase opening with a clean rag to prevent the clip from falling into the crankcase.
- 3. Install:
 - O-ring New
 - Cylinder gasket New
 - Dowel pins
- 4. Lubricate:
 - Piston
 - Piston rings
 - Cylinder (with the recommended lubricant)



Recommended lubricant Engine oil







- 5. Offset:
- Piston ring end gaps
- (a) Top ring
- b Upper oil ring rail
- © Oil ring expander

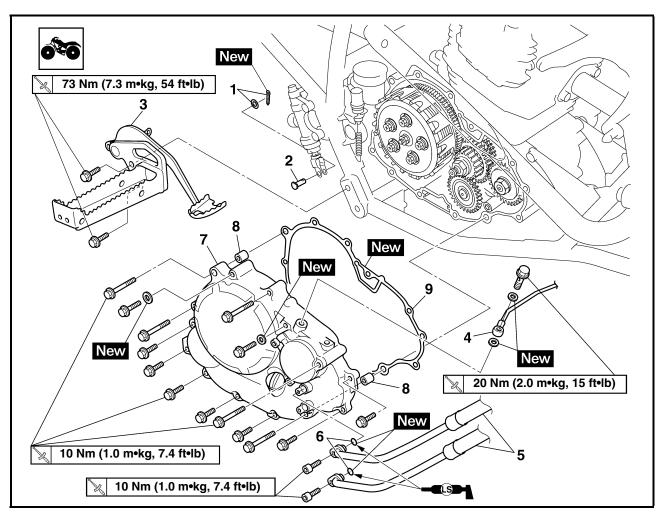
 d Lower oil ring rail
- (e) 2nd ring
- (f) 20 mm
- 6. Install:
 - Cylinder

NOTE: _

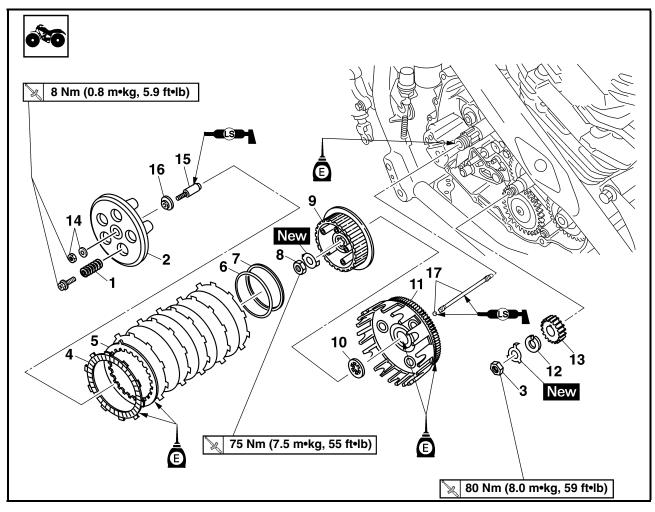
- While compressing the piston rings with one hand, install the cylinder with the other hand.
- Pass the timing chain and timing chain guide (exhaust side) through the timing chain cavity.
- 7. Tighten:
 - Cylinder bolts



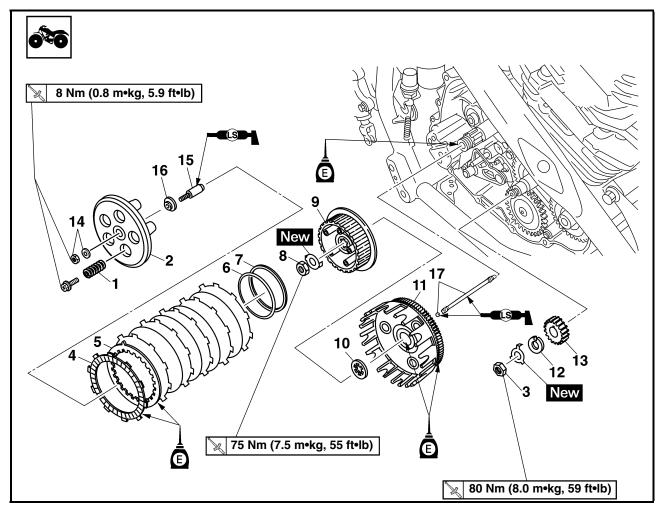
Cylinder bolt 10 Nm (1.0 m•kg, 7.4 ft•lb)



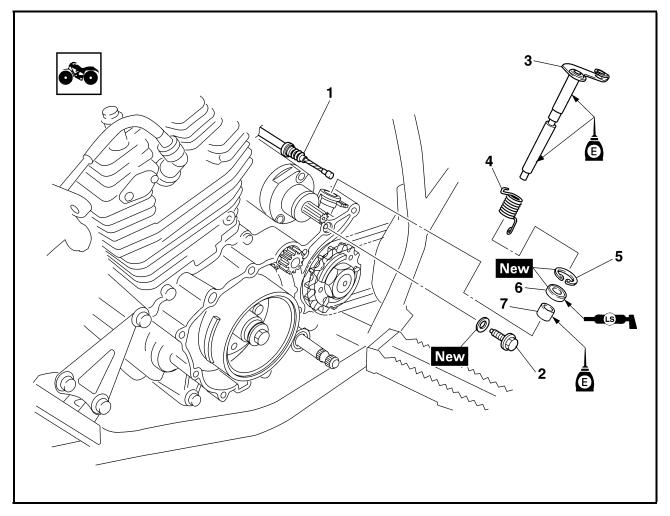
Order	Job/Parts to remove	Q'ty	Remarks
	Removing the clutch cover		Remove the parts in the order listed.
	Engine oil		Drain.
1	Cotter pin/Washer	1/1	
2	Clevis pin	1	
3	Brake pedal/Footrest	1/1	
4	Oil delivery pipe	1	
5	Oil cooler hose	2	
6	O-ring	2	
7	Right crankcase cover	1	
8	Dowel pin	2	
9	Crankcase cover gasket	1	
			For installation, reverse the removal procedure.



Order	Job/Parts to remove	Q'ty	Remarks
	Removing the clutch		Remove the parts in the order listed.
1	Clutch spring	5	
2	Pressure plate	1	
3	Primary drive gear nut	1	
4	Friction plate	6	
5	Clutch plate	5	
6	Cushion spring	1	
7	Seat plate	1	
8	Clutch boss nut	1	
9	Clutch boss	1	
10	Thrust washer	1	
11	Clutch housing	1	
12	Claw washer	1	
13	Primary drive gear	1	
14	Locknut/Washer	1/1	
15	Push rod1	1	
16	Push plate	1	



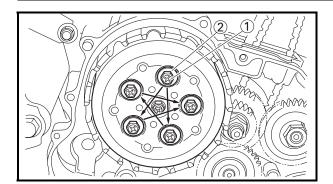
Order	Job/Parts to remove	Q'ty	Remarks
17	Push rod 2/Ball	1/1	For installation, reverse the removal procedure.

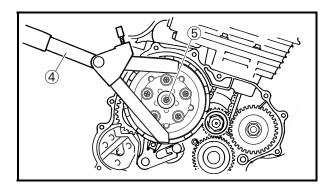


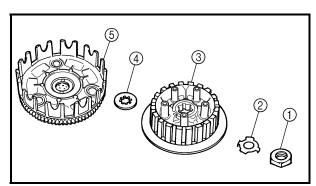
Order	Job/Parts to remove	Q'ty	Remarks
	Removing the push lever shaft		Remove the parts in the order listed.
	Shift pedal		Refer to "SHIFT SHAFT".
	Left crankcase cover		Refer to "PICK UP COIL ROTOR AND STARTER CLUTCH".
	Clutch assembly		
1	Clutch cable	1	
2	Bolt	1	
3	Push lever shaft	1	
4	Torsion spring	1	
5	Circlip	1	
6	Oil seal	1	
7	Bearing	1	
			For installation, reverse the removal procedure.

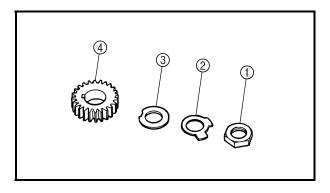












REMOVING THE CLUTCH

- 1. Remove:
 - Bolt (1)
 - Clutch spring ②

NOTE: _

Loosen the bolts in stages and in a crisscross pattern.

- 2. Straighten the lock washer tab.
- 3. Loosen:
 - Primary drive gear nut
 - Clutch boss nut

NOTE: _

- Place the aluminum plate (a) between clutch housing (1) and primary drive gear (2), and then loosen the primary drive gear nut (3).
- While holding the clutch boss with the universal clutch holder ④, loosen the clutch boss nut ⑤.

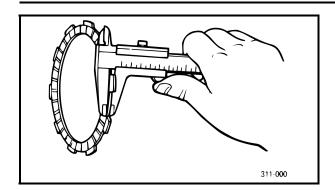


Universal clutch holder 90890-04086, YM-91042

- 4. Remove:
 - Clutch boss nut (1)
 - Lock washer (2)
 - Clutch boss (3)
 - Thrust washer 4
 - Clutch housing (5)
- 5. Remove:
 - Primary drive gear nut 1
 - Lock washer (2)
 - Claw washer ③
 - Primary drive gear 4







CHECKING THE FRICTION PLATES

The following procedure applies to all of the friction plates.

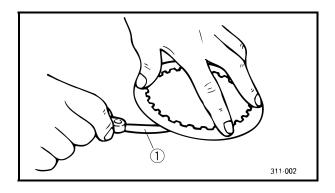
- 1. Check:
 - Friction plate
 Damage/wear → Replace the friction plate.
- 2. Measure:
 - Friction plate thickness
 Out of specification → Replace the friction
 plate.

NOTE: _

Measure the friction plate at four places.



Friction plate thickness 2.9 ~ 3.1 mm (0.114 ~ 0.122 in) Wear limit 2.8 mm (0.110 in)



CHECKING THE CLUTCH PLATES

The following procedure applies to all of the clutch plates.

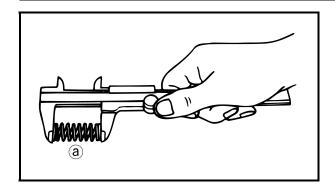
- 1. Check:
 - Clutch plate
 Damage → Replace the clutch plate.
- 2. Measure:

Out of specification \rightarrow Replace the clutch plate.



Warpage limit 0.2 mm (0.0079 in)





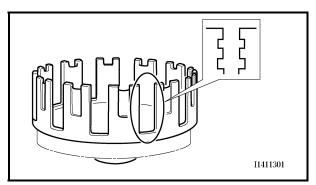
CHECKING THE CLUTCH SPRINGS

The following procedure applies to all of the clutch springs.

- 1. Check:
 - Clutch spring
 Damage → Replace the clutch spring.
- 2. Measure:
 - Clutch spring free length ⓐ
 Out of specification → Replace the clutch spring.



Clutch spring free length 47.80 mm (1.88 in) Minimum length 46.50 mm (1.83 in)



TI410301

CHECKING THE CLUTCH HOUSING

- 1. Check:
 - Clutch housing dogs
 Damage/pitting/wear → Deburr the clutch
 housing dogs or replace the clutch housing.

NOTE:

Pitting on the clutch housing dogs will cause erratic clutch operation.

CHECKING THE CLUTCH BOSS

- 1. Check:
 - Clutch boss splines
 Damage/pitting/wear → Replace the clutch boss.

NOTE: ____

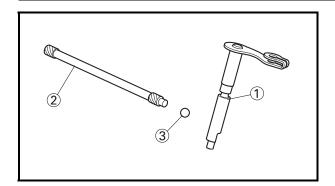
Pitting on the clutch boss splines will cause erratic clutch operation.

CHECKING THE PRESSURE PLATE

- 1. Check:
 - Pressure plate Cracks/damage → Replace.







CHECKING THE CLUTCH PUSH RODS

- 1. Check:
 - Push lever shaft (1)
 - Push rod 2 (2)
 - Ball ③

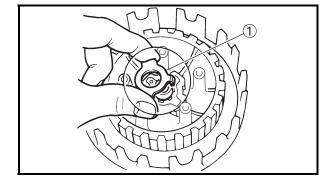
Cracks/damage/wear \rightarrow Replace the defective part(s).

CHECKING THE PRIMARY DRIVE GEAR

- 1. Check:
 - Primary drive gear
 Damage/wear → Replace the primary drive
 and primary driven gears as a set.

 Excessive noise during operation →
 Replace the primary drive and primary
 driven gears as a set.
- 2. Check:
 - Primary-drive-gear-to-primary-driven-gear free play

Free play exists \rightarrow Replace the primary drive and primary driven gears as a set.



INSTALLING THE CLUTCH

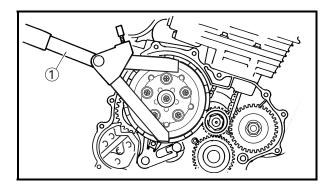
- 1. Install:
 - Primary drive gear
 - Claw washer
 - Lock washer New
 - Primary drive gear nut
- 2. Install:
 - Clutch housing
 - Thrust washer
 - Clutch boss
 - Lock washer ① New
 - Clutch boss nut

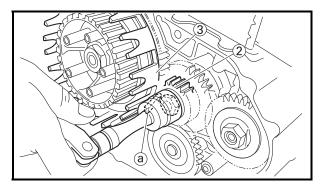
NOTE: _

Make sure the teeth on the lock washer are correctly aligned with the grooves on the clutch boss.









- 3. Tighten:
 - Clutch boss nut
 - Primary drive gear nut



Clutch boss nut 75 Nm (7.5 m•kg, 55 ft•lb) Primary drive gear nut 80 Nm (8.0 m•kg, 59 ft•lb)

NOTE: _

- While holding the clutch boss with the universal clutch holder ①, tighten the clutch boss nut.
- Place the aluminum plate (a) between primary drive gear (2) and clutch housing (3), and then tighten the primary drive gear nut.

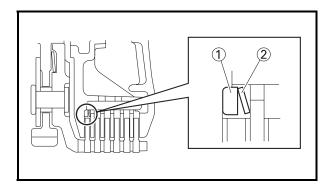


Universal clutch holder 90890-04086, YM-91042

- 4. Bend the lock washer tab along a flat side of the nut.
- 5. Lubricate:
 - Friction plates
 - Clutch plates (with the recommended lubricant)



Recommended lubricant Engine oil



- 6. Install:
 - Seat plate
 - Cushion spring
 - Friction plates (6 piece)
 - Clutch plates (5 piece)

NOTE: _

- Install the seat plate (1) and cushion spring
 (2) as shown.
- First, install a friction plate and then alternate between a clutch plate and a friction plate.





- 7. Install:
 - Bearing
 - Oil seal New
 - Circlip New
 - Torsion spring
 - Push lever shaft
 - Bolt
 - Clutch cable

NOTE: _

After installing the clutch cable, bend the push lever shaft tab along a flat side of the nut.



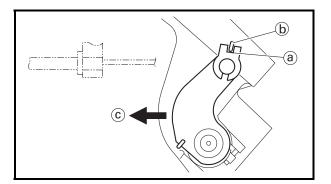
- Push rod 2
- Ball
- Push rod 1
- Push plate
- Washer
- Locknut
- Pressure plate
- Clutch spring (1)
- Bolt (2)
- 9. Tighten:
 - Clutch spring bolt
 - Locknut



Clutch spring bolt 8 Nm (0.8 m•kg, 5.9 ft•lb) Locknut 8 Nm (0.8 m•kg, 5.9 ft•lb)

NOTE: _

Tighten the clutch spring bolts in stages and in a crisscross pattern.



10.Check:

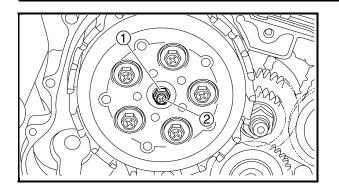
Push lever position
 Push lever mark (a) and crankcase mark (b)
 not aligned → Correct.

NOTE: _

Push the push lever in direction © and make sure the marks are aligned.







6)

(5)

(13)

YAMAHA

(10)

- 11.Adjust:
 - Push lever position

a. Loosen the locknut (1).

- b. Turn the adjusting screw 2 in or out until the marks are aligned.
- c. Hold the adjusting screw to prevent it from moving and then tighten the locknut to specification.

8 Nm (0.8 m•kg, 5.9 ft•lb)

CAUTION:

Do not overtighten the locknut since this will remove the free play between both push rods.

12.Check:

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



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

13.Install:

- Spacer
- Dowel pin
- Crankcase cover gasket New

14.Install:

• Right crankcase cover

15.Install:

- Crankcase cover bolts M6 × 50 mm (1), (2)
- Copper washers to (1), (2)
- Crankcase cover bolts M6 × 40 mm ③ ~ ⑥
- Crankcase cover bolts M6 × 25 mm (7) ~ (13)
- Oil filter element cover bolt M6 × 70 mm (14)

16. Tighten:

- Crankcase cover bolts (1) ~ (13)
- Oil filter element cover bolt (14)

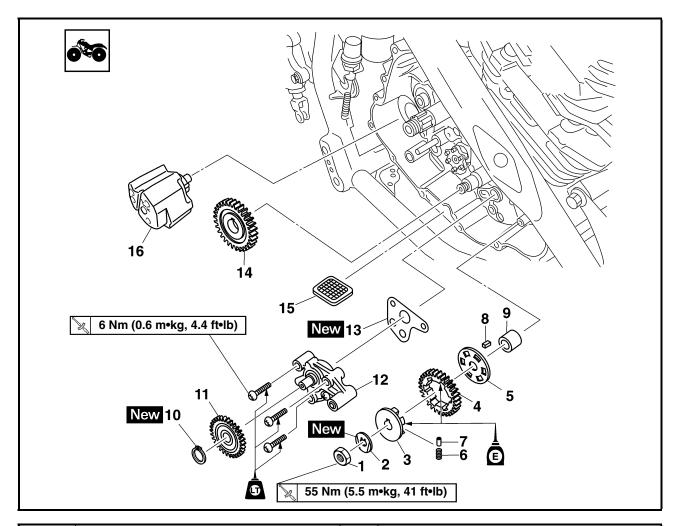
Tighten the bolts in stages, using a crisscross pattern.



Crankcase cover bolt 10 Nm (1.0 m•kg, 7.4 ft•lb) Oil filter element cover bolt 10 Nm (1.0 m•kg, 7.4 ft•lb)

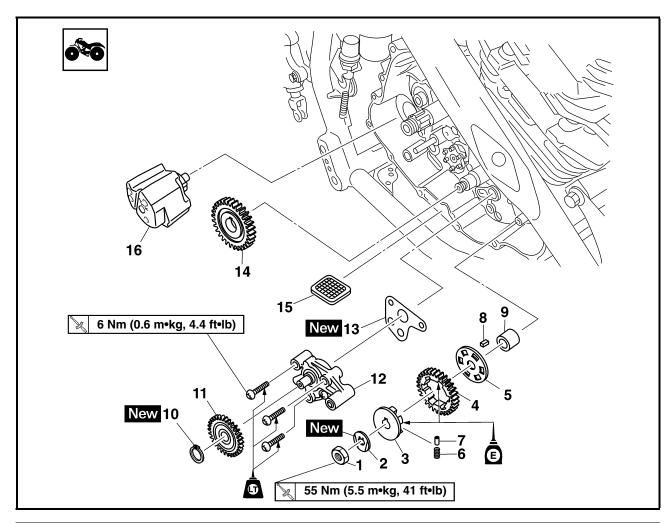






Order	Job/Parts to remove	Q'ty	Remarks
	Removing the oil pump and bal- ancer weight gear		Remove the parts in the order listed.
	Right crankcase cover		Refer to "CLUTCH".
	Clutch		
	Primary drive gear		
1	Balancer weight gear nut	1	
2	Lock washer	1	
3	Buffer boss	1	
4	Balancer weight gear	1	
5	Absorber plate	1	
6	Compression spring	6	
7	Dowel pin	3	
8	Straight key	1	
9	Spacer	1	
10	Circlip	1	
11	Oil pump driven gear	1	
12	Oil pump assembly	1	
13	Gasket	1	

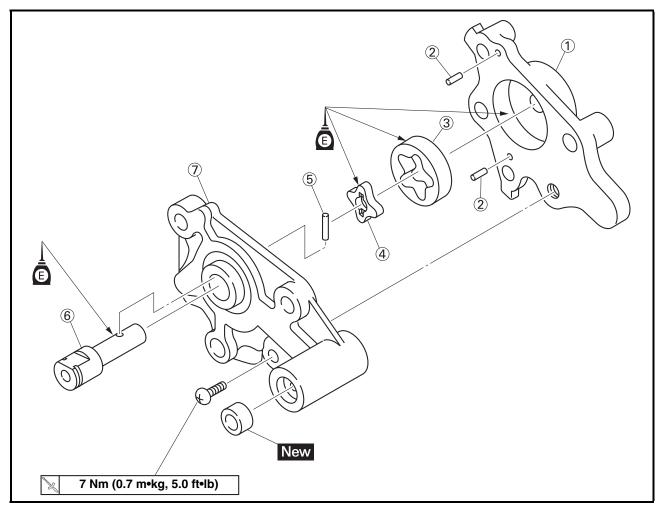




Order	Job/Parts to remove	Q'ty	Remarks
14	Balancer drive gear	1	
15	Oil strainer	1	
16	Spacer	1	
			For installation, reverse the removal
			procedure.



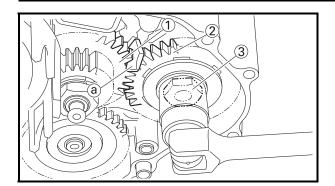




Order	Job/Parts to remove	Q'ty	Remarks
	Disassembling the oil pump		Remove the parts in the order listed.
1	Oil pump housing	1	
2	Dowel pin	2	
3	Outer rotor	1	
4	Inner rotor	1	
(5)	Dowel pin	1	
6	Shaft	1	
7	Oil pump cover	1	
			For assembly, reverse the disassembly procedure.







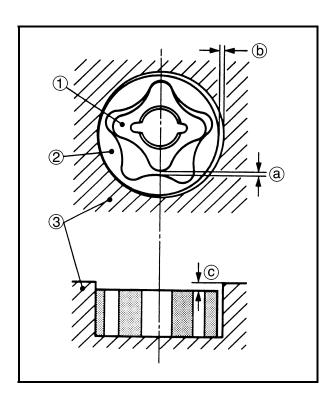
REMOVING THE BALANCER WEIGHT GEAR AND OIL PUMP

- 1. Straighten the lock washer tab.
- 2. Remove:
 - Balancer weight gear nut
 - Lock washer
 - Balancer weight gear

NOTE: _

Place the aluminum plate ⓐ between balancer drive gear ① and balancer weight gear ②, and then loosen the balancer weight gear nut ③.

- 3. Remove:
 - Oil pump assembly



CHECKING THE OIL PUMP

- 1. Check:
 - Oil pump driven gear
 - Oil pump housing
- Oil pump cover
 Cracks/damage/wear → Replace the
 defective part(s).
- 2. Measure:
 - Inner-rotor-to-outer-rotor-tip clearance (a)
 - Outer-rotor-to-oil-pump-housing clearance
 b
 - Oil-pump-housing-to-inner-rotor-and-outer-rotor clearance ©
 - Out of specification \rightarrow Replace the oil pump.
- 1 Inner rotor
- ② Outer rotor
- (3) Oil pump housing







Inner-rotor-to-outer-rotor-tip clearance 0.150 mm (0.0059 in) Limit 0.23 mm (0.0091 in) Outer-rotor-to-oil-pump-housing clearance 0.100 ~ 0.151 mm $(0.0039 \sim 0.0059 in)$ Limit 0.22 mm (0.0087 in) Oil-pump-housing-to-inner-andouter-rotor clearance 0.04 ~ 0.09 mm $(0.0016 \sim 0.0035 in)$ Limit 0.16 mm (0.0063 in)

3. Check:

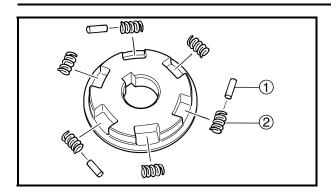
 Oil pump operation Rough movement → Repeat steps (1) and (2) or replace the defective part(s).

CHECKING THE BALANCER WEIGHT GEAR

- 1. Check:
 - Balancer weight gear
 - Buffer boss
 - Compression spring
 - Dowel pin
 - Cracks/damage/wear → Replace.







ASSENBLING THE BALANCER DRIVE GEAR

- 1. Assemble:
 - Dowel pin (1)
 - Compression spring ②

NOTE: _

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

- 2. Assemble:
 - Buffer boss

INSTALLING THE OIL PUMP

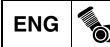
- 1. Install:
 - Gasket New
 - Oil pump
- 2. Tighten:
 - Oil pump bolts

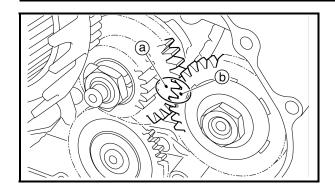


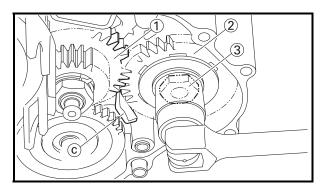
Oil pump bolt 6 Nm (0.6 m•kg, 4.4 ft•lb) LOCTITE®

CAUTION:

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







INSTALLING THE BALANCER WEIGHT GEAR

- 1. Install:
 - Balancer weight gear
 - Lock washer New
 - Balancer weight gear nut
- 2. Tighten:
 - Balancer weight gear nut



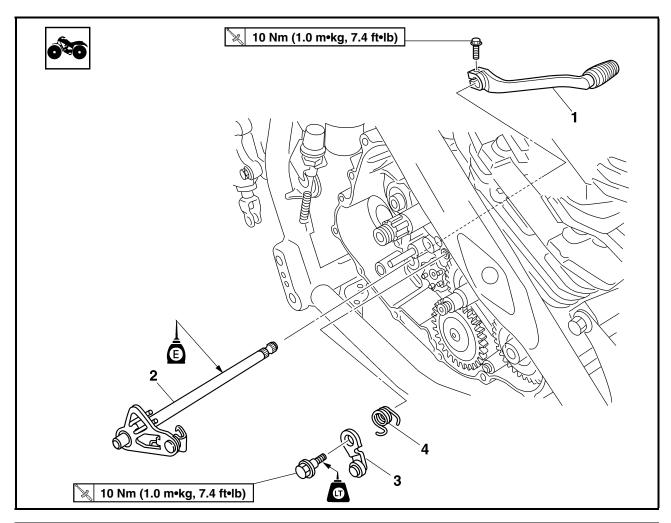
Balancer weight gear nut 55 Nm (5.5 m•kg, 41 ft•lb)

NOTE: _

- Align the punch mark (a) in the balancer drive gear with the punch mark (b) in the balancer weight gear.
- Place the aluminum plate © between balancer drive gear ① and balancer weight gear ②, and then tighten the balancer weight gear nut ③.
- 3. Bend the lock washer tab along a flat side of the nut.



SHIFT SHAFT

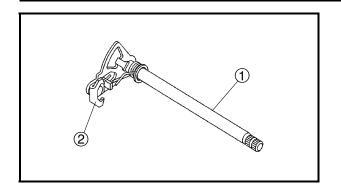


Order	Job/Parts to remove	Q'ty	Remarks
	Removing the shift shaft and		Remove the parts in the order listed.
	stopper lever		
	Right crankcase cover		Refer to "CLUTCH".
	Clutch		
1	Shift pedal	1	
2	Shift shaft assembly	1	
3	Stopper lever	1	
4	Torsion spring	1	
	-		For installation, reverse the removal
			procedure.

SHIFT SHAFT

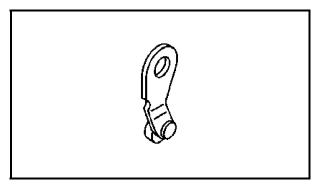






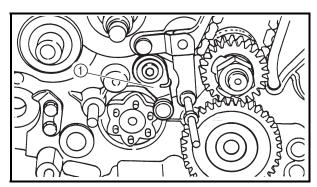
CHECKING THE SHIFT SHAFT

- 1. Check:
 - Shift shaft (1)
 - Shift lever ②
 Bends/damage/wear → Replace.
 - Shift lever spring Damage/wear → Replace.



CHECKING THE STOPPER LEVER

- 1. Check:
 - Stopper lever
 Bends/damage → Replace.
 Roller turns roughly → Replace the stopper lever.
 - Torsion spring Damage/wear → Replace.



INSTALLING THE SHIFT SHAFT

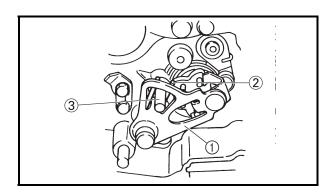
- 1. Install:
 - Stopper lever 1

NOTE: _

- Hook the ends of the stopper lever spring onto the stopper lever and the crankcase boss.
- Mesh the stopper lever with the shift drum segment assembly.
- 2. Tighten:
 - Stopper lever bolt



Stopper lever bolt 10 Nm (1.0 m•kg, 7.4 ft•lb) LOCTITE®



- 3. Install:
 - Shift shaft (1)

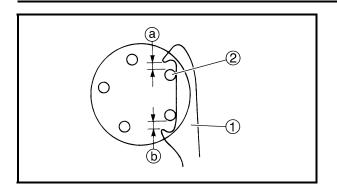
NOTE: _

Install the shift shaft ① by aligning the shift shaft spring ② with the stopper ③.

SHIFT SHAFT







- 4. Check:
 - When the gear position is in Neutral, check the length (a), b) between the tip of the shift lever 1 and dowel pin 2 are equal.
 If not → Replace the shift shaft.
- 5. Install:
 - Shift pedal
- 6. Tighten:
 - Shift pedal bolt



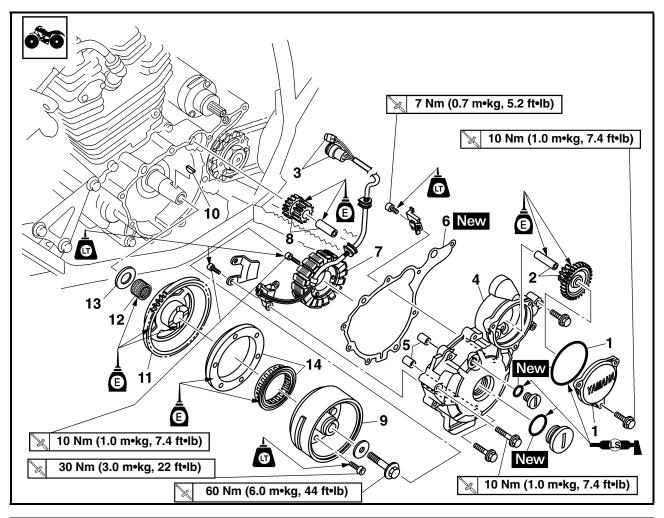
Shift pedal bolt 10 Nm (1.0 m•kg, 7.4 ft•lb)

- 7. Adjust:
 - Shift pedal height Refer to "ADJUSTING THE SHIFT PEDAL" in chapter 3.





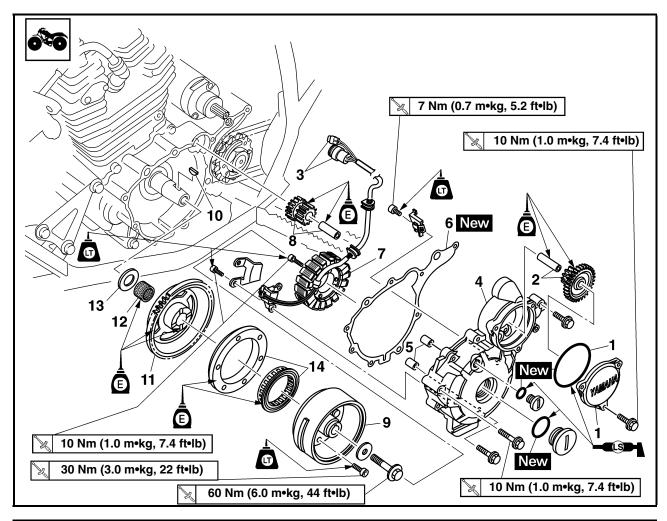
PICKUP COIL ROTOR AND STARTER CLUTCH



Order	Job/Parts to remove	Q'ty	Remarks
	Removing the pickup coil rotor and starter clutch		Remove the parts in the order listed.
	Engine oil		Drain.
	Shift pedal		Refer to "SHIFT SHAFT".
	Drive sprocket cover		Refer to "REAR SHOCK ABSORBER, SWINGARM AND DRIVE CHAIN" in chapter 6.
1	Starter idle gear cover/O-ring	1/1	
2	Starter idler gear 1/shaft	1/1	
3	Pickup coil rotor lead coupler	2	Disconnect.
4	Left crankcase cover	1	
5	Dowel pin	2	
6	Crank case cover gasket	1	
7	Stator coil assembly/pickup coil	1/1	
8	Starter idler gear 2/shaft	1/1	
9	Pickup coil rotor	1	
10	Woodruff key	1	
11	Starter wheel gear	1	



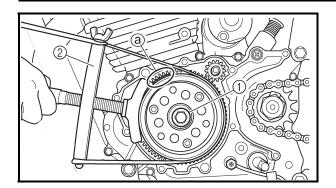




Order	Job/Parts to remove	Q'ty	Remarks
12	Bearing	1	
13	Washer	1	
14	Starter clutch assembly	1	
	•		For installation, reverse the removal
			procedure.







REMOVING THE PICKUPCOIL ROTOR

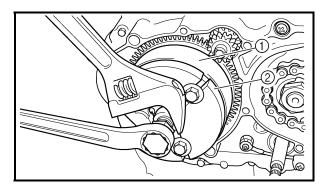
- 1. Remove:
 - Pickup coil rotor bolt (1)
 - Washer

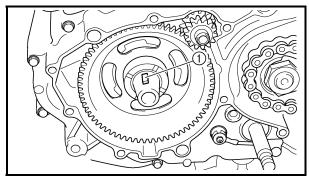
NOTE: _

- Loosen the pickup coil rotor bolt ① while holding the rotor with a sheave holder ②.
- Do not allow the sheave holder to touch the projection on the rotor (a).



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





- 2. Remove:
 - Pickup coil rotor ①

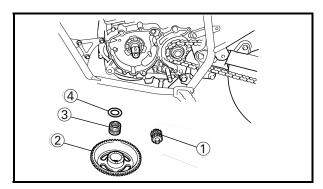
NOTE:

Remove the rotor using flywheel puller 2.



Flywheel puller 90890-01362 Heavy duty puller YU-33270-B Bolt (M8 × 80 mm) 90890-01359

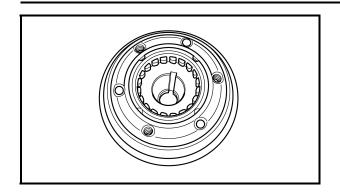
- 3. Remove:
 - Woodruff key (1)



- 4. Remove:
 - Starter idle gear 2 ①
 - Starter wheel gear 2
 - Bearing ③
 - Washer (4)

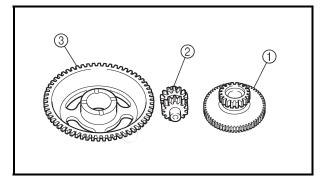


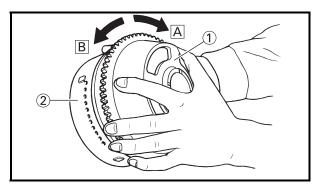




CHECKING THE STARTER CLUTCH

- 1. Check:
 - Starter clutch rollers
 Damage/wear → Replace the starter clutch.





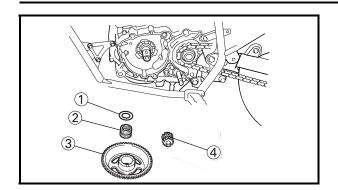
- 2. Check:
 - Starter idle gear (1)
 - Starter wheel gear ②
 - Starter clutch gear ③
 Burrs/chips/roughness/wear → Replace the defective part(s).
- 3. Check:
 - Starter clutch gear's contacting surfaces
 Damage/pitting/wear → Replace the
 starter clutch gear.
- 4. Check:
- Starter clutch operation
- a. Install the starter wheel gear ① onto the starter clutch ② and hold the starter clutch.
- b. When turning the starter wheel gear clockwise A, the starter clutch and the starter wheel gear should engage, otherwise the starter clutch is faulty and must be replaced.
- c. When turning the starter wheel gear counterclockwise B, it should turn freely, otherwise the starter clutch is faulty and must be replaced.

- 5. Check:
 - Shaft

Damage/fatigue/wear \rightarrow Replace the defective part(s).

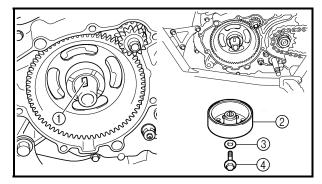






INSTALLING THE PICKUP COIL ROTOR

- 1. Install:
 - Washer (1)
 - Bearing (2)
 - Starter wheel gear ③
 - Starter idle gear 2 4

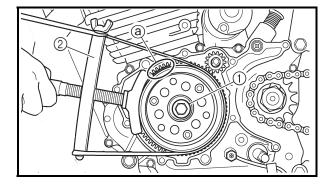


2. Install:

- Woodruff key (1)
- Pickup coil rotor ②
- Washer ③
- Pickup coil rotor bolt 4)

NOTE: _

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



3. Tighten:

• Pickup coil rotor bolt (1)



Pickup coil rotor bolt 60 Nm (6.0 m•kg, 44 ft•lb)

NOTE: _

- Tighten the pickup coil rotor bolt ① while holding the rotor with a sheave holder ②.
- Do not allow the sheave holder to touch the projection on the rotor (a).

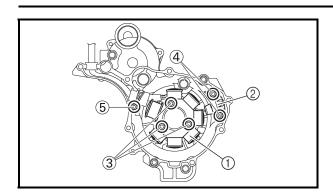


Sheave holder 90890-01701 Primary clutch holder YS-01880-A

PICKUP COIL ROTOR AND STARTER CLUTCH







- 4. Install:
- Stater coil (1)
- Pickup coil (2)
- 5. Tighten:
 - Stater coil bolts ③
 - Pickup coil bolts (4)
 - Left crankcase cover bolt (5)



Stater coil bolt 10 Nm (1.0 m•kg, 7.4 ft•lb) **LOCTITE®** Pickup coil bolt 10 Nm (1.0 m•kg, 7.4 ft•lb) **LOCTITE®**

Left crankcase cover bolt 7 Nm (0.7 m•kg, 5.2 ft•lb) **LOCTITE®**

- 6. Install:
 - Dowel pin
 - Crankcase cover gasket New

- 7. Install:
 - Left crankcase cover
- 8. Install:
 - Crankcase cover bolts M6 × 30 mm (1) ~ (5)
 - Crankcase cover bolt M6 × 45 mm (6)
- Crankcase cover bolts M6 × 40 mm (7) ~ (9)
- 9. Tighten:
 - Crankcase cover bolts (1) ~ (9)

NOTE: _

Tighten the bolts in stages and in a crisscross pattern as shown.

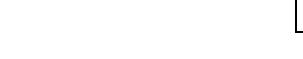


Crankcase cover bolt 10 Nm (1.0 m•kg, 7.2 ft•lb)

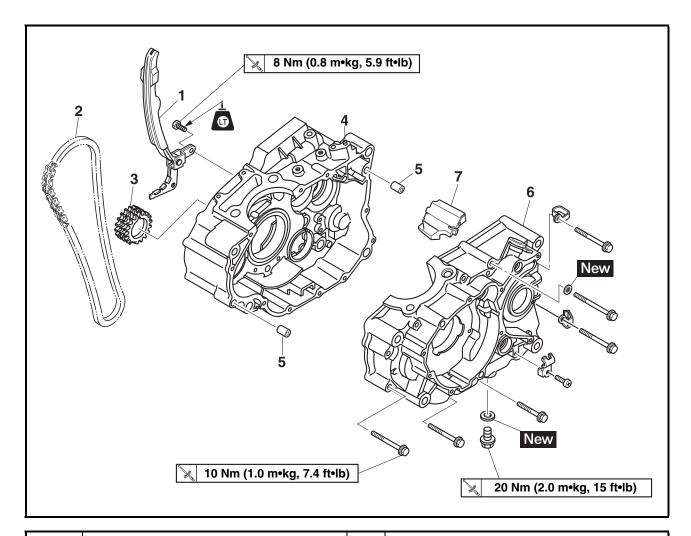
- 10.Install:
 - Starter idle gear 1
 - Shaft
- 11.Install:
 - O-ring New
 - Starter idle gear cover
- 12. Tighten:
 - Starter idle gear cover bolt



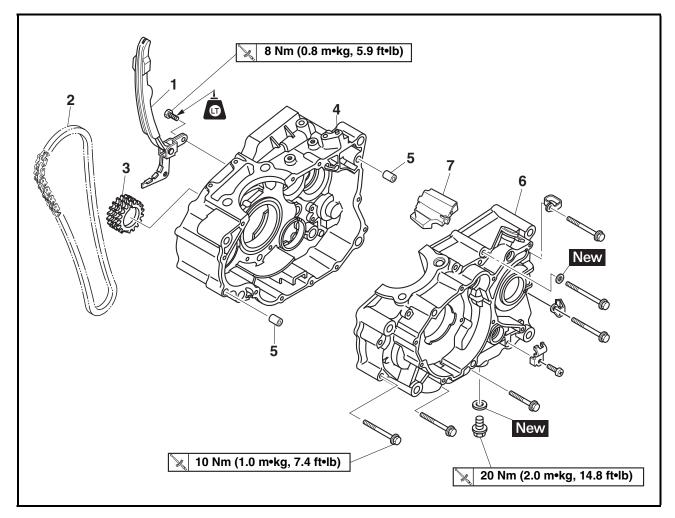
Starter idle gear cover bolt 10 Nm (1.0 m•kg, 7.4 ft•lb)





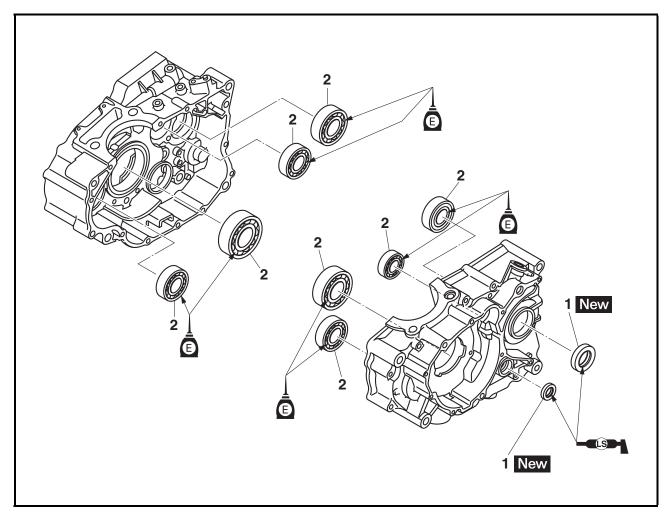


Order	Job/Parts to remove	Q'ty	Remarks
	Separating the crankcase		Remove the parts in the order listed.
	Engine		Refer to "ENGINE REMOVAL".
	Cylinder head		Refer to "CYLINDER HEAD".
	Cylinder		Refer to "CYLINDER AND PISTON".
	Clutch		Refer to "CLUTCH".
	Oil pump		Refer to "OIL PUMP AND BLANCER
			WEIGHT GEAR".
	Balancer weight gear		
	Shift shaft		Refer to "SHIFT SHAFT".
	Pickup coil rotor		Refer to "PICKUP COIL ROTOR AND STARTER CLUTCH".
1	Timing chain guide (intake side)	1	
2	Timing chain	1	
3	Crankshaft sprocket	1	
4	Right crankcase	1	
5	Dowel pin	2	
6	Left crankcase	1	



Order	Job/Parts to remove	Q'ty	Remarks
7	Spacer	1	For installation, reverse the removal procedure.

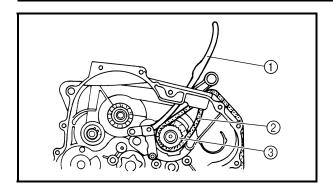




Order	Job/Parts to remove	Q'ty	Remarks
	Removing the bearing		Remove the parts in the order listed.
	Crankshaft assembly		Refer to "CRANKSHAFT ASSEMBLY".
	Main axle assembly/drive axle assem-		Refer to "TRANSMISSION".
	bly		
1	Oil seal	2	
2	Bearing	8	
			For installation, reverse the removal procedure.

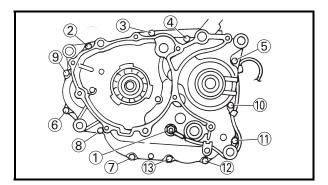






DISASSEMBLING THE CRANKCASE

- 1. Remove:
 - Timing chain guide (intake side) 1
 - Timing chain ②
 - Crankshaft sprocket ③

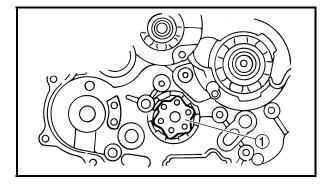


2. Remove:

- Neutral switch (1)
- Crankcase bolts M6 × 70 mm (2) ~ (4)
- Copper washers
- Crankcase bolts M6 × 60 mm (5), (6)
- Crankcase bolts M6 × 55 mm (7) ~ (9)
- Crankcase bolts M6 × 45 mm (10) ~ (13)

NOTE: _

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



3. Turn:

Shift drum segment

NOTE:

Turn the shift drum segment ① to the position shown in the illustration. In this position, the shift drum segment's teeth will not contact the crankcase during crankcase separation.

- 4. Remove:
 - Right crankcase

CAUTION:

- First check that the shift drum segment's teeth and the drive axle circlip are properly positioned, then remove the right crankcase.
- Do not damage the crankcase mating surfaces.

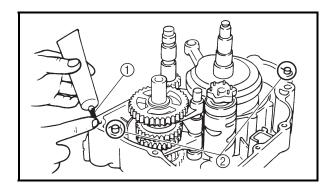


CHECKING THE CRANKCASE

- 1. Thoroughly wash the crankcase halves in a mild solvent.
- 2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.
- 3. Check:
 - Crankcase

Cracks/damage \rightarrow Replace.

Oil delivery passages
 Obstruction → Blow out with compressed air.



ASSEMBLING THE CRANKCASE

- 1. Apply:
 - Yamaha bond No.1215 (Three Bond No.1215 $^{\scriptsize (B)}$) $\stackrel{\frown}{\bigcirc}$

(onto the crankcase mating surfaces)



Yamaha bond No.1215 (Three Bond No.1215[®]) 90890-85505

NOTE: __

Do not allow any sealant to come into contact with the oil gallery.

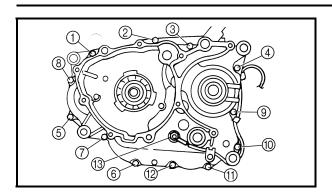
- 2. Install:
 - Dowel pins (2)
- 3. Install:
 - Right crankcase (onto the left crankcase)

NOTE:

Tap lightly on the right crankcase with a soft-face hammer.







- 4. Install:
 - Crankcase bolts M6 × 70 mm ① ~ ③
 - Copper washers to 1 ~ 3.
 - Crankcase bolts M6 × 60 mm (4), (5)
 - Crankcase bolts M6 × 55 mm 6 ~ 8
 - Crankcase bolts M6 × 45 mm (9) ~ (12)
- 5. Tighten:
 - Crankcase bolts (1) ~ (12)

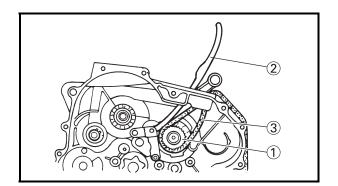


Crankcase bolt 10 Nm (1.0 m•kg, 7.4 ft•lb)

NOTE: _

Tighten each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern.

- 6. Install:
 - Neutral switch (13)



7. Install:

- Crankshaft sprocket (1)
- Timing chain guide (intake side) ②
- Timing chain (3)
- 8. Tighten:
 - Timing chain guide (intake side) bolt



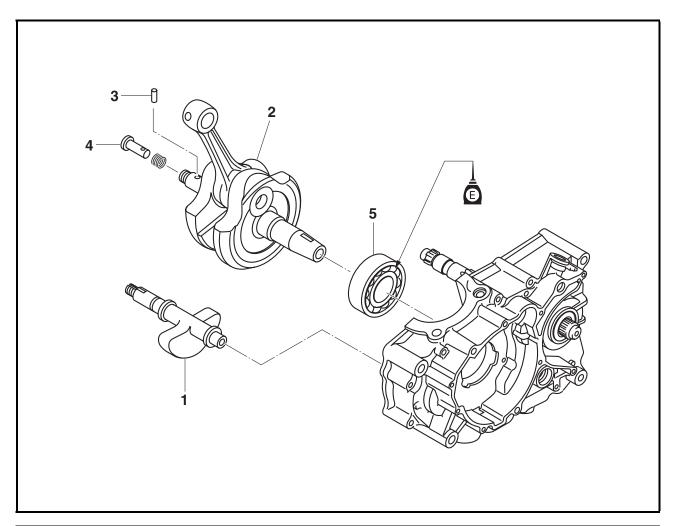
Timing chain guide (intake side) bolt

8 Nm (0.8 m•kg, 5.9 ft•lb) LOCTITE®

- 9. Apply:
 - Engine oil (onto the crankshaft pins bearings and oil delivery holes)
- 10.Check:
- Crankshaft and transmission operation Rough movement → Repair.

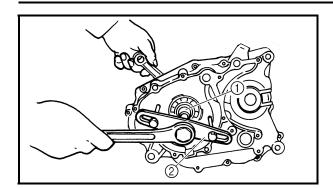






Order	Job/Parts to remove	Q'ty	Remarks
	Removing the crankshaft assembly		Remove the parts in the order listed.
	Crankcase		Refer to "CRANKCASE".
1	Balancer weight	1	
2	Crankshaft assembly	1	
3	Dowel pin	1	
4	Plunger seal	1	
5	Bearing	1	
			For installation, reverse the removal procedure.





REMOVING THE CRANKSHAFT ASSEMBLY

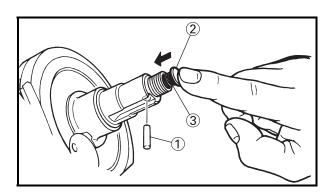
- 1. Remove:
 - Balancer weight
 - Crankshaft assembly (1)

NOTE: _

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

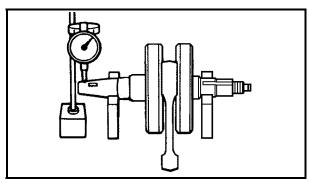


Crankcase separating tool 90890-01135 Crankcase separator YU-01135-B



REMOVING THE PLUNGER SEAL

- 1. Remove:
- Dowel pin (1)
- Plunger seal ②
- Compression spring ③
 Remove the plunger seal and compression spring, push the plunger seal lightly and remove the dowel pin.



CHECKING THE CRANKSHAFT AND CONNECTING ROD

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

NOTE: _

Turn the crankshaft slowly.



Runout limit C 0.03 mm (0.0012 in)





2. Measure:

Big end side clearance
 Out of specification → Replace the big end
 bearing, crankshaft pin, or connecting rod.



Big end side clearance D 0.350 ~ 0.650 mm (0.0138 ~ 0.0256 in)

3. Measure:

Crankshaft width
 Out of specification → Replace the crankshaft.



Width A 69.25 ~ 69.30 mm (2.726 ~ 2.728 in)

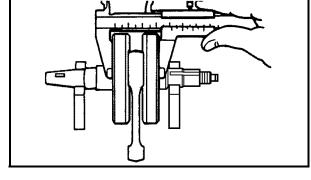
4. Check:

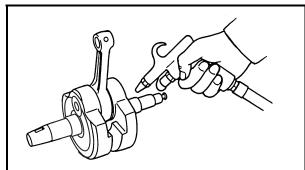
Crankshaft sprocket
 Damage/wear → Replace the crankshaft.

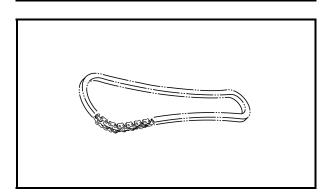
 Bearing Cracks/damage/wear → Replace the crankshaft.

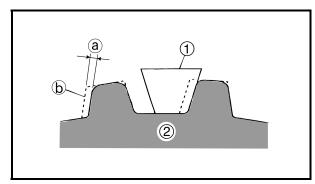
5. Check:

Crankshaft journal oil passage
 Obstruction → Blow out with compressed
 air









CHECKING THE TIMING CHAIN, CRANKSHAFT SPROCKET AND TIMING CHAIN GUIDE

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

1. Check:

Timing chain
 Damage/stiffness → Replace the timing chain and camshaft sprocket and crank-shaft sprocket as a set.

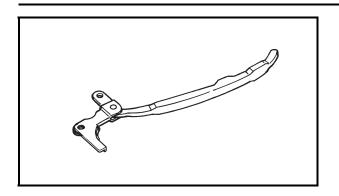
2. Check:

Crankshaft sprocket
 More than 1/4 tooth wear ⓐ → Replace
 the timing chain and camshaft sprocket and
 crankshaft sprocket as a set.

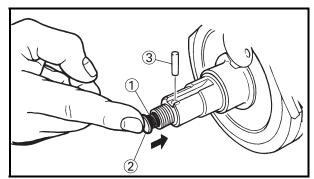
- (a) 1/4 tooth
- (b) Correct
- (1) Timing chain roller
- (2) Crankshaft sprocket







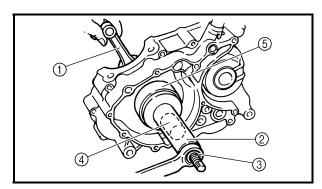
- 3. Check:
- Timing chain guide (intake side)
 Damage/wear → Replace the timing chain guide (intake side)



INSTALLING THE PLUNGER SEAL

- 1. Install:
 - Compression spring ①
 - Plunger seal (2)
 - Dowel pin (3)

Check the plunger seal smooth operation pushing the plunger seal by your finger.



INSTALLING THE CRANKSHAFT ASSEMBLY

- 1. Install:
 - Crankshaft assembly (1)

NOTE: _

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



Crankshaft installer pot 90890-01274

Installing pot YU-90058

Crankshaft installer bolt

90890-01275

Bolt

YU-90060

Spacer

90890-01288

Adapter (M10)

90890-01383

Adapter #2

YU-90062

ENG	
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To avoid scratching the crankshaft and to ease the installation procedure, lubricate the oil seal lips with lithium-soap-based grease and each bearing with engine oil.

NOTE:

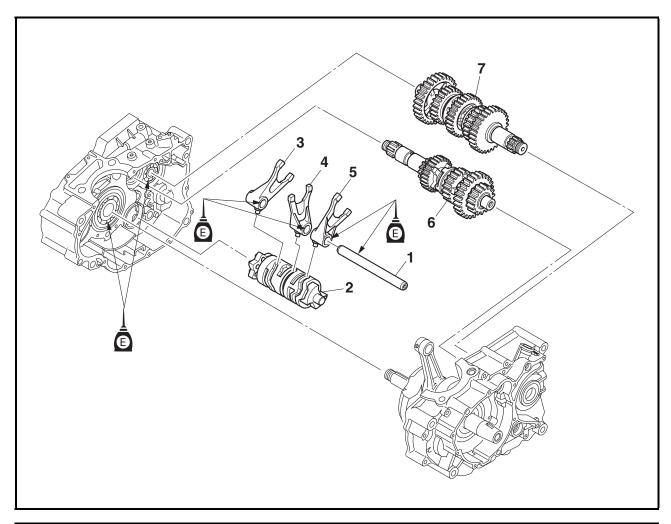
Hold the connecting rod at top dead center (TDC) with one hand while turning the nut of the crankshaft installer bolt with the other. Turn the crankshaft installer bolt until the crankshaft assembly bottoms against the bearing.

2. Install:

 Balancer weight To the right crank case.

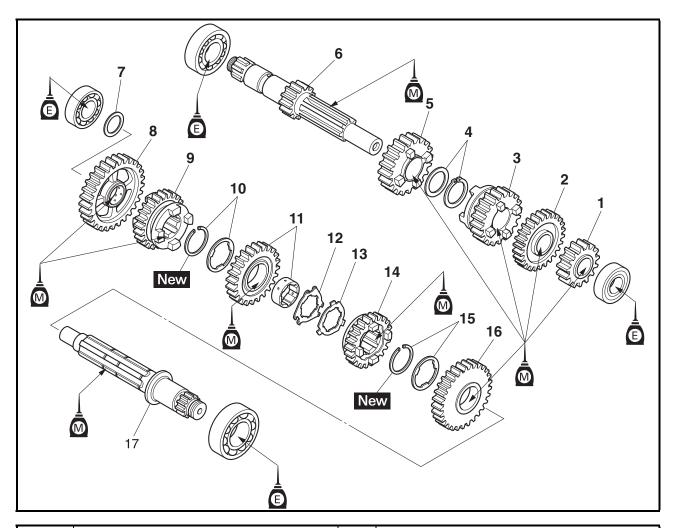






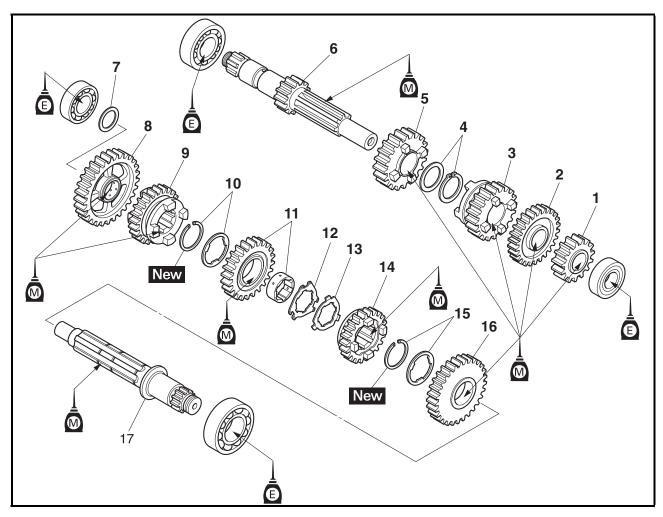
Order	Job/Parts to remove	Q'ty	Remarks
	Removing the transmission, shift drum assembly, and shift forks		Remove the parts in the order listed.
	Crankcase		Separate.
			Refer to "CRANKCASE".
1	Shift fork guide bar	1	
2	Shift drum assembly	1	
3	Shift fork-3 (R)	1	
4	Shift fork-2 (C)	1	
5	Shift fork-1 (L)	1	
6	Main axle assembly	1	
7	Drive axle assembly	1	
			For installation, reverse the removal procedure.





Order	Job/Parts to remove	Q'ty	Remarks
	Disassembling the transmission		Remove the parts in the order listed.
1	2nd pinion gear	1	
2	5th pinion gear	1	
3	3rd pinion gear	1	
4	Circlip/washer	1/1	
5	4th pinion gear	1	
6	Main axle	1	
7	Plain washer	1	
8	1st wheel gear	1	
9	4th wheel gear	1	
10	Circlip/washer	1/1	
11	3rd wheel gear/collar	1/1	
12	Claw washer 1	1	
13	Claw washer 2	1	
14	5th wheel gear	1	
15	Circlip/washer	1/1	
16	2nd wheel gear	1	

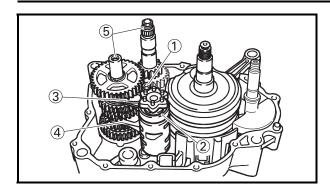


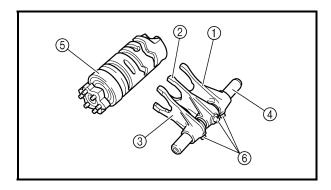


Order	Job/Parts to remove	Q'ty	Remarks
17	Drive axle	1	
			For installation, reverse the removal
			procedure.









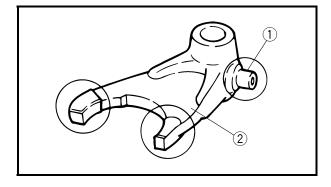
REMOVING THE TRANSMISSION

- 1. Remove:
 - Shift fork guide bar ①
 - Shift drum assembly ②
 - Shift fork 3 (R) (3)
 - Shift fork 2 (C)
- Shift fork 1 (L) (4)
- 2. Remove:
 - Transmission (5)

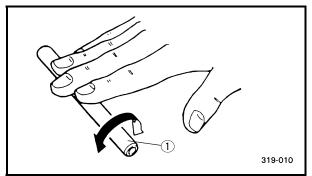
CHECKING THE SHIFT FORKS

The following procedure applies to all of the shift forks.

- 1. Check:
 - Shift fork movement (along the shift fork guide bar) Rough movement → Replace the shift forks and shift fork guide bar as a set.
- 1 Shift fork 3 (R)
- 2 Shift fork 2 (C)
- 3 Shift fork 1 (L)
- 4 Shift fork guide bar
- (5) Shift drum assembly
- 6 Shift fork cam follower



- 2. Check:
 - Shift fork cam follower (1)
- Shift fork pawl ②
 Bends/damage/scoring/wear → Replace the shift fork.



- 3. Check:
 - Shift fork guide bar ①
 Roll the shift fork guide bar on a flat surface.

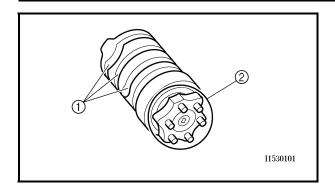
Bends \rightarrow Replace.

A WARNING

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

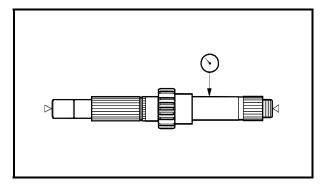






CHECKING THE SHIFT DRUM ASSEMBLY

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

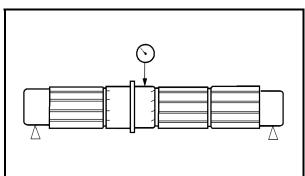


CHECKING THE TRANSMISSION

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



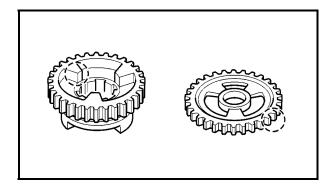
Main axle runout limit 0.06 mm (0.0024 in)



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



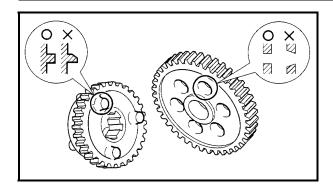
Drive axle runout limit 0.06 mm (0.0024 in)

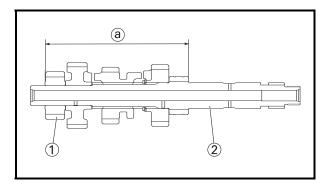


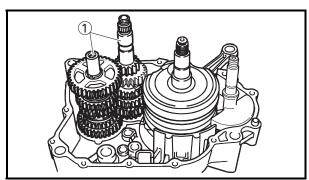
- 3. Check:
 - Transmission gears
 Blue discoloration/pitting/wear → Replace
 the defective gear(s).
 - Transmission gear dogs
 Cracks/damage/rounded edges →
 Replace the defective gear(s).

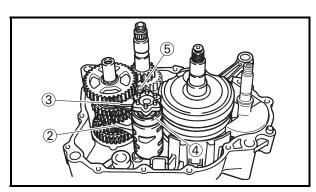


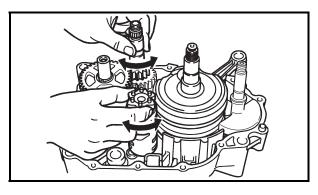












4. Check:

 Transmission gear engagement (each pinion gear to its respective wheel gear)

Incorrect \rightarrow Reassemble the transmission axle assemblies.

NOTE: _

When reassembling the main axle, press the 2nd pinion gear (1) onto it (2) as shown.

(a) 102.2 ~ 102.4 mm (4.02 ~ 4.03 in)

5. Check:

- Transmission gear movement
 Rough movement → Replace the defective part(s).
- 6. Check:
- Circlips
 Bends/damage/looseness → Replace.

INSTALLING THE SHIFT FORKS AND SHIFT DRUM ASSEMBLY

- 1. Install:
 - Transmission (1)
 - Shift fork 1 (L) (2)
 - Shift fork 2 (C)
 - Shift fork 3 (R) (3)
 - Shift drum assembly (4)
 - Shift fork guide bar (5)
 - Spacer
 - Right crankcase

NOTE: _

- The embossed marks on the shift forks should face towards the left side of the engine and be in the following sequence: "L", "C", "R".
- The grooved side of the shift fork guide bar should face towards the right side of the engine.

2. Check:

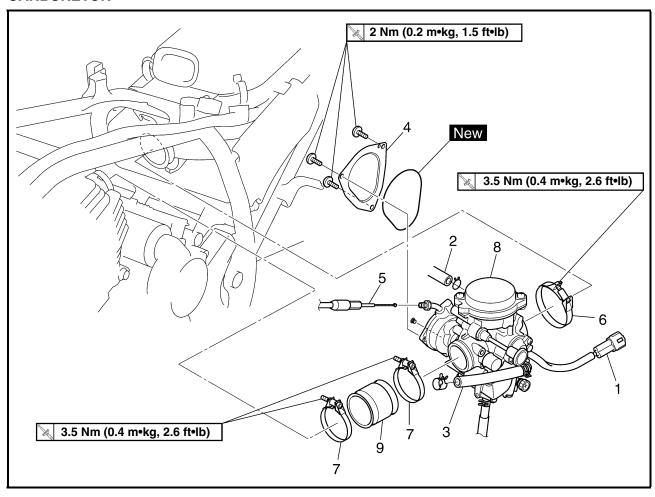
Shift cam operation
 Unsmoothy operation → Repair.

NOTE: _

Check the transmission and shift forks for smooth operation by turning the shift cam with your hand. EBS00141

CARBURETOR

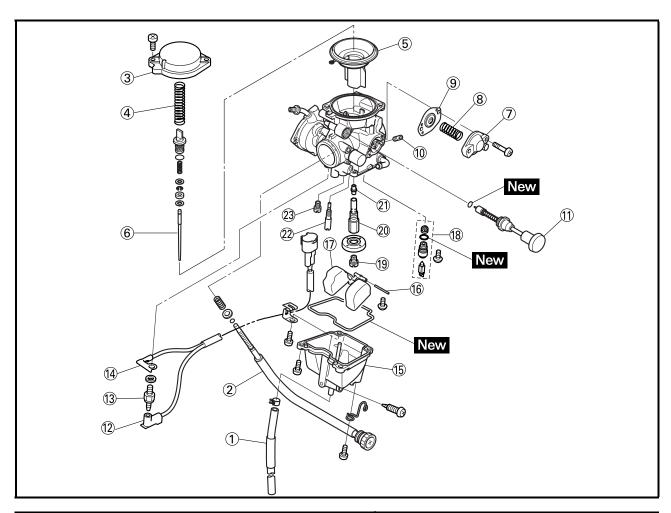
CARBURETOR



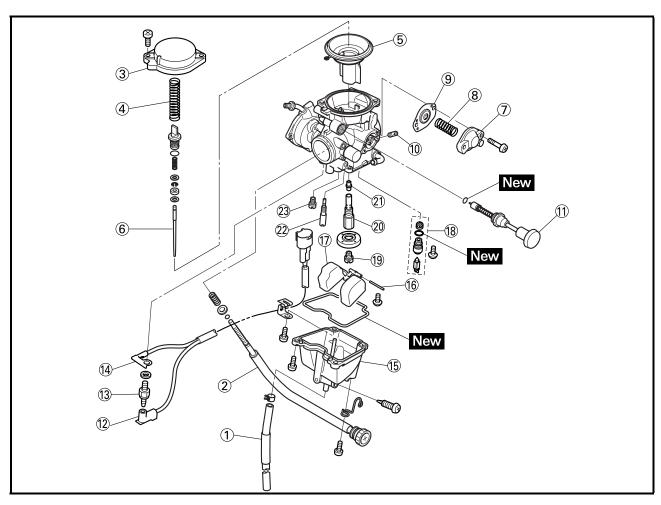
Order	Job/Part	Q'ty	Remarks
1	Removing a carburetor Seat/front fender/rear fender/air filter case Carburetor warmer coupler	1	Remove the parts in the order listed. Refer to "SEAT, FENDERS AND FUEL TANK" in chapter 3. Disconnect.
2 3 4 5 6 7 8 9	Air vent hose Fuel hose (carburetor side) Throttle cable cover Throttle cable Clamp Clamp Carburetor Carburetor joint	1 1 1 1 1 2 1	Loosen. Loosen. In Refer to "INSTALLING THE CARBURETOR JOINT" and "INSTALLING THE CARBURETOR TOR".
			For installation, reverse the removal procedure.

5

EBS00144

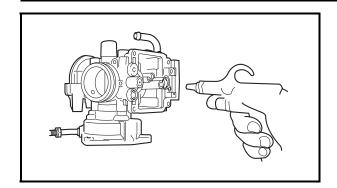


Order	Job/Part	Q'ty	Remarks
	Disassembling the carburetor		Remove the parts in the order listed.
1	Drain hose	1	
2	Throttle stop screw	1	
3	Cover	1	
4	Diaphragm spring	1	
(4) (5)	Piston valve	1	
6	Jet needle	1	
7	Cover	1	
8	Spring	1	
9	Coasting enricher diaphragm	1	
10	Coasting enricher jet (P. A. J. 2)	1	
11)	Starter plunger	1	
12	Carburetor warmer positive lead	1	
13	Carburetor warmer	1	
14)	Carburetor warmer negative lead	1	
15	Float chamber	1	
16	Float pin	1	



Order	Job/Part	Q'ty	Remarks
17	Float	1	
18	Needle valve seat set	1	
19	Main jet	1	
20	Needle jet holder	1	
21	Needle jet	1	
22	Pilot jet	1	
23	Starter jet	1	
			For assembly, reverse the disassembly procedure.



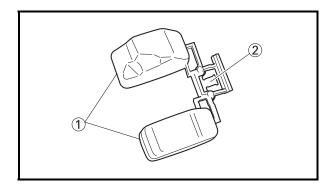


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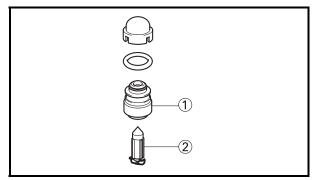
CHECKING THE CARBURETOR

- 1. Check:
- carburetor body
- float chamber
 Cracks/damage → Replace.
- fuel passage Contamination → Clean as indicated.
- fuel chamber body
 Contamination → Clean.

- 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.

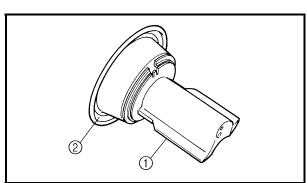


- 3. Check:
 - valve seat (1)
- needle valve ②
 Contamination → Clean.

 Wear/damage → Replace as a set.

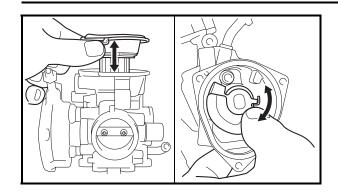
NOTE:

Always replace the valve seat, needle valve and O-ring as a set.



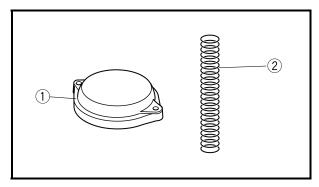
- 4. Check:
 - piston valve ①
 Scratches/wear/damage → Replace.
 - piston valve diaphragm ②
 Cracks/tears → Replace.





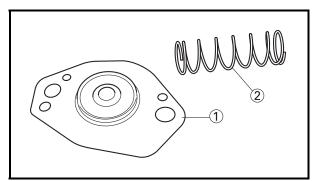
5. Check:

- piston valve movement
 Sticks → Replace.
 Insert the piston valve into the carburetor body, and check for free movement.
- 6. Check:
- throttle valve movement Sticks → Replace.



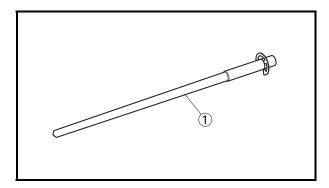
7. Check:

- cover (1)
- diaphragm spring ②
 Cracks/damage → Replace.



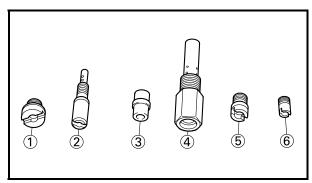
8. Check:

- coasting enricher diaphragm (1)
- spring ②
 Cracks/damage → Replace.



9. Check:

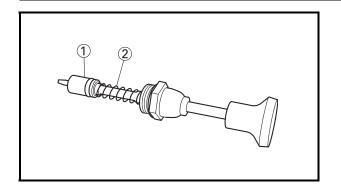
- jet needle ①
 Bends/wear/damage → Replace.
- clip groove
 Free play/wear → Replace.



10.Check:

- main jet ①
- pilot jet ②
- needle jet ③
- needle jet holder 4
- starter jet (5)
- coasting enricher jet (P. A. J. 2) ⑥
 Bends/wear/damage → Replace.
 Blockage → Blow out the jets with compressed air.





11.Check:

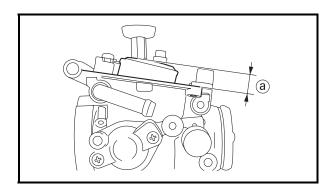
- starter plunger (1)
- starter plunger spring ②
 Bends/cracks/damage → Replace.

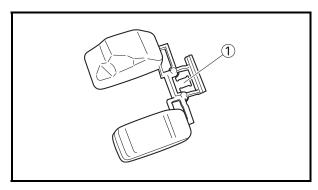
EBS00150

ASSEMBLING THE CARBURETOR

CAUTION:

Before reassembling, wash all of the parts in a clean petroleum based solvent.





- 1. Measure:
 - float height (a)
 Out of specification → Adjust.



Float height (F.H) 13.0 mm (0.51 in)

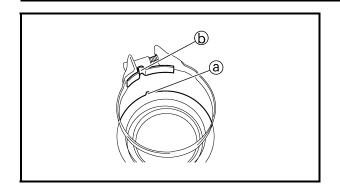
- a. Hold the carburetor in an upside down position
- b. Measure the distance from the front mating surface of the float chamber (gasket removed) to the top of the float.

NOTE: _

The float arm should be resting on the needle valve, but not compressing it.

- c. If the float height is not within the specification, check the valve seat and needle valve.
- d. If either is worn, replace the valve seat, needle valve and O-ring as a set.
- e. If both are fine, adjust the float height by bending the float tang ① on the float.
- f. Recheck the float height.



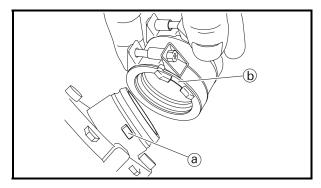


INSTALLING THE CARBURETOR JOINT

- 1. Install:
 - clamp

NOTE: _

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

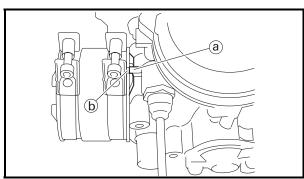


2. Install:

carburetor joint

NOTE: __

Align the projection ⓐ on the cylinder head with the slot ⓑ in the carburetor joint.



INSTALLING THE CARBURETOR

- 1. Install:
 - carburetor

NOTE: _

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

- 2. Install:
 - throttle cable
 - throttle cable cover
- 3. Adjust:
 - throttle lever free play Refer to "ADJUSTING THE THROTTLE LEVER FREE PLAY" in chapter 3.
- 4. Adjust:
 - engine idling speed
 Refer to "ADJUSTING THE ENGINE IDLING SPEED" in chapter 3.

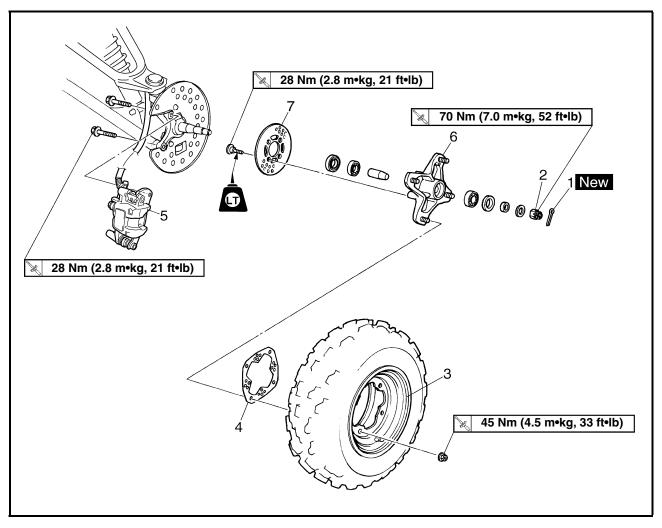


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CHASSIS

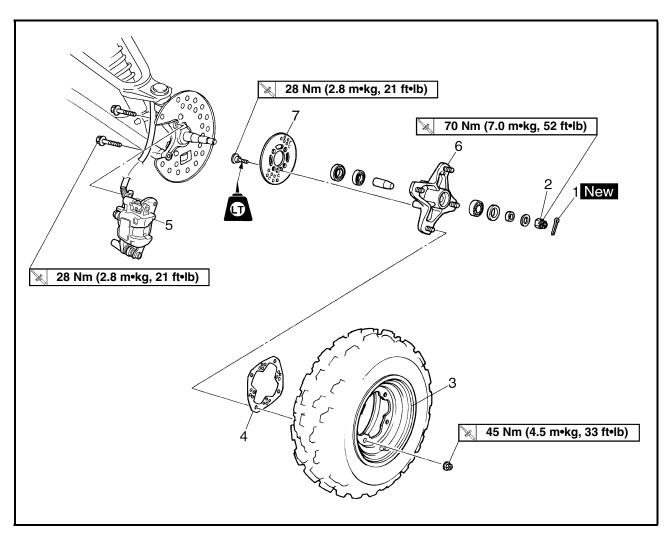
FRONT AND REAR WHEELS

FRONT WHEELS



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

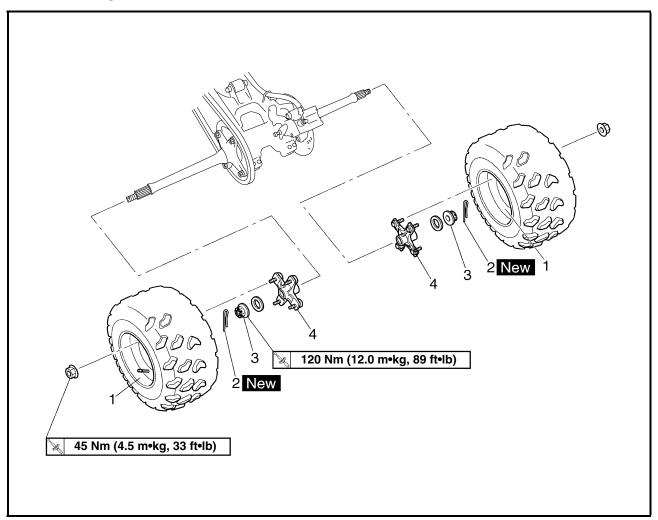




Order	Job/Part	Q'ty	Remarks
5	Brake caliper assembly	1	NOTE:
			Do not squeeze the brake lever when the brake caliper is off of the brake discs as the brake pads will be forced shut.
6	Wheel hub	1	Refer to "INSTALLING THE WHEEL HUB BEARINGS".
7	Brake disc	1	Rear to "INSTALLING FRONT BRAKE DISCS".
		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

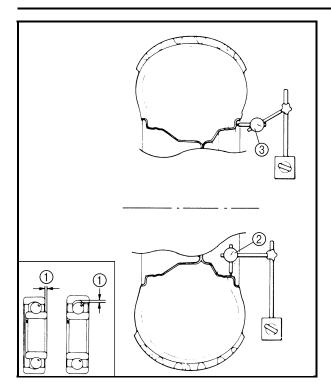


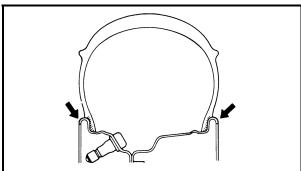
REAR WHEELS

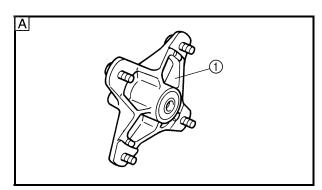


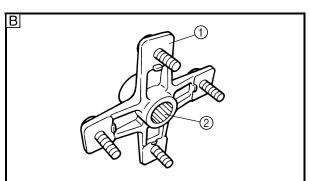
Order	Job/Part	Q'ty	Remarks
	Removing the rear wheels		Remove the parts in the order listed. Place the machine on a level surface.
			▲ WARNING
			Securely support the machine so there is no danger of it falling over.
1	Rear wheel	2	
2	Cotter pin	2	Refer to "INSTALLING THE WHEEL
3	Axle nut	2	┘ HUBS".
4	Wheel hub	2	
			For installation, reverse the removal procedure.











EBS00383

CHECKING THE WHEELS

- 1. Check:
 - wheels
- 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

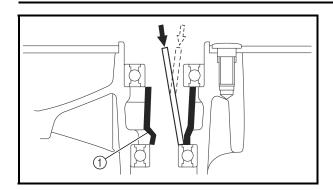
After replacing the tire, ride conservatively to allow the tire to be properly seated in the rim. Failure to do so may cause an accident resulting in machine damage and possible operator injury.

EBS0038

CHECKING THE WHEEL HUBS

- 1. Check:
 - wheel hubs 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.

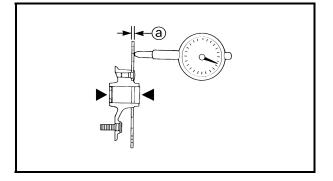
A WARNING

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.

CAUTION:

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



EBS00389

CHECKING THE BRAKE DISCS

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



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

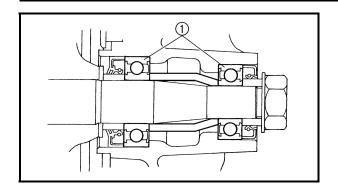
brake disc thickness (a)
 Out of specification → Replace.



Brake disc minimum thickness Front: 3 mm (0.12 in)

Rear: 3.5 mm (0.14 in)



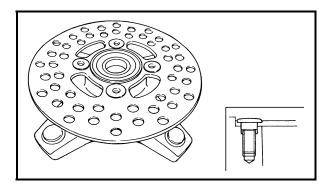


INSTALLING THE FRONT WHEEL HUB BEARINGS

- 1. Install:
 - bearings ①

NOTE: __

Face the oil seal side of the bearing inward.

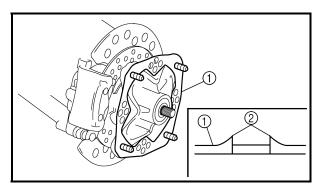


INSTALLING THE FRONT BRAKE DISCS

- 1. Install:
 - brake discs

NOTE: ___

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



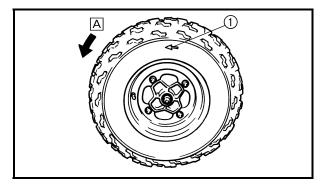
EBS00392

INSTALLING THE FRONT WHEELS

- 1. Install:
 - brake disc guards (outer) 1

NOTE: ___

Install the brake disc guard (outer) with punched burrs ② on the wheel hub side.

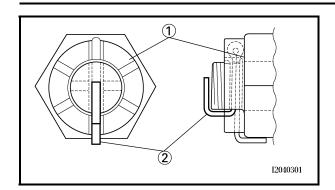


- 2. Install:
 - wheels

NOTE: _

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





EBS00390

INSTALLING THE WHEEL HUBS

- 1. Install:
 - front axle nuts ①



Front axle nut 70 Nm (7.0 m•kg, 52 ft•lb)

• rear axle nuts (1)



Rear axle nut 120 Nm (12.0 m•kg, 89 ft•lb)

• cotter pins 2 New

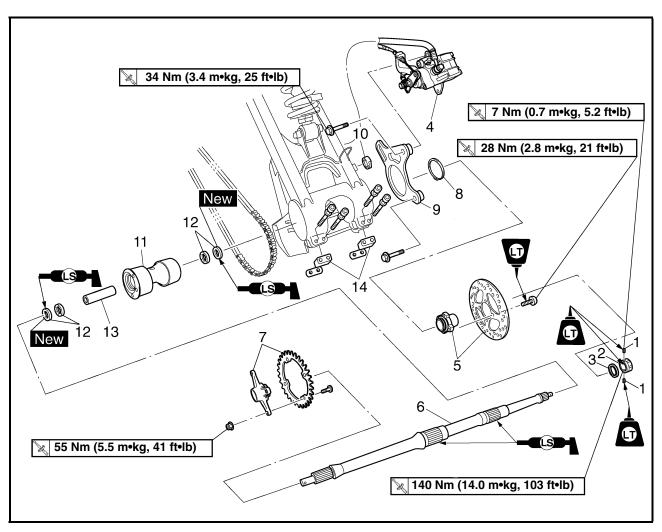
NOTE: _

- 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.



FBS0038

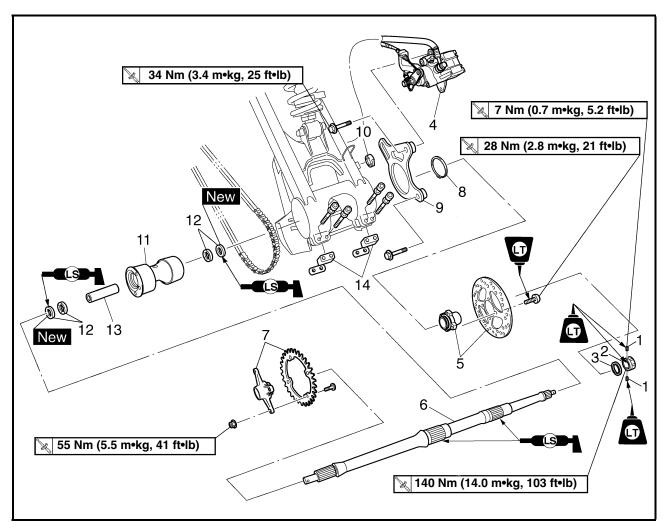
REAR AXLE AND REAR AXLE HUB



Order	Job/Part	Q'ty	Remarks
	Removing the rear axle and rear axle hub		Remove the parts in the order listed.
	Rear wheels/rear wheel hubs		Refer to "FRONT AND REAR WHEELS".
1	Bolt	2	Refer to "REMOVING THE REAR
2	Nut	1	-AXLE" and "INSTALLING THE REAR
3	Conical spring washer	1	│ AXLE".
4	Brake caliper	1	NOTE:
			Do not apply the brake pedal and do not use the parking brake when the brake caliper is off of the brake disc as the brake pad will be force shut.

REAR AXLE AND REAR AXLE HUB

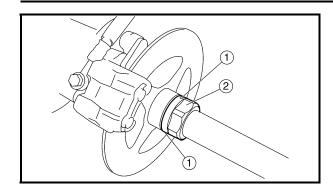




Order	Job/Part	Q'ty	Remarks
5	Brake disc/brake disc bracket	1/1	
6	Rear axle	1	Refer to "REMOVING THE REAR AXLE".
7	Driven sprocket/sprocket bracket	1/1	Refer to "INSTALLING THE DRIVEN SPROCKET".
8	Circlip	1	
9	Brake caliper bracket	1	
10	Collar	1	
11	Rear axle hub	1	
12	Bearing/oil seal	2/2	
13	Spacer	1	
14	Dust cover	1	
			For installation, reverse the removal procedure.

REAR AXLE AND REAR AXLE HUB





3

EBS00393

REMOVING THE REAR AXLE

- 1. Place the machine on a level surface.
- 2. Loosen:
 - bolts 1
- 3. Remove:
 - nut (2)

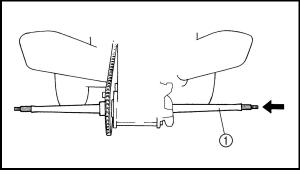
NOTE: _

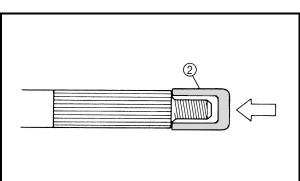
- Apply the brake pedal so that the rear axle does not turn, when loosening the nut.
- Use the PTT wrench 46 or axle nut wrench (46 mm) (3).



PTT wrench 46 90890-06588 Axle nut wrench (46 mm) YM-37134

- 4. Elevate the rear wheels by placing the suitable stand under the frame.
- 5. Remove:
 - rear wheels
 - wheel hubs
 - nuts
 - washers





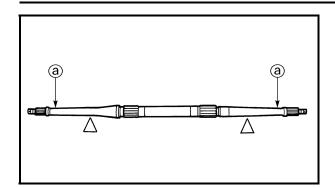
- 6. Remove:
 - rear axle (1)

CAUTION:

- 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, then pull out the rear axle to the right.

REAR AXLE AND REAR AXLE HUB





EBS00395

CHECKING THE REAR AXLE

- 1. Check:
 - rear axle runout (a)
 Out of specification → Replace.

A WARNING

Do not attempt to straighten a bent axle.



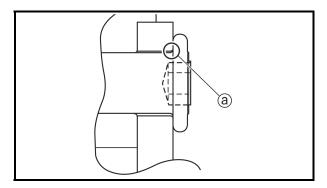
Rear axle runout limit 1.5 mm (0.06 in)

CHECKING THE DRIVEN SPROCKET

- 1. Check:
 - driven sprocket
 Refer to "REAR SHOCK ABSORBER,
 SWINGARM AND DRIVE CHAIN".

CHECKING THE BRAKE DISC

- 1. Check:
 - brake disc Refer to "FRONT AND REAR WHEELS".

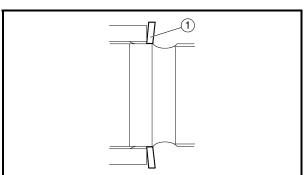


INSTALLING THE DRIVEN SPROCKET

- 1. Install:
 - driven sprocket

NOTE: _

Make sure that the blunt-edged corner (a) of the driven sprocket is facing outward.



EBS00397

INSTALLING THE REAR AXLE

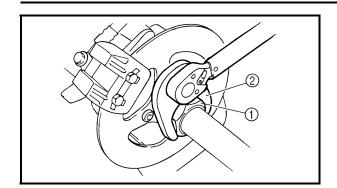
- 1. Install:
- conical spring washer 1

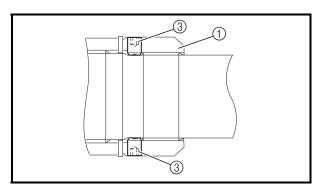
NOTE: _

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

REAR AXLE AND REAR AXLE HUB







- 2. Tighten:
 - nut (1)

a. Tighten the nut with PTT wrench 46 or rear axle nut wrench ② to specification while holding the rear axle.

140 Nm (14.0 m•kg, 103 ft•lb)



PTT wrench 46 90890-06588 Axle nut wrench (46 mm) YM-37134

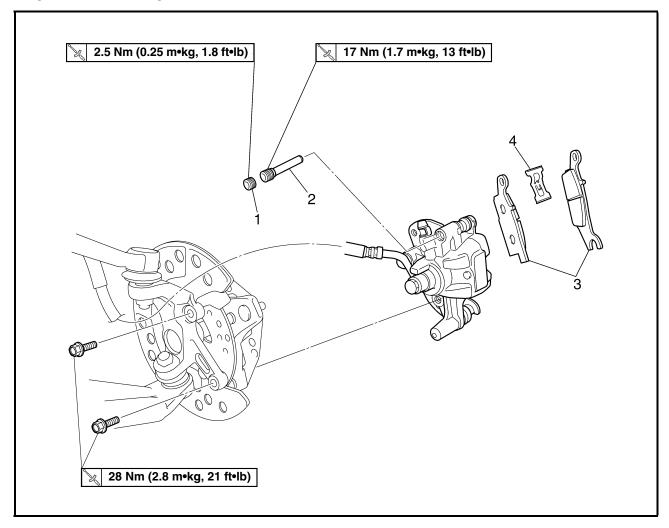
b. Tighten bolts 3.

7 Nm (0.7 m•kg, 5.2 ft•lb)



FRONT AND REAR BRAKES

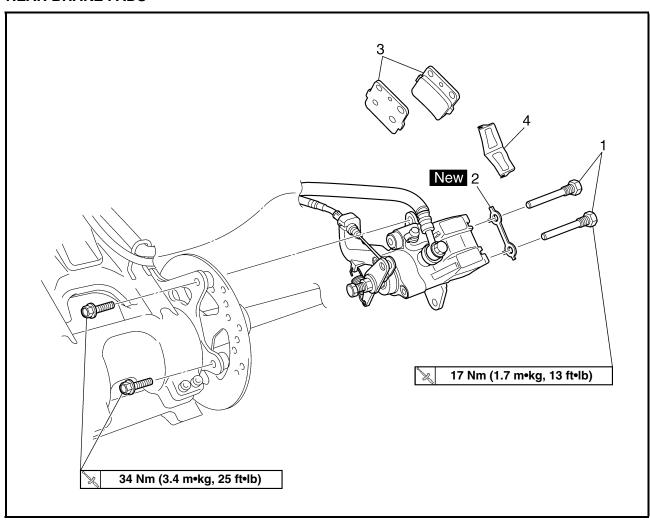
FRONT BRAKE PADS



Order	Job/Part	Q'ty	Remarks
1 2 3 4	Front wheel Bolt Brake pad retaining bolt Brake pad Brake pad Brake pad spring	1 1 2 1	Remove the parts in the order listed. The following procedure applies to both of the front brake calipers. Refer to "FRONT AND REAR WHEELS". Refer to "REPLACING THE FRONT BRAKE PADS". For installation, reverse the removal procedure.



REAR BRAKE PADS



Order	Job/Part	Q'ty	Remarks
	Removing the rear brake pads		Remove the parts in the order listed.
1	Brake pad retaining bolt	2	
2	Lock washer	1	Refer to "REPLACING THE REAR
3	Brake pad	2	BRAKE PADS".
4	Brake pad spring	1	
			For installation, reverse the removal procedure.

EBS00402

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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.

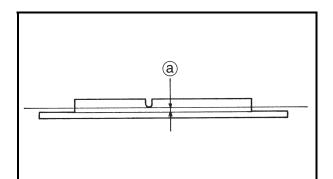
EBS00404

REPLACING THE FRONT BRAKE PADS

The following procedure applies to both of the front brake calipers.

			_	
NI	\mathbf{C}	ГІ		•

It is not necessary to disassemble the brake calipers and brake hoses to replace the brake pads.

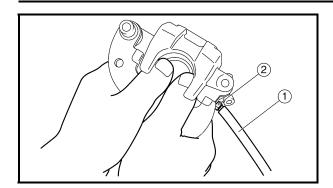


- 1. Remove:
- brake pads
- (a) Wear limit

NOTF:

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

NOTE: _

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.

№ 5 Nm (0.5 m•kg, 3.7 ft•lb)

- d. Install new brake pads and a new brake pad spring.
- 3. Install:
 - brake pad retaining bolt
 - bolt



Brake pad retaining bolt 17 Nm (1.7 m•kg, 13 ft•lb) **Bolt**

3 Nm (0.3 m•kg, 2 ft•lb)

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



Brake caliper mounting bolt 28 Nm (2.8 m•kg, 21 ft•lb)

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

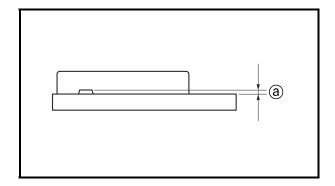
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

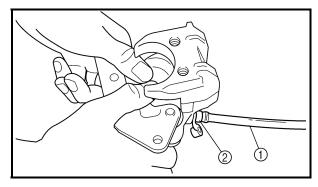
EBS00405

REPLACING THE REAR BRAKE PADS

NOTE: _

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





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

NOTE: _

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

NOTE: _

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.

5 Nm (0.5 m•kg, 3.7 ft•lb)

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

- 3. Install:
 - brake pad retaining bolts (Bend the lock washer tabs along a flat side of the bolts)
 - brake caliper
 - brake caliper mounting bolts



Brake pad retaining bolt 17 Nm (1.7 m•kg, 13 ft•lb) Brake caliper mounting bolt 34 Nm (3.4 m•kg, 25 ft•lb)

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

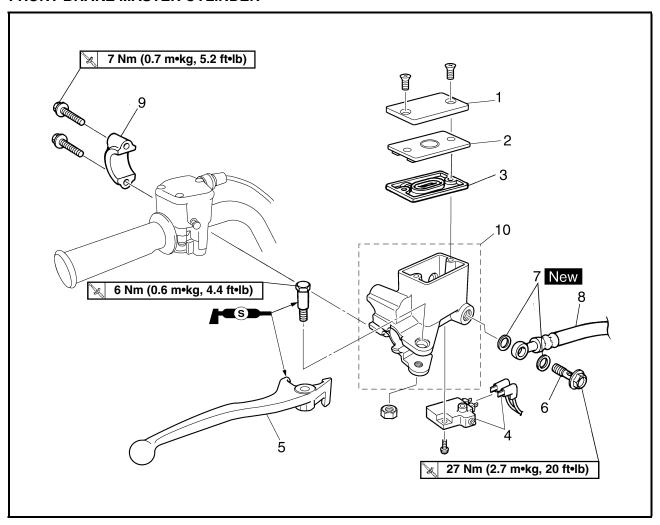


- 5. Check:
 - brake lever or brake pedal operation
 Soft or spongy feeling → Bleed the brake system.

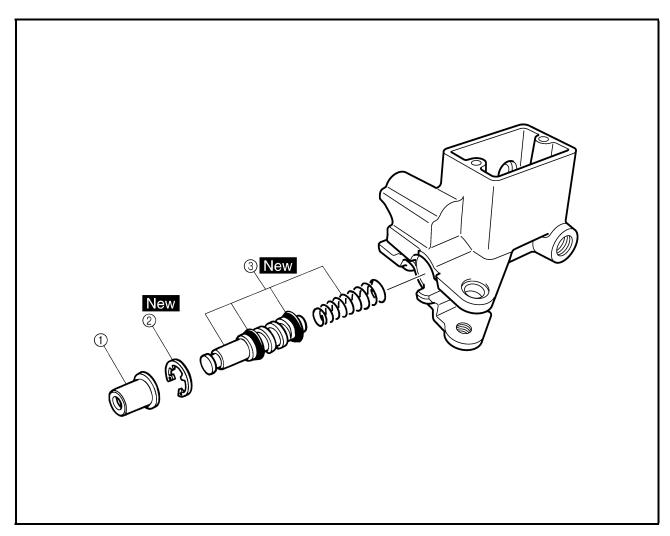
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.



FRONT BRAKE MASTER CYLINDER



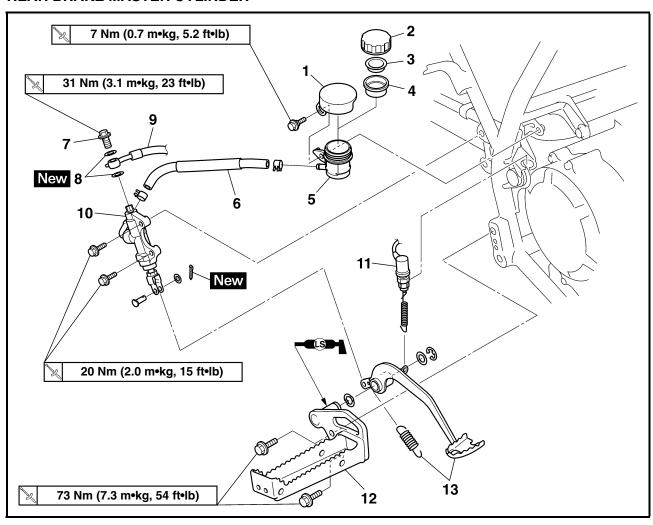
Order	Job/Part	Q'ty	Remarks
	Removing the front brake master cylinder		Remove the parts in the order listed.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
1	Brake fluid reservoir cap	1	
2	Brake fluid reservoir diaphragm plate	1	
3	Brake fluid reservoir diaphragm	1	
4	Front brake light switch	1	
5	Brake lever	1	
6	Union bolt	1	٦
7	Copper washer	2	Refer to "INSTALLING
8	Brake hose	1	Disconnect THE FRONT BRAKE
9	Brake master cylinder bracket	1	MASTER CYLINDER".
10	Brake master cylinder	1	_
			For installation, reverse the removal
			procedure.



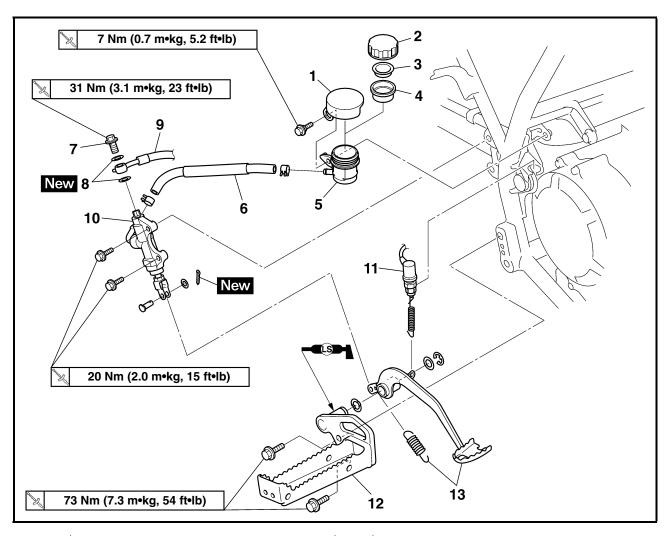
Order	Job/Part	Q'ty	Remarks
1) (2) (3)	Disassembling the front brake master cylinder Dust boot Circlip Brake master cylinder kit	1 1 1	Remove the parts in the order listed. Refer to "ASSEMBLING THE FRONT BRAKE MASTER CYLINDER". For assembly, reverse the disassembly procedure.



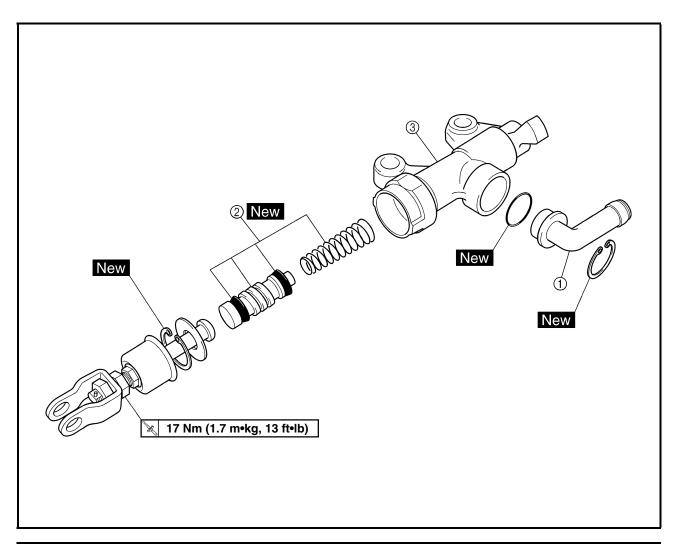
REAR BRAKE MASTER CYLINDER



Order	Job/Part	Q'ty	Remarks
	Removing the rear brake master		Remove the parts in the order listed.
	cylinder		
	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	Brake fluid reservoir cover	1	
2	Brake fluid reservoir cap	1	
3	Brake fluid reservoir diaphragm holder	1	
4	Brake fluid reservoir diaphragm	1	
5	Brake fluid reservoir	1	
6	Brake fluid reservoir hose	1	

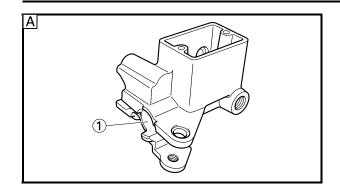


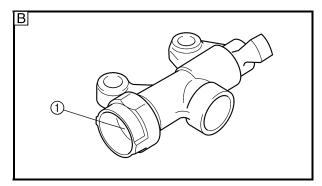
Order	Job/Part	Q'ty	Remarks
7	Union bolt	1	Refer to "INSTALLING
8	Copper washer	2	_ Heier to INSTALLING _ THE REAR BRAKE
9	Brake hose	1	Disconnect. MASTER CYLINDER".
10	Brake master cylinder	1	J MASTER OTERNOER.
11	Rear brake light switch	1	
12	Right footrest	1	
13	Brake pedal/spring	1/1	
			For installation, reverse the removal
			procedure.



Order	Job/Part	Q'ty	Remarks
1 2 3	Disassembling the rear brake master cylinder Hose joint Brake master cylinder kit Brake master cylinder	1 1 1	Remove the parts in the order listed. Refer to "ASSEMBLING THE REAR BRAKE MASTER CYLINDER". For assembly, reverse the disassembly procedure.



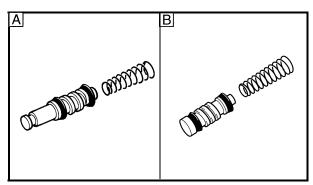






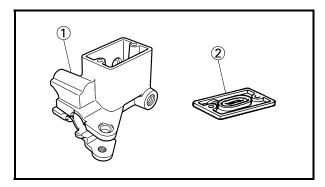
CHECKING THE MASTER CYLINDERS

- 1. Check:
 - brake master cylinder (1) Wear/scratches → Replace the brake master cylinder assembly.
 - brake master cylinder body Cracks/damage \rightarrow Replace.
 - brake fluid delivery passage (brake master cylinder body) Blockage → Blow out with compressed air.
- A Front B Rear



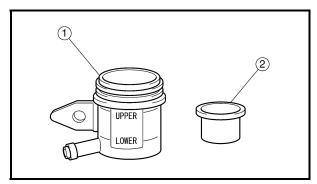
2. Check:

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

EBS00415

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.

EBS00416

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)

NOTE: _

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



Clearance

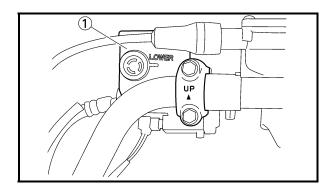
2.2 ~ 3.2 mm (0.09 ~ 0.13 in)

- 2. Tighten:
- nut (1)



Nut

17 Nm (1.7 m•kg, 13 ft•lb)



EBS00418

INSTALLING THE FRONT BRAKE MASTER CYLINDER

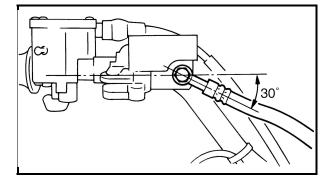
- 1. Install:
 - brake master cylinder (1)



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

NOTE: _

- The "UP" mark on the brake master cylinder bracket should face up.
- Install the brake master cylinder so that the gaps between the brake master cylinder and the brake master cylinder bracket are equal.



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



Union bolt

27 Nm (2.7 m•kg, 20 ft•lb)

NOTE:

- 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

CAUTION:

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

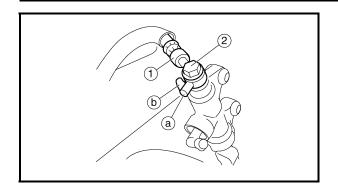
A WARNING

- 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 \rightarrow Add the recommended brake fluid to the proper level.

Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.





EBS00419

INSTALLING THE REAR BRAKE MASTER CYLINDER

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



Union bolt

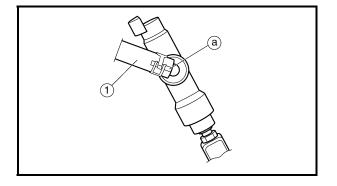
31 Nm (3.1 m•kg, 23 ft•lb)

CAUTION:

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

A 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)

NOTE:

Install the brake fluid reservoir hose with the white paint mark (a) facing up as shown.

- 3. Fill:
 - brake fluid reservoir



Recommended brake fluid DOT 4

CAUTION:

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



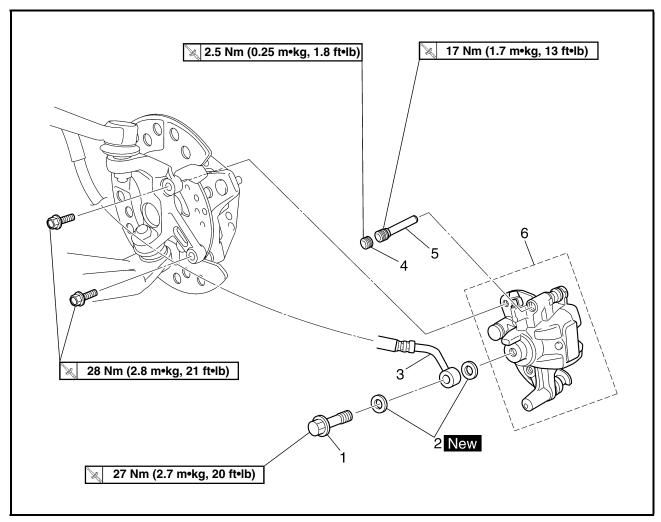
A WARNING

- 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.

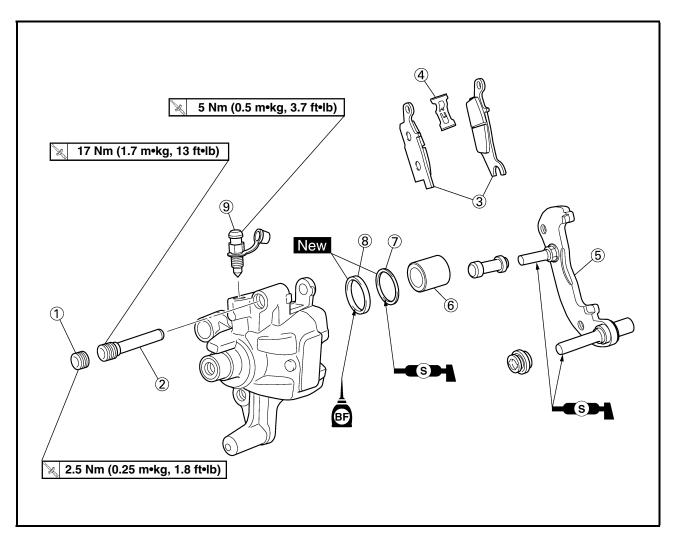
Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.



FRONT BRAKE CALIPERS



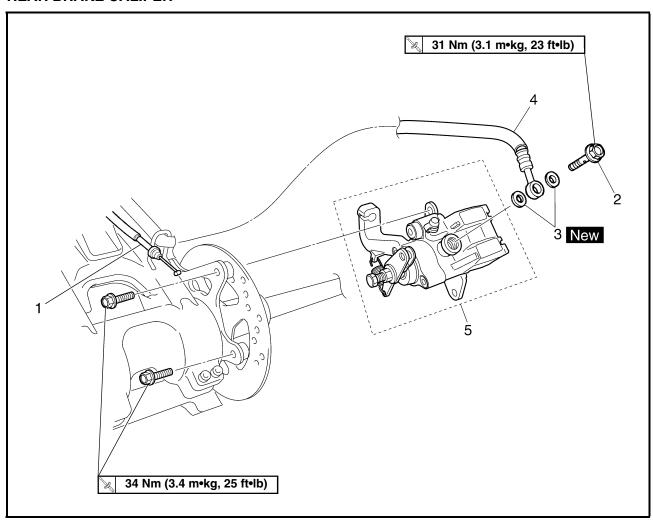
Order	Job/Part	Q'ty	Remarks
	Removing the front brake calipers Brake fluid Front wheel		Remove the parts in the order listed. The following procedure applies to both of the front brake calipers. Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3. Refer to "FRONT AND REAR WHEELS".
1 2 3 4 5 6	Union bolt Copper washer Brake hose Bolt Brake pad retaining bolt Brake caliper assembly	1 2 1 1 2 1	Disconnect. Refer to "INSTALLING THE FRONT BRAKE CALIPERS". For installation, reverse the removal procedure.



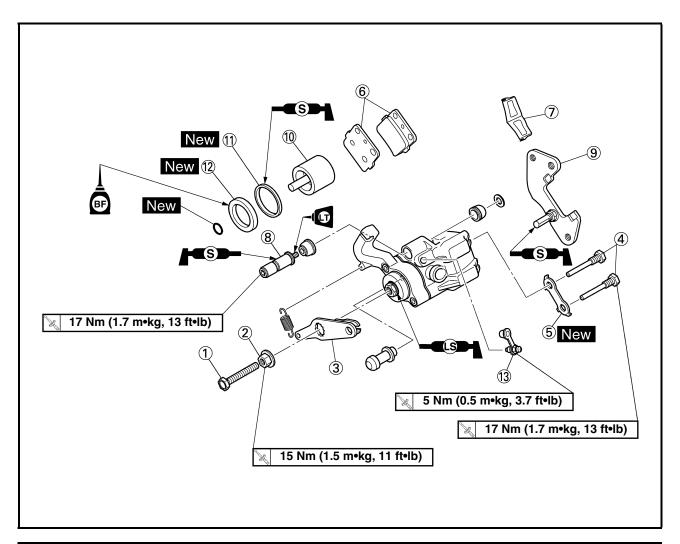
Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake calipers		Remove the parts in the order listed.
			The following procedure applies to both of the front brake calipers.
1	Bolt	1	
② ③	Brake pad retaining bolt	1	
3	Brake pad	2	
4	Brake pad spring	1	
⑤ ⑥	Caliper bracket	1	
6	Caliper piston	1	Refer to "DISASSEMBLING THE
7	Dust seal	1	-FRONT AND REAR BRAKE CALIPERS"
8	Caliper piston seal	1	☐ and "ASSEMBLING THE FRONT BRAKE CALIPERS".
9	Bleed screw	1	
			For assembly, reverse the disassembly 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	Parking brake cable	1	Disconnect. Refer to "REMOVING THE PARKING BRAKE CABLE".
2	Union bolt	1	Refer to "INSTALLING
3	Copper washer	2	-THE REAR BRAKE
4	Brake hose	1	Disconnect. CALIPER".
5	Brake caliper assembly	1	
			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	Locknut	1	
3	Parking brake arm	1	
<u>4</u> <u>5</u>	Brake pad retain bolt	2	
(5)	Lock washer	1	
6	Brake pad	2	
7	Brake pad spring	1	
8	Retaining bolt	1	
9	Caliper bracket	1	Defer to "DICACCEMPLING THE
10	Brake caliper piston	1	Refer to "DISASSEMBLING THE FRONT AND REAR BRAKE
11)	Dust seal	1	CALIPERS" and "ASSEMBLING THE
12	Caliper piston seal	1	REAR BRAKE CALIPER".
13	Bleed screw	1	
			For assembly, reverse the disassembly
			procedure.



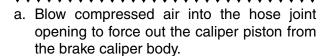
REMOVING THE PARKING BRAKE CABLE

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



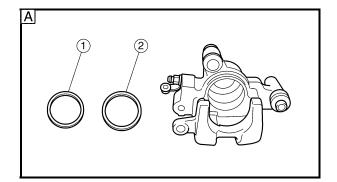
DISASSEMBLING THE FRONT AND REAR BRAKE CALIPERS

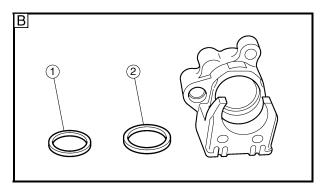
- 1. Remove:
 - brake caliper piston
 - caliper dust seal (1)
- caliper piston seal ②
- A Front
- B Rear

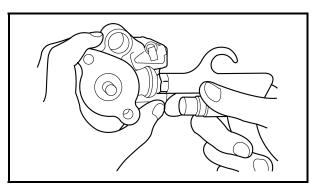


WARNING

- Never try to pry out the caliper piston.
- Cover the caliper piston with a rag. Be careful not to get injured when the piston is expelled from the caliper cylinder.
- b. Remove the caliper piston seal.









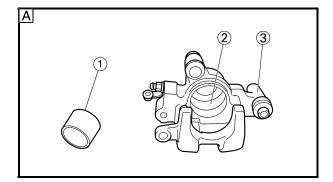
EBS00429

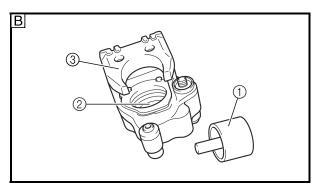
CHECKING THE FRONT AND REAR BRAKE CALIPERS

Recommended brake component replacement schedule		
Brake pads	As required	
Piston seals, dust seals	Every two years	
Brake hoses	Every four years	
Brake fluid	Replace when brakes are disassembled.	

A WARNING

All internal brake components should be cleaned in new brake fluid only. Do not use solvents as they will cause seals to swell and distort.





- 1. Check:
 - brake caliper piston ①
 Scratches/rust/wear → Replace the brake caliper assembly.
 - brake caliper cylinder ②
 Wear/scratches → Replace the brake caliper assembly.
 - brake caliper body ③
 Cracks/damage → Replace.
 - brake fluid delivery passage (brake caliper body)
 Blockage → Blow out with compressed air.

A WARNING

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

A Front



EBS00431

ASSEMBLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the front brake calipers.

A WARNING

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



Recommended brake fluid DOT 4

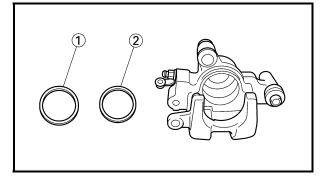
 Replace the caliper piston seal whenever a brake caliper is disassembled.

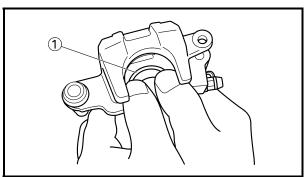
- 1. Install:
 - caliper piston seal (1) New
 - caliper dust seal ② New





• brake caliper piston 1





ASSEMBLING THE REAR BRAKE CALIPER

A WARNING

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

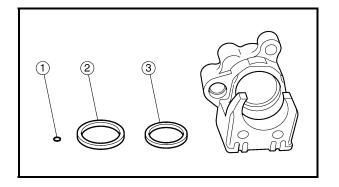


Recommended brake fluid DOT 4

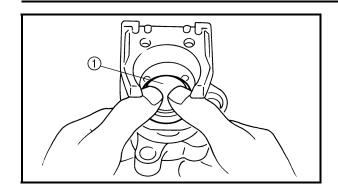
• Replace the caliper piston seal whenever a brake caliper is disassembled.



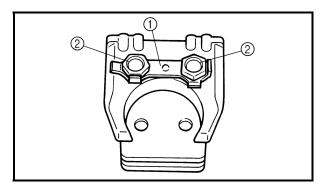
- O-ring ① New
- caliper piston seal 2 New
- caliper dust seal ③ New







- 2. Install:
 - brake caliper piston ①



- 3. Install:
 - lock washer 1 New
 - brake pad retaining bolts 2



Brake pad retaining bolt 17 Nm (1.7 m•kg, 13 ft•lb)

4. Bend the lock washer tabs along a flat side of the bolts.

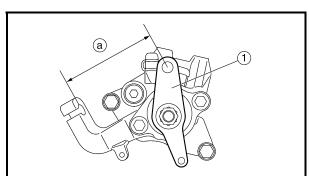


- parking brake arm 1
- 6. Measure:
 - parking brake arm to parking brake bracket distance (a)

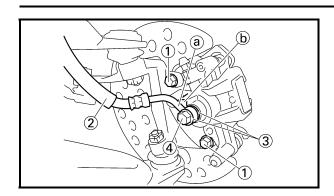
Out of specification \rightarrow Adjust.



Parking brake arm to parking brake bracket distance 73.3 mm (2.89 in)







EBS00434

INSTALLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the front brake calipers.

- 1. Install:
 - brake caliper assembly
 - brake caliper mounting bolts (1)



Brake caliper mounting bolt 28 Nm (2.8 m•kg, 21 ft•lb)

- brake hose (2)
- copper washers ③ New
- union bolt 4



Union bolt 27 Nm (2.7 m•kg, 20 ft•lb)

CAUTION:

When installing the brake hose on the brake caliper, make sure that the brake pipe (a) touches the projection (b) on the brake caliper.

A WARNING

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

- 2. Fill:
 - brake reservoir



Recommended brake fluid DOT 4

CAUTION:

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



WARNING

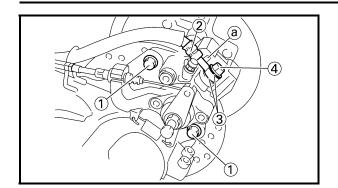
- Use only the designated quality brake fluid: other brake fluids may deteriorate the rubber seals, causing leakage and poor brake performance.
- Refill with the same type of brake fluid: mixing brake fluids may result in a harmful chemical reaction and lead to poor brake performance.
- Be careful that 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.





EBS00436

INSTALLING THE REAR BRAKE CALIPER

- 1. Install:
- brake caliper assembly
- brake caliper mounting bolts (1)



Brake caliper mounting bolt 34 Nm (3.4 m•kg, 25 ft•lb)

- brake hose (2)
- copper washers ③ New
- union bolt 4



Union bolt 31 Nm (3.1 m•kg, 23 ft•lb)

CAUTION:

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

WARNING

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

- 2. Fill:
 - brake reservoir



Recommended brake fluid DOT 4

CAUTION:

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



A 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.

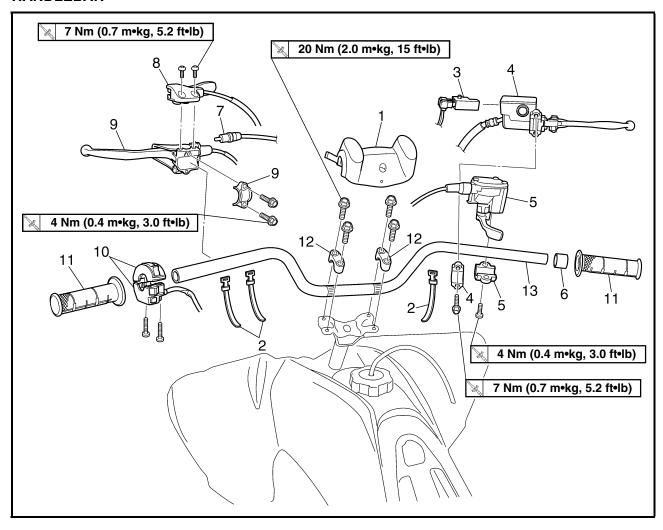
3. Air bleed:

- 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.

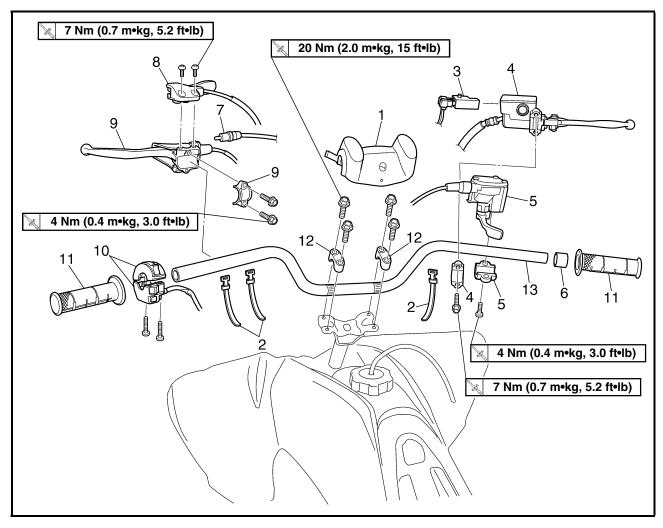


STEERING SYSTEM

HANDLEBAR



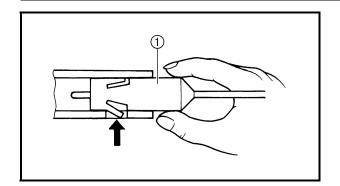
Order	Job/Part	Q'ty	Remarks
	Removing the handlebar		Remove the parts in the order listed.
1	Handlebar protecter	1	
2	Band	3	
3	Front brake light switch	1	
4	Brake master cylinder/bracket	1/1	Defende "INOTALLING THE DRAKE
5	Throttle lever assembly/bracket	1/1	Refer to "INSTALLING THE BRAKE MASTER CYLINDER".
6	Spacer	1	I MASTER CYLINDER .
7	Clutch switch	1	Refer to "REMOVING THE CLUTCH
0	Parking brake lover	4	SWITCH".
8	Parking brake lever		
9	Clutch lever/bracket	1/1	Refer to "INSTALLING THE CLUTCH
10	Handlebar switch	1	┘ LEVER".



Order	Job/Part	Q'ty	Remarks
11	Handlebar grip	2	Refer to "REMOVING THE HANDLEBAR GRIPS" and "INSTALLING THE HANDLEBAR GRIPS".
12 13	Handlebar holder Handlebar	1	Refer to "INSTALLING THE HANDLEBAR". For installation, reverse the removal procedure.

STEERING SYSTEM





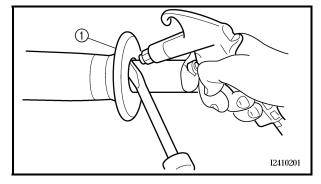
EBS00446

REMOVING THE CLUTCH SWITCH

- 1. Remove:
 - clutch switch (1)

NOTE: _

Push the fastener when removing the clutch switch out of the clutch lever holder.



FRS0044

REMOVING THE HANDLEBAR GRIPS

- 1. Remove:
- handlebar grips ①

NOTE: _

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

FBS0044

CHECKING THE HANDLEBAR

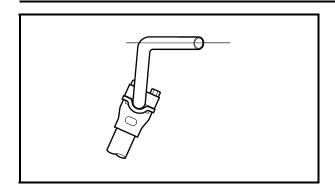
- 1. Check:
 - handlebar ①
 Bends/cracks/damage → Replace.

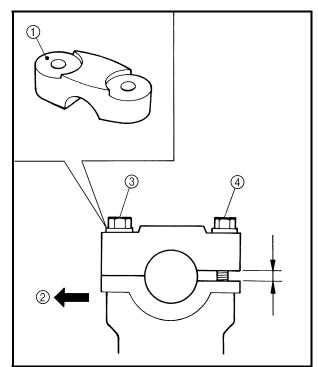
A WARNING

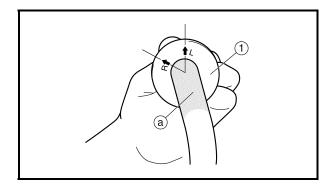
Do not attempt to straighten a bent handlebar as this may dangerously weaken the handlebar.

STEERING SYSTEM









FRS0044

INSTALLING THE HANDLEBAR

- 1. Install:
- handlebar
- handlebar holders



Handleber holder 20 Nm (2.0 m•kg, 15 ft•lb)

NOTE: _

- Install the handlebar horizontally shown in the illustration.
- The upper handlebar holder should be installed with the punched mark ① forward ②.

CAUTION:

First tighten the bolt ③ on the front side of the handlebar holder, and then tighten the bolt ④ on the rear side.

EBS0045

INSTALLING THE HANDLEBAR GRIPS

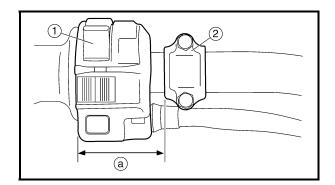
- 1. Install:
 - handlebar grips 1

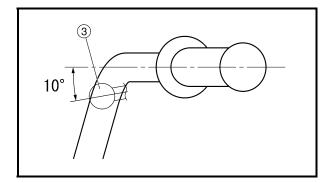
NOTE: _

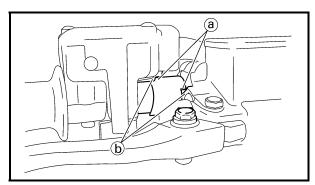
- Before applying the adhesive, wipe off grease or oil on the handlebar surface (a) with a lacquer thinner.
- Install the handlebar grips so that the "L" arrow on the left grip and "R" arrow on the right grip are placed vertically.

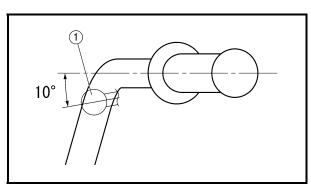
STEERING SYSTEM











EBS00452

INSTALLING THE CLUTCH LEVER

- 1. Install:
 - handlebar switch (1)
 - clutch lever
 - clutch lever bracket ②

NOTE: _

- Install the clutch lever bracket as shown.
- Install the clutch lever ③ at 10 degrees angle as shown.

(a) 53 ~ 54 mm (2.09 ~ 2.13 in)

FBS00453

INSTALLING THE BRAKE MASTER CYLINDER

- 1. Install:
 - throttle lever assembly
 - spacer
 - brake master cylinder



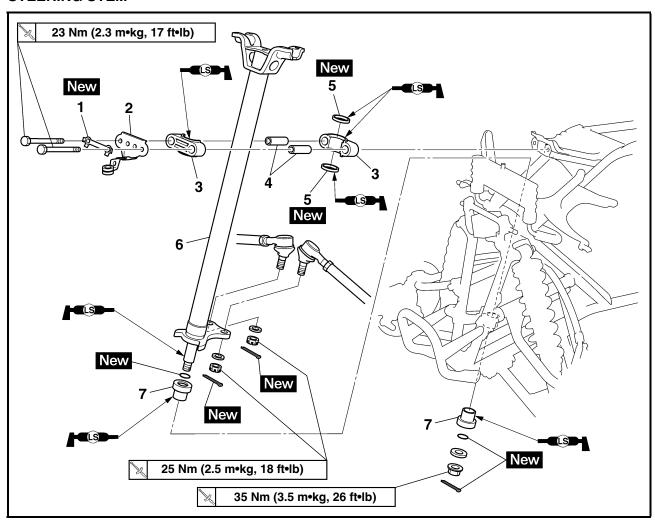
Brake master cylinder bracket 7 Nm (0.7 m•kg, 5.2 ft•lb)

NOTE: _

- Engage the indentations (a) in the spacer with the lobes (b) on the throttle lever assembly and brake master cylinder.
- The "UP" mark on the brake master cylinder bracket should face up.
- Install the brake lever ① at 10 degrees angle as shown.



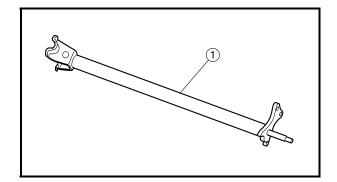
STEERING STEM



Order	Job/Part	Q'ty	Remarks
	Removing the steering stem		Remove the parts in the order listed.
	Front fender		Refer to "SEAT, FENDERS AND FUEL TANK" in chapter 3.
1	Lock washer	1	Refer to "INSTALLING THE LOCK WASHER".
2	Bracket	1	
3	Steering stem bushing	2	
4	Spacer	2	
5	Oil seal	2	
6	Steering stem	1	
7	Bushing	2	

STEERING SYSTEM





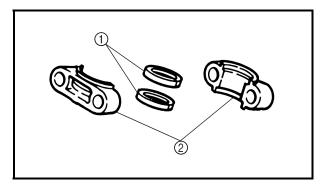
CHF

CHECKING THE STEERING STEM

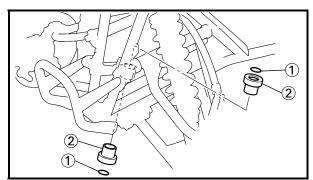
- 1. Check:
 - steering stem
 Bends/damage → Replace.



Do not attempt to straighten a bent stem; this may dangerously weaken the stem.



- 2. Check:
 - oil seals ① New
- steering stem bushings ②
 Wear/damage → Replace.



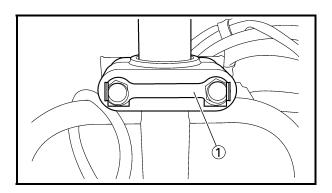
- 3. Check
 - O-rings ① New
- bushings ②
 Wear/damage → Replace.

INSTALLING THE STEERING STEM

- 1. Install:
 - steering stem

NOTE: _

Pass the throttle cable through the cable guide. Refer to "CABLE ROUTING" in chapter 2.



EBS00459

INSTALLING THE LOCK WASHER

- 1. Install:
 - lock washer ① New
 - bolts



Bolt

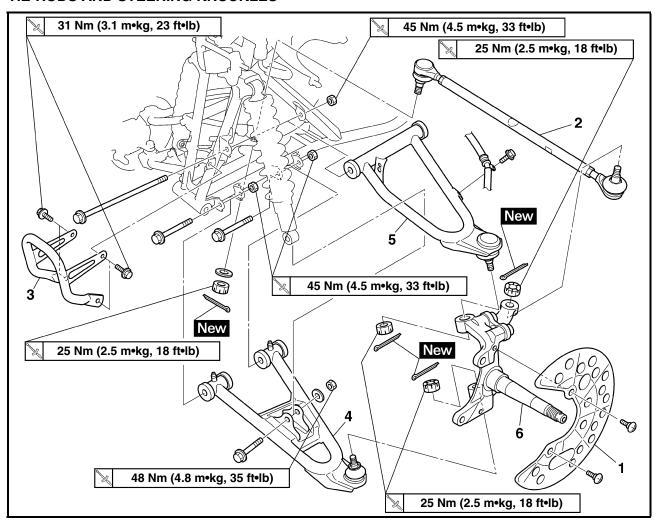
23 Nm (2.3 m•kg, 17 ft•lb)

2. Bend the lock washer tab along a flat side of the bolt.



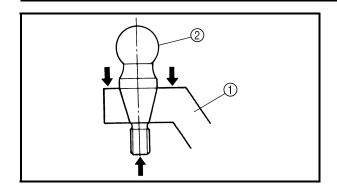
EBS00460

TIE-RODS AND STEERING KNUCKLES



Order	Job/Part	Q'ty	Remarks
	Removing the tie-rods and steering		Remove the parts in the order listed.
	knuckles		
			The following procedure applies to both of
			the tie-rods and steering knuckles.
	Front wheel/brake disc		Refer to "FRONT AND REAR WHEELS".
	Front brake caliper		Refer to "FRONT AND REAR BRAKES".
1	Brake disc guard (inner)	1	
2	Tie-rod	1	Refer to "INSTALLING THE TIE-RODS".
3	Front bumper	1	
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.

STEERING SYSTEM



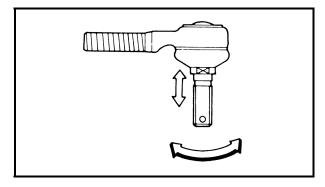
EBS00461

REMOVING THE STEERING KNUCKLES

- 1. Remove:
 - steering knuckles 1

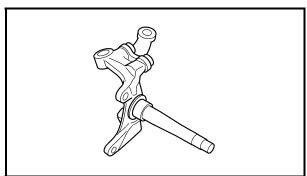
NOTE: _

Use a general puller to separate the ball joint ② and steering knuckle.



CHECKING THE TIE-RODS

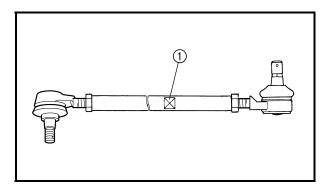
- 1. Check:
 - tie-rod free play and movement
 Free play → Replace the tie-rod end.
 Turns roughly → Replace the tie-rod end.
- 2. Check:
 - tie-rods
 Bends/damage → Replace.



EBS00464

CHECKING THE STEERING KNUCKLES

- 1. Check:
 - steering knuckles
 Damage/pitting → Replace.



EBS00465

INSTALLING THE TIE-RODS

- 1. Install:
 - tie-rods (left and right)



Ball joint nut 25 Nm (2.5 m•kg, 18 ft•lb)

NOTE: _

The tie-rod side which must be installed on the outside has grooves (1).

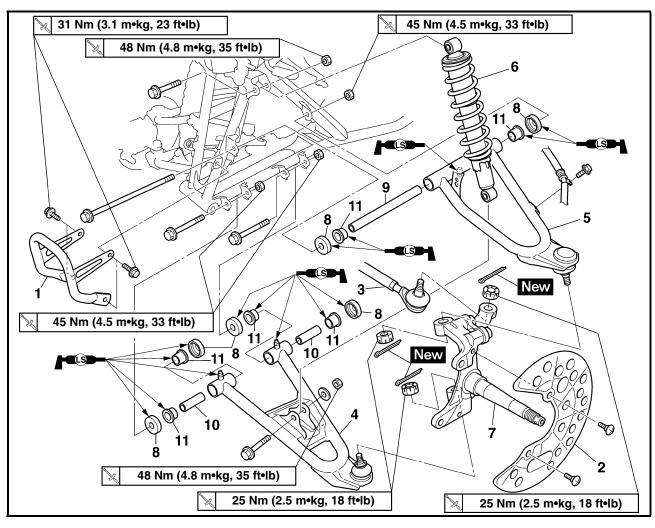
- 2. Adjust:
 - toe-in

Refer to "ADJUSTING THE TOE-IN" in chapter 3.



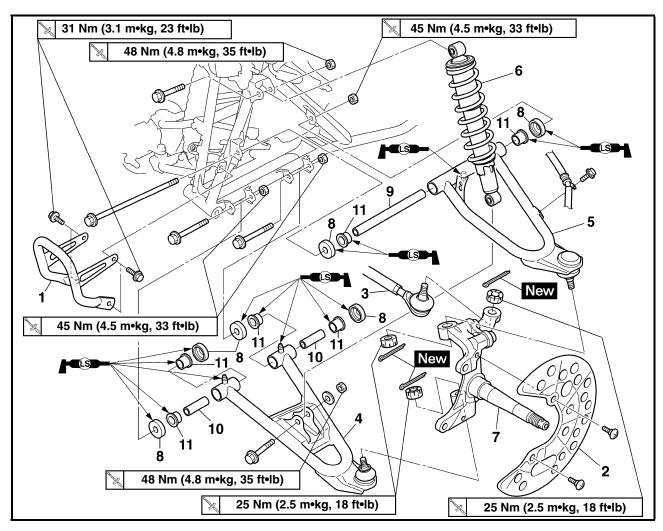
EBS0046

FRONT ARMS AND FRONT SHOCK ABSORBER ASSEMBLIES



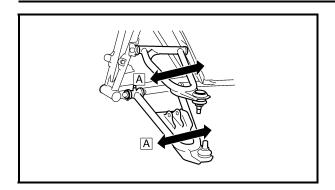
Order	Job/Part	Q'ty	Remarks
	Removing the front arms and front shock absorber assemblies		Remove the parts in the order listed.
			The following procedure applies to both of the front arms and front shock absorber assemblies.
	Front wheel/brake disc		Refer to "FRONT AND REAR WHEELS".
	Front brake caliper		Refer to "FRONT AND REAR BRAKES".
1	Front bumper	1	
2	Brake disc guard (inner)	1	
3	Tie-rod	1	Disconnect.
4	Lower front arm	1	Refer to "REMOVING THE FRONT ARMS"
5	Upper front arm	1	and "INSTALLING THE FRONT ARMS".
6	Front shock absorber	1	
7	Steering knuckle	1	

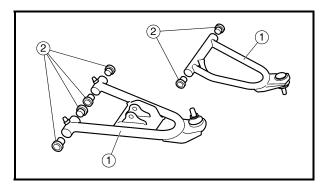


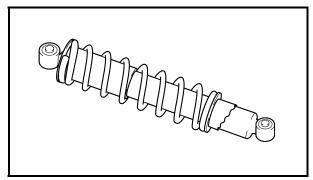


Order	Job/Part	Q'ty	Remarks
8	Dust cover	6	
9	Spacer	1	
10	Spacer	2	
11	Bushing	6	
			For installation, reverse the removal procedure.









EBS00469

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

EDC0047

CHECKING THE FRONT ARMS

- 1. Check:
 - front arms ①
 Bends/damage → Replace.
- 2. Check:
 - bushings ②
 Wear/damage → Replace.

EBS00488

CHECKING THE FRONT SHOCK ABSORBERS

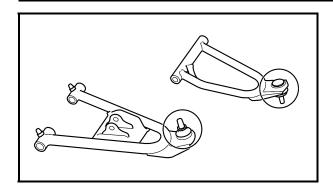
The following procedure applies to both of the front shock absorber assemblies.

- 1. Check:
 - shock absorber
 - Oil leaks \rightarrow Replace the front shock absorber assembly.
 - shock absorber rod
 Bends/damage → Replace the front shock
 absorber assembly.
 - spring

Fatigue \rightarrow Replace the front shock absorber assembly.

Move the spring up and down.





3

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 \rightarrow Replace the front arm.

Turns roughly \rightarrow 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)



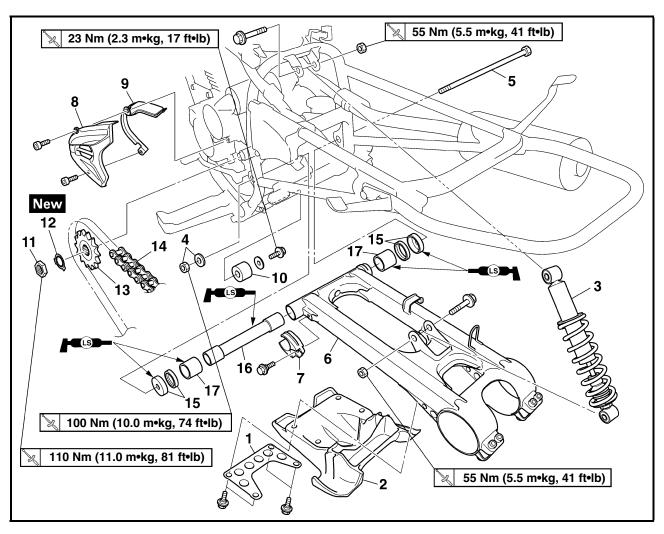
Front arm (upper, lower) 45 Nm (4.5 m•kg, 33 ft•lb)

NOTE: _

- •Be sure to position the bolts (upper and lower) so that the bolt head faces forward.
- Apply lithium-soap-based grease to the grease nipple (3).

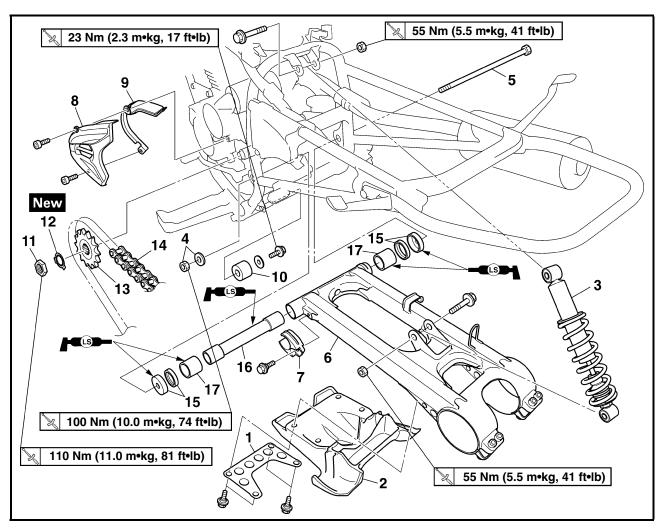


REAR SHOCK ABSORBER, SWINGARM AND DRIVE CHAIN



Order	Job/Part	Q'ty	Remarks
	Removing the rear shock absorber,		Remove the parts in the order listed.
	swingarm and drive chain		
	Seat/rear fender/air filter case		Refer to "SEAT, FENDERS AND FUEL
			TANK" in chapter 3.
	Rear axle hub		Refer to "REAR AXLE AND REAR AXLE
			HUB".
1	Plate	1	
2	Swingarm end cover	1	
3	Rear shock absorber	1	
4	Pivot shaft nut/washer	1/1	
5	Pivot shaft	1	
6	Swingarm	1	
7	Drive chain guide 1	1	
8	Drive sprocket cover	1	





Order	Job/Part	Q'ty	Remarks
9	Drive chain guide 2	1	
10	Drive chain guide 3	1	
11	Nut	1	Refer to "INSTALLING THE DRIVE
12	Lock washer	1	SPROCKET".
13	Drive sprocket	1	
14	Drive chain	1	
15	Dust cover/oil seal	2/2	
16	Spacer	1	Refer to "INSTALLING THE
17	Bearing	2	└SWINGARM".
			For installation, reverse the removal procedure.

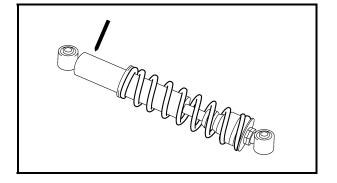


HANDLING THE REAR SHOCK ABSORBER

A WARNING

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

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



DISPOSING OF A REAR SHOCK ABSORBER

Gas pressure must be released before disposing of a rear shock absorber. To release the gas pressure, drill a 2 \sim 3 mm (0.08 \sim 0.12 in) hole through the rear shock absorber at point 15 \sim 20 mm (0.59 \sim 0.79 in) from its end as shown.

WARNING

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



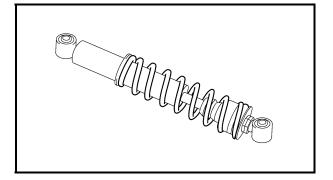
EBS00487

REMOVING THE REAR SHOCK ABSORBER

- 1. Remove:
- rear shock absorber lower bolt
- rear shock absorber upper bolt

NOTE: _

While removing the rear shock absorber lower bolt, hold the swingarm so that it does not drop down.



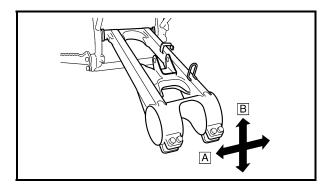
EBS00488

CHECKING THE REAR SHOCK ABSORBER

- 1. Check:
 - shock absorber
 Gas leaks/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.

EBS00493		
NOTE:		

Before removing the drive chain and the sprockets, measure the drive chain slack and a 15-link section of the drive chain.



EBS00494

REMOVING THE SWINGARM

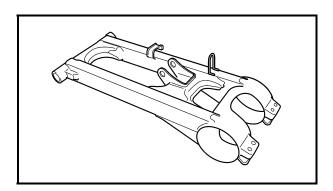
- 1. Check:
 - swingarm free play
- a. Check the tightening torque of the pivot shaft nut. 100 Nm (10.0 m*kg, 74 ft*lb)





Swingarm free play limit (at the end of the swingarm) 1.0 mm (0.04 in)

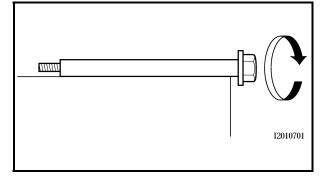
- b. Check the swingarm side play A by moving it from side to side.
 - If side play is noticeable, check the spacer, bearings and frame pivot.
- c. Check the swingarm vertical movement B
 by moving it up and down.
 If vertical movement is tight or rough, or if
 there is binding, check the spacer, bearings
 and frame pivot.
- 2. Remove:
 - pivot shaft nut
 - washer
 - pivot shaft
 - swingarm



FBS0049

CHECKING THE SWINGARM

- 1. Check:
 - $\begin{tabular}{ll} \bullet \ swingarm \\ Bends/cracks/damage \rightarrow Replace. \\ \end{tabular}$



- 2. Check:
 - pivot shaft
 Roll the axle on a flat surface.
 Bends → Replace.



Do not attempt to straighten a bent pivot shaft.

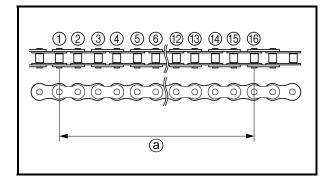
- 3. Clean:
 - pivot shaft
 - spacer
 - bearings



Recommended cleaning solvent Kerosene



- 4. Check:
 - oil seals
 - $\mathsf{Damage/wear} \to \mathsf{Replace}.$
 - bearings
 Damage/pitting → Replace.



EBS00496

CHECKING THE DRIVE CHAIN

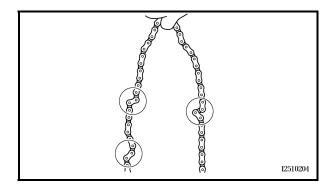
- 1. Measure:
 - 15-link section ⓐ of the drive chain
 Out of specification → Replace the drive chain.



15-link drive chain section limit (maximum) 239.3 mm (9.42 in)

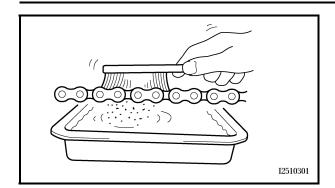
NOTE: __

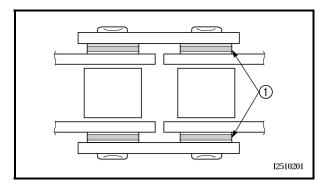
- While measuring the 15-link section, push down on the drive chain to increase its tension.
- Measure the length between drive chain roller (1) and (16) as shown.
- Perform this measurement at two or three different places.



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



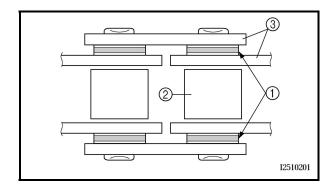




- 3. Clean:
- drive chain
- a. Wipe the drive chain with a clean cloth.
- b. Put the drive chain in kerosene and remove any remaining dirt.
- c. Remove the drive chain from the kerosene and completely dry it.

CAUTION:

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



- 4. Check:
 - O-rings (1)

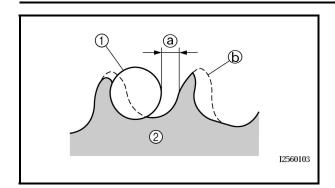
Damage → Replace the drive chain.

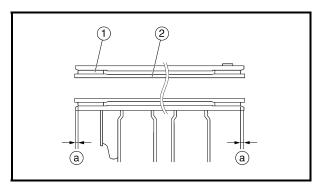
- drive chain rollers ②
 Damage/wear → Replace the drive chain.
- drive chain side plates ③
 Cracks/damage/wear → Replace the drive chain.
- 5. Lubricate:
 - drive chain



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







- 6. Check:
- drive sprocket

Bent teeth \rightarrow Replace the drive chain sprockets as a set.

- (b) Correct
- 1 Drive chain roller
- 2 Drive chain sprocket

EBS0049

INSTALLING THE SWINGARM

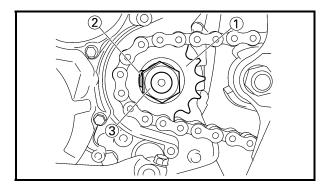
- 1. Install:
 - bearings (1)
 - spacer ②

NOTE: _

- Inject the bearing with the character stamp turned outward. Apply the lithium-soap-based grease to inside.
- Apply the lithium-soap-based grease on the spacer when installing.



Installed depth of bearing ⓐ 1 ~ 2 mm (0.04 ~ 0.08 in)



EBS00498

INSTALLING THE DRIVE SPROCKET

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



Drive sprocket nut 110 Nm (11.0 m•kg, 81 ft•lb)

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

ELECTRICAL COMPONENTS

ELEC

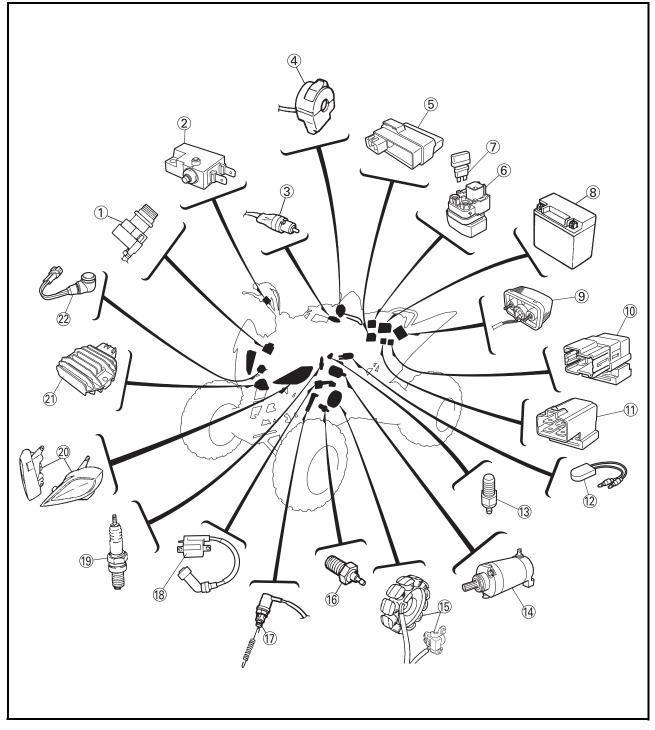
EBS00500

ELECTRICAL

ELECTRICAL COMPONENTS

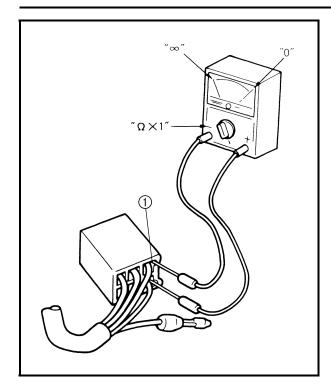
- 1 Main switch
- ② Front brake light switch ③ Clutch switch
- (4) Handlebar switch
- 5 CDI unit
- 6 Starter relay
 7 Fuse
- 8 Battery

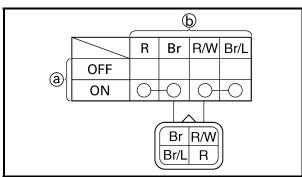
- 9 Tail/brake light
- 10 Headlight relay
- (1) Starting circuit cut-off (6) Neutral switch relay
- 12 Thermo switch
- (13) Carburetor warmer
- (14) Starter motor
- 15 Pickup coil/stator assembly
- (17) Rear brake light switch
- (18) Ignition coil
- 19 Spark plug 20 Headlight
- 21 Rectifier/regulator 22 Neutral indicator light



CHECKING SWITCH CONTINUITY







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.

CAUTION:

Never insert the tester probes into the coupler terminal slots ①. Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.



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

NOTE: _

- Before checking for continuity, set the pocket tester to "0" and to the " $\Omega \times 1$ " range.
- When checking for continuity, switch back and forth between the switch positions a few times.

The terminal connections for switches (e.g., main switch, engine stop switch) are shown in an illustration similar to the one on the left. The switch positions (a) are shown in the far left column and the switch lead colors (b) are shown in the top row in the switch illustration.

NOTE:

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

The example illustration on the left shows that:

There is continuity between the switch terminals for the red and brown switch leads and between the switch terminals for the red/white and brown/blue switch leads when the switch is set to "ON".

7

CHECKING THE SWITCHES



FBS01029

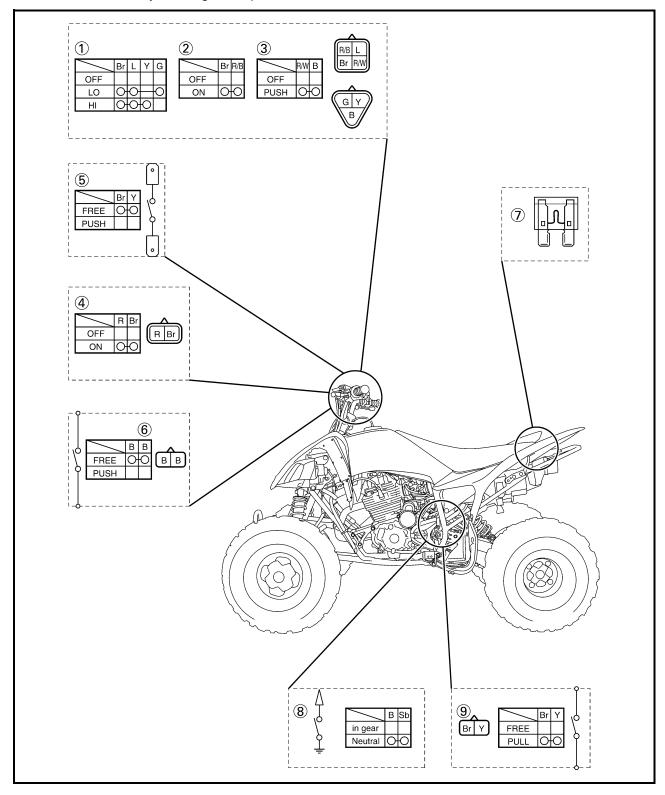
CHECKING THE SWITCHES

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.



CHECKING THE SWITCHES



- 1 Light switch
 2 Engine stop switch
 3 Start switch
 4 Main switch
 5 Front brake light switch
 6 Clutch switch
 7 Fuse
 8 Neutral switch
 9 Rear brake light switch

CHECKING THE BULBS AND BULB SOCKETS

ELEC -

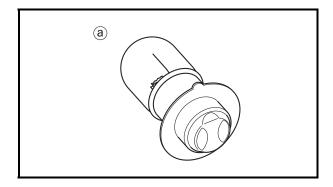
EBS01030

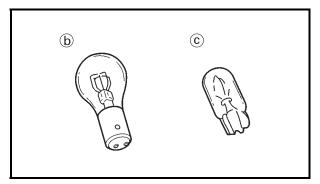
CHECKING THE BULBS AND BULB SOCKETS

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

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

Improperly connected \rightarrow Properly connect. No continuity \rightarrow Repair or replace the bulb, bulb socket or both.





TYPES OF BULBS

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

- Bulb (a) is used for the headlight and can be pulled out by turning counterclockwise while pushing the bulb holder and removing.
 - After this, you can remove the bulb.
- Bulb (b) is used for tail/ brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.
- Bulb © is used for 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

CHECKING THE BULBS AND BULB SOCKETS

ELEC	+
	L

A WARNING

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

CAUTION:

- Be sure to hold the socket firmly when removing the bulb. Never pull the lead, otherwise it may be pulled out of the terminal in the coupler.
- Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb, and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.



bulb (for continuity)
 (with the pocket tester)
 No continuity → Replace.



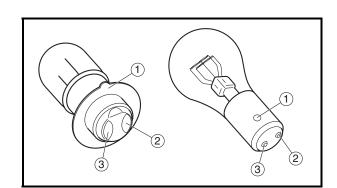
Pocket tester 90890-03112, YU-03112-C

NOTE:

Before checking for continuity, set the pocket tester to "0" and to the " $\Omega \times 1$ " range.

a. Connect the positive tester probe to terminal (1) and the negative tester probe to terminal (2), and check the continuity.

- b. Connect the positive tester probe to terminal (1) and the negative tester probe to terminal (3), and check the continuity.
- c. If either of the readings indicate no continuity, replace the bulb.



CHECKING THE BULBS AND BULB SOCKETS

ELEC	- +
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CHECKING THE CONDITION OF THE BULB SOCKETS

The following procedure applies to all of the bulb sockets.

- 1. Check:
 - bulb socket (for continuity) (with the pocket tester)
 No continuity → Replace



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

NOTE: _

Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.

- a. Install a good bulb into the bulb socket.
- b. Connect the pocket tester probes to the respective leads of the bulb socket.

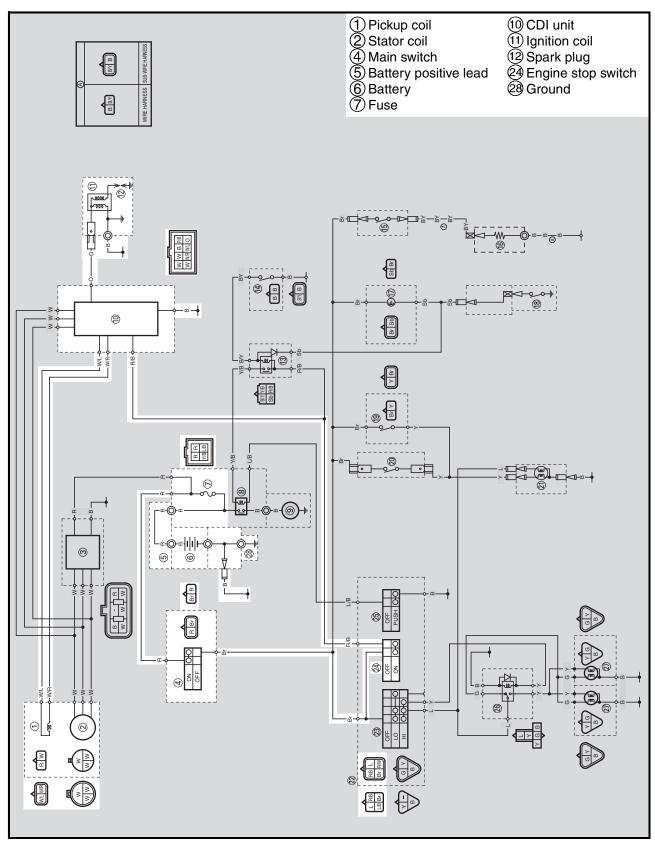
c. Check the bulb socket for continuity. If any of the readings indicate no continuity, replace the bulb socket.



EBS0050

IGNITION SYSTEM

CIRCUIT DIAGRAM





FBS01045

TROUBLESHOOTING

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

Check:

- 1. fuse
- 2. battery
- 3. spark plug
- 4. ignition spark gap
- 5. ignition coil resistance
- 6. main switch
- 7. engine stop switch
- 8. pickup coil resistance
- wiring connections (of the entire ignition system)

NOTE:

- Before troubleshooting, remove the following part(s):
- 1. seat
- 2. front panel
- 3. front fender
- 4. rear fender
- 5. side cover
- Troubleshoot with the following special tool(s).



Ignition checker 90890-06754 Opama pet-4000 spark checker YM-34487 Pocket tester 90890-03112 Analog pocket tester YU-03112-C

FBS01043

- 1. Fuse
- Check the fuse for continuity.

 Refer to "CHECKING THE SWITCHES".
- Is the fuse OK?





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 12.8 V or more at 20°C (68°F)

• Is the battery OK?





NO

- Clean the battery terminals.
- Recharge or replace the battery.

FBS01032

3. 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 DR7EA (NGK) Spark plug gap 0.6 ~ 0.7 mm (0.024 ~ 0.028 in)

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





Re-gap or replace the spark plug.

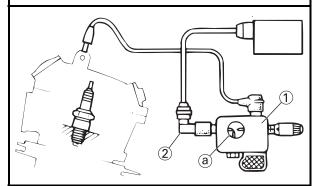


EBS01034

4. Ignition spark gap

The following procedure applies to all of the spark plugs.

- Disconnect the spark plug cap from the spark plug.
- Connect the ignition checker ① and spark plug cap ② as shown.
- Set the main switch to "ON".
- Measure the ignition spark gap a.
- Crank the engine by pushing the starter switch and gradually increase the spark gap until a misfire occurs.



N.

Minimum ignition spark gap 6 mm (0.24 in)

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





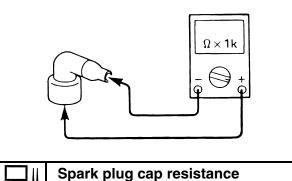
The ignition system is OK.

EAS00745

5. Spark plug cap resistance

The following procedure applies to all of the spark plug caps.

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



O

Spark plug cap resistance 10 kΩ at 20°C (68°F)

• Is the spark plug cap OK?



Replace the spark plug cap.

NO

ELEC -

EBS01038

6. Ignition coil resistance

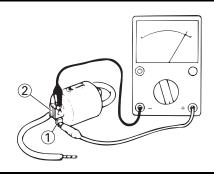
- Disconnect the ignition coil coupler from the ignition coil.
- Connect the pocket tester ($\Omega \times 1$) to the ignition coil as shown.

Positive tester probe →

orange lead terminal (1)

Negative tester probe \rightarrow

ignition coil base 2



Measure the primary coil resistance.



Primary coil resistance 0.18 ~ 0.28 Ω at 20°C (68°F)

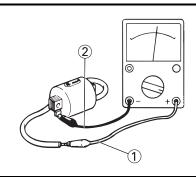
• Connect the pocket tester ($\Omega \times 1k$) to the ignition coil as shown.

Positive tester probe →

high tension code (1)

Negative tester probe →

orange lead terminal ②



Measure the secondary coil resistance.



Secondary coil resistance 6.32 ~ 9.48 kΩ at 20°C (68°F)

• Is the ignition coil OK?





Replace the ignition coil.

EBS01041

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





Replace the main switch.

EBS01042

- 8. Engine stop switch
- Check the engine stop switch for continuity.
 Refer to "CHECKING THE SWITCHES".
- Is the engine stop switch OK?





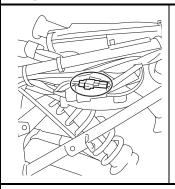
NO

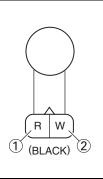
Replace the handlebar switch.

EBS01040

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

Positive tester probe \rightarrow red terminal 1Negative tester probe \rightarrow white terminal 2





Measure the pickup coil resistance.



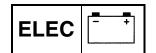
Pickup coil resistance 248 ~ 372 Ω at 20°C (68°F)

Is the pickup coil OK?





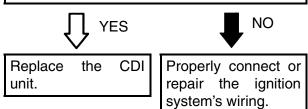
Replace the pickup coil/stator assembly.



EBS01047

10. Wiring

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

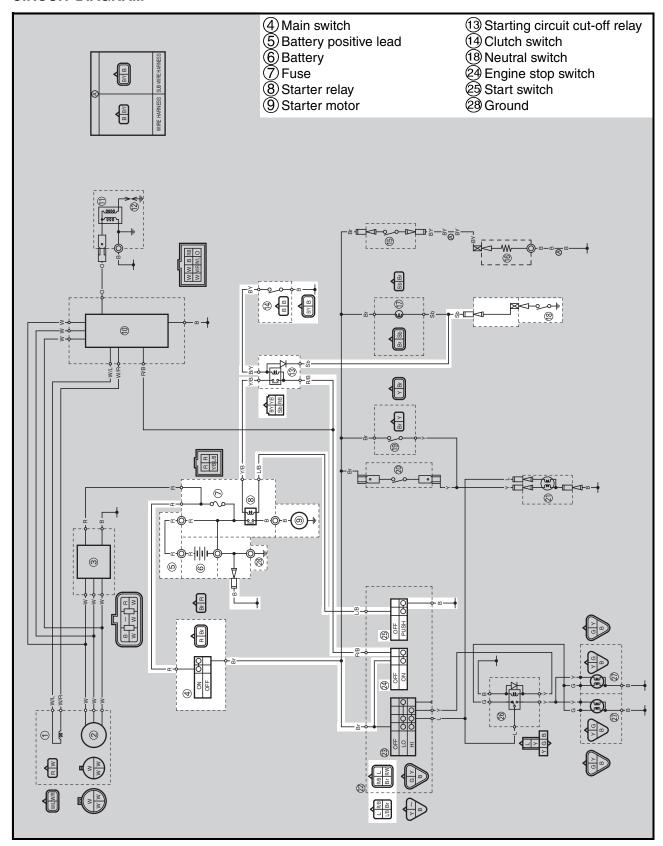




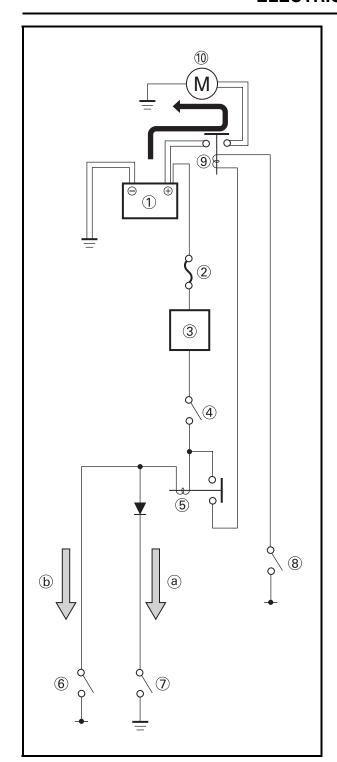
EBS0050

ELECTRIC STARTING SYSTEM

CIRCUIT DIAGRAM







EBS00508

STARTING CIRCUIT CUT-OFF SYSTEM **OPERATION**

The starting circuit on this model consists of the starter motor, starter relay, clutch switch, and 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:

(a) The transmission is in neutral (the neutral switch is closed)

- (b) You pull in the clutch lever (the clutch switch is closed).
- 1 Battery
- ② Fuse ´
 ③ Main switch
- 4 Engine stop switch
- (5) Starting circuit cut-off relay
- 6 Clutch switch
- (7) Neutral switch
- 8 Start switch
- 9 Starter relay
- 10 Starter motor



EBS01050

TROUBLESHOOTING

The starter motor fails to turn.

Check:

- 1. fuse
- 2. battery
- 3. starter motor
- 4. starting circuit cut-off relay
- 5. starting circuit cut-off relay (diode)
- 6. starter relay
- 7. main switch
- 8. engine stop switch
- 9. neutral switch
- 10.clutch switch
- 11.start switch
- 12.wiring connections (of the entire starting system)

NOTE

- Before troubleshooting, remove the following part(s):
- 1. seat
- 2. front panel
- 3. front fender
- 4. rear fender
- 5. side cover
- Troubleshoot with the following special tool(s).



Pocket tester 90890-03112, YU-03112-C

FBS01043

- 1. Fuse
- Check the fuse for continuity.

 Refer to "CHECKING THE SWITCHES".
- Is the fuse OK?





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 12.8 V or more at 20°C (68°F)

• Is the battery OK?





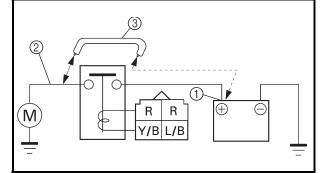
NO

- Clean the battery terminals.
- Recharge or replace the battery.

FBS01051

3. Starter motor

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



WARNING

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





Repair or replace the starter motor.



EBS01052

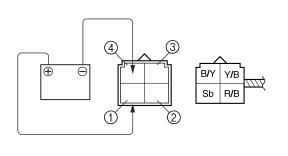
4. Starting circuit cut-off relay

- Remove the starting circuit cut-off relay from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the starting circuit cut-off relay as shown.

Positive battery terminal \rightarrow red/black \bigcirc Negative battery terminal \rightarrow

sky blue ② or black/yellow ③

Positive tester probe → red/black ①
Negative tester probe → yellow/black ④



 Does the starting circuit cut-off relay have continuity between red/black and yellow/ black?



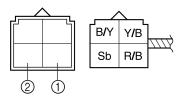


Replace the starting circuit cut-off relay.

EBS01053

- 5. Starting circuit cut-off relay (diode)
- Remove the starting circuit cut-off relay from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the starting circuit cut-off relay as shown.
- Measure the starting circuit cut-off relay for continuity as follows.

Positive tester probe → sky blue ① Negative tester probe → red/black ②	Continuity
Positive tester probe → red/black ② Negative tester probe → sky blue ①	No continuity



NOTE: .

When you switch the tester's positive and negative probes, the readings in the above chart will be reversed.

Are the testing readings correct?





Replace the starting circuit cut-off relay.



EBS01054

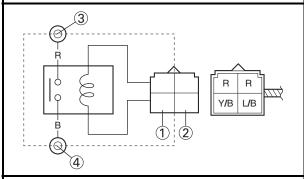
6. Starter relay

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

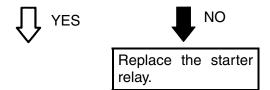
Positive battery terminal \rightarrow blue/black \bigcirc Negative battery terminal \rightarrow

yellow/black 2

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



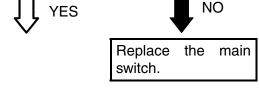
 Does the starter relay have continuity between red and black?



EBS01041

7. Main switch

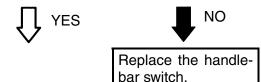
- Check the main switch for continuity.
 Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?



EBS01042

8. Engine stop switch

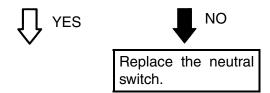
- Check the engine stop switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the engine stop switch OK?



EBS01046

9. Neutral switch

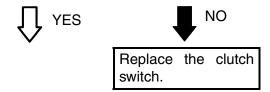
- Check the neutral switch for continuity.
 Refer to "CHECKING THE SWITCHES".
- Is the neutral switch OK?



FBS01056

10. Clutch switch

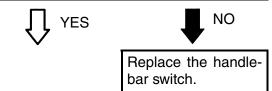
- Check the clutch switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the clutch switch OK?



EBS01057

11. Start switch

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

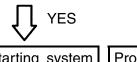




EBS01059

12. Wiring

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





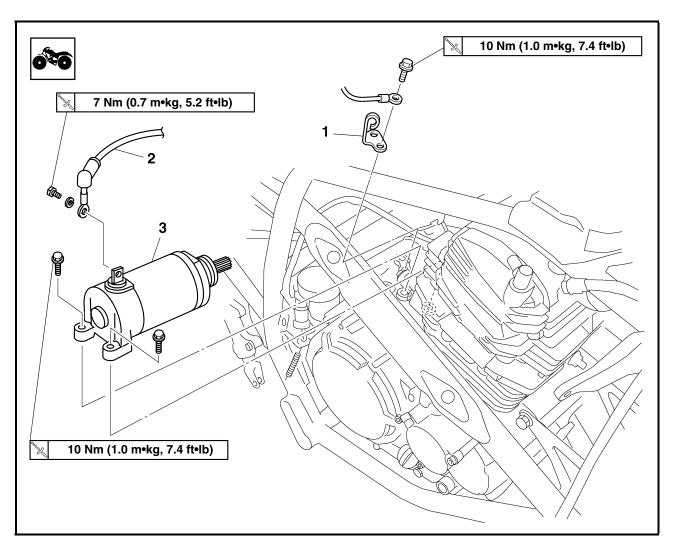
The starting system circuit is OK.

Properly connect or repair the starting system's wiring.



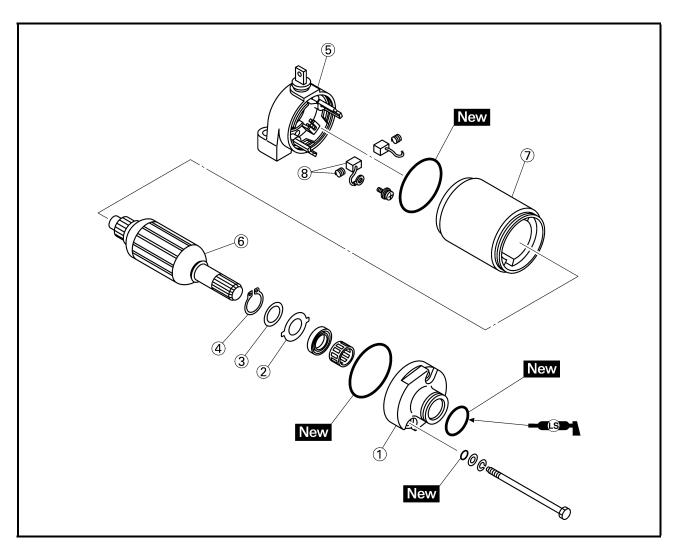
EBS01061

STARTER MOTOR



Order	Job/Part	Q'ty	Remarks
	Removing the starter motor		Remove the parts in the order listed.
	Exhaust pipe		Refer to "ENGINE REMOVAL" in chapter
	Idle gear cover and idle gear		4.
1	Clutch cable holder	1	
2	Starter motor lead	1	Disconnect.
3	Starter motor	1	
			For installation, reverse the removal procedure.

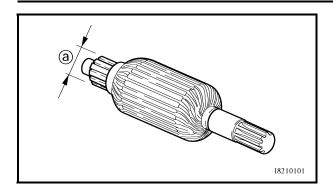
EBS01062

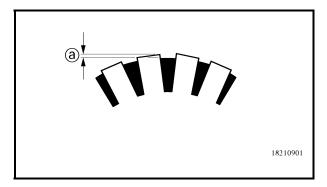


Order	Job/Part	Q'ty	Remarks
	Disassembling the starter motor		Remove the parts in the order listed.
1	Front bracket	1	
2	Tang washer	1	
3	Plate washer	1	
4	Circlip	1	Refer to "ASSEMBLING THE STARTER
(5)	Rear bracket/Brush	1/1	MOTOR".
6	Armature assembly	1	
7	Starter motor yoke	1	
8	Brush/spring	2/2	\sqcup
			For assembly, reverse the disassembly
			procedure.

STARTER MOTOR







EBS0106

CHECKING THE STARTER MOTOR

- 1. Check:
 - commutator
 Dirt → Clean with 600-grit sandpaper.
- 2. Measure:
 - commutator diameter (a)
 Out of specification → Replace the starter motor.



Commutator wear limit 21 mm (0.83 in)

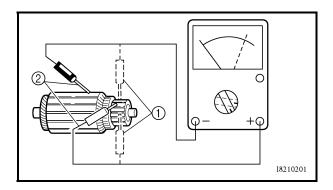
- 3. Measure:
 - mica undercut ⓐ
 Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.



Mica undercut 1.5 mm (0.06 in)

NOTE: _

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



- 4. Measure:
 - armature assembly resistances (commutator and insulation)
 Out of specification → Replace the starter motor
- a. Measure the armature assembly resistances with the pocket tester.



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



Armature coil

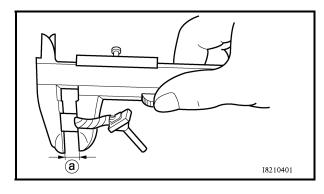
Commutator resistance ① $0.013 \sim 0.015~\Omega$ at 20°C (68°F) Insulation resistance ② Above 1 M Ω at 20°C (68°F)

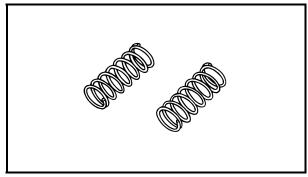
STARTER MOTOR



b. If any resistance is out of specification, replace the starter motor.

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA





5. Measure:

 brush length (a)
 Out of specification → Replace the brushes as a set.



Brush length wear limit 3.5 mm (0.14 in)

- 6. Measure:
 - brush spring force
 Out of specification → Replace the brush
 springs as a set.



Brush spring force

5.52 ~ 8.28 N

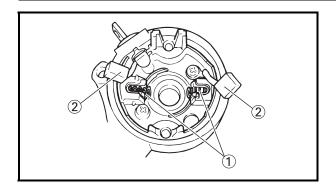
(563 ~ 844 gf, 19.85 ~ 29.78 oz)

- 7. Check:
- gear teeth
 Damage/wear → Replace the gear.
- 8. Check:
 - bushing
 - bearing
 - oil seal

Damage/wear \rightarrow Replace the defective part(s).

STARTER MOTOR

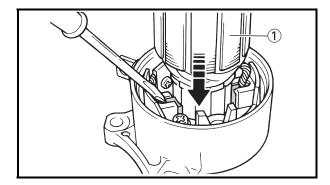




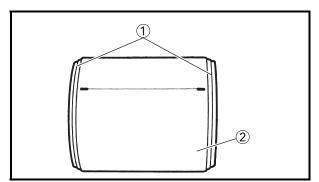
BS00515

ASSEMBLING THE STARTER MOTOR

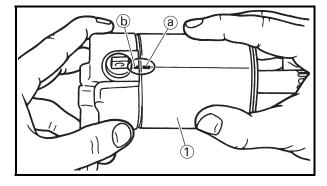
- 1. Install:
 - brush spring ①
 - brush ②



- 2. Install:
 - armature coil (1)



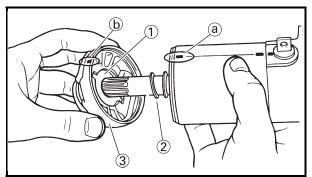
- 3. Install
 - O-rings 1 to starter motor yoke 2.



- 4. Install
 - Starter motor yoke 1

NOTE:

Align the match marks (a) on the starter motor york (1) with the match marks (b) on the rear bracket.



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

NOTE: _

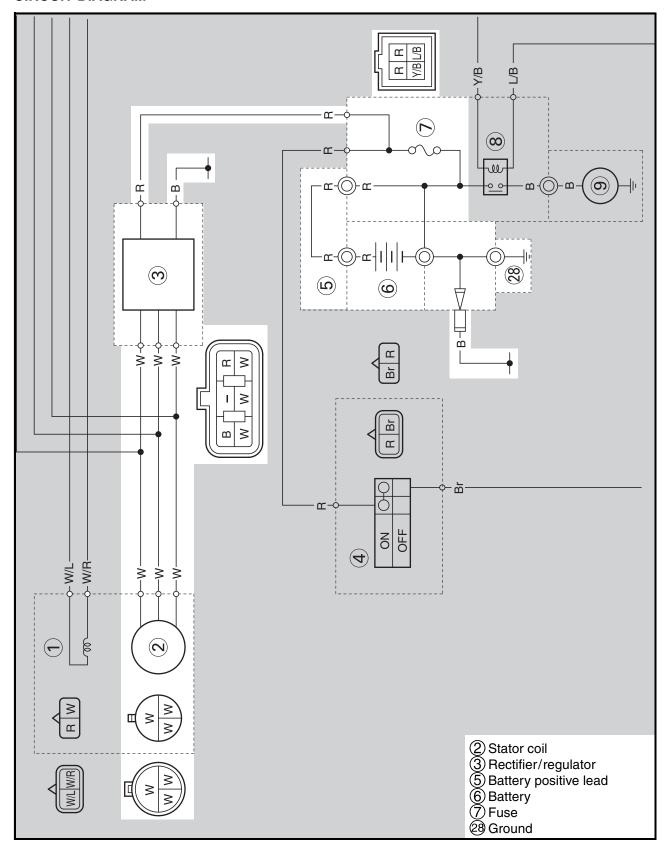
Align the match marks (a) on the starter motor york with the match marks (b) on the front bracket.

ELEC -

EBS0051

CHARGING SYSTEM

CIRCUIT DIAGRAM



CHARGING SYSTEM

ELEC -

EBS01065

TROUBLESHOOTING

The battery is not being charged.

Check:

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

NOTE: _

- Before troubleshooting, remove the following part(s):
- 1. seat
- 2. front panel
- 3. front fender
- 4. rear fender
- 5. side cover
- Troubleshoot with the following special tool(s).



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

EBS01043

- 1. Fuse
- Check the fuse for continuity.
 Refer to "CHECKING THE SWITCHES".
- Is the fuse OK?





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 12.8 V or more at 20°C (68°F)

• Is the battery OK?





NO

- Clean the battery terminals.
- Recharge or replace the battery.

CHARGING SYSTEM

ELEC -

EBS01066

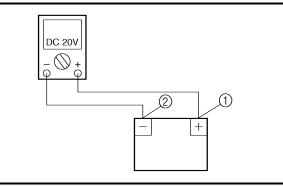
- 3. Charging voltage
- Connect the engine tachometer to on to the ignition coil.
- Connect the pocket tester (DC 20 V) to the battery as shown.

Positive tester probe →

positive battery terminal (1)

Negative tester probe \rightarrow

negative battery terminal 2



- 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

NOTE: _

Make sure the battery is fully charged.

Is the charging voltage within specification?



NO



The charging circuit is OK.

EBS01100

- 4. Stator coil resistance
- Disconnect the AC magneto coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the charging coils.

Tester (+) lead \rightarrow White terminal \bigcirc

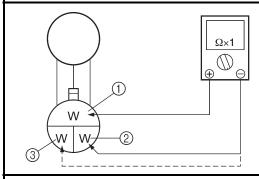
Tester (–) lead \rightarrow White terminal (2)

Tester (+) lead \rightarrow White terminal ①

Tester (–) lead \rightarrow White terminal $\stackrel{\circ}{3}$

Tester (+) lead → White terminal ②

Tester (–) lead \rightarrow White terminal 3



• Measure the stator coil resistance.



Charging coil resistance: 0.688 ~ 1.032 Ω at 20°C (68°F)





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?





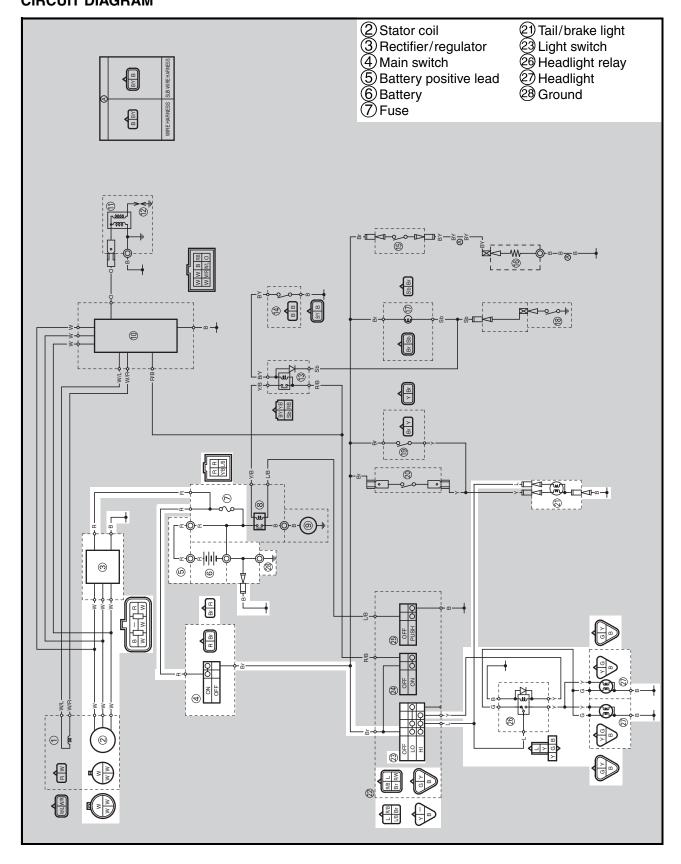
Replace the rectifier/regulator.

Replace the diode and properly connect or repair the charging system's wiring.



FBS0051

LIGHTING SYSTEM CIRCUIT DIAGRAM



LIGHTING SYSTEM



EBS01067

TROUBLESHOOTING

Any of the following fail to light: head-light, tail/brake light.

Check:

- 1. light switch
- 2. Stator coil resistance
- wiring connections (of the entire lighting system)

NOTE

- Before troubleshooting, remove the following part(s):
- 1. seat
- 2. front panel
- 3. front fender
- 4. rear fender
- 5. side cover
- Troubleshoot with the following special tool(s).



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

FAS00783

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





Replace the handle-bar switch.

EAS007

- 2. Stator coil resistance
- Disconnect the AC magneto coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the charging coils.

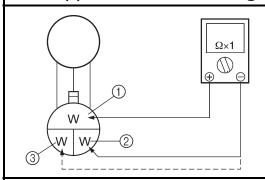
Tester (+) lead \rightarrow White terminal 1

Tester (–) lead \rightarrow White terminal \bigcirc

Tester (+) lead \rightarrow White terminal ① Tester (-) lead \rightarrow White terminal ③

Tester (+) lead ightarrow White terminal @

Tester (–) lead \rightarrow White terminal 3



• Measure the stator coil resistance.



Charging coil resistance: 0.688 ~ 1.032 Ω at 20°C (68°F)





Replace the pickup coil/stator assembly.

LIGHTING SYSTEM



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 "CHECK-ING THE LIGHT-ING 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"

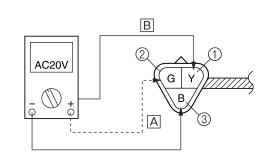
Headlight coupler (wire harness side)

Headlight

Positive tester probe →

yellow (1) or green (2)

Negative tester probe \rightarrow 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 yellow ①
 or green ② on the headlight coupler (wire
 harness side).
- Is the voltage within specification?





This circuit is OK.

Replace the rectifier/regulator.

LIGHTING SYSTEM

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

- 1. Tail/brake light bulb and bulb socket (4D31)
- 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?



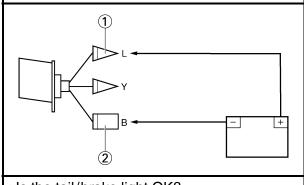


Replace the tail/brake light bulb, socket or both.

2. Tail/brake light (4D35, 4D39)

- Disconnect the tail/brake light coupler.
- Connect the battery (12 V) to the tail/brake light coupler terminals as shown.
- When the jumper leads are connected to the terminals, the tail/brake light should illuminate.

Positive battery terminal → blue ①
Negative battery terminal → black ②



• Is the tail/brake light OK?





Replace the tail/brake light.

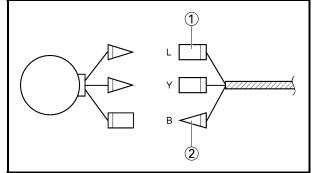
3. Voltage

• 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 → blue ①
Negative tester probe → black ②



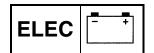
- Set the main switch to "ON".
- Start the engine.
- Measure the voltage (AC 12 V) of blue ①
 on the tail/brake light coupler (wire harness side).
- Is the voltage within specification?





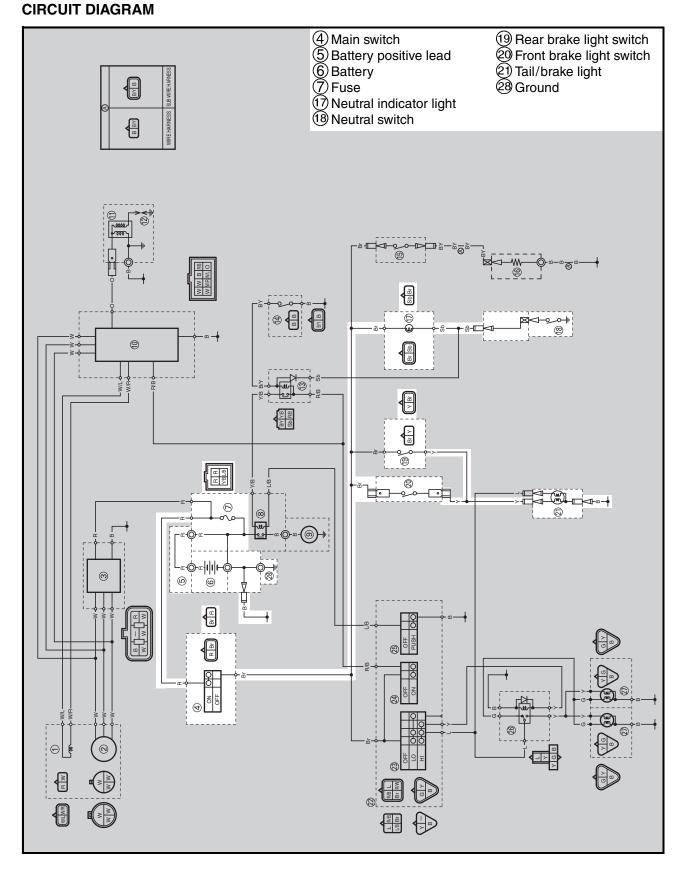
This circuit is OK.

Replace the rectifier/regulator.



FBS0052

SIGNAL SYSTEM





FBS01073

TROUBLESHOOTING

Any of the following fail to light: brake light or an indicator light.

Check:

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

NOTE: .

- Before troubleshooting, remove the following part(s):
- 1. seat
- 2. front fender
- Troubleshoot with the following special tool(s).



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

EBS01043

- 1. Fuse
- Check the fuse for continuity.
 Refer to "CHECKING THE SWITCHES".
- Is the fuse OK?





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 12.8 V or more at 20°C (68°F)

• Is the battery OK?





NO

- Clean the battery terminals.
- Recharge or replace the battery.

FBS01041

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





Replace the main switch.

EBS01074

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





Check the condition of each of the signaling system's circuits. Refer to "CHECK-ING THE SIGNAL-ING SYSTEM". Properly connect or repair the signaling system's wiring.

ELEC -

EBS01075

CHECKING THE SIGNALING SYSTEM

EBS01076

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

- 1. Tail/brake light bulb and bulb socket (4D31)
- 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?



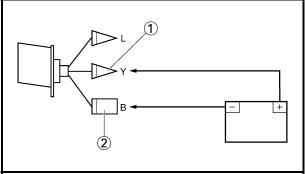


Replace the tail/ brake light bulb, bulb socket or both.

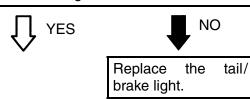
2. Tail/brake light (4D35, 4D39)

- Disconnect the tail/brake light coupler.
- Connect the battery (12 V) to the tail/brake light coupler terminals as shown.
- When the jumper leads are connected to the terminals, the tail/brake light should illuminate.

Positive battery terminal → yellow ①
Negative battery terminal → black ②



• Is the tail/brake light OK?



3. Brake light switches

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



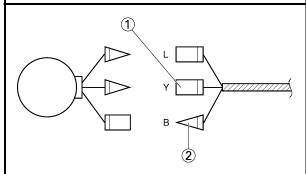


Replace the brake light switch.

4. Voltage

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

Positive tester probe \rightarrow yellow ① Negative tester probe \rightarrow black ②



- Set the main switch to "ON".
- Pull in the brake lever or push down on the brake pedal.
- Measure the voltage (DC 12 V) of 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.

ELEC -

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. Neutral switch

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



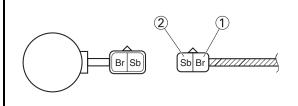


Replace the neutral switch.

3. Voltage

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

Positive tester probe \rightarrow brown ① Negative tester probe \rightarrow sky blue ②



- Set the main switch to "ON".
- Measure the voltage (DC 12 V).
- Is the voltage within specification?





This circuit is OK.

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



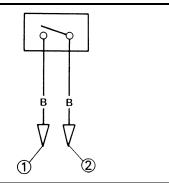
FBS01083

3. The carburetor heater fails to come on.

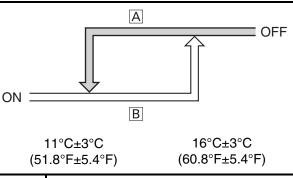
1. Thermo switch

- Disconnect the thermo switch from the wireharness.
- Connect the pocket tester ($\Omega \times$ 1) to the thermo switch lead.

Tester positive probe \rightarrow black ① Tester negative probe \rightarrow black ②



 Check the thermo switch for continuity at the temperatures indicated below.





A COOL DOWN

BHEAT UP

Does the thermo switch operated properly?





Replace the thermo switch.

2. Carburetor warmer

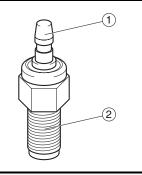
- Remove the carburetor heating element from the carburetor.
- Connect the pocket tester ($\Omega \times 1$) to the carburetor heating element.

Tester positive probe →

heating element (1)

Tester negative probe →

heating element body 2



• Measure the carburetor heating element resistance.



Carburetor heating element resistance:

 $6 \sim 12 \Omega (20^{\circ}C)$

• Is the carburetor heating element OK?





This circuit is OK.

Replace the carburetor warmer element.

STARTING FAILURE/HARD STARTING

TRBL ?

EBS00537

TROUBLESHOOTING

NOTE: _

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

STARTING FAILURE/HARD STARTING

FUEL SYSTEM

Fuel tank

- Empty
- Clogged fuel strainer
- Clogged fuel tank 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

Ignition coil

- Broken or shorted primary/secondary
- Faulty ignition coil lead
- Broken body

CDI system

- Faulty CDI 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 neutral switch
- Faulty start switch
- Faulty clutch switch
- Faulty throttle switch
- Faulty carburetor switch
- Loose connections

Starter motor

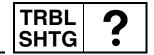
- Faulty starter motor
- Faulty starter relay
- · Faulty starting circuit cut-off relay
- Faulty starter clutch
- Faulty torque limiter

Battery

- · Faulty battery
- Discharged battery

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STARTING FAILURE/HARD STARTING/POOR IDLE SPEED PERFORMANCE/POOR MEDIUM AND HIGH-SPEED PERFORMANCE



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 CDI 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

Shift drum

Shift guide

Transmission

- Improper thrust play
- Worn shift drum groove

• Seized transmission gear

Incorrectly assembled transmission

Jammed impurities

• Broken shift guide

Transmission

• Worn gear dog

EBS00545

CLUTCH SLIPPING/DRAGGING CLUTCH SLIPPING Clutch

- · Loose clutch spring
- Fatigued clutch spring
- Worn friction plate
- Worn clutch plate
- · Incorrectly assembled clutch

Engine oil

- Low oil level
- Improper quality (low viscosity)
- Deterioration

CLUTCH DRAGGING Clutch

- Warped pressure plate
- Unevenly tensioned clutch springs
- Loose clutch boss nut
- · Burnt primary driven gear bushing
- Bent clutch plate
- Swollen friction plate
- Broken clutch boss

Engine oil

- High oil level
- Improper quality (high viscosity)
- Deterioration

OVERHEATING/FAULTY BRAKE/ SHOCK ABSORBER MALFUNCTION

TRBL ?

EBS00547

OVERHEATING OVERHEATING Ignition system

- Improper spark plug gap
- Improper spark plug heat range
- Faulty CDI unit

Fuel system

- Improper carburetor main jet (improper setting)
- Improper fuel level
- Clogged air filter element

Compression system

• Heavy carbon deposit

EBS00550

FAULTY BRAKE POOR BRAKING EFFECT Disc 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

Engine oil

- Improper oil level
- Improper oil viscosity
- · Inferior oil quality

Brake

Brake drag

FBS00552

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 electrical 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

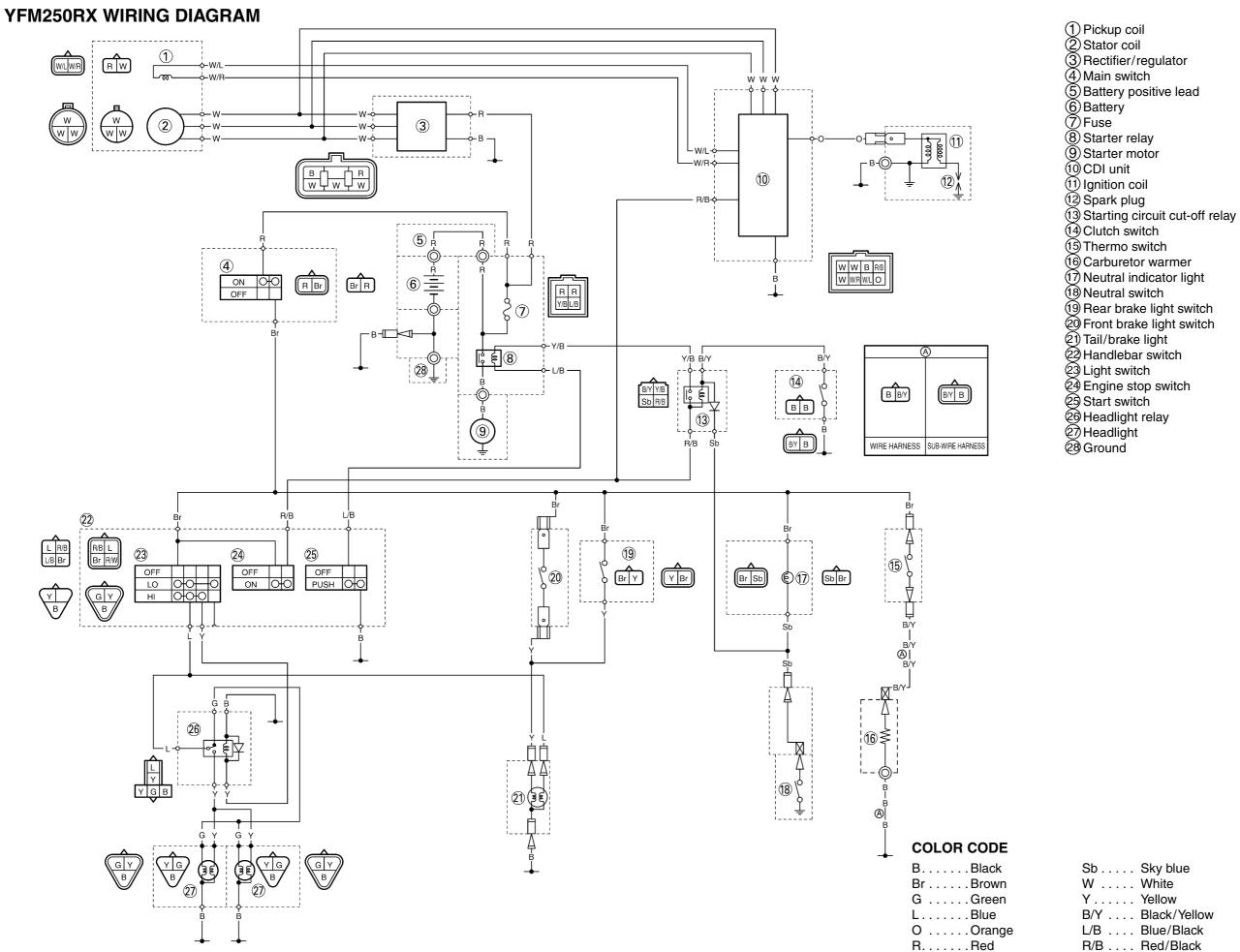
BULB BURNT OUT

- 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





R/W Red/White Sb Sky blue W White W/L White/Blue W/R White/Red Y Yellow B/Y Black/Yellow Y/B. . . . Yellow/Black

R/B Red/Black