



FS-1

'87

2RT-SE1

**SERVICE
INFORMATION**

FOREWORD

This Service Information has been prepared to introduce new service and data for the FS-1. For complete service information procedures it is necessary to use this publication together with the following microfiche service manual.

FS-1 SERVICE MANUAL: 2RT-ME1

FS-1

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NOTICE

This manual was written by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to put an entire mechanic's education into one manual, so it is assumed that persons using this book to perform maintenance and repairs on Yamaha motorcycles have a basic understanding of the mechanical concepts and procedures inherent in motorcycle repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit to use and/or unsafe.

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

TECHNICAL PUBLICATIONS
SERVICE DIVISION
MOTORCYCLE OPERATIONS
YAMAHA MOTOR CO., LTD.

HOW TO USE THIS MANUAL

PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.

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

CAUTION: A CAUTION indicates special procedures that must be followed to avoid damage to the motorcycle.

WARNING: A WARNING indicates special procedures that must be followed to avoid injury to a motorcycle operator or person inspecting or repairing the motorcycle.

MANUAL FORMAT

All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspection operations.

In this revised format, the condition of a faulty component will precede an arrow symbol and the course of action required will follow the symbol, e.g.,

- Bearings
Pitting/Damage → Replace.

EXPLODED DIAGRAM

Each chapter provides exploded diagrams before each disassembly section for ease in identifying correct disassembly and assembly procedures.



ILLUSTRATED SYMBOLS (Refer to the illustration)

Illustrated symbols ① to ⑨ are designed as thumb tabs to indicate the chapter's number and content.

- ① General information
- ② Specifications
- ③ Periodic inspection and adjustment
- ④ Engine
- ⑤ Cooling system
- ⑥ Carburetion
- ⑦ Chassis
- ⑧ Electrical
- ⑨ Troubleshooting

Illustrated symbols ⑩ to ⑯ are used to identify the specifications appearing in the text.

- ⑩ Filling fluid
- ⑪ Lubricant
- ⑫ Special tool
- ⑬ Tightening
- ⑭ Wear limit, clearance
- ⑮ Engine speed
- ⑯ Ω, V, A

Illustrated symbols ⑰ to ㉓ in the exploded diagram indicate grade of lubricant and location of lubrication point.

- ⑰ Apply engine oil
- ⑱ Apply gear oil
- ⑲ Apply molybdenum disulfide oil
- ⑳ Apply wheel bearing grease
- ㉑ Apply lightweight lithium-soap base grease
- ㉒ Apply molybdenum disulfide grease
- ㉓ Apply locking agent (LOCTITE®)

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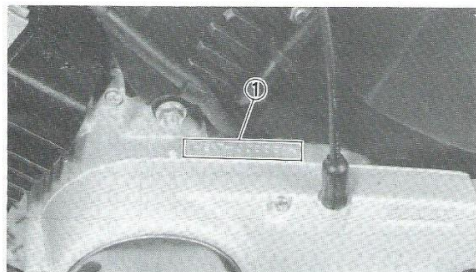
MOTORCYCLE IDENTIFICATION



GENERAL INFORMATION MOTORCYCLE IDENTIFICATION

FRAME SERIAL NUMBER

The frame serial number ① is stamped into the right side of the steering head pipe.



ENGINE SERIAL NUMBER

The engine serial number ① is stamped into the elevated part of the left rear section of the engine.

NOTE:

The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.

Starting Serial Number:

2RU-000101 (For Holland)

2RT-000101 (For Belgium)

3F6-105101 (For England)

(For Belgium & England)

NOTE:

Designs and specifications are subject to change without notice.



(For Holland)



PERIODIC INSPECTION AND ADJUSTMENT

INTRODUCTION

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

PERIODIC MAINTENANCE

Unit: km (mi)

Item	Remarks	Initial			Thereafter every	
		500 (300)	1,500 (1,000)	3,000 (2,000)	3,000 (2,000)	6,000 (4,000)
*Cylinder head/Exhaust pipe	Decarbonize			○		○
Spark plug	Inspect/Clean or replace as required	○	○	○	○	
Air filter	Clean/Replace as required		○	○	○	
*Carburetor	Check operation/Adjust as required		○	○	○	
*Brake system (Complete)	Check/Adjust as required — Repair as required	○	○	○	○	
*Wheels and tires	Check pressure/Wheel/Balance/Runout	○	○		○	
Fuel cock	Clean/Flush tank as required			○		○
*Autolube pump	Check/Adjust/Air bleeding	○	○	○		○
*Battery	Top-up/Check specific gravity and breather pipe	○	○	○	○	
*Ignition timing	Adjust/Clean or replace as required	○				○
Lights/Signals	Check operation/Replace as required	○		○	○	
Fittings/Fasteners	Tighten before each trip and/or.....	○			○	
Drive chain	Check chain slack/Alignment	Every 500 (300)				
Clutch	Check/Adjust	○	○		○	
Suspension system	Check/Tighten	○			○	

*It is recommended that these item be serviced by a Yamaha dealer.

LUBRICATION INTERVALS



LUBRICATION INTERVALS

Unit: km (mi)

Item	Remarks	Type (Recommended lubricants)	Initial			Thereafter every	
			500 (300)	1,500 (1,000)	3,000 (2,000)	3,000 (2,000)	6,000 (4,000)
Transmission oil	Replace/Warm engine before draining	SAE 10W/30, type "SE" motor oil	○		○	○	
Control/Meter cables	Apply lightly	SAE 10W30 motor oil		○	○	○	
Throttle grip/ Housing	Apply lightly	Lithium base grease	○		○	○	
*Steering bearings	Inspect thoroughly/ Pack moderately	Medium-weight wheel bearing grease			Check		○
*Speedometer gear housing	Inspect thoroughly/ Pack	Lithium base grease			○		○
Rear arm pivot shaft	Apply grease fully	Medium-weight wheel bearing grease			○		○
*Wheel bearings	Do not over-pack	Medium-weight wheel bearing grease			○		○
Drive chain	Clean and lube	SAE 10W/30 type "SE" motor oil	Every 500 (300)				
Brake pedal shaft	Apply lightly	Lithium base grease		○	○	○	
Stand shaft pivot	Apply lightly	Lithium base grease					○
*Point cam lubrication wick	Apply very lightly	Light-weight machine oil			○	○	

*It is recommended that these items be serviced by a Yamaha dealer.



EXPLODED DIAGRAM

CRANKSHAFT/PISTON

- | | |
|-------------------------|---------------------|
| ① Flange nut | ⑩ Woodruff key |
| ② Conical spring washer | ⑪ Piston pin clip |
| ③ Primary drive gear | ⑫ Piston ring set |
| ④ Bearing | ⑬ Piston |
| ⑤ Crank (Right) | ⑭ Piston pin |
| ⑥ Crank pin | ⑮ Small end bearing |
| ⑦ Big end bearing | ⑯ Bearing |
| ⑧ Connecting rod | ⑰ Oil seal |
| ⑨ Crank (Left) | |

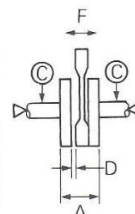
A PISTON TO CYLINDER CLEARANCE:
0.035 ~ 0.040 mm (0.0014 ~ 0.0016 in)

END GAP (INSTALLED):

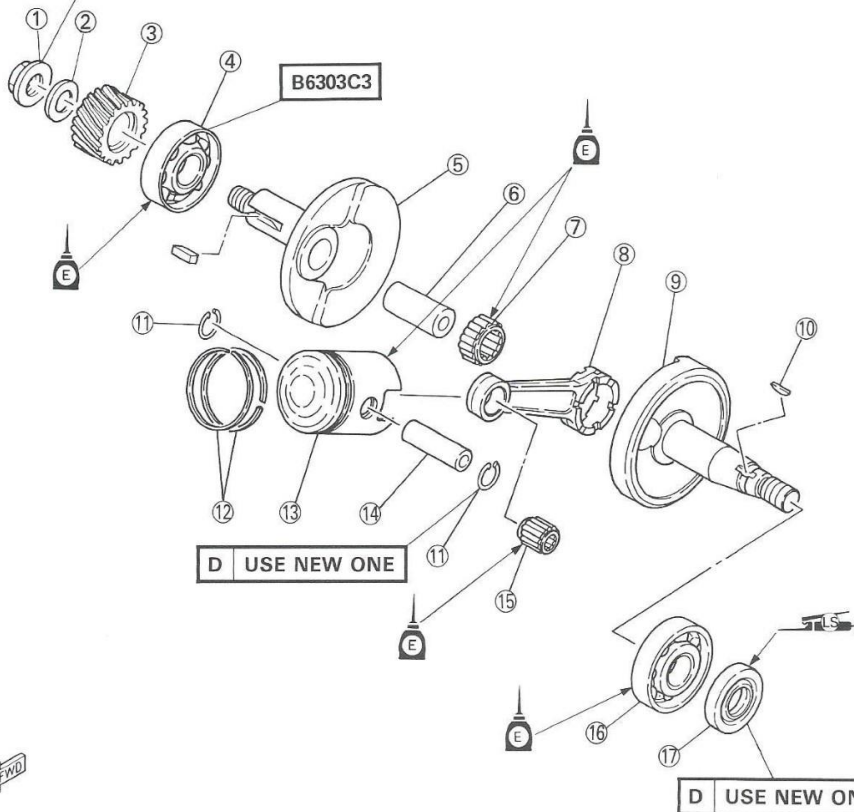
B
Top ring
0.15 ~ 0.35 mm (0.006 ~ 0.014 in)
2nd ring
0.15 ~ 0.35 mm (0.006 ~ 0.014 in)

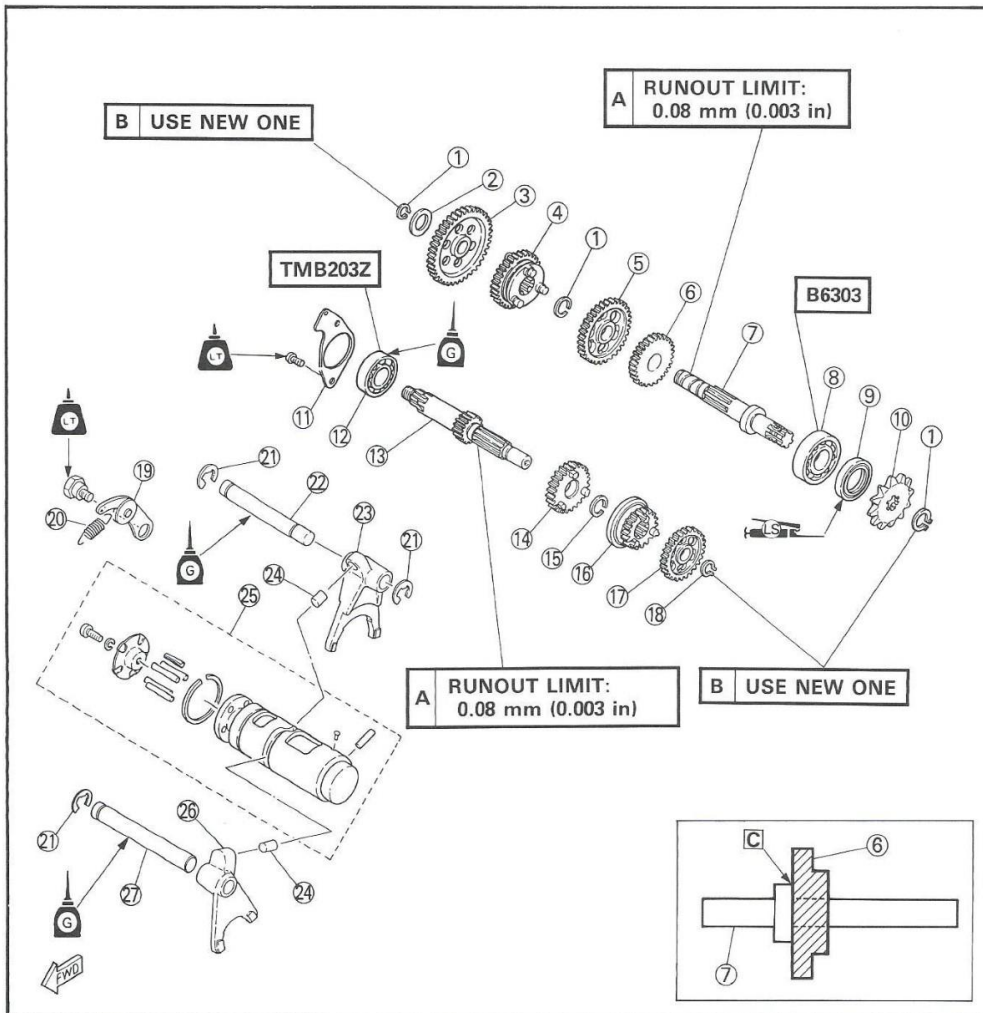
C CRANKSHAFT:

A: 37.90 ~ 37.95 mm
(1.492 ~ 1.494 in)
C: 0.03 mm (0.0012 in)
D: 0.2 ~ 0.7 mm
(0.008 ~ 0.028 in)
F: 0.8 ~ 1.0 mm
(0.03 ~ 0.04 in)



45 Nm (4.5 m•kg, 32 ft•lb)







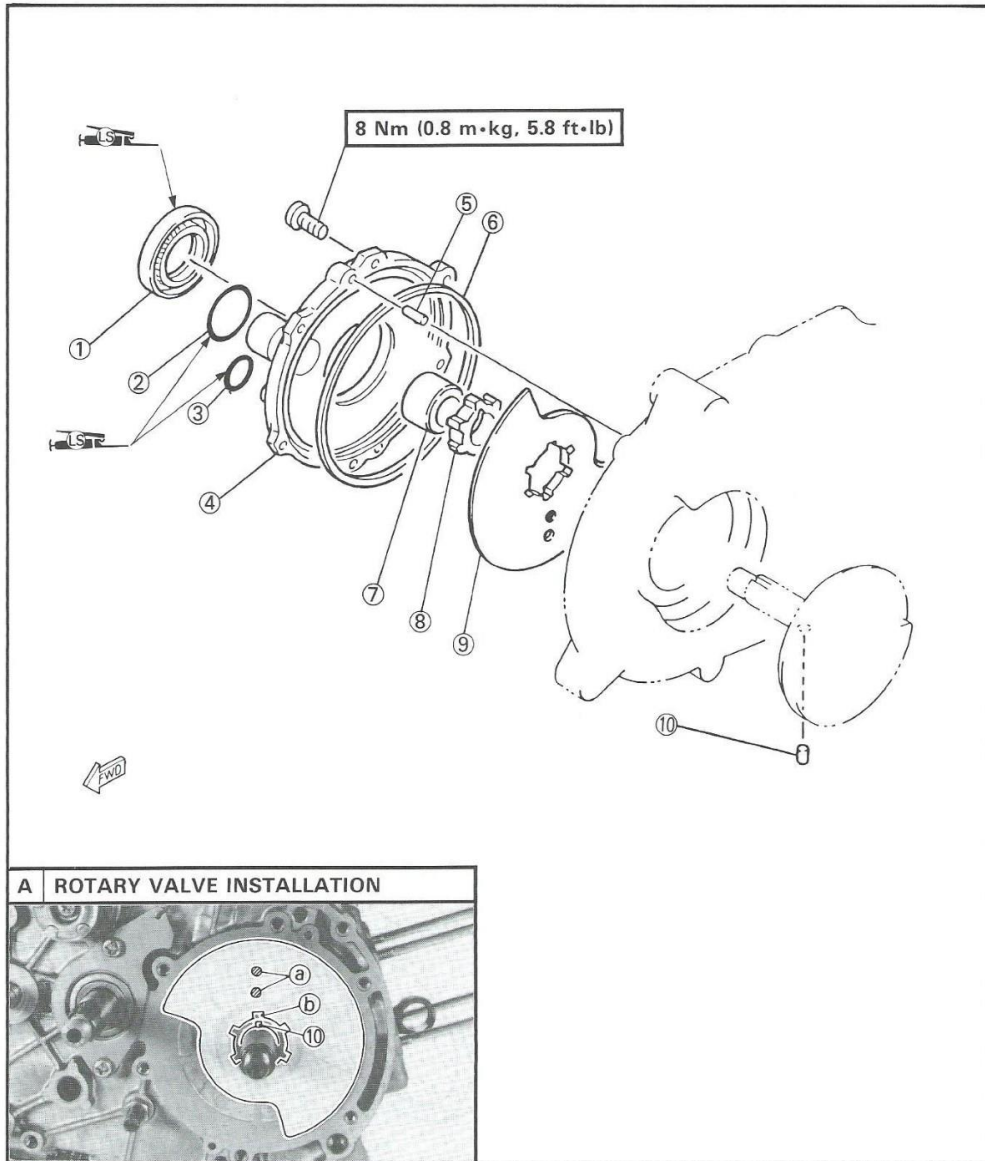
ROTARY VALVE

- ① Oil seal
- ② O-ring
- ③ O-ring
- ④ Rotary valve cover
- ⑤ Dowel pin
- ⑥ O-ring
- ⑦ Collar
- ⑧ Valve collar
- ⑨ Rotary valve
- ⑩ Pin

A

NOTE:

Insert the pin ⑩ in the crankshaft. Then install the crankshaft with the pin in line with the marking **a** and valve collar slit **b**.





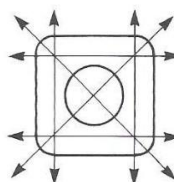
CYLINDER HEAD/CYLINDER

- ① Spark plug
- ② Cylinder head
- ③ Gasket (Cylinder head)
- ④ Cylinder
- ⑤ Gasket (Cylinder)
- ⑥ Stud bolt

A	SPARK PLUG:
B	MANUFACTURER: NGK
	TYPE:
C	BR-6HS (Holland) BR-7HS (Belgium, England)
D	PLUG GAP: 0.6 ~ 0.7 mm (0.02 ~ 0.03 in)

CYLINDER HEAD
WARPAGE LIMIT:
0.03 mm (0.0012 in)

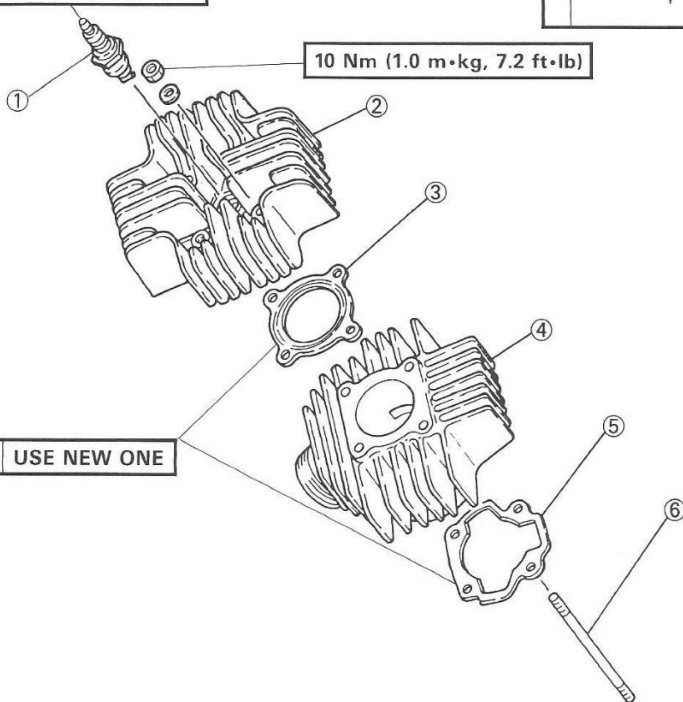
E



25 Nm (2.5 m•kg, 18 ft•lb)

10 Nm (1.0 m•kg, 7.2 ft•lb)

F USE NEW ONE



CARBURETOR

CARB

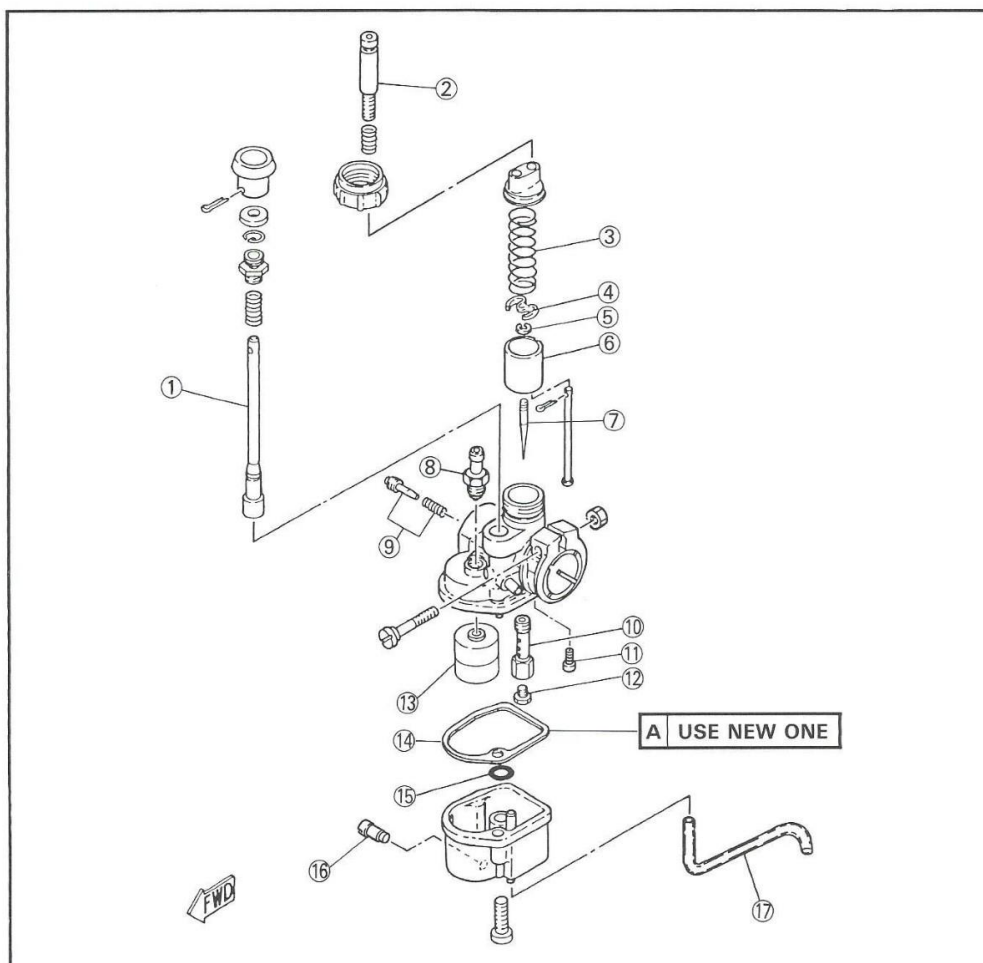


CARBURETOR

SPECIFICATIONS

- ① Starter plunger
- ② Throttle stop screw
- ③ Throttle valve spring
- ④ Spring seat
- ⑤ Clip
- ⑥ Throttle valve
- ⑦ Jet needle
- ⑧ Valve seat assembly
- ⑨ Pilot air screw
- ⑩ Needle jet
- ⑪ Pilot jet
- ⑫ Main jet
- ⑬ Float
- ⑭ Gasket
- ⑮ O-ring
- ⑯ Drain screw
- ⑰ Overflow hose

	BELGIUM AND ENGLAND	HOLLAND
MAIN JET (M.J.)	#150	#78
AIR JET (A.J.)	0.5	2.3
JET NEEDLE (J.N.)	3G9-3	3E11-4
NEEDLE JET (N.J.)	E-4	←
CUTAWAY (C.A.)	1.5	2.5
PILOT JET (P.J.)	#25	←
AIR SCREW (A.S.)	1 1/2 ~ 2	1 ~ 1 1/2
STARTER JET (G.S.)	#35	←
ENGINE IDLING SPEED	1,250 ~ 1,350 r/min	←



FRONT WHEEL

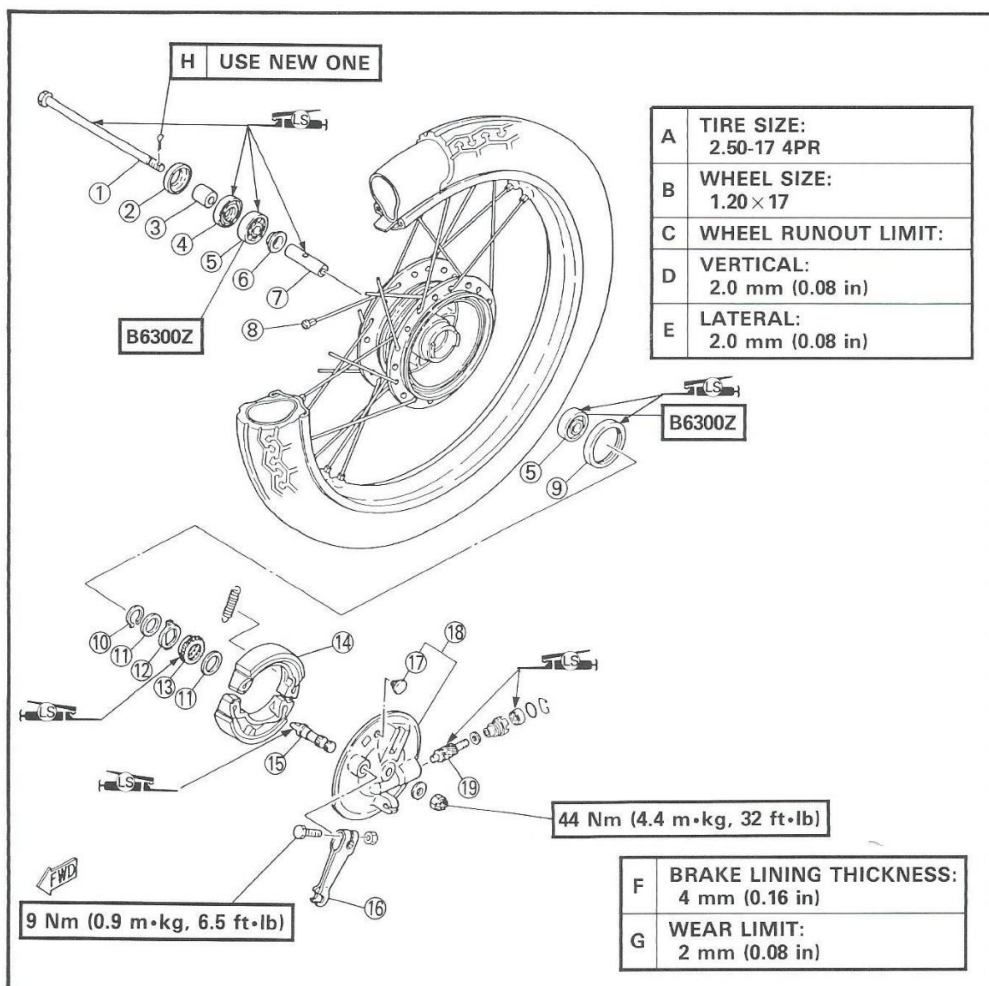


FRONT WHEEL

- | | |
|------------------|--------------------|
| ① Wheel axle | ⑪ Plain washer |
| ② Hub dust cover | ⑫ Meter clutch |
| ③ Collar | ⑬ Drive gear |
| ④ Oil seal | ⑭ Brake shoe comp |
| ⑤ Bearing | ⑮ Brake camshaft |
| ⑥ Spacer flange | ⑯ Camshaft lever |
| ⑦ Spacer | ⑰ Cap |
| ⑧ Spoke | ⑱ Brake shoe plate |
| ⑨ Oil seal | ⑲ Driven gear |
| ⑩ Circlip | |

BASIC WEIGHT: WITH OIL AND FULL FUEL TANK	81 kg (179 lb) 82 kg (181 lb) FOR ENGLAND
MAXIMUM LOAD*	241 kg (531 lb)
	COLD TIRE PRESSURE
FRONT	250 kpa (2.5 kg/cm ² , 36 psi)
REAR	250 kpa (2.5 kg/cm ² , 36 psi)

* Load is the total weight of cargo rider, passenger, and accessories.

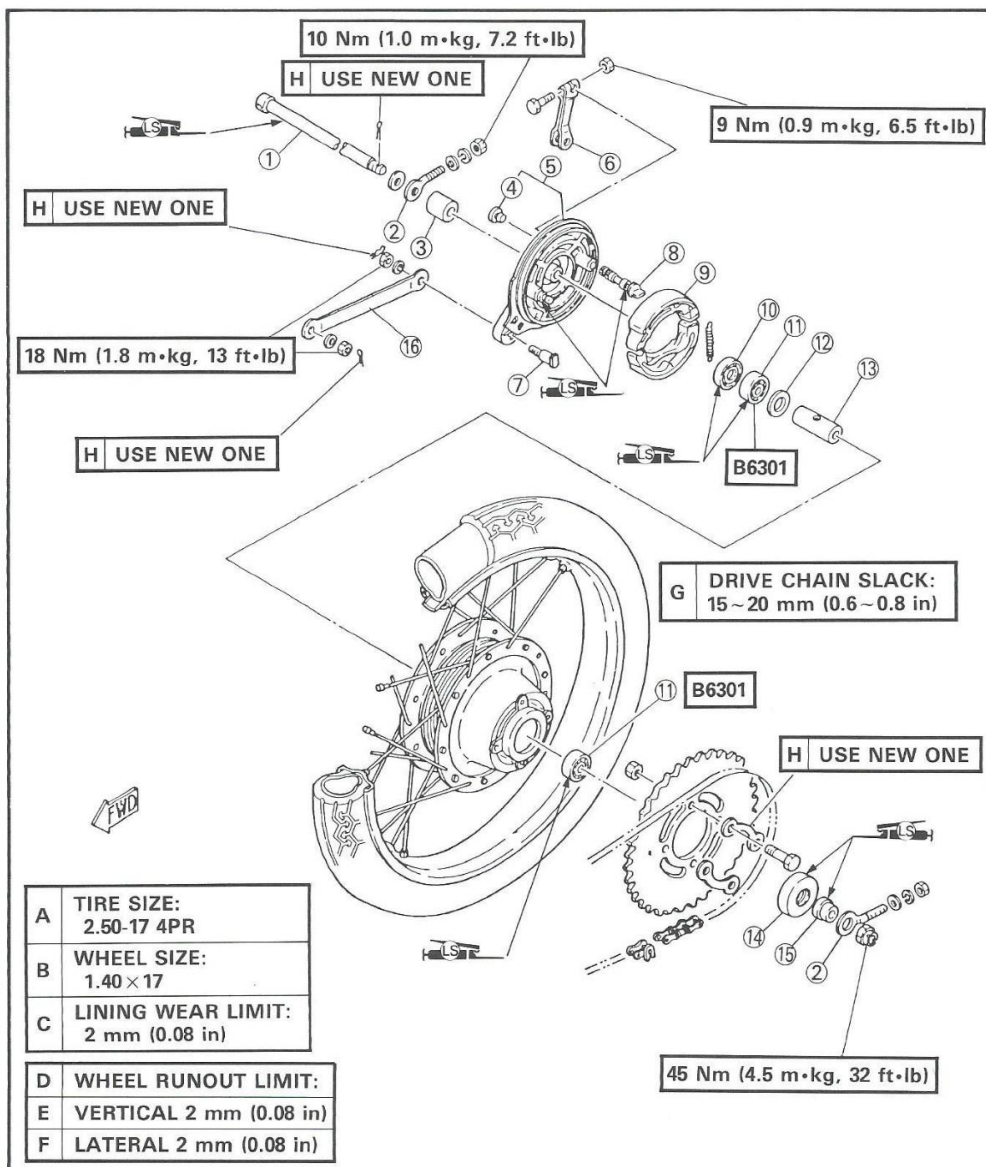


REAR WHEEL



REAR WHEEL

- | | |
|--------------------|---------------------|
| ① Wheel axle | ⑨ Brake shoe lining |
| ② Chain puller | ⑩ Oil seal |
| ③ Spacer | ⑪ Bearing |
| ④ Cap | ⑫ Plain washer |
| ⑤ Brake shoe plate | ⑬ Spacer |
| ⑥ Camshaft lever | ⑭ Oil seal |
| ⑦ Bolt | ⑮ Collar |
| ⑧ Camshaft | ⑯ Tension bar |

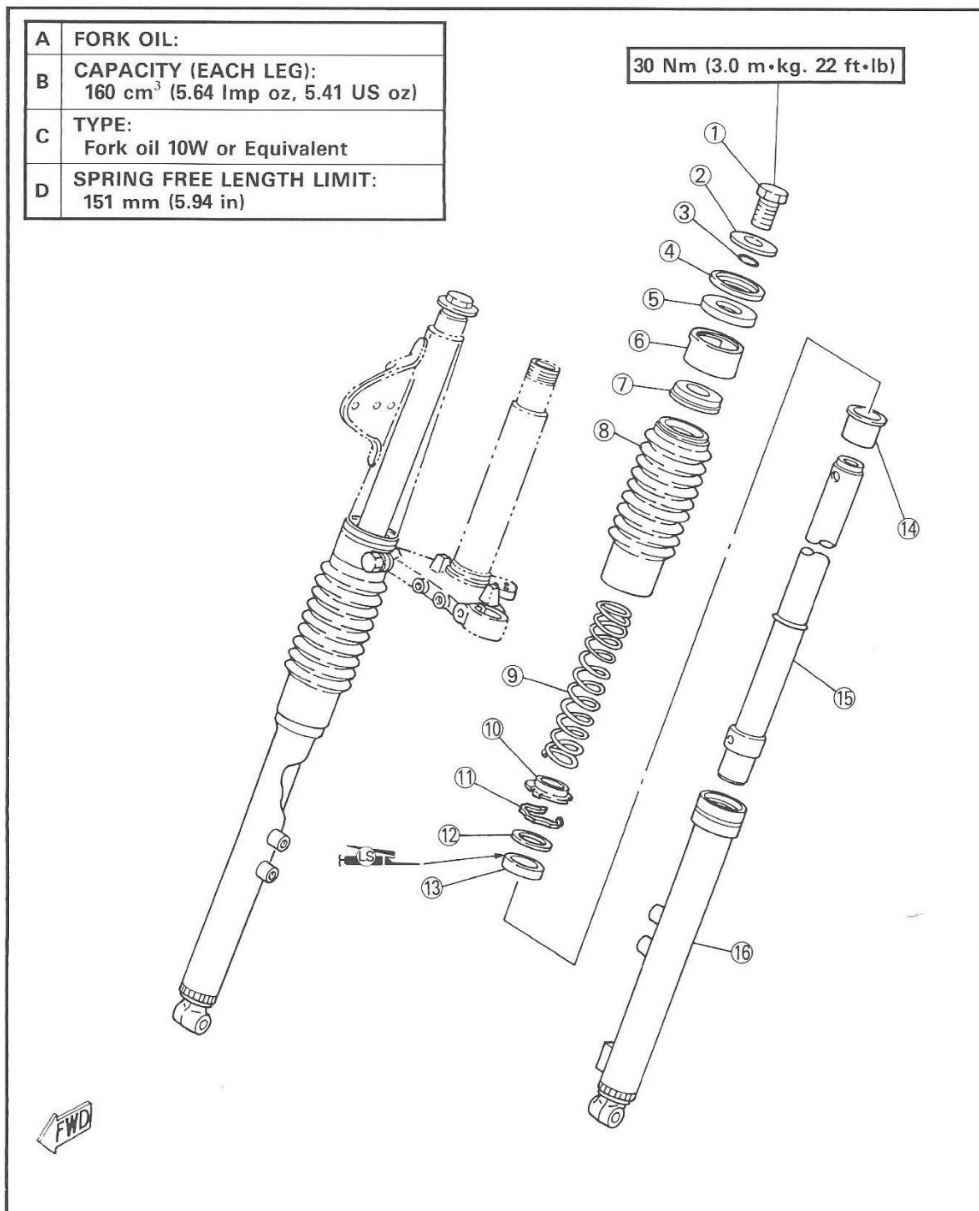


FRONT FORK



FRONT FORK

- | | | |
|----------------|-------------------|----------------|
| ① Cap bolt | ⑥ Outer cover | ⑪ Circlip |
| ② Plain washer | ⑦ Spring seat | ⑫ Plain washer |
| ③ O-ring | ⑧ Front fork boot | ⑬ Oil seal |
| ④ Guide cover | ⑨ Spring | ⑭ Slide bush |
| ⑤ Gasket | ⑩ Spring seat | ⑮ Inner tube |
| | | ⑯ Outer tube |

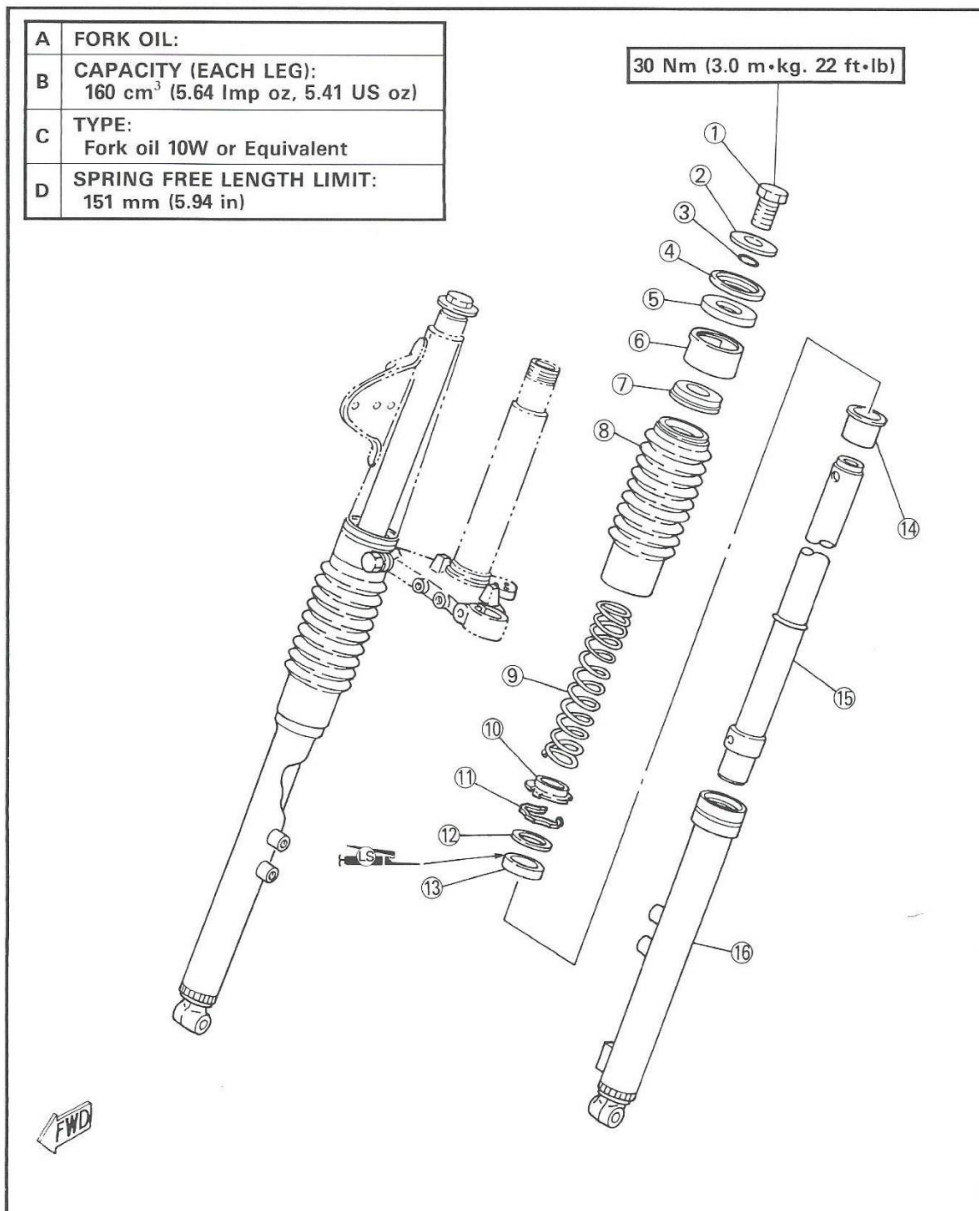


FRONT FORK



FRONT FORK

- | | | |
|----------------|-------------------|----------------|
| ① Cap bolt | ⑥ Outer cover | ⑪ Circlip |
| ② Plain washer | ⑦ Spring seat | ⑫ Plain washer |
| ③ O-ring | ⑧ Front fork boot | ⑬ Oil seal |
| ④ Guide cover | ⑨ Spring | ⑭ Slide bush |
| ⑤ Gasket | ⑩ Spring seat | ⑮ Inner tube |
| | | ⑯ Outer tube |

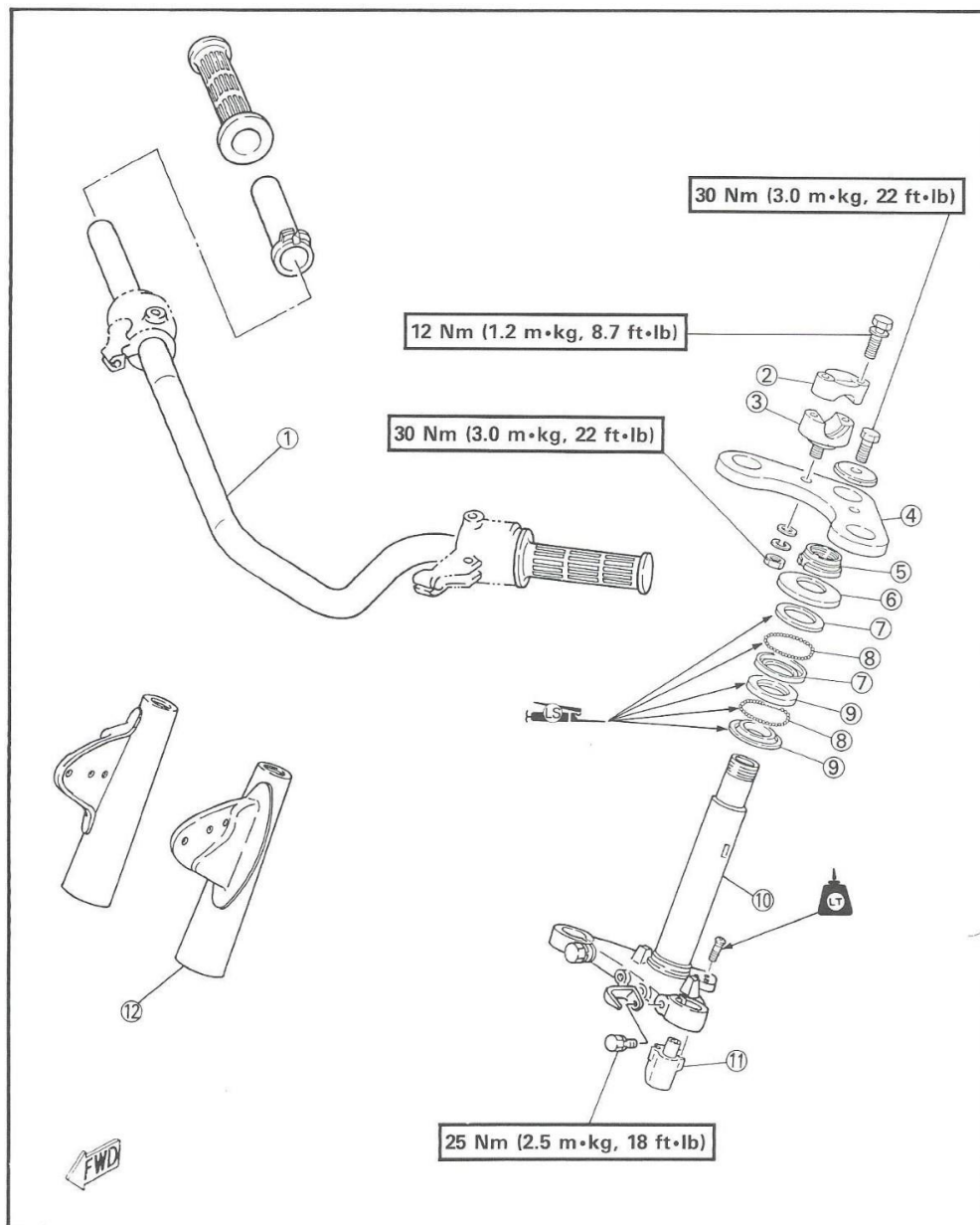


STEERING HEAD AND HANDLEBAR

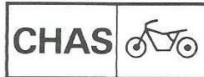


STEERING HEAD AND HANDLEBAR

- | | |
|---------------------------|------------------------|
| ① Handlebar | ⑦ Bearing race (Upper) |
| ② Handlebar upper bracket | ⑧ Ball bearing |
| ③ Handlebar lower bracket | ⑨ Bearing race (Lower) |
| ④ Handlebar crown | ⑩ Steering stem |
| ⑤ Ring nut | ⑪ Steering lock |
| ⑥ Ball race cover | ⑫ Headlight stay |

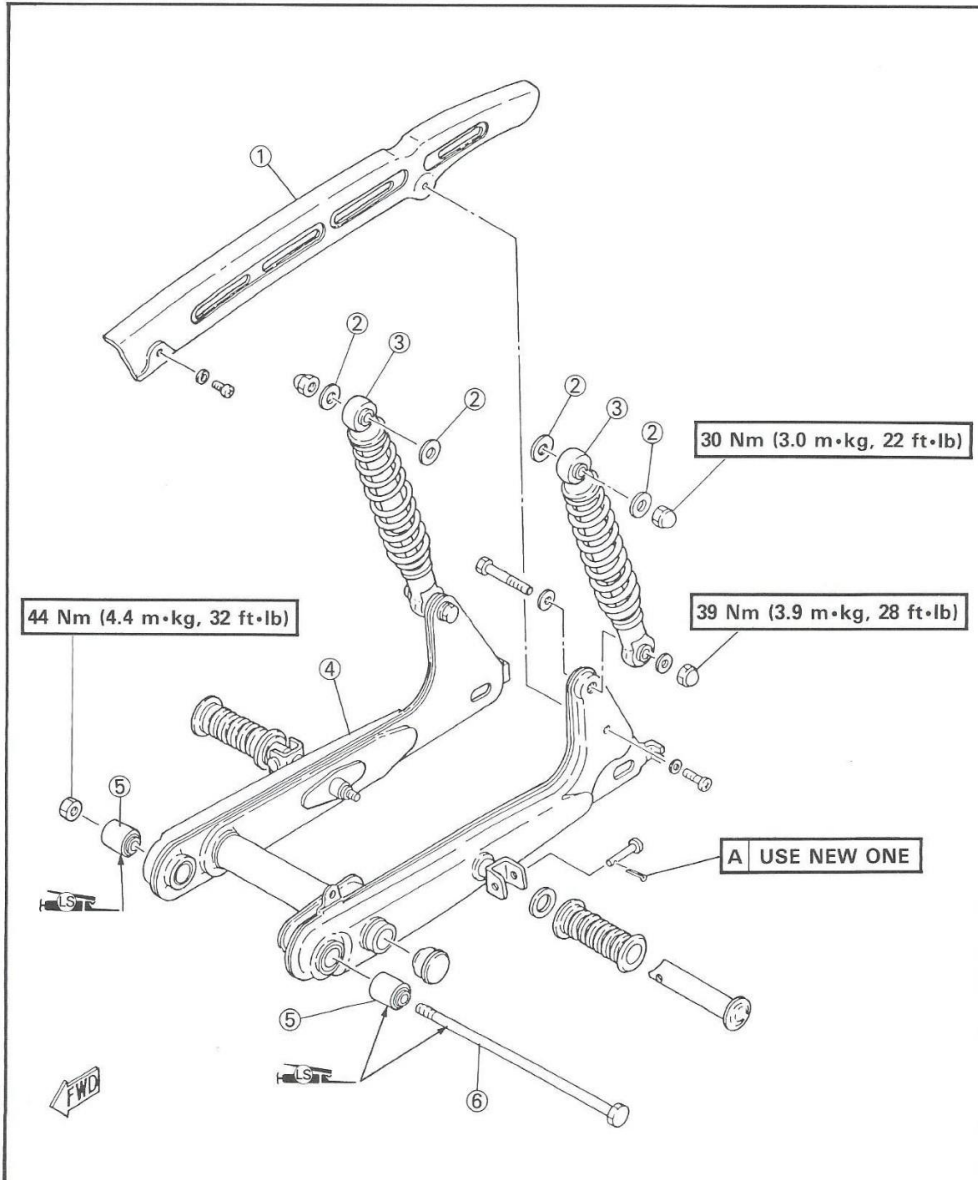


REAR SHOCK ABSORBER AND SWINGARM



REAR SHOCK ABSORBER AND SWINGARM

- ① Chain cover
- ② Thick washer
- ③ Rear shock absorber
- ④ Swingarm
- ⑤ Bush
- ⑥ Pivot shaft



ELECTRICAL COMPONENTS

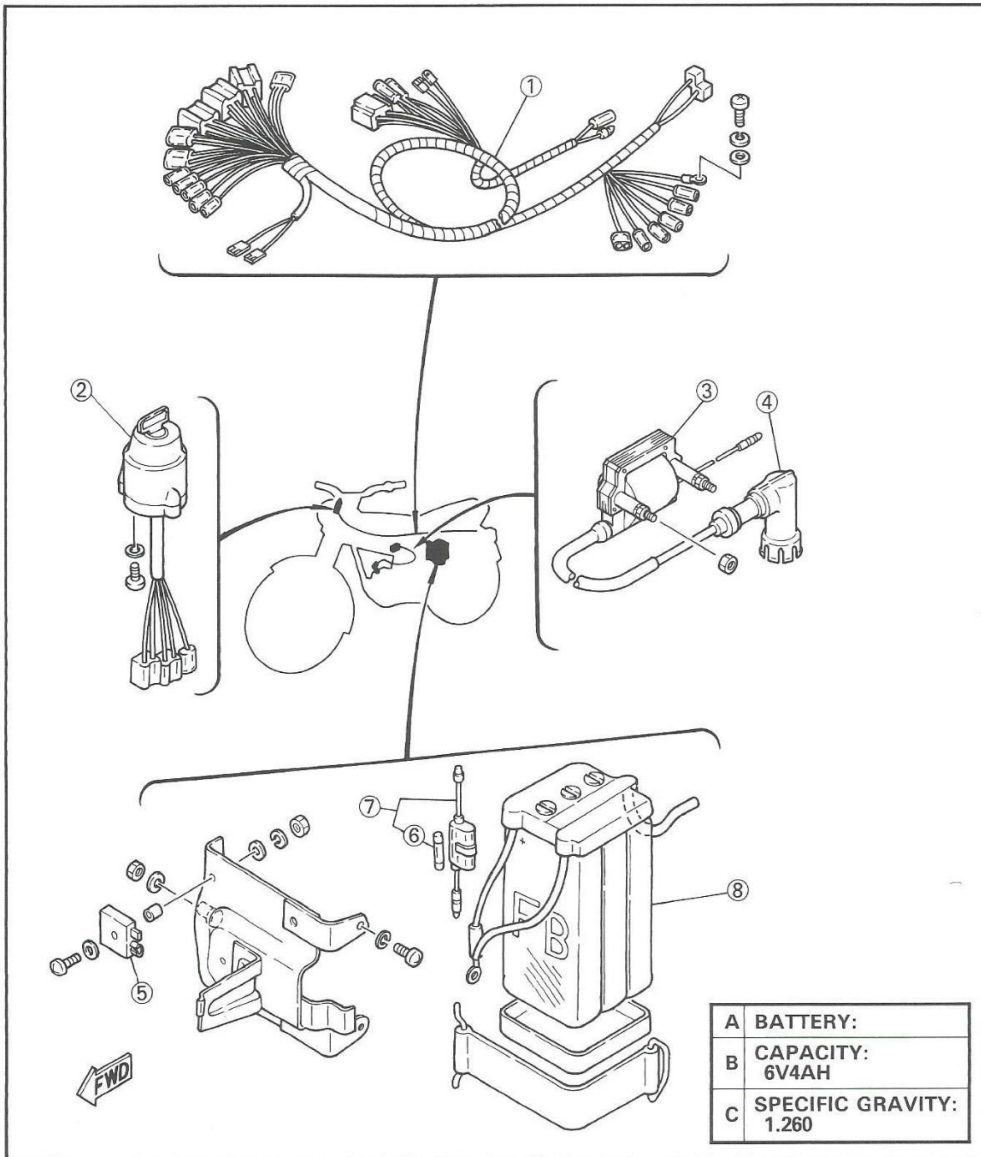
ELEC



ELECTRICAL COMPONENTS

- ① Wireharness
- ② Main switch
- ③ Ignition coil
- ④ Spark plug cap
- ⑤ Diode
- ⑥ Reserve fuse
- ⑦ Main fuse
- ⑧ Battery

SPECIFICATIONS	RESISTANCE
IGNITION COIL: PRIMARY	1.4 ~ 1.8Ω
SECONDARY	6.0 ~ 7.3kΩ
SPARK PLUG CAP:	5kΩ



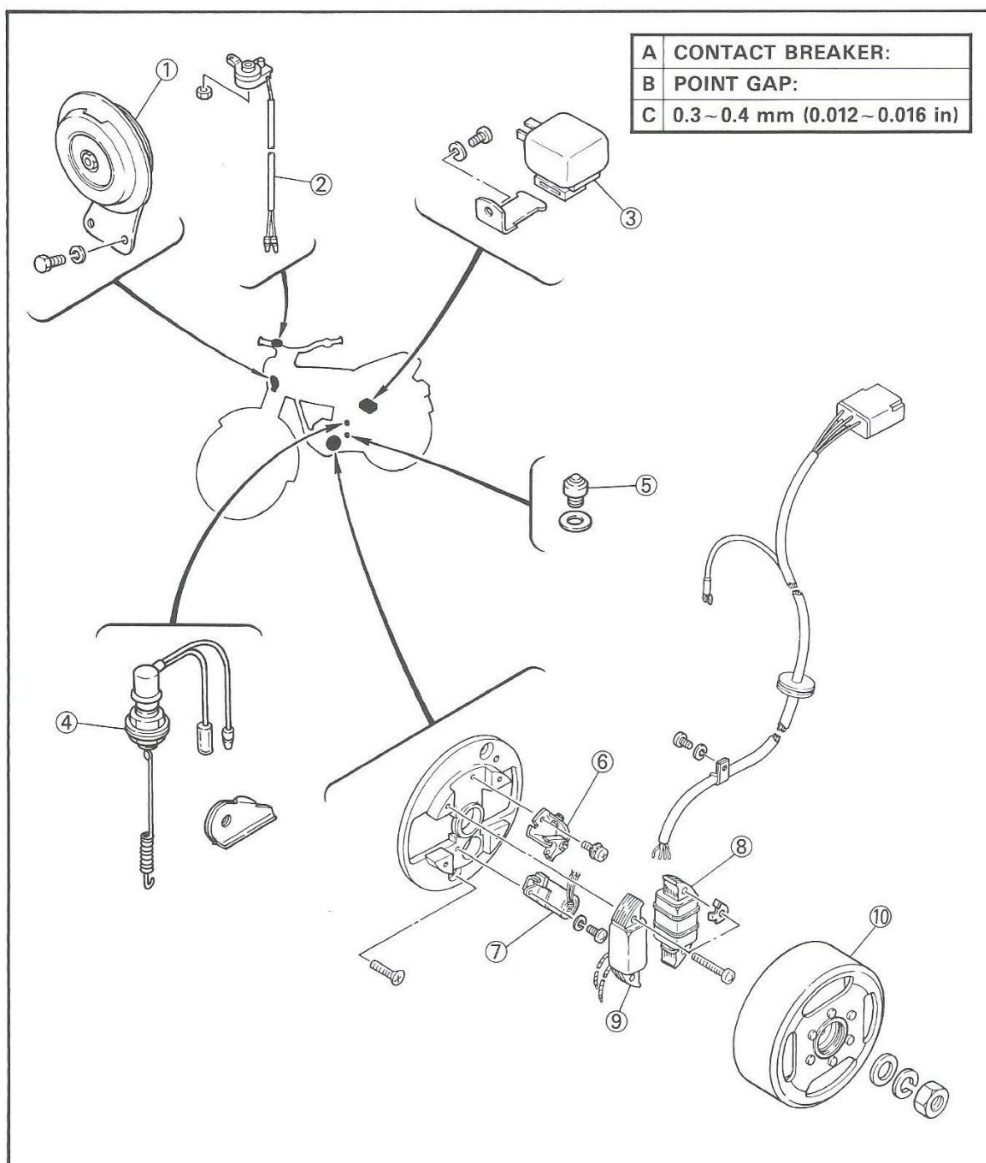
ELECTRICAL COMPONENTS

ELEC



- ① Horn (Except for Holland)
- ② Front brake switch
- ③ Flasher relay
- ④ Rear brake switch
- ⑤ Neutral switch
- ⑥ Contact breaker assembly
- ⑦ Condenser
- ⑧ Charging coil
- ⑨ Source coil
- ⑩ Rotor assembly

SPECIFICATIONS	RESISTANCE
SOURCE COIL: BLACK—BLACK/WHITE	1.4 ~ 2.0Ω
CHARGING COIL: BLACK—YELLOW BLACK—GREEN/RED	0.4 ~ 0.6Ω 0.3 ~ 0.5Ω



CABLE ROUTING

SPEC

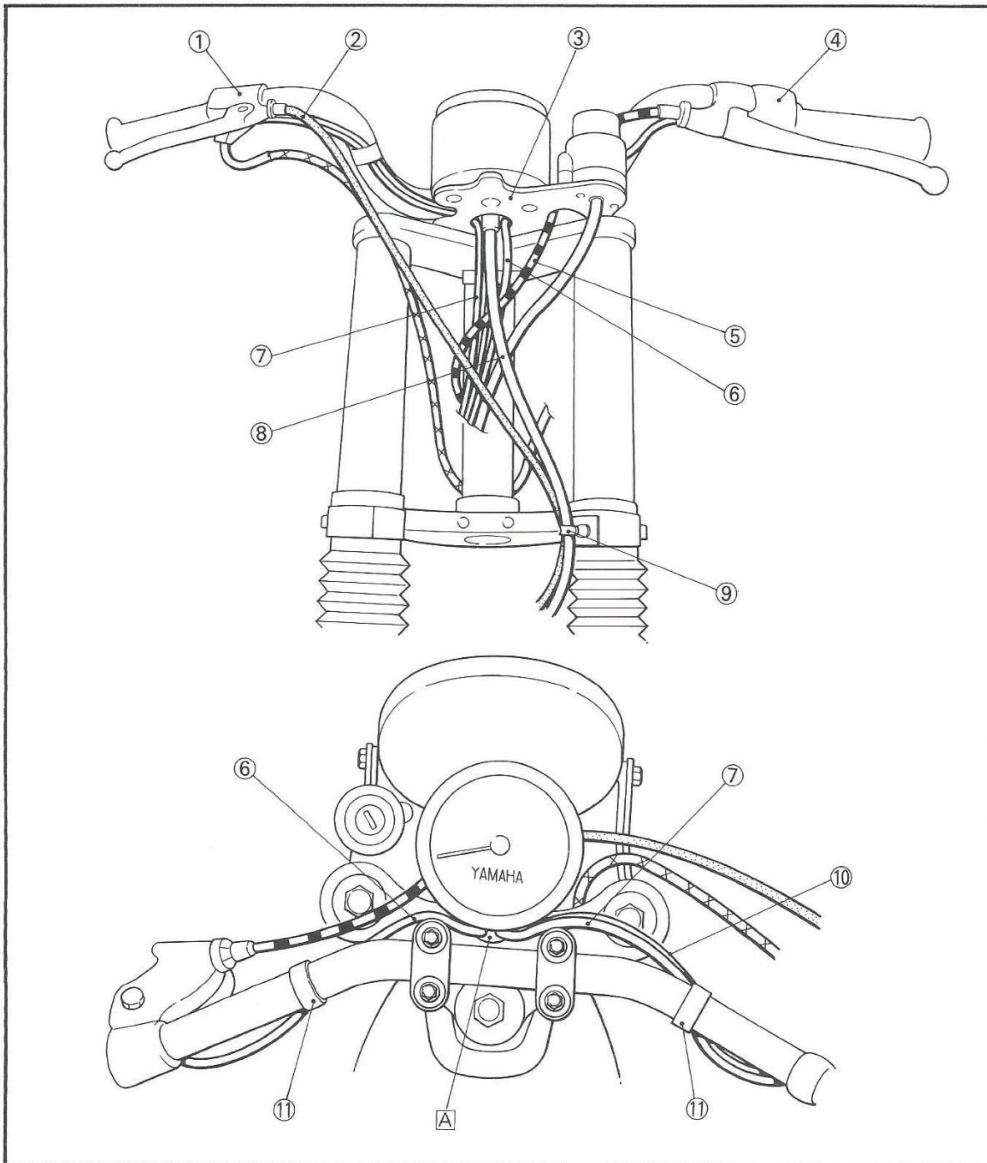


CABLE ROUTING

- ① Lever holder (Right)
- ② Brake cable
- ③ Meter bracket
- ④ Lever holder (Left)
- ⑤ Clutch cable
- ⑥ Handlebar switch (Left) lead

- ⑦ Handlebar switch (Right) lead
- ⑧ Speedometer cable
- ⑨ Clamp
- ⑩ Front brake switch lead
- ⑪ Band

Ⓐ Pass between meter bracket and handlebar.



CABLE ROUTING

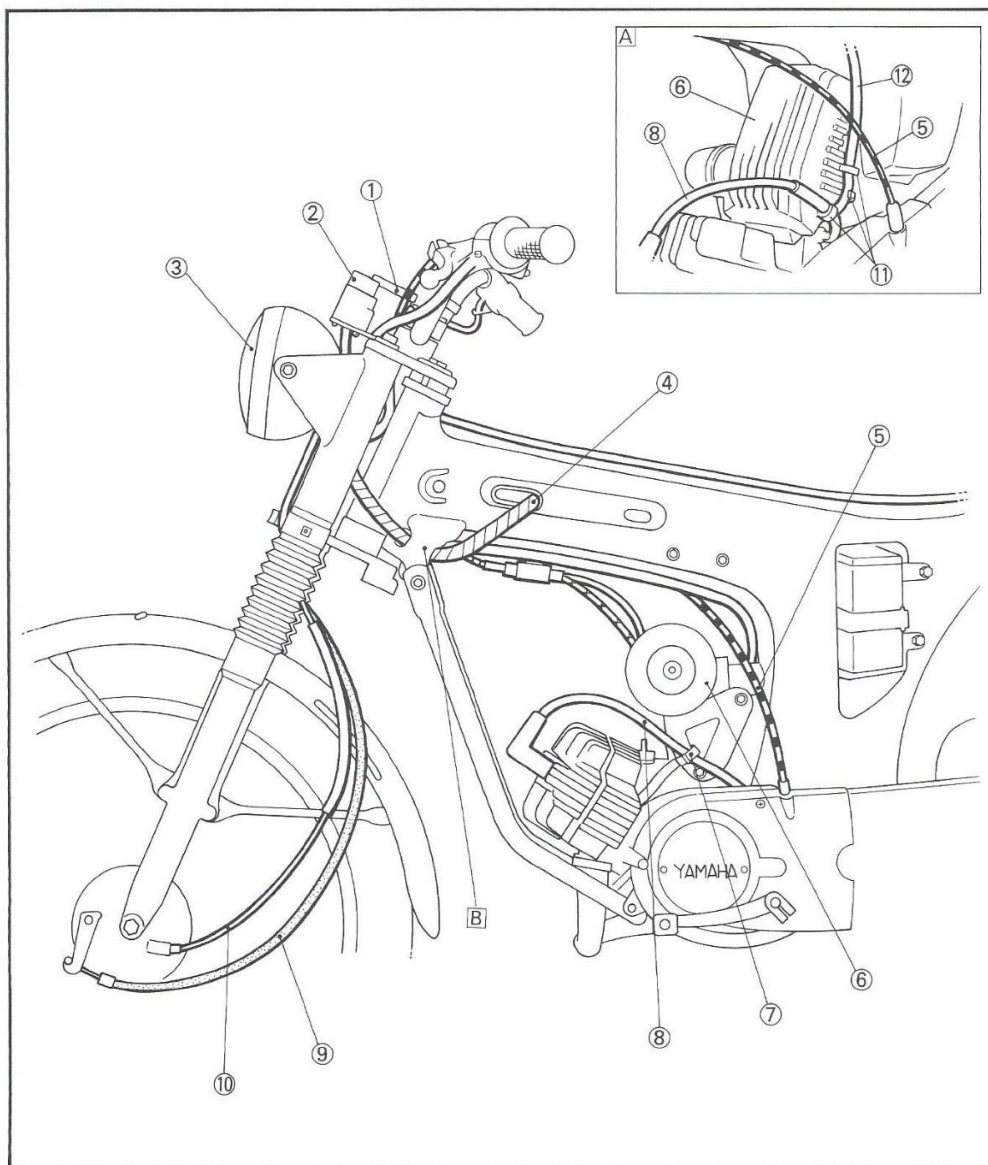
SPEC



- ① Speedometer assembly
- ② Main switch
- ③ Headlight unit assembly
- ④ Wireharness
- ⑤ Clutch cable
- ⑥ Air cleaner case

- ⑦ Band
- ⑧ Spark plug lead
- ⑨ Brake cable
- ⑩ Speedometer cable
- ⑪ Clamp
- ⑫ Fuel hose

- A For Belgium and England
- B Pass through downtube stay



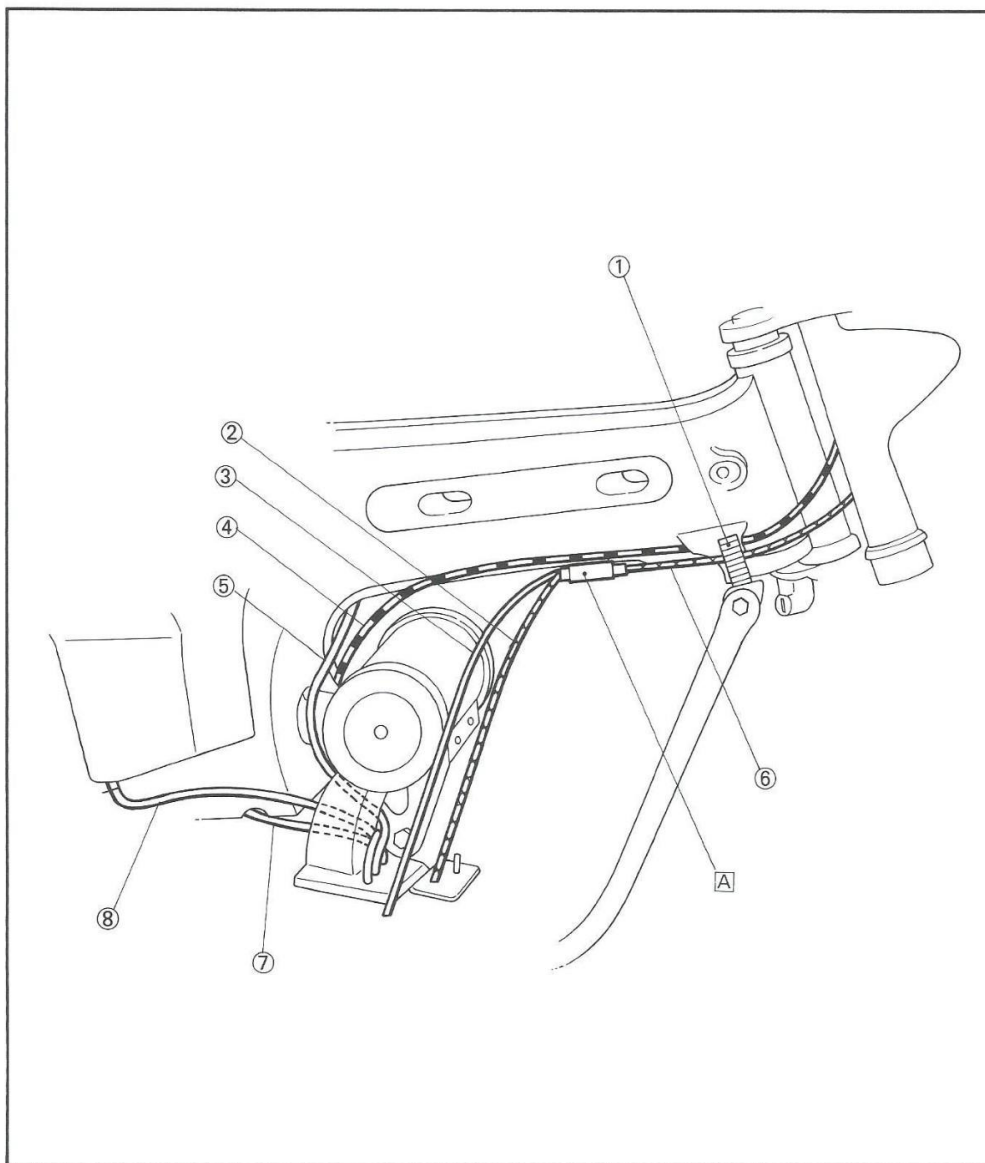
CABLE ROUTING

SPEC



- ① Band
- ② Throttle cable 2
- ③ Oil pump cable
- ④ Clutch cable
- ⑤ Fuel hose
- ⑥ Throttle cable 1
- ⑦ Vacuum hose (Carburetor)
- ⑧ Oil hose

[A] Fit wire cylinder on to frame tab.



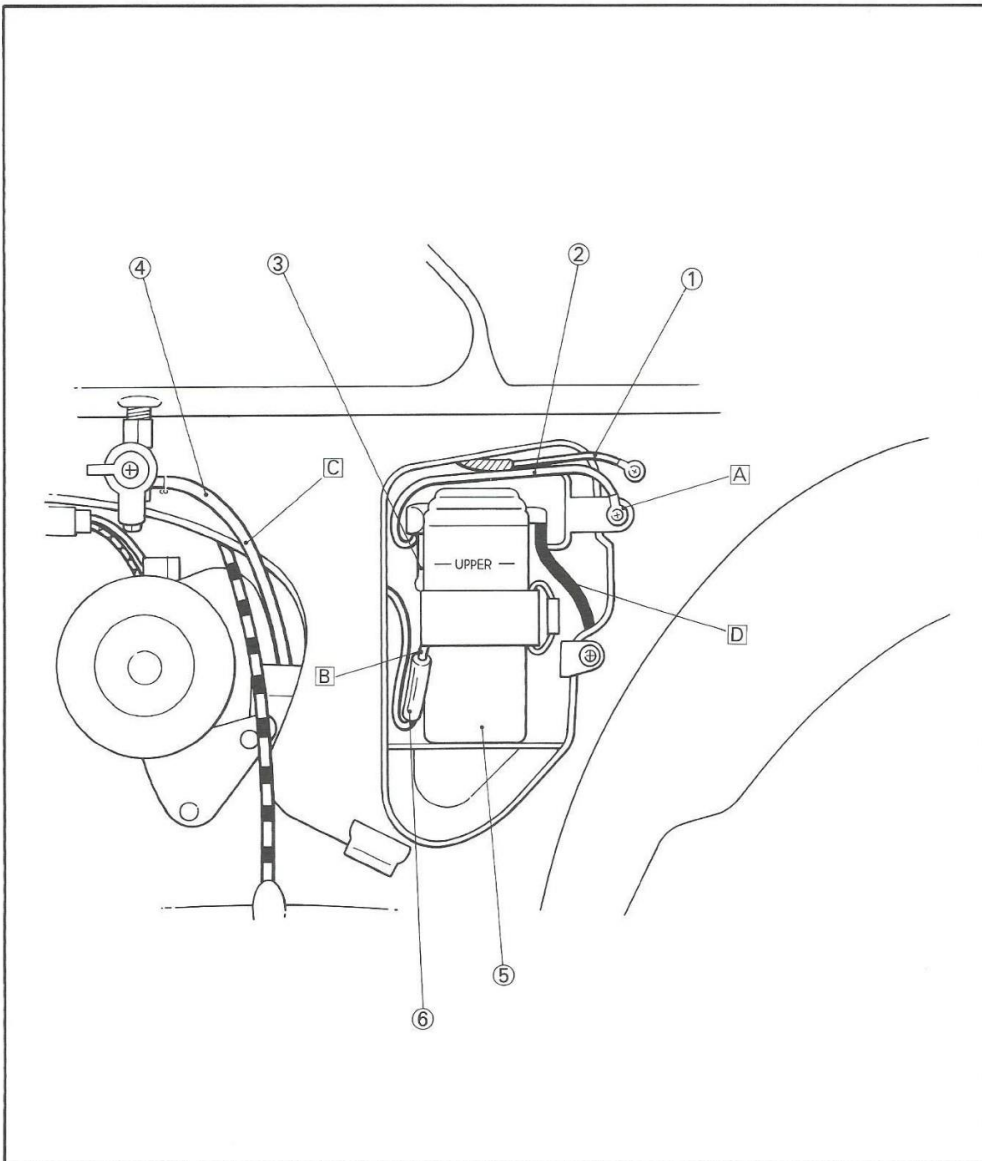
CABLE ROUTING

SPEC



- ① Negative lead (Wireharness)
- ② Negative lead (Battery)
- ③ Positive lead (Battery)
- ④ Fuel hose
- ⑤ Battery
- ⑥ Fuse holder

- A Install terminal (Negative) over battery.
- B Secure battery lead (Positive) underneath battery band.
- C Pass fuel hose back of clutch cable.
- D Pass battery breather hose through frame and between frame-cross-tube and rear-arm-cross-member.



GENERAL SPECIFICATIONS

SPEC



SPECIFICATIONS

GENERAL SPECIFICATIONS

(H): For Holland (B): For Belgium

(E): For England

Model	FS-1
Model Code Number:	2RU (H), 2RT (B), 2RV (E)
Frame Serial Number:	2RU-000101 (H)
Engine Serial Number:	2RT-000101 (B) 3F6-105101 (E)
Dimensions:	
Overall Length	1,770 mm (69.7 in) (H)(B), 1,825 mm (71.9 in) (E)
Overall Width	750 mm (29.5 in)
Overall Height	1,015 mm (40.0 in)
Seat Height	780 mm (30.7 in)
Wheelbase	1,160 mm (45.7 in)
Minimum Ground Clearance	145 mm (5.7 in)
Basic Weight:	
With Oil and Full Fuel Tank	81 kg (179 lb) (H)(B), 82 kg (181 lb) (E)
Minimum Turning Radius:	1,900 mm (74.8 in)
Engine:	
Engine Type	Air cooled 2-stroke
Induction System	Rotary valve
Cylinder Arrangement	Forward inclined single cylinder
Displacement	49 cm ³
Bore × Stroke	40.0 × 39.7 mm (1.57 × 1.56 in)
Compression Ratio	5.8 : 1
Starting System	Kick starter
Lubrication System:	
Type	Separate lubrication (Yamaha Autolube)
Engine Oil Type	Yamaha oil 2T or equivalent
Transmission Oil Type	Air cooled 2-stroke engine oil SAE 10W30 type SE motor oil
Oil Capacity:	
Engine Oil (Oil Tank)	1.4 L (1.2 Imp qt, 1.5 US qt)
Transmission Oil:	
Periodic Oil Change	0.60 L (0.53 Imp qt, 0.63 US qt)
Total Amount	0.65 L (0.57 Imp qt, 0.69 US qt)
Air Filter:	
Type	Wet element (H), Dry element (B)(E)

GENERAL SPECIFICATIONS

SPEC



Model	FS-1	
Fuel: Type Fuel Tank Capacity: Full Amount Reserve Amount	Regular gasoline 9.0 L (2.0 Imp gal, 2.4 US gal) 0.4 L (0.09 Imp gal, 0.1 US gal)	
Carburetor: Type/Quantity Manufacturer	VM10SC/1 (H), VM16SC/1 (B)(E) MIKUNI	
Spark Plug: Type/Quantity Manufacturer Plug Gap	BR-6HS (H), BR-7HS (B)(E) NGK 0.6~0.7 mm (0.02~0.03 in)	
Clutch: Type	Wet, multiple disc	
Transmission: Type Primary Reduction System Primary Reduction Ratio Secondary Reduction System Secondary Reduction Ratio Operation Gear Ratio: 1st 2nd 3rd 4th	Constant mesh 4-speed Helical gear 74/19 (3.895) Chain drive 45/12 (3.750) (H), 39/12 (3.250) (B), 39/13 (3.000) (E) Left foot operation 40/13 (3.077) 34/18 (1.889) 30/23 (1.304) 27/26 (1.038)	
Chassis: Frame Type Caster Angle Trail	Pressed backbone 26.5° 80 mm (3.1 in)	
Tire: Type Size: Front Rear	With tube 2.50-17 4PR 2.50-17 4PR	
Tire Pressure:	Front	Rear
	250 kPa (2.5 kg/cm ² , 36 psi)	250 kPa (2.5 kg/cm ² , 36 psi)

GENERAL SPECIFICATIONS

SPEC



Model	FS-1
Brake: Front Brake Type Front Brake Operation Rear Brake Type Rear Brake Operation	Drum brake Right hand operation Drum brake Right foot operation
Suspension: Front Suspension Type Rear Suspension Type	Telescopic fork Swingarm
Shock Absorber: Front Shock Absorber Rear Shock Absorber	Coil spring/Oil damper Coil spring/Oil damper
Wheel Travel: Front Wheel Travel Rear Wheel Travel	85 mm (3.3 in) 67 mm (2.6 in)
Electrical: Ignition System Generator System	Flywheel magneto Flywheel magneto
Battery: Type Capacity	6N4A-4D 6V4AH
Headlight: Type	Bulb
Bulb Wattage (Quantity): Headlight Tail/Brake Light Flasher Light Meter Light "NEUTRAL" Indicator Light "HIGH BEAM" Indicator Light (England only) "TURN" Indicator Light (England only)	6V 15W/15W (H)(B), 6V 18W/18W (E) (1 pc.) 6V 2W/5W (H), 6V 5.3W/17W (B) 6V 5W/21W (E) (1 pc.) 6V 10W (H)(B), 6V 21W (E) (4 pcs.) 6V 3W (1 pc.) 6V 3W (1 pc.) 6V 3W (1 pc.) 6V 3W (1 pc.)

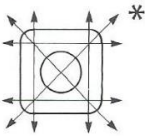
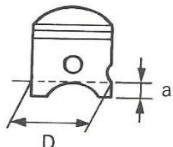
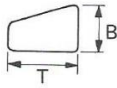
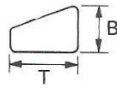
MAINTENANCE SPECIFICATIONS

SPEC



MAINTENANCE SPECIFICATIONS

ENGINE

Model		FS-1
Cylinder Head: Warpage Limit 		0.03 mm (0.0012 in) *Lines indicate straightedge measurement.
Cylinder: Bore Size Taper Limit Out of Round Limit		40.00 ~ 40.02 mm (1.575 ~ 1.576 in) 0.05 mm (0.002 in) 0.01 mm (0.0004 in)
Piston: Piston Size "D" Measuring Point "a" 		39.96 ~ 39.98 mm (1.573 ~ 1.574 in) 10 mm (0.4 in)
Piston Off-Set Piston-to-Cylinder Clearance < Limit > Over Size 1st Over Size 2nd		0.2 mm (0.008 in) 0.035 ~ 0.040 mm (0.0014 ~ 0.0016 in) < 0.1 mm (0.004 in) > 40.25 mm (1.58 in) 40.50 mm (1.59 in)
Piston Ring: Sectional Sketch <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> Top Ring  </div> <div> 2nd Ring  </div> </div>		Keystone type B = 1.5 mm (0.06 in) T = 1.8 mm (0.07 in) Keystone type B = 1.5 mm (0.06 in) T = 1.8 mm (0.07 in)
End Gap (Installed) <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> Top Ring 2nd Ring </div> <div> 0.15 ~ 0.35 mm (0.006 ~ 0.014 in) 0.15 ~ 0.35 mm (0.006 ~ 0.014 in) </div> </div>		
Side Clearance <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> Top Ring 2nd Ring </div> <div> 0.03 ~ 0.08 mm (0.001 ~ 0.003 in) 0.03 ~ 0.08 mm (0.001 ~ 0.003 in) </div> </div>		

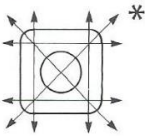
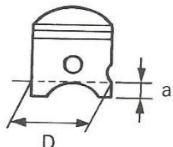
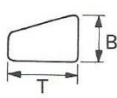
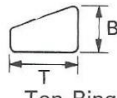
MAINTENANCE SPECIFICATIONS

SPEC



MAINTENANCE SPECIFICATIONS

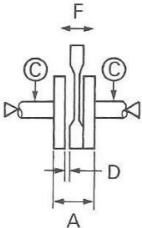
ENGINE

Model		FS-1
Cylinder Head: Warpage Limit		0.03 mm (0.0012 in) *Lines indicate straightedge measurement.
Cylinder: Bore Size Taper Limit Out of Round Limit		40.00 ~ 40.02 mm (1.575 ~ 1.576 in) 0.05 mm (0.002 in) 0.01 mm (0.0004 in)
Piston: Piston Size "D" Measuring Point "a"		39.96 ~ 39.98 mm (1.573 ~ 1.574 in) 10 mm (0.4 in)
Piston Off-Set Piston-to-Cylinder Clearance < Limit > Over Size 1st Over Size 2nd		0.2 mm (0.008 in) 0.035 ~ 0.040 mm (0.0014 ~ 0.0016 in) < 0.1 mm (0.004 in) > 40.25 mm (1.58 in) 40.50 mm (1.59 in)
Piston Ring: Sectional Sketch	<p>Top Ring</p>  <p>2nd Ring</p> 	<p>Keystone type B = 1.5 mm (0.06 in) T = 1.8 mm (0.07 in)</p> <p>Keystone type B = 1.5 mm (0.06 in) T = 1.8 mm (0.07 in)</p>
End Gap (Installed)	<p>Top Ring</p> <p>2nd Ring</p>	<p>0.15 ~ 0.35 mm (0.006 ~ 0.014 in)</p> <p>0.15 ~ 0.35 mm (0.006 ~ 0.014 in)</p>
Side Clearance	<p>Top Ring</p> <p>2nd Ring</p>	<p>0.03 ~ 0.08 mm (0.001 ~ 0.003 in)</p> <p>0.03 ~ 0.08 mm (0.001 ~ 0.003 in)</p>

MAINTENANCE SPECIFICATIONS

SPEC



Model	FS-1
<p>Crankshaft:</p> <p>Crank Width "A"</p> <p>Runout Limit "C"</p> <p>Big End Side Clearance "D"</p> <p>Small End Free Play "F"</p> 	<p>37.90~37.95 mm (1.492~1.494 in)</p> <p>0.03 mm (0.0012 in)</p> <p>0.2~0.7 mm (0.008~0.028 in)</p> <p>0.8~1.0 mm (0.03~0.04 in)</p>
<p>Clutch:</p> <p>Friction Plate:</p> <p>Thickness</p> <p>Quantity</p> <p>Wear Limit</p> <p>Clutch Plate:</p> <p>Thickness</p> <p>Quantity</p> <p>Warping Limit</p> <p>Clutch Spring:</p> <p>Free Length</p> <p>Quantity</p> <p>Minimum Free Length</p> <p>Clutch Release Method</p>	<p>3.5 mm (0.14 in)</p> <p>2 pcs.</p> <p>3.2 mm (0.13 in)</p> <p>1.6 mm (0.06 in)</p> <p>1 pcs.</p> <p>0.05 mm (0.002 in)</p> <p>34.0 mm (1.34 in)</p> <p>4 pcs.</p> <p>31.0 mm (1.22 in)</p> <p>Inner push, Screw push</p>
<p>Transmission:</p> <p>Main Axle Runout Limit</p> <p>Drive Axle Runout Limit</p>	<p>0.08 mm (0.003 in)</p> <p>0.08 mm (0.003 in)</p>
<p>Shifter:</p> <p>Type</p> <p>Guide Bar Bending Limit</p>	<p>Guide bar</p> <p>0.03 mm (0.001 in)</p>
<p>Kick Starter:</p> <p>Type</p>	<p>Kick & mesh type</p>
<p>Air Filter:</p> <p>Oil Grade (Holland only)</p>	<p>SAE 10W30 motor oil</p>

MAINTENANCE SPECIFICATIONS

SPEC






Model	FS-1	
	Holland	Belgium, England
Carburetor:	2RU 00	3F6 00
I.D. Mark		
Main Jet (M.J.)	# 78	# 150
Air Jet (A.J.)	φ2.3	φ0.5
Jet Needle-Position (J.N.)	3E11-4	3G9-3
Needle Jet (N.J.)	E-4	←
Cutaway (C.A.)	2.5	1.5
Pilot Outlet (P.O.)	φ0.9	←
Pilot Jet (P.J.)	# 25	←
Air Screw (A.S.)	1 ~ 1 1/2	1 1/2 ~ 2
Valve Seat Size (V.S.)	φ1.2	←
Starter Jet (G.S.)	# 35	←
Idling Speed	1,250 ~ 1,350 r/min	←
Rotaly Valve:		
Valve Thickness	3.0 mm (0.12 in)	
Disc Outside Diameter	100.0 mm (4 in)	
Lubrication System:		
Autolube Pump:		
Color Code	Dark blue	
Minimum Stroke	0.20 ~ 0.25 mm (0.008 ~ 0.010 in)	
Maximum Stroke	1.45 ~ 1.70 mm (0.057 ~ 0.067 in)	
Pulley Adjusting Mark	Auto adjuster	

MAINTENANCE SPECIFICATIONS

SPEC



Tightening Torque:						
Part to be tightened	Q'ty	Thread size	Tightening torque			Remarks
			Nm	m•kg	ft•lb	
Cylinder head nut	4	M6	10	1.0	7.2	
Spark plug	1	M14	25	2.5	18	
Cylinder stud bolt	4	M6	10	1.0	7.2	
Crankcase cover (Right-Front) screw	4	M6	8	0.8	5.8	
Autolube pump screw	2	M5	8	0.8	5.8	
Kick crank bolt	1	M6	12	1.2	2.6	
Crankcase cover (Right) screw	7	M6	8	0.8	5.8	
Primary drive gear nut	1	M12	45	4.5	32	
Clutch spring holding screw	4	M5	6	0.6	4.3	
Clutch housing nut	1	M12	45	4.5	32	
Crankcase cover (Left)	5	M6	8	0.8	5.8	
Shift pedal bolt	1	M6	10	1.0	7.2	
Flywheel magneto nut	1	M12	45	4.5	32	
Stator assembly screw	2	M5	7	0.7	5.1	
Rotary valve cover screw	6	M6	8	0.8	5.8	
Bearing stopper plate screw	2	M6	8	0.8	5.8	 
Securing bolt (Stopper lever)	1	M6	14	1.4	10	
Crankcase screw	11	M6	8	0.8	5.8	
Neutral switch	1	M12	20	2.0	14	
Drain bolt	1	M12	20	2.0	14	
Exhaust pipe ring nut	1	M42	45	4.5	32	

MAINTENANCE SPECIFICATIONS

SPEC



Tightening Torque:

Part to be tightened	Q'ty	Thread size	Tightening torque			Remarks
			Nm	m•kg	ft•lb	
Cylinder head nut	4	M6	10	1.0	7.2	
Spark plug	1	M14	25	2.5	18	
Cylinder stud bolt	4	M6	10	1.0	7.2	
Crankcase cover (Right-Front) screw	4	M6	8	0.8	5.8	
Autolube pump screw	2	M5	8	0.8	5.8	
Kick crank bolt	1	M6	12	1.2	2.6	
Crankcase cover (Right) screw	7	M6	8	0.8	5.8	
Primary drive gear nut	1	M12	45	4.5	32	
Clutch spring holding screw	4	M5	6	0.6	4.3	
Clutch housing nut	1	M12	45	4.5	32	
Crankcase cover (Left)	5	M6	8	0.8	5.8	
Shift pedal bolt	1	M6	10	1.0	7.2	
Flywheel magneto nut	1	M12	45	4.5	32	
Stator assembly screw	2	M5	7	0.7	5.1	
Rotary valve cover screw	6	M6	8	0.8	5.8	
Bearing stopper plate screw	2	M6	8	0.8	5.8	
Securing bolt (Stopper lever)	1	M6	14	1.4	10	
Crankcase screw	11	M6	8	0.8	5.8	
Neutral switch	1	M12	20	2.0	14	
Drain bolt	1	M12	20	2.0	14	
Exhaust pipe ring nut	1	M42	45	4.5	32	

MAINTENANCE SPECIFICATIONS

SPEC



CHASSIS

Model	FS-1
Steering System: Bearing Type Bearing Size (Quantity): Upper Lower	Ball bearing 1/4 in (19 pcs.) 1/4 in (19 pcs.)
Front Suspension: Front Fork Travel Fork Spring Free Length < Limit > Spring Rate (K ₁) Stroke (K ₁) Optional Spring Oil Capacity Oil Grade	85 mm (3.35 in) 153 mm (6.02 in) < 151 mm (5.94 in) > 4.51 N/mm (0.46 kg/mm, 25.8 lb/in) 0~85 mm (0~3.35 in) No. 160 cm ³ (5.64 Imp oz, 5.41 US oz) Fork oil 10W or equivalent
Rear Suspension: Shock Absorber Travel Spring Free Length Spring Rate (K ₁) Stroke (K ₁) Optional Spring	65 mm (2.56 in) 211.5 mm (8.33 in) 27.9 N/mm (2.85 kg/mm, 160 lb/in) 0~65 mm (0~2.56 in) No.
Swingarm: Free Play Limit (Swingarm end)	1.0 mm (0.04 in) Move swingarm end side to side
Front Wheel: Type Rim Size Rim Material Rim Runout Limit: Vertical Lateral	Spoke wheel 1.20 × 17 Steel 2.0 mm (0.08 in) 2.0 mm (0.08 in)
Rear Wheel: Type Rim Size Rim Material Rim Runout Limit: Vertical Lateral	Spoke wheel 1.40 × 17 Steel 2.0 mm (0.08 in) 2.0 mm (0.08 in)

MAINTENANCE SPECIFICATIONS

SPEC



Model	FS-1
Drive Chain: Type/Manufacturer Number of Links Chain Free Play	420/DAIDO 100 Links (H), 96 Links (B)(E) 15~20 mm (0.6~0.8 in)
Front Drum Brake: Type Brake Drum Inside Dia <Wear Limit> Lining Thickness <Wear Limit> Shoe Spring Free Length	Leading, trailing 110 mm (4.33 in) <111 mm (4.37 in)> 4 mm (0.16 in) <2 mm (0.08 in)> 34.5 mm (1.36 in)
Rear Drum Brake: Type Brake Drum Inside Dia <Wear Limit> Lining Thickness <Wear Limit> Shoe Spring Free Length	Leading, trailing 110 mm (4.33 in) <111 mm (4.37 in)> 4 mm (0.16 in) <2 mm (0.08 in)> 34.5 mm (1.36 in)
Brake Lever and Brake Pedal: Brake Lever Free Play Brake Pedal Position Brake Pedal Free Play	5~8 mm (0.20~0.32 in) At lever pivot side 15 mm (0.60 in) 20~30 mm (0.8~1.2 in)
Clutch Lever and Throttle Grip Clutch Lever Free Play Throttle Cable Free Play	2~3 mm (0.08~0.12 in) At lever pivot side 2~5 mm (0.08~0.20 n) At grip flange

MAINTENANCE SPECIFICATIONS

SPEC



Tightening Torque:					
Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m•kg	ft•lb	
Engine mount					Refer to "NOTE"
[Rear, upper]	M8 × 1.25	24	2.4	17	
[Rear, lower]	M8 × 1.25	24	2.4	17	
[Upper]	M8 × 1.25	24	2.4	17	
[Downtube upper]	M8 × 1.25	24	2.4	17	
[Downtube lower]	M8 × 1.25	24	2.4	17	
Pivot shaft and nut	M10 × 1.25	44	4.4	32	
Rear shock and frame	M10 × 1.25	30	3.0	22	
Rear shock and rear arm	M10 × 1.25	39	3.9	28	
Ring nut (Steering shaft)	M25 × 1.0				
Cap bolt (Front fork)	M10 × 1.25	30	3.0	22	
Handlebar crown and steering shaft	M10 × 1.25	30	3.0	22	
Handlebar crown and handlebar lower bracket	M10 × 1.25	30	3.0	22	
Handlebar upper bracket and handlebar lower bracket	M6 × 1.0	12	1.2	8.7	
Inner tube pinch bolt	M10 × 1.25	25	2.5	18	
Front wheel axle	M10 × 1.25	44	4.4	32	
Rear wheel axle	M10 × 1.25	45	4.5	32	
Driven sprocket and wheel hub	M8 × 1.25	24	2.4	17	
Tension bar and brake shoe plate	M8 × 1.25	18	1.8	13	
Tension bar and rear arm	M8 × 1.25	18	1.8	13	
Camshaft lever (Brake)	M6 × 1.0	9	0.9	6.5	
Frame and footrest	M8 × 1.25	24	2.4	17	
Frame and seat	M8 × 1.25	10	1.0	7.2	
Chain puller nut	M6 × 1.0	10	1.0	7.2	



NOTE:

Tighten the ring nut so all free play is taken up, but so the steering stem can still pivot freely from lock to lock. Recheck for free play after the entire fork unit has been installed.

MAINTENANCE SPECIFICATIONS

SPEC



ELECTRICAL

Model	FS-1
Voltage:	6V
Ignition System: Ignition Timing (B.T.D.C.) Advancer Type	22° at 5,000 r/min Centrifugal type
Ignition: Magneto Model/Manufacturer Contact-Breaker-Point Gap Spring Pressure Condenser Capacity Source Coil Resistance	F355/YAMAHA 0.3 ~ 0.4 mm (0.012 ~ 0.016 in) 600 ~ 800 g (21.162 ~ 28.216 oz) 0.27 ~ 0.33 μ F 1.4 ~ 2.0 Ω at 20°C (68°F) (Black/White—Ground)
Ignition Coil: Model/Manufacturer Minimum Spark Gap Primary Coil Resistance Secondary Coil Resistance	C481/YAMAHA 6 mm (0.24 in) 1.4 ~ 1.8 Ω at 20°C (68°F) 6.0 ~ 7.3k Ω at 20°C (68°F)
Spark Plug Cap: Type Plug Cap Resistance	Resin Type 5k Ω at 20°C (68°F)
Charging System: Type	Flywheel Magneto
Flywheel Magneto: Magneto Model/Manufacturer Charging Current—Day (Min.) (Max.) Charging Current—Night (Min.) (Max.) Lighting Voltage (Min.) (Max.) Charging Coil Resistance	F355/YAMAHA 0.7A or more at 3,000 r/min 4.7A or less at 8,000 r/min 0.35A or more at 3,000 r/min 2.5A or less at 8,000 r/min 5.8V or more at 3,000 r/min 8.2V or less at 8,000 r/min 0.4 ~ 0.6 Ω at 20°C (68°F) (Ground—Yellow) 0.3 ~ 0.5 Ω at 20°C (68°F) (Ground—Green/Red)

MAINTENANCE SPECIFICATIONS

SPEC



Model		FS-1
[Reference date]		
Rectifier:		
Model/Manufacturer		DE4504/STANLEY
Capacity		4A
Withstand Voltage		400V
Battery:		
Specific Gravity		1.260
Horn: (Except for Holland)		
Type		Plane Type
Quantity		1 pc.
Model/Manufacturer		MF-6/NIKKO
Maximum Amperage		1.5A
Flasher Relay:		
Type		Condenser Type
Model/Manufacturer		FZ618SD/NIPPON DENSO (H), FZ650SD/NIPPON DENSO (B)(E)
Self Cancelling Device		No.
Flasher Frequency		60 ~ 120 cycles/min
Wattage		10W×2 (H)(B), 21W×2+3W (E)
Curcuit Breaker:		
Type		Fuse
Curcuit (Fuse):		
Main		10A (1 pc.)
Reserve		10A (1 pc.)

GENERAL TORQUE SPECIFICATIONS/ DEFINITION OF UNITS

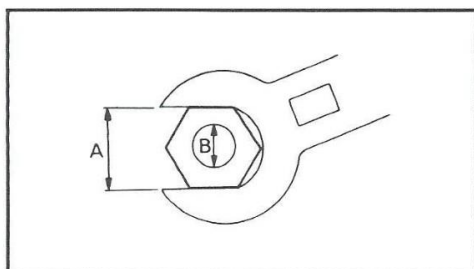
SPEC



GENERAL TORQUE SPECIFICATIONS

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multi-fastener assemblies in a crisscross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.

A (Nut)	B (Bolt)	General torque specifications		
		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



A: Distance across flats

B: Outside thread diameter

DEFINITION OF UNITS



















Unit	Read	Definition	Measure
mm	millimeter	10^{-3} meter	Length
cm	centimeter	10^{-2} meter	Length
kg	kilogram	10^3 gram	Weight
N	Newton	$1 \text{ kg} \times \text{m/sec}^2$	Force
Nm	Newton meter	$\text{N} \times \text{m}$	Torque
m•kg	Meter kilogram	$\text{m} \times \text{kg}$	Torque
Pa	Pascal	N/m^2	Pressure
N/mm	Newton per millimeter	N/mm	Spring rate
L	Liter	—	Volume or capacity
cm^3	Cubic centimeter	—	Volume or capacity
r/min	Rotation per minute	—	Engine speed

LUBRICATION POINTS AND LUBRICANT TYPE

SPEC



LUBRICATION POINTS AND LUBRICANT TYPE ENGINE















Lubrication Points (Part name)	Lubricant Type
Oil seal lips (All)	
O-rings (All)	
Bearing retainer Crankshaft bearings (Left and center) Needle bearings (Connecting rod) Main axle bearings Drive axle bearings	    
Crank pins	
Piston rings, piston pins and pistons	
Warm shaft (Autolube pump)	
Kick idle gear	
Kick axle	
Primary driven gear (Clutch housing)	
Push rod	
Push screw (Push lever)	
Sliding gear (Transmission)	
Free movement gear (Transmission)	
Guide bar (Shift forks)	
Crankcase mating surfaces	Yamaha bond No. 4

LUBRICATION POINTS AND LUBRICANT TYPE

SPEC



CHASSIS

Lubrication Points (Part name)	Lubricant Type
Ball bearings (Steering shaft)	
Oil seal lips (Front wheel and rear wheel)	
Pivoting point (Brake pedal)	
Pivoting point (Centerstand)	
Right handlebar end	
Throttle cable end (Throttle grip)	
Pivoting point (Clutch lever)	
Clutch cable end (Clutch lever)	
Pivoting point (Brake lever)	
Pivot shaft (Swingarm)	
Bushes (Swingarm)	
Front wheel axle	
Rear wheel axle	
Collar (Front wheel)	
Speedometer gear unit	