YAMAHA

YFM400FWA(M) 2000

5GH3-AE1

SERVICE MANUAL

YFM400FWA(M) 2000
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First Edition, July 1999

EB001000

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.

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!

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

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

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

EB002000

HOW TO USE THIS MANUAL

MANUAL ORGANIZATION

This manual consists of chapters for the main categories of subjects. (See "Illustrated symbols")

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

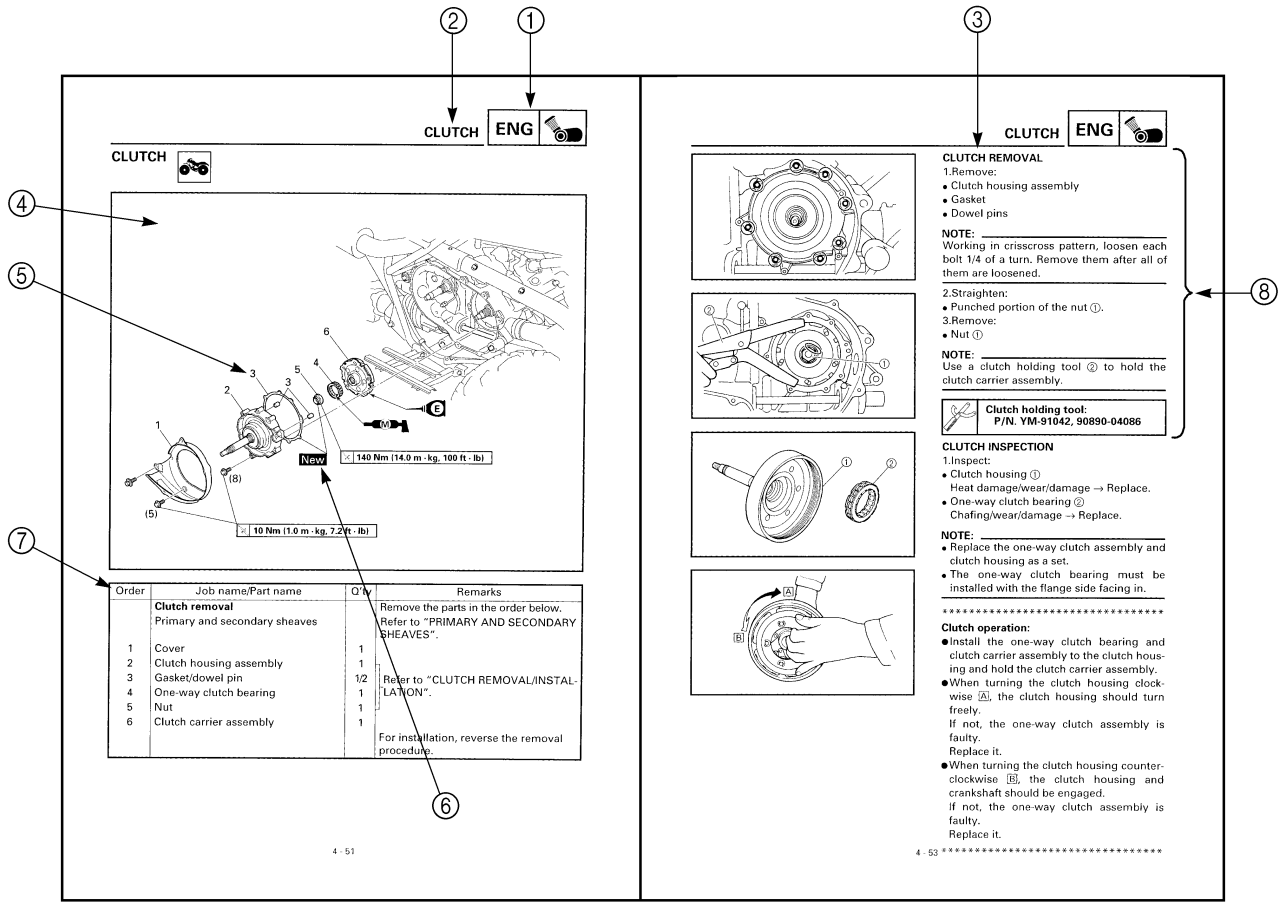
2nd title ②: This title indicates the section of the chapter and only appears on the first page of each section. It is located in the upper left corner of the page.

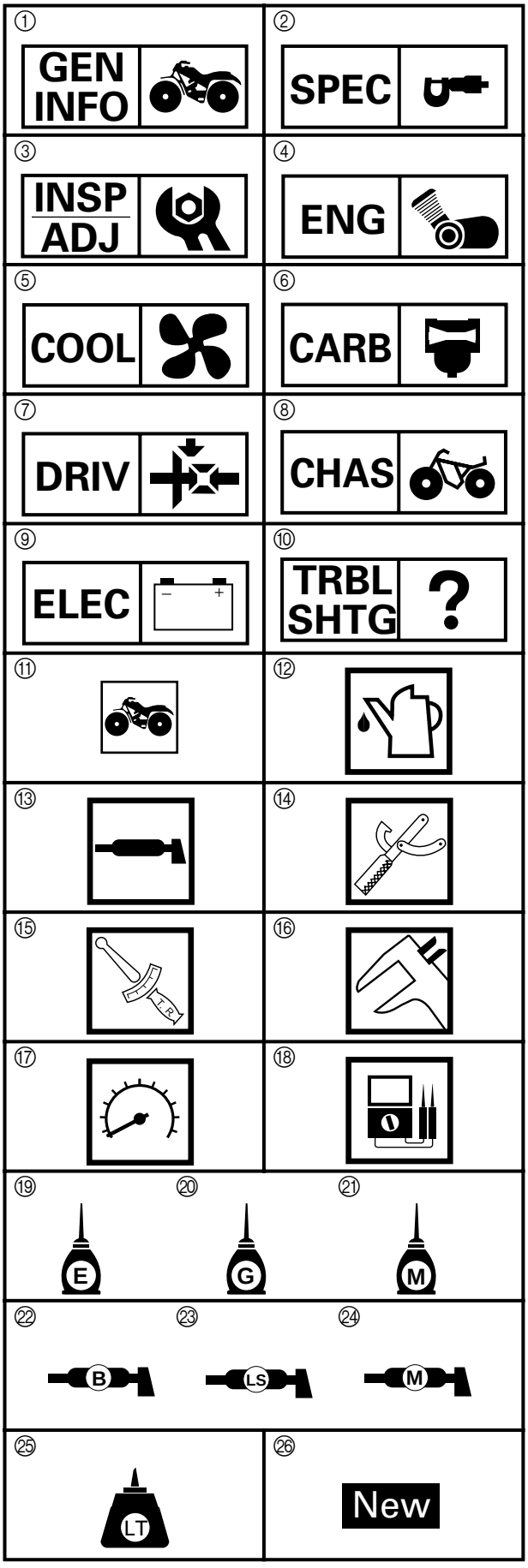
3rd title ③: This title indicates a sub-section that is followed by step-by-step procedures accompanied by corresponding illustrations.

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.





EB003000

ILLUSTRATED SYMBOLS

Illustrated symbols ① to ⑩ are printed on the top right of each page and indicate the subject of each chapter.

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

Illustrated symbols ⑪ to ⑱ are used to identify the specifications appearing in the text.

⑪ Can be serviced with engine mounted
⑫ Filling fluid
⑬ Lubricant
⑭ Special tool
⑮ Torque
⑯ Wear limit, clearance
⑰ Engine speed
⑱ Ω, V, A

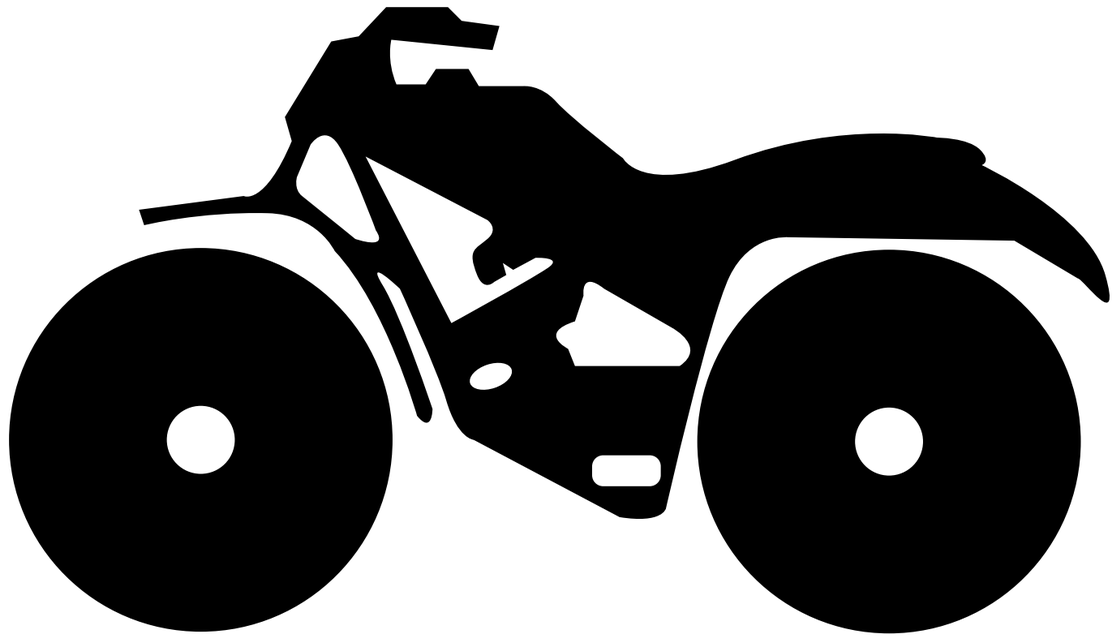
Illustrated symbols ⑲ to ㉔ in the exploded diagrams indicate the types of lubricants and lubrication points.

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

Illustrated 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

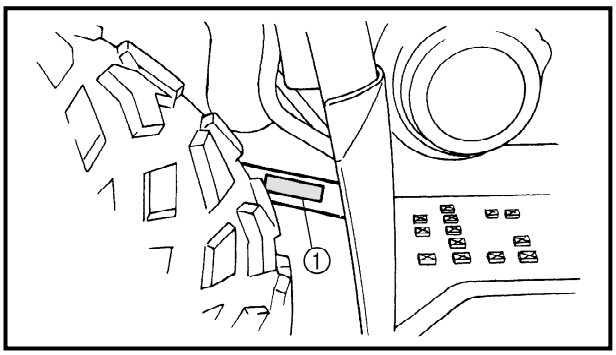
TABLE OF CONTENTS



GEN INFO

1

CHAPTER 1.
GENERAL INFORMATION

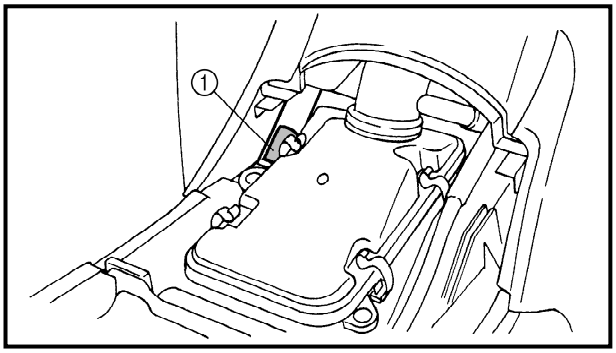


GENERAL INFORMATION

MACHINE IDENTIFICATION

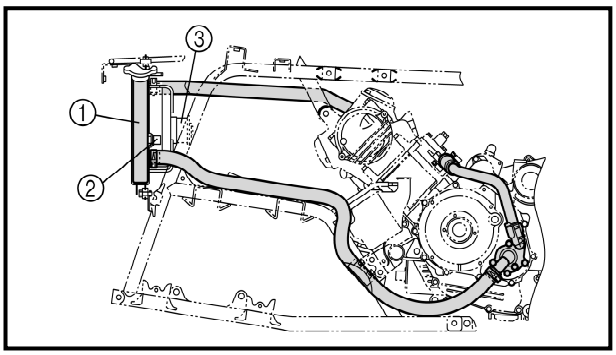
VEHICLE IDENTIFICATION NUMBER

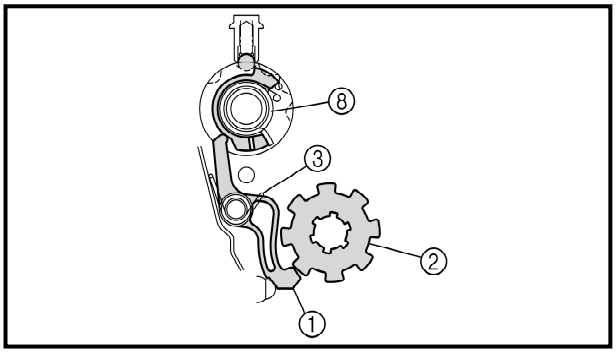
The vehicle identification number ① is stamped into the left side of the frame.

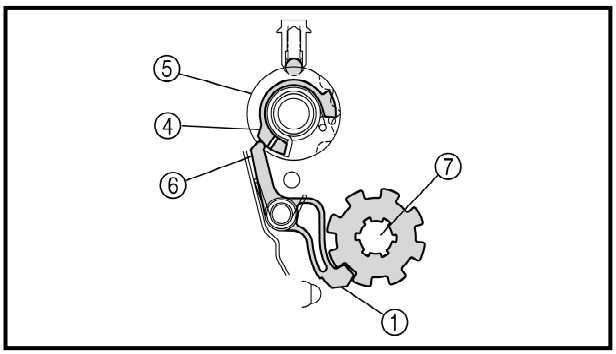


MODEL LABEL

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







FEATURES

LIQUID COOLING ENGINE

Compact liquid cooled 45˚ inclined engine. A liquid cooling system has been incorporated for stable power and engine endurance.

① Radiator
② Thermo switch
③ Fan motor

PARK POSITION

When the drive select lever is shifted into the park position, a stopper lever is engaged into the stopper gear preventing the drive select lever and transmission from moving.

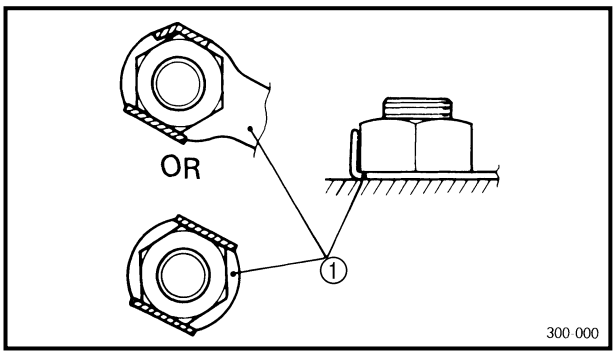
When the drive select lever is at the "L", "H", "N", or "R" positions, the stopper lever end ① is moved away from the stopper gear ② by the return spring ③.
When the drive select lever is in the "P" position, the lever cam ④ at the side of the shift cam ⑤ lifts the stopper lever end ⑥ and the stopper lever end locks the drive axle ⑦.

When the stopper lever end ① is not synchronized, a torsion spring ⑧ retains the rotation force of the shift cam ⑤ until it is synchronized.

EB101000
IMPORTANT INFORMATION
PREPARATION FOR REMOVAL PROCEDURES
1. Remove all dirt, mud, dust and foreign material before removal and disassembly.
2. Use proper tools and cleaning equipment. Refer to the "SPECIAL TOOLS" section.
3. When disassembling the machine, always keep mated parts together. This includes gears, cylinder, piston and other parts that have been "mated" through normal wear. Mated parts must always be reused or replaced as an assembly.
4. During machine disassembly, clean all 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.

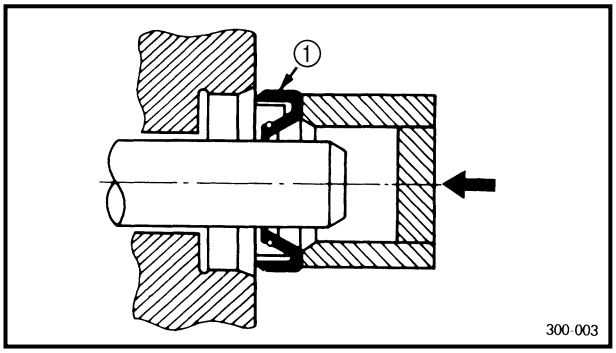
EB101010
REPLACEMENT PARTS
1. Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.

EB101020
GASKETS, OIL SEALS AND O-RINGS
1. Replace all gaskets, seals and O-rings when overhauling the engine. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.



EB101030
LOCK WASHERS/PLATES AND COTTER PINS

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



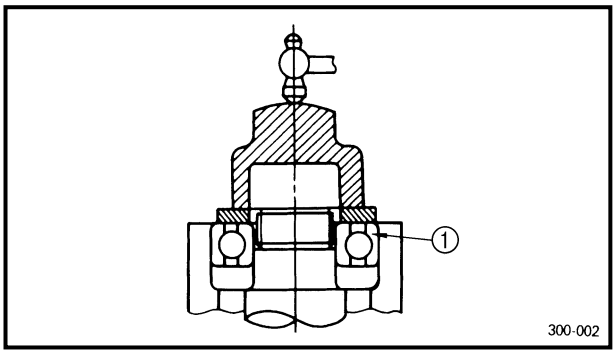
EB101040
BEARINGS AND OIL SEALS

1. Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals, apply a light coating of lightweight lithium base grease to the seal lips. Oil bearings liberally when installing, if appropriate.

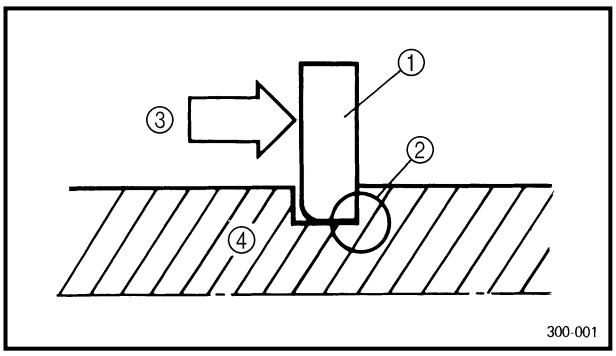
① Oil seal

CAUTION:

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



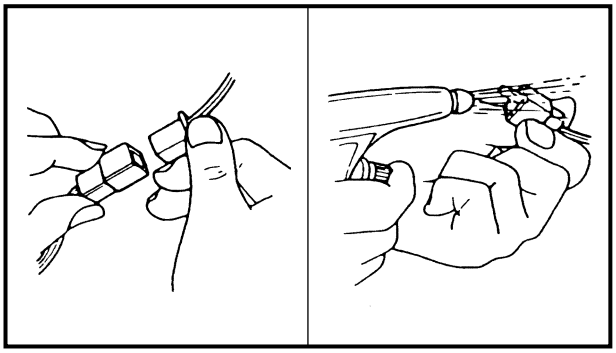
① Bearing

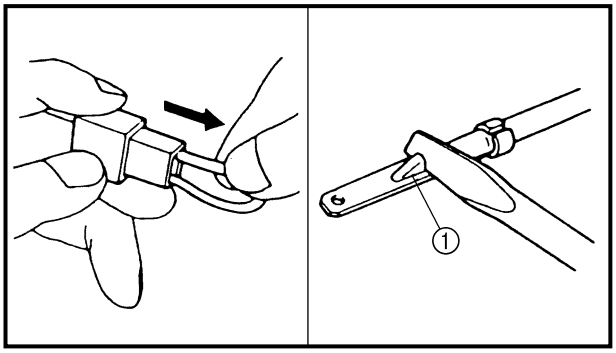


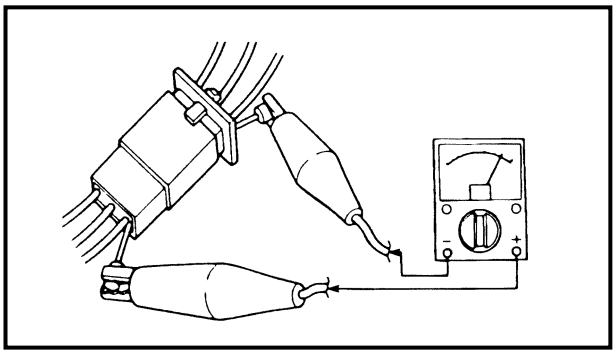
EB101050
CIRCLIPS

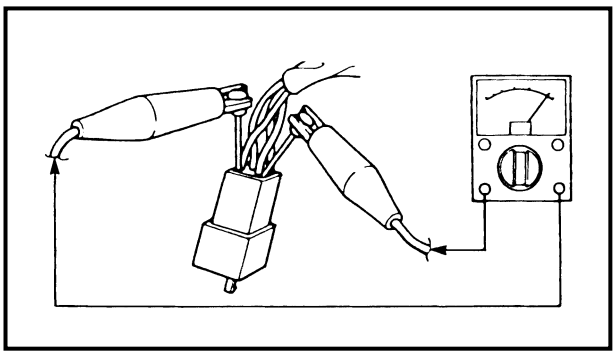
1. Check all circlips carefully before reassembly. Always replace piston pin clips after one use. Replace distorted circlips. When installing a circlip ①, make sure that the sharp-edged corner ② is positioned opposite the thrust ③ it receives. See sectional view.

④ Shaft









EB801000

CHECKING OF CONNECTIONS

Check the connectors for stains, rust, moisture, etc.

1.Disconnect:
- Connector

2.Check:
- Connector

  Moisture → Dry each terminal with an air blower.

  Stains/rust → Connect and disconnect the terminals several times.

3.Check:
- Connector leads

  Looseness → Bend up the pin ① and connect the terminals.

4.Connect:
- Connector terminals

NOTE:

The two terminals "click" together.

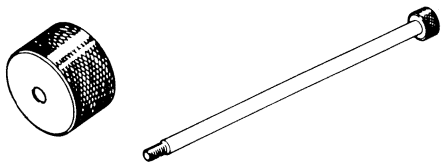
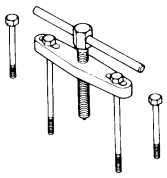
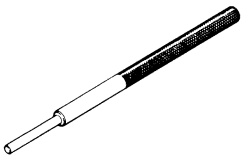
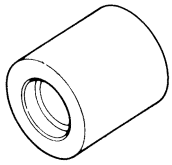
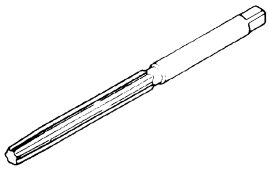
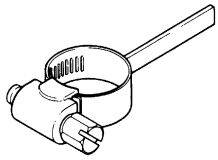
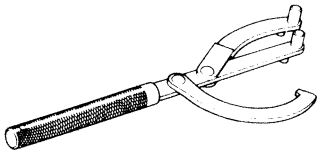
5.Check:
- Continuity (using a pocket tester)

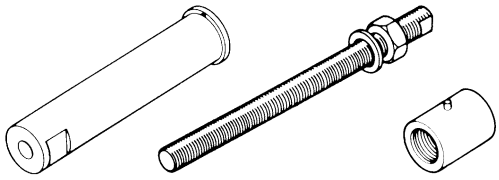
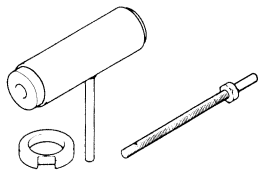
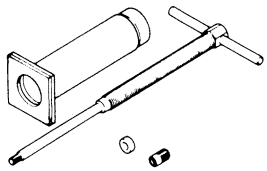
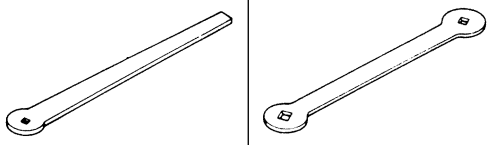
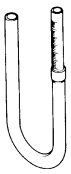
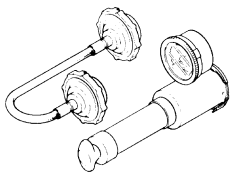
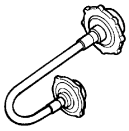
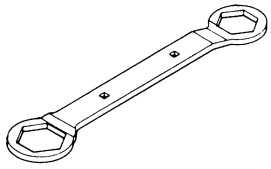
NOTE:
- If there is no continuity, clean the terminals.
- When checking the wire harness be sure to perform steps 1 to 3.
- As a quick remedy, use a contact revitalizer available at most part stores.
- Check the connector with a pocket tester as shown.

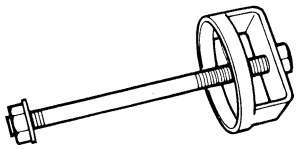
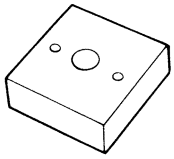
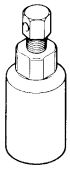
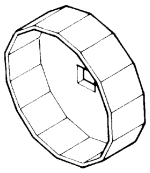
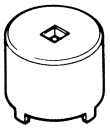
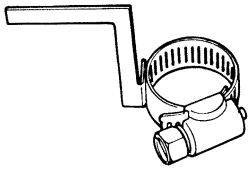
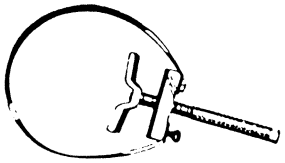
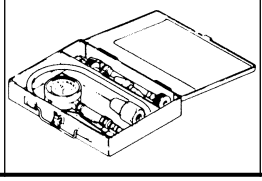
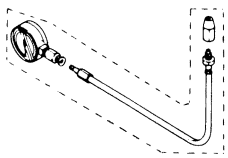
EB102001
SPECIAL TOOLS

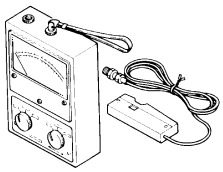
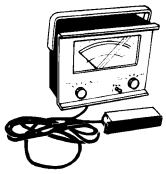
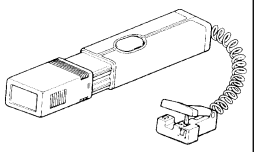
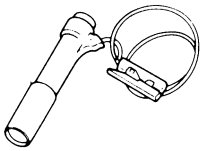
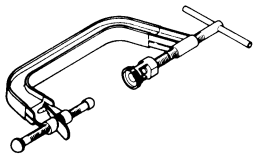
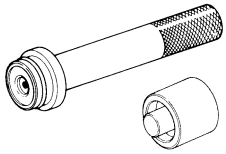
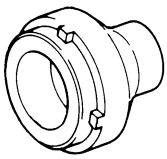
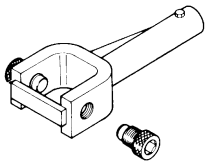
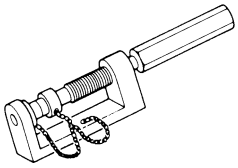
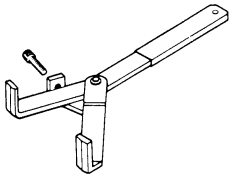
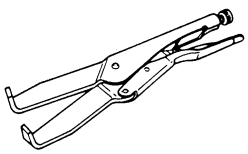
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools; this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools may differ by shape and part number from country to country. In such a case, two types are provided.
When placing an order, refer to the list provided below to avoid any mistakes.

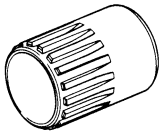
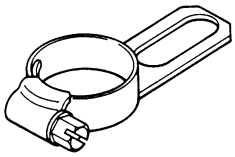
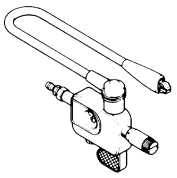
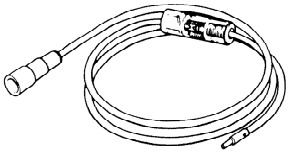
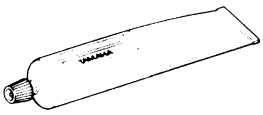
For US and CDN
P/N. YM-, YU-, YS-, YK-, ACC-
Except for US and CDN
P/N. 90890-

Tool No.	Tool name/How to use	Illustration
Bolt 90890-01083 Weight 90890-01084 Set YU-01083-A	Slide hammer bolt (M6)/weight/set These tools are used to remove the rocker arm shaft.	
90890-01135 YU-01135-A	Crankcase separating tool This tool is used to separate the crankcase.	
90890-01225 YM-01225-A	Valve guide remover (7.0 mm) This tool is needed to remove and install the valve guide.	
90890-04017 YM-04017	Valve guide installer (7.0 mm) This tool is needed to install the valve guide.	
90890-01227 YM-01227	Valve guide reamer (7.0 mm) This tool is needed to rebore the new valve guide.	
90890-01231 YM-01231	Gear lash measurement tool This tool is used to measure the gear lash.	
90890-01235 YU-01235	Rotor holding tool This tool is needed to hold the starter puller when removing/installing the starter puller bolt or camshaft sprocket bolts.	

Tool No.	Tool name/How to use	Illustration
Kit 90890-04088 Bolt 90890-01275	Buffer boss installer set Crankshaft installer bolt These tools are used to install the crankshaft.	
YU-90050	Crankshaft installer set These tools are used to install the crankshaft.	
Adapter YM-33279 Spacer 90890-04060 YM-90070-A	Adapter (#11) Spacer (crankshaft installer) These tools are used to install the crankshaft.	
90890-01304 YU-01304	Piston pin puller This tool is used to remove the piston pin.	
90890-01311 YU-08035	Tappet adjusting tool (3 mm) This tool is necessary for adjusting the valve clearance.	
90890-01312 YM-01312-A	Fuel level gauge This gauge is used to measure the fuel level in the float chamber.	
90890-01325 YU-24460-01	Radiator cap tester This tool is used to check the cooling system.	
90890-01352 YU-33984	Adapter This tool is used to check the cooling system.	
90890-01348	Locknut wrench This tool is needed when removing or installing the secondary sheave spring.	

Tool No.	Tool name/How to use	Illustration
90890-04134 YM-04134	Sheave spring compressor This tool is needed when removing or installing the secondary sheave spring.	
90890-04135 YM-04135	Sheave fixed block This tool is needed when removing or installing the secondary sheave spring.	
90890-01404 YM-01404	Flywheel puller These tools are needed to remove the rotor.	
90890-01327 YM-01327	Damper rod holder (30 mm) This tool is needed to loosen and tighten the steering stem bearing retainer.	
90890-01426 YU-38411	Oil filter wrench This tool is needed to loosen or tighten the oil filter cartridge.	
90890-01430 YM-38404	Ring nut wrench This tool is needed to removing and installing the middle driven shaft bearing retainer.	
90890-01467 YM-01467 90890-01475 YM-01475	Gear lash measurement tool This tool is used to measure the gear lash.	
90890-01701 YU-01880	Sheave holder This tool is needed to hold the primary sheave when removing or installing the sheave bolts.	
Set 90890-03081 YU-33223 Adapter 90890-04082 YU-33223-3	Compression gauge set Adapter These tools are needed to measure engine compression.	 

Tool No.	Tool name/How to use	Illustration
90890-03112 YU-03112	Pocket tester This instrument is needed for checking the electrical system.	
90890-03113	Engine tachometer This tool is needed for observing engine rpm.	
YU-8036-A	Inductive tachometer This tool is needed for observing engine rpm.	
90890-03141 YM-33277-A	Timing light This tool is necessary for checking ignition timing.	 
90890-04019 YM-04019	Valve spring compressor This tool is needed to remove and install the valve assemblies.	
Middle driven shaft bearing driver 90890-04058 YM-04058-1 Mechanical seal installer 90890-04078 YM-33221	Middle driven shaft bearing driver Mechanical seal installer These tools are used to install the water pump seal.	
90890-04050 YM-04050	Bearing retainer wrench This tool is needed when removing or installing the final drive shaft bearing retainer.	
90890-04062 YM-04062	Universal joint holder This tool is needed when removing or installing the universal joint yoke nut.	 
90890-04086 YM-91042	Clutch holding tool This tool is needed to hold the clutch carrier when removing or installing the carrier nut.	 

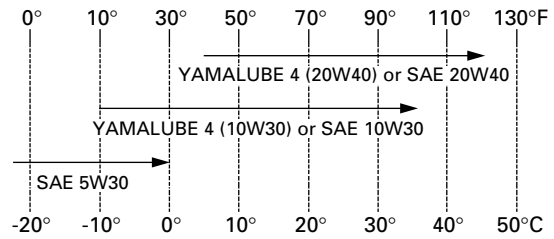
Tool No.	Tool name/How to use	Illustration
90890-04128 YM-04128	Bearing retainer wrench This tool is needed when removing or installing the middle driven pinion gear bearing retainer.	
90890-04129 YM-04129	Pinion gear fix clamp This tool is used to hold the shift cam.	
90890-06754	Ignition checker This instrument is necessary for checking the ignition system components.	
YM-34487	Dynamic spark tester This instrument is necessary for checking the ignition system components.	
Bond 90890-85505 Sealant ACC-11001-05-01	Yamaha bond No. 1215 Sealant (Quick Gasket®) This sealant (bond) is used on crankcase mating surfaces, etc.	

SPEC 2

CHAPTER 2.
SPECIFICATIONS

SPECIFICATIONS

GENERAL SPECIFICATIONS

Item	Standard
Model code:	5GH3 : (For CDN) 5GH4 : (For GB, F, CH) 5GH5 : (For Oceania)
Dimensions:	
Overall length	1,965 mm (77.36 in)
Overall width	1,070 mm (42.13 in)
Overall height	1,120 mm (44.09 in)
Seat height	820 mm (32.28 in)
Wheelbase	1,225 mm (48.23 in)
Minimum ground clearance	245 mm (9.65 in)
Minimum turning radius	3,000 mm (118.11 in)
Basic weight:	
With oil and full fuel tank	262 kg (578 lb)
Engine:	
Engine type	Liquid-cooled 4-stroke, SOHC
Cylinder arrangement	Forward-inclined single cylinder
Displacement	401 cm^3
Bore × stroke	84.5 × 71.5 mm (3.33 × 2.81 in)
Compression ratio	10.5 : 1
Starting system	Electric and recoil starter
Lubrication system:	Wet sump
Oil type or grade:	
Engine oil	 API service SE, SF, SG type or higher
Final gear oil	SAE 80API “GL-4” Hypoid Gear Oil
Differential gear oil	SAE 80API “GL-4” Hypoid Gear Oil
Oil capacity:	
Engine oil	
Periodic oil change	2.3 L (2.0 Imp qt, 2.4 US qt)
With oil filter replacement	2.4 L (2.1 Imp qt, 2.5 US qt)
Total amount	2.6 L (2.3 Imp qt, 2.7 US qt)
Final gear case oil	
Periodic oil change	0.19 L (0.17 Imp qt, 0.20 US qt)
Total amount	0.22 L (0.19 Imp qt, 0.23 US qt)

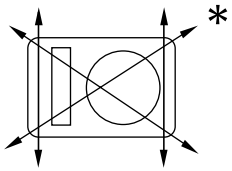
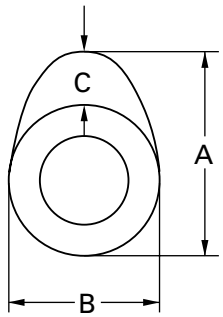
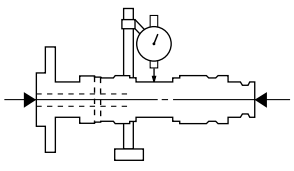
Item		Standard
Differential gear case oil		
Periodic oil change		0.35 L (0.31 Imp qt, 0.37 US qt)
Total amount		0.40 L (0.35 Imp qt, 0.42 US qt)
Radiator capacity (including all routes)		1.1 L (0.97 Imp qt, 1.16 US qt)
Air filter:		Wet type element
Fuel:		
Type		Regular unleaded gasoline (For CDN, GB, F, CH) Unleaded fuel only (For Oceania)
Fuel tank capacity		15 L (3.3 Imp gal, 3.9 US gal)
Fuel reserve amount		4.5 L (0.99 Imp gal, 1.19 US gal)
Carburetor:		
Type/quantity		BSR33/1
Manufacturer		MIKUNI
Spark plug:		
Type/manufacturer		DR8EA/NGK (For CDN, GB, F, CH) D8EA/NGK (For Oceania) X24ES-U/DENSO (For Oceania)
Spark plug gap		0.6 ~ 0.7 mm (0.02 ~ 0.03 in)
Clutch type:		Wet, centrifugal automatic
Transmission:		
Primary reduction system		V-belt
Secondary reduction system		Spur gear
Secondary reduction ratio		39/24 × 24/18 × 33/9 (7.944)
Transmission type		V-belt automatic
Operation		Left hand operation
Single speed automatic		2.55 ~ 0.75 : 1
Sub transmission ratio	low	45/16 (2.813)
	high	38/23 (1.652)
Reverse gear		29/17 (1.706)
Chassis:		
Frame type		Steel tube frame
Caster angle		4.0°
Camber angle		1°
Kingpin angle		11°
Kingpin offset		1 mm (0.04 in)
Trail		21 mm (0.83 in)
Tread (STD)	front	850 mm (33.46 in)
	rear	825 mm (32.48 in)
Toe-in		0 ~ 10 mm (0 ~ 0.39 in)
Tire:		
Type		Tubeless
Size	front	AT25 × 8–12
	rear	AT25 × 10–12

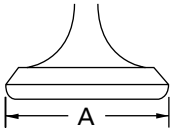
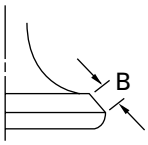
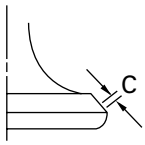
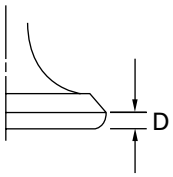
Item		Standard
Manufacturer	front	DUNLOP (For CDN, GB, F, CH) CHENG SHIN (For Oceania)
	rear	DUNLOP (For CDN, GB, F, CH) CHENG SHIN (For Oceania)
Type	front	KT123 (For CDN, GB, F, CH) C828 (For Oceania)
	rear	KT127 (For CDN, GB, F, CH) C828 (For Oceania)

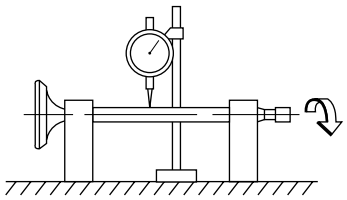
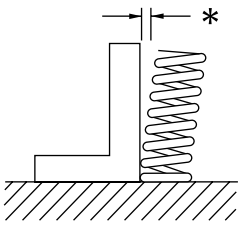
Item		Standard
Tire pressure (cold tire):		
Maximum load*		210 kg (463 lb)
Off-road riding	front	22 ~ 28 kPa (0.22 ~ 0.28 kg/cm^2, 3.2 ~ 4.0 psi)
	rear	22 ~ 28 kPa (0.22 ~ 0.28 kg/cm^2, 3.2 ~ 4.0 psi)
*Load in total weight of rider accessories		
Brake:		
Front brake	type	Dual disc brake
	operation	Right hand operation
Rear brake	type	Single disc brake
	operation	Left hand and right foot operation
Suspension:		
Front suspension		Double wishbone
Rear suspension		Swingarm (monocross)
Shock absorber:		
Front shock absorber		Coil spring/oil damper
Rear shock absorber		Coil spring/oil damper
Wheel travel:		
Front wheel travel		160 mm (6.30 in)
Rear wheel travel		180 mm (7.09 in)
Electrical:		
Ignition system		C.D.I.
Generator system		A.C. magneto
Battery type		YTX20L-BS
Battery capacity		12 V 18 AH
Headlight type:		Krypton bulb
Bulb wattage × quantity:		
Headlight		12 V 30 W/30 W × 2
Tail light		12 V 7.5 W × 1
Meter light		14 V 3.4 W × 1
Indicator lights		
Neutral		14 V 1.7 W × 1
Reverse		14 V 1.7 W × 1
Coolant temperature		14 V 1.7 W × 1
Four-wheel drive		14 V 1.7 W × 1
Park		14 V 1.7 W × 1

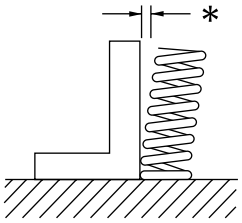
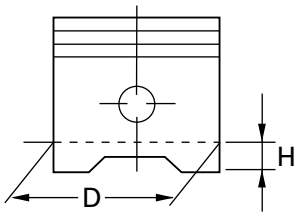
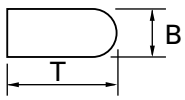
MAINTENANCE SPECIFICATIONS

ENGINE

Item	Standard	Limit
Cylinder head:		
Warp limit 	----	0.03 mm (0.0012 in)
Cylinder:		
Bore size	84.500 ~ 84.510 mm (3.3268 ~ 3.3272 in)	84.600 mm (3.3307 in)
Taper limit	----	0.05 mm (0.0016 in)
Out of round limit	----	0.01 mm (0.0004 in)
Camshaft:		
Drive method	Chain drive (Left)	----
Cam dimensions 		
Intake “A”	40.62 ~ 40.72 mm (1.5992 ~ 1.6031 in)	40.52 mm (1.5953 in)
“B”	32.18 ~ 32.28 mm (1.2669 ~ 1.2709 in)	32.08 mm (1.2630 in)
“C”	8.61 ~ 8.73 mm (0.3390 ~ 0.3437 in)	----
Exhaust “A”	40.62 ~ 40.72 mm (1.5992 ~ 1.6031 in)	40.52 mm (1.5953 in)
“B”	32.18 ~ 32.28 mm (1.2669 ~ 1.2709 in)	32.08 mm (1.2630 in)
“C”	8.61 ~ 8.73 mm (0.3390 ~ 0.3437 in)	----
Camshaft runout limit 	----	0.03 mm (0.0012 in)

Item		Standard	Limit
Cam chain:			
Cam chain type/No. of links		92RH2015/116	----
Cam chain adjustment method		Automatic	----
Rocker arm/rocker arm shaft:			
Shaft outside diameter		11.981 ~ 11.991 mm (0.4717 ~ 0.4721 in)	11.951 mm (0.4705 in)
Arm-to-shaft clearance		0.009 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.08 mm (0.0031 in)
Valve, valve seat, valve guide:			
Valve clearance (cold)	IN	0.06 ~ 0.10 mm (0.0024 ~ 0.0039 in)	----
	EX	0.16 ~ 0.20 mm (0.0063 ~ 0.0079 in)	----
Valve dimensions			
 Head Diameter		 Face Width	 Seat Width
 Margin Thickness			
"A" head diameter	IN	39.9 ~ 40.1 mm (1.5708 ~ 1.5787 in)	----
	EX	33.9 ~ 34.1 mm (1.3346 ~ 1.3425 in)	----
"B" face width	IN	2.26 mm (0.0890 in)	----
	EX	2.26 mm (0.0890 in)	----
"C" seat width	IN	1.2 ~ 1.4 mm (0.0472 ~ 0.0551 in)	1.6 mm (0.0630 in)
	EX	1.2 ~ 1.4 mm (0.0472 ~ 0.0551 in)	1.6 mm (0.0630 in)
"D" margin thickness	IN	1.0 ~ 1.4 mm (0.0394 ~ 0.0551 in)	----
	EX	0.8 ~ 1.2 mm (0.0314 ~ 0.0472 in)	----
Stem outside diameter	IN	6.975 ~ 6.990 mm (0.2746 ~ 0.2752 in)	6.950 mm (0.2736 in)
	EX	6.955 ~ 6.970 mm (0.2738 ~ 0.2744 in)	6.915 mm (0.2722 in)
Guide inside diameter	IN	7.000 ~ 7.012 mm (0.2756 ~ 0.2761 in)	7.030 mm (0.2768 in)
	EX	7.000 ~ 7.012 mm (0.2756 ~ 0.2761 in)	7.030 mm (0.2768 in)
Stem-to-guide clearance	IN	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.08 mm (0.0031 in)
	EX	0.030 ~ 0.057 mm (0.0012 ~ 0.0022 in)	0.10 mm (0.0039 in)

Item		Standard	Limit
Stem runout limit		----	0.01 mm (0.0004 in)
			
Valve seat width	IN	1.2 ~ 1.4 mm (0.0472 ~ 0.0551 in)	----
	EX	1.2 ~ 1.4 mm (0.0472 ~ 0.0551 in)	----
Valve spring:			
Inner spring			
Free length	IN	39.9 mm (1.57 in)	37.9 mm (1.49 in)
	EX	39.9 mm (1.57 in)	37.9 mm (1.49 in)
Set length (valve closed)	IN	33.6 mm (1.32 in)	----
	EX	33.6 mm (1.32 in)	----
Compressed pressure (installed)	IN	104.9 ~ 120.6 N (10.70 ~ 12.30 kg, 23.58 ~ 27.11 lb)	----
	EX	104.9 ~ 120.6 N (10.70 ~ 12.30 kg, 23.58 ~ 27.11 lb)	----
Tilt limit *	IN		2.5°/1.6 mm (2.5°/0.06 in)
	EX		2.5°/1.6 mm (2.5°/0.06 in)
			
Direction of winding (top view)	IN	Counterclockwise	----
	EX	Counterclockwise	----
Outer spring			
Free length	IN	43.27 mm (1.70 in)	41.27 mm (1.62 in)
	EX	43.27 mm (1.70 in)	41.27 mm (1.62 in)
Set length (valve closed)	IN	36.6 mm (1.44 in)	----
	EX	36.6 mm (1.44 in)	----

Item		Standard	Limit
Compressed pressure (installed)	IN	235.4 ~ 251.1 N (24.00 ~ 25.60 kg, 52.92 ~ 56.45 lb)	----
	EX	235.4 ~ 251.1 N (24.00 ~ 25.60 kg, 52.92 ~ 56.45 lb)	----
Tilt limit *	IN		2.5°/1.6 mm (2.5°/0.06 in)
	EX		2.5°/1.6 mm (2.5°/0.06 in)
			
Direction of winding (top view)	IN	Clockwise	----
	EX	Clockwise	----
Piston:			
Piston to cylinder clearance		0.040 ~ 0.065 mm (0.0016 ~ 0.0026 in)	0.15 mm (0.0059 in)
Piston size "D"		84.445 ~ 84.460 mm (3.3246 ~ 3.3252 in)	----
			
Measuring point "H"		5 mm (0.20 in)	----
Piston off-set		0.5 mm (0.0200 in)	----
Piston pin bore inside diameter		20.004 ~ 20.015 mm (0.7876 ~ 0.7880 in)	20.045 mm (0.7892 in)
Piston pin outside diameter		19.993 ~ 20.000 mm (0.7871 ~ 0.7874 in)	19.973 mm (0.7863 in)
Piston rings:			
Top ring			
			
Type		Barrel	----
Dimensions (B × T)		1.2 × 3.1 mm (0.0472 × 0.1220 in)	----
End gap (installed)		0.2 ~ 0.4 mm (0.0079 ~ 0.0157 in)	0.65 mm (0.0256 in)
Side clearance (installed)		0.03 ~ 0.08 mm (0.0012 ~ 0.0031 in)	0.13 mm (0.0051 in)