YAMAHA

FZR400SP '91

3TJ-ME1

SERVICE MANUAL

FZR400SP
SERVICE MANUAL
1990 by Yamaha Motor Co., Ltd.
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NOTICE

This manual was 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 machines have a basic understanding of the mechanical concepts and procedures inherent in machine 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 GROUP
YAMAHA MOTOR CO., LTD.

PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.

⚠ — 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 motorcycle operator, a bystander, or a person inspecting or repairing the motorcycle.

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

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

HOW TO USE THIS MANUAL

CONSTRACTION OF THIS MANUAL

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

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

2nd title: This title appears on the upper of each page on the left of the chapter symbol. (For the chapter "Periodic inspection and adjustment," the 3rd title appears.)

3rd title: This is a final title.

MANUAL FORMAT

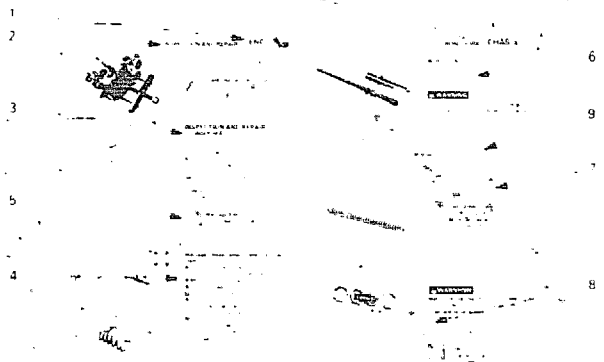
All of the procedures in this manual are organized in a sequential step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspections.
A set of particularly important procedure is placed between a line of asterisks "*" with each procedure preceded by "●".

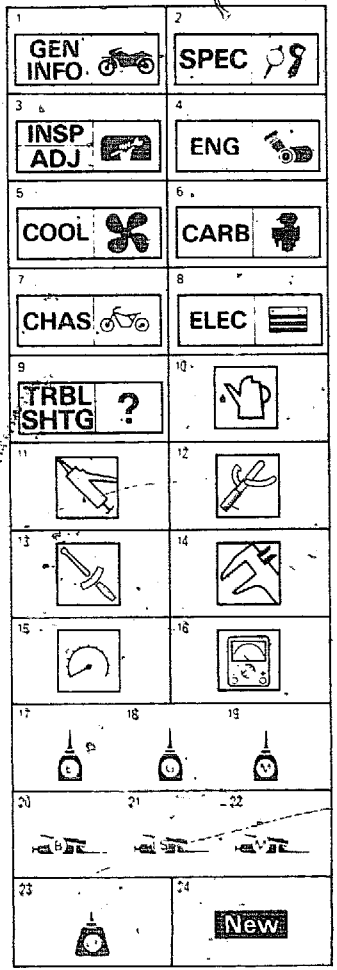
IMPORTANT FEATURES

- Data and a special tool are framed in a box preceded by a relevant symbol.
- An encircled numeral (1) indicates a part name, and an encircled alphabetical letter (A) data or an alignment mark (1), the others being indicated by an alphabetical letter in a box (A).
- A condition of a faulty component will precede an arrow symbol and the course of action required the symbol (→).

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 Electrical value

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)
24 Use new one

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ELECTRICAL	ELEC 8
TROUBLESHOOTING	TRBL SHTG 9

GEN INFO

1

CHAPTER 1.
GENERAL INFORMATION

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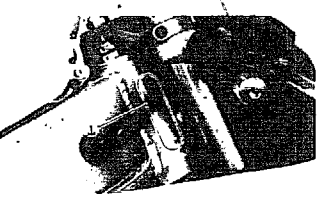
GENERAL INFORMATION



MOTORCYCLE IDENTIFICATION

FRAME SERIAL NUMBER

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

Starting serial number
3TJ-141101

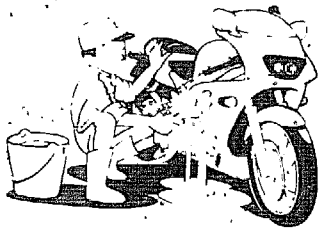
ENGINE SERIAL NUMBER

The engine serial number 1 is stamped into the right side of the engine.

Starting serial number
3TJ 141101

NOTE

- The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.
- Designs and specifications are subject to change without notice.



IMPORTANT INFORMATION

PREPARATION FOR REMOVAL

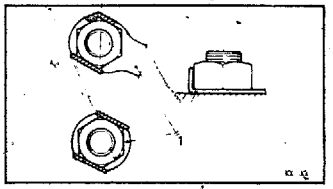
1. Remove all dirt, mud, dust and foreign material before removal and disassembly.
2. Use proper tools and cleaning equipment. Refer to SPECIAL TOOL.
3. When disassembling the machine, keep mated parts together. This includes gears, cylinders, pistons, and other mated parts that have been mated through normal wear. Mated parts must be reused as an assembly or replaced.
4. During the machine disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help assure that all parts are correctly reinstalled.
5. Keep away from fire.

ALL REPLACEMENT PARTS

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

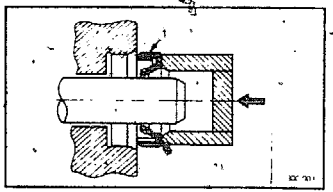
GASKETS, OIL SEALS, AND O-RINGS

1. All gaskets, seals, and O-rings should be replaced when an engine is overhauled. 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.



LOCK WASHERS PLATES AND COTTER PINS

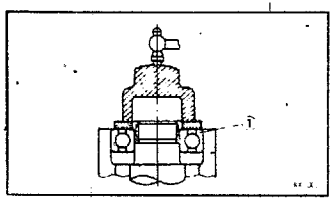
1. All lock washers plates 1 and cotter pins must be replaced when they are removed. Lock tab(s) should be bent along the bolt or nut flat(s) after the bolt or nut has been properly tightened.



BEARINGS AND OIL SEALS

1. Install the bearing(s) and oil seal(s) with their manufacturer's marks or numbers facing outward. (In other words, the stamped letters must be on the side exposed to view.) When installing oil seal(s), apply a light coating of light weight lithium base grease to the seal lip(s). Oil the bearings liberally when installing.

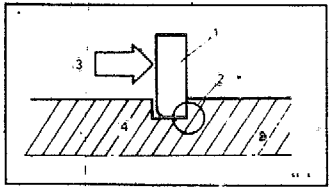
1 Oil seal



CAUTION:

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

1 Bearing



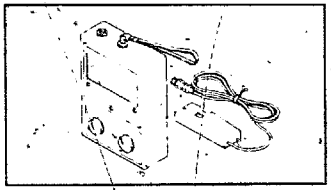
CIRCLIPS

1. All circlips should be inspected 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 to the thrust 3 it receives. See the sectional view.

4 Shaft

SPECIAL TOOLS

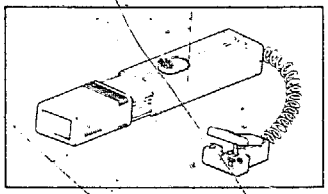
The proper special tools are necessary for complete and accurate tune up and assembly. Using the correct special tools will help prevent damage caused by the use of improper tools or improvised techniques.



FOR TUNE UP

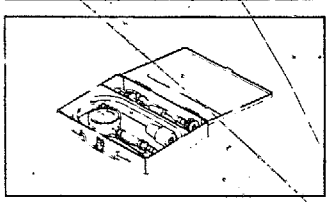
1. Inductive tachometer
   P/N 90890-03113

This tool is needed for detecting engine rpm.



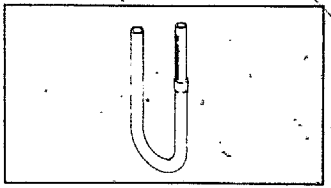
2. Inductive timing light
   P/N 90890-03141

This tool is necessary for checking ignition timing.



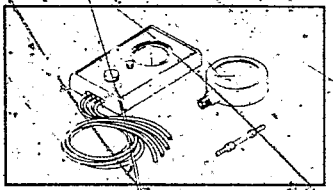
3. Compression gauge
   P/N 90890-03081

This gauge is used to measure the engine cam pression.



4. Fuel level gauge
   P/N 90890-01312

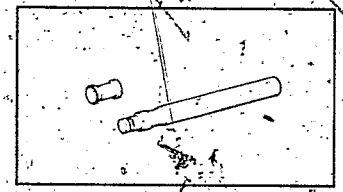
This gauge is used to measure the fuel level in the float chamber.



5 Vacuum gauge
P/N 90890-03094

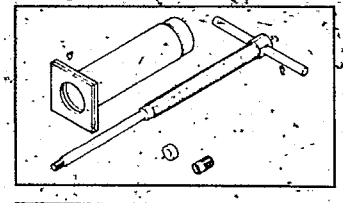
This gauge is needed for carburetor synchronization.

FOR ENGINE SERVICE



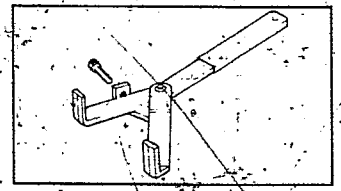
1 Valve lapper
P/N 90890-04101

This tool is used to lap the valves



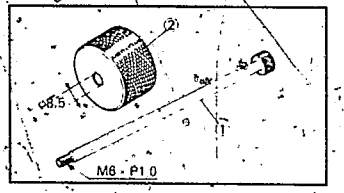
2 Piston pin puller
P/N 90890-01304

This tool is used to remove the piston pin.



3. Universal clutch holder
P/N 90890-04086

This tool is used to hold the clutch when removing or installing the clutch boss locknut

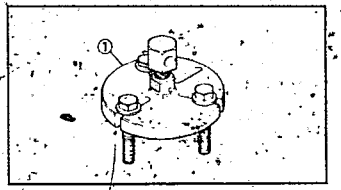


4. Slide hammer bolt (M6)
P/N 90890-01083 1
Weight
P/N 90890-01084 2

These tools are used to remove the clutch spacer

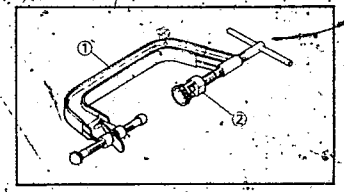
5 Rotor holder
P/N 90890 01701

This tool is used to hold the rotor



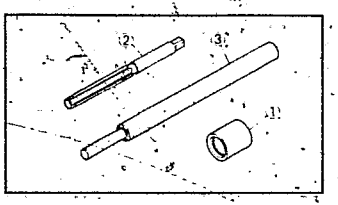
6 Rotor puller
P/N 90890 01362 1

This tool is used to remove the rotor



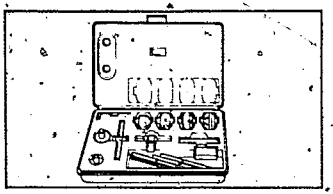
7 Valve spring compressor
P/N 90890-04019 1
Attachment
P/N 90890 04114 2

These tools are used to remove and install the valve assemblies



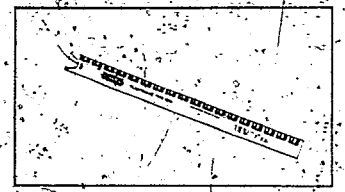
8. Valve guide installer (4 mm)
P/N 90890-04112
Valve guide reamer (4 mm) 2
P/N 90890 04113
Valve guide remover (4 mm) 3
P/N 90890-04111

These tools are used to remove, install and rebore the valve guide



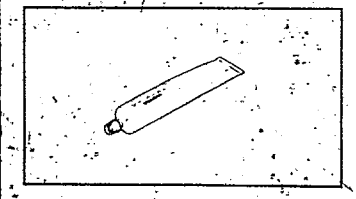
9. Valve seat cutter
P/N YM-91043

This tool is used to adjust the valve clearance.



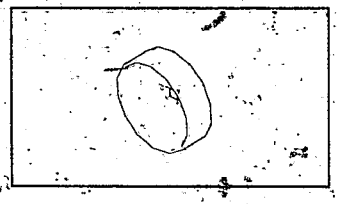
10. "Plastigage" set "Green"
P/N YU-33210

This gauge is needed to measure the clearance for the connecting rod bearing and the crankshaft bearing.



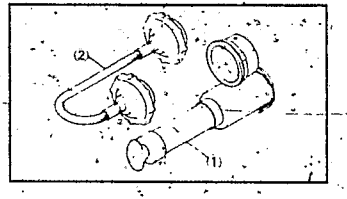
11. YAMAHA bond No. 1215
P/N 90890-85505

This sealant (bond) is used for crankcase mating surfaces, etc.



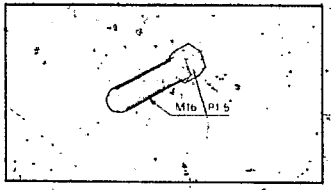
12. Oil filter wrench
P/N 90890-01426

This tool is used to remove and install the oil filter.



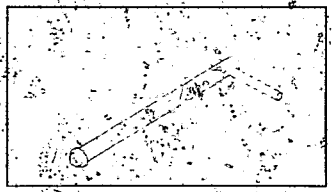
13. Radiator cap tester
P/N 90890-01325 1
Adapter
P/N 90890-01352 2

This tester is used for checking the cooling system.



14. Rotor puller
P/N 90890-01080

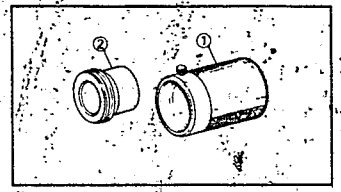
This tool is used to remove the rotor.



FOR CHASSIS SERVICE

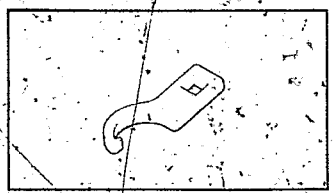
1. Damper rod holder
P/N 90890-01425

This tool is used to loosen and tighten the front fork damper rod holding bolt.



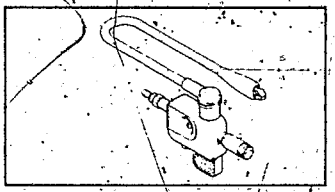
2. Front fork seal driver (weight)
P/N 90890-01367 1
Adapter (43 mm)
P/N 90890-01374 2

These tools are used when installing the fork oil seal.



3. Ring nut wrench
P/N 90890-01403

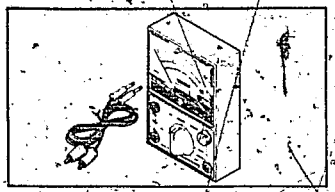
This tool is used to loosen and tighten the steering ring nut.



FOR ELECTRICAL COMPONENTS

1. Ignition checker
P/N 90890-06754

This instrument is necessary for checking the ignition system components.



2. Pocket tester
P/N 90890-03112

This instrument is invaluable for checking the electrical system.

SPEC 2

CHAPTER 2
SPECIFICATIONS

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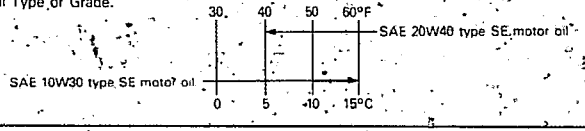
CABLE ROUTING B-9

SPECIFICATIONS

GENERAL SPECIFICATIONS

Model	FZR400SP
Model Code Number:	3TJ2
Frame Starting Number:	3TJ-141101
Engine Starting Number:	3TJ-141101
Dimensions:	
Overall Length	1,975 mm (77.8 in)
Overall Width	705 mm (27.8 in)
Overall Height	1,090 mm (42.9 in)
Seat Height	760 mm (29.9 in)
Wheelbase	1,365 mm (53.7 in)
Minimum Ground Clearance	125 mm (4.9 in)
Basic Weight:	
With Oil and Full Fuel Tank	185 kg (408 lb)
Engine:	
Engine Type	Liquid cooled 4-stroke, DOHC
Cylinder Arrangement	Forward inclined parallel 4-cylinder
Displacement	399 cm³
Bore × Stroke	56.0 × 40.5 mm (2.20 × 1.59 in)
Compression Ratio	12.2 : 1
Compression Pressure	1,100 kPa (11.0 kg/cm², 156 psi)
Starting System	Electric starter
Lubrication System:	Wet sump
Engine Oil Type or Grade:	

Model	FZR400SP		
Engine Oil Capacity:			
Periodic Oil Change	2.6 L (2.3 Imp qt, 2.7 US qt)		
With Oil Filter Replacement	2.9 L (2.6 Imp qt, 3.1 US qt)		
Total Amount	3.5 L (3.1 Imp qt, 3.7 US qt)		
Coolant Total Amount (Including All Routes)	2.18 L (1.9 Imp qt, 2.3 US qt)		
Air Filter:	Dry type element		
Fuel:			
Type	Regular unleaded gasoline		
Tank Capacity	15 L (3.3 Imp gal, 4.0 US gal)		
Reserve Amount	3 L (0.7 Imp gal, 0.8 US gal)		
Carburetor:			
Type × Quantity	BDST 32 × 4		
Manufacturer	MIKUNI		
Spark Plug:			
Type	CR8E, CR9E/U24ESR-N, U27ESR-N		
Manufacturer	NGK/NIPPONDENSO		
Gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in)		
Clutch Type:	Wet, multiple-disc		
Transmission:			
Primary Reduction System	Spur gear		
Primary Reduction Ratio	89/41 (2.170)		
Secondary Reduction System	Chain Drive		
Secondary Reduction Ratio	52/19 (2.736)		
Transmission Type	Constant mesh 6 speed		
Operation	Left foot operation		
Gear Ratio 1st	32/13 (2.461)		
2nd	33/17 (1.941)		
3rd	31/19 (1.631)		
4th	27/18 (1.500)		
5th	26/19 (1.368)		
6th	25/20 (1.250)		
Chassis:			
Frame Type	Backbone		
Caster Angle	24°		
Trail	92 mm (3.62 in)		
Tire:		Front	Rear
Type		Tubeless	Tubeless
Size		120/60R17 55H	160/60R17 69H
Manufacturer (Type)		MICHELIN (TX11)	MICHELIN (TX23)

Model	FZR400SP
Tire Pressure (Cold Tire):	
Maximum Load	100 kg (220 lb)
Cold Tire Pressure	Front / Rear
Up to Maximum Load*	200 kPa (2.00 kg/cm², 28 psi) / 250 kPa (2.50 kg/cm², 36 psi)
*Load is total weight of cargo, rider and accessories	
Brake:	
Front Brake Type	Dual disc brake
Operation	Right hand operation
Rear Brake Type	Single disc brake
Operation	Right foot operation
Suspension:	
Front Suspension	Telescopic fork
Rear Suspension	Swingarm (Link suspension)
Shock Absorber:	
Front Shock Absorber	Coil spring/Oil damper
Rear Shock Absorber	Coil Gas spring/Oil damper
Wheel Travel:	
Front Wheel Travel	120 mm (4.72 in)
Rear Wheel Travel	130 mm (5.12 in)
Electrical:	
Ignition System	T.C.I. (Digital)
Generator System	A.C. magneto generator
Battery Type or Model	YTX9-BS
Battery Capacity	12V 8AH
Headlight Type:	Quartz bulb (Halogen)
Bulb Wattage × Quantity:	
Headlight	12V 55/40W × 2
Tail/Brake Light	12V 5W/21W × 2
Flasher Light	12V 15W × 4
Indicator Light:	
Wattage × Quantity "METER LIGHT"	12V 1.7W × 4
"NEUTRAL"	12V 3.4W
"HIGH BEAM"	12V 3.4W
"TURN"	12V 3.4W
"OIL"	12V 3.4W

MAINTENANCE SPECIFICATIONS

ENGINE

Model	FZR400SP
Cylinder Head:	
Warp Limit*	0.05 mm (0.0020 in)
	*Lines indicate straightedge measurement
Cylinder:	
Bore Size	56.000 ~ 56.005 mm (2.2047 ~ 2.2049 in)
<Wear Limit>	56.055 mm (2.226 in)
Camshaft:	
Drive Method	Chain drive (Center)
Shaft-to-cap Clearance	0.020 ~ 0.054 mm (0.0008 ~ 0.0021 in)
<Limit>	0.08 mm (0.0031 in)
Cam Dimensions, Intake "A"	32.55 ~ 32.65 mm (1.282 ~ 1.285 in)
<Limit>	32.50 mm (1.28 in)
"B"	25.045 ~ 25.145 mm (0.986 ~ 0.990 in)
<Limit>	25.005 mm (0.98 in)
Exhaust "A"	32.25 ~ 32.35 mm (1.270 ~ 1.274 in)
<Limit>	32.20 mm (1.27 in)
"B"	25.00 ~ 25.10 mm (0.984 ~ 0.988 in)
<Limit>	24.96 mm (0.98 in)
Camshaft Runout Limit	0.03 mm (0.0012 in)
Timing Chain:	
Chain Type/No. of Links	DID215F3/110 Links
Chain Adjustment Method	Automatic

Model		FZR400SP
Valve, Valve Seat, Valve Guide:		
Valve Clearance (Cold):		
1	IN.	0.11 ~ 0.20 mm (0.004 ~ 0.008 in)
	EX.	0.21 ~ 0.30 mm (0.008 ~ 0.012 in)
Valve Dimensions:		
	Head Dia.	Face Width / Seat Width / Margin Thickness
"A" Head Dia.	IN.	21.9 ~ 22.1 mm (0.86 ~ 0.87 in)
	EX.	18.9 ~ 19.1 mm (0.74 ~ 0.75 in)
"B" Face Width	IN.	1.6 ~ 2.4 mm (0.063 ~ 0.094 in)
	EX.	1.6 ~ 2.4 mm (0.063 ~ 0.094 in)
"C" Seat Limit Width	IN.	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
	EX.	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
"D" Margin Thickness Limit	IN.	0.6 ~ 0.8 mm (0.024 ~ 0.031 in)
	EX.	0.6 ~ 0.8 mm (0.024 ~ 0.032 in)
Stem Outside Diameter	IN.	3.975 ~ 3.990 mm (0.1565 ~ 0.1571 in)
	EX.	3.960 ~ 3.975 mm (0.1559 ~ 0.1565 in)
<Limit>	IN.	3.950 mm (0.156 in)
	EX.	3.850 mm (0.152 in)
Guide Inside Diameter	IN.	4.000 ~ 4.012 mm (0.1575 ~ 0.1580 in)
	EX.	4.000 ~ 4.012 mm (0.1575 ~ 0.1580 in)
<Limit>	IN.	4.042 mm (0.159 in)
	EX.	4.042 mm (0.159 in)
Stem Runout Limit		0.02 mm (0.008 in)
Valve Seat Width	IN.	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
	EX.	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)

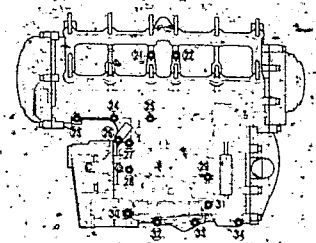
Model		FZR400SP
Valve Spring:		
Free Length	IN.	40.05 mm (1.59 in)
	EX.	40.05 mm (1.59 in)
<Limit>	IN.	38.00 mm (1.50 in)
	EX.	38.00 mm (1.50 in)
Tilt Limit	IN.	2.5° / 1.8 mm (2.5° / 0.07 in)
	EX.	2.5° / 1.8 mm (2.5° / 0.07 in)
Direction of Winding (Top View)	IN.	Counter clockwise
	EX.	Counter clockwise
Piston:		
Piston Size "D"		55.940 ~ 55.955 mm (2.202 ~ 2.203 in)
Measuring Point "H"		3 mm (0.12 in)
Piston Off-set		0.5 mm (0.02 in)
Piston Off-set Direction		INSIDE
Piston-to-Cylinder Clearance		0.045 ~ 0.065 mm (0.0018 ~ 0.0026 in)
<Limit>		<0.15 mm (0.0059 in)>
Piston Ring:		
Top Ring:		
Type		Barrel
Dimensions (B × T)		0.8 × 2.1 mm (0.031 × 0.083 in)
End Gap (Installed)		0.15 ~ 0.30 mm (0.006 ~ 0.012 in)
Side Clearance (Installed)		0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)
2nd Ring:		
Type		Taper
Dimensions (B × T)		0.8 × 2.1 mm (0.031 × 0.083 in)
End Gap (Instaled)		0.15 ~ 0.30 mm (0.006 ~ 0.012 in)
Side Clearance		0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
Oil Ring:		
Dimensions (B × T)		1.5 × 2.2 mm (0.059 × 0.087 in)
End Gap (Installed)		0.2 ~ 0.7 mm (0.008 ~ 0.028 in)

Model	FZR400SP
Connecting Rod:	
Oil Clearance	0.043 ~ 0.066 mm (0.0017 ~ 0.0026 in)
Bearing Color Code	1. Blue 2. Black 3. Brown 4. Green
Crankshaft:	
Runout Limit "C"	0.03 mm (0.0012 in)
Big End Side Clearance "D"	0.16 ~ 0.26 mm (0.006 ~ 0.010 in)
Oil Clearance	0.025 ~ 0.043 mm (0.0010 ~ 0.0017 in)
Bearing Color Code	1. Blue 2. Black 3. Brown 4. Green 5. Yellow
Clutch:	
Friction plate:	
Thickness	2.9 ~ 3.1 mm (0.114 ~ 0.122 in)
Quantity	9 pcs.
Wear Limit	2.8 mm (0.11 in)
Clutch Plate:	
Thickness	1.8 ~ 2.2 mm (0.071 ~ 0.087 in)
Quantity	8 pcs.
Warp Limit	0.1 mm (0.004 in)
Clutch Spring:	
Free Length	33.5 mm (1.32 in)
Quantity	5 pcs.
Minimum Free Length	32.5 mm (1.28 in)
Clutch Release Method	Inner push, Screw push
Transmission:	
Main Axle Runout Limit	0.02 mm (0.0008 in)
Drive Axle Runout Limit	0.02 mm (0.0008 in)
Shifter:	
Type	Guide bar

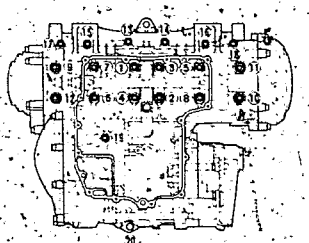
Model		FZR400SP
Carburetor:		
I.D. Mark		31J 10
Main Jet	(M.J)	#1.4 #100 #2.3 #97.5
Main Air Jet	(M.A.J.)	#70
Jet Needle	(J.N.)	#1.4: 5CEW16-3 #2.3: 5CKR3-3
Needle Jet	(N.J.)	X-6
Throttle Valve Size	(Th.V.)	#130
Pilot Jet 1	(P.J.1)	#32.5
Pilot Air Jet	(P.A.J.)	#110
Bypass 1	(B.P.1)	ø0.8
2	(B.P.2)	ø0.8
3	(B.P.3)	ø0.8
Pilot Screw	(P.S.)	2-1/2 turns out
Valve Seat	(V.S.)	ø1.2
Starter Jet 1	(G.S.1)	#50
2	(G.S.2)	ø0.6
Fuel Level		20.9 ~ 21.9 mm (0.82 ~ 0.86 in) Above from the float chamber line
Engine Idling Speed		1,250 ~ 1,350 r/min
Vacuum Pressure at Idling Speed		19.1 kPa or more (145 mmHg, 5.7 inHg)
Lubrication System:		
Oil Filter Type		Paper type
Oil Pump Type		Trochoid pump type
Tip Clearance		0.03 ~ 0.08 mm (0.0012 ~ 0.0031 in)
Side Clearance		0.09 ~ 0.15 mm (0.0035 ~ 0.0059 in)
Cooling System:		
Radiator Core Size	Width	320 mm (12.6 in)
	Height	238 mm (9.37 in)
	Thickness	24 mm (0.94 in)
Radiator Cap Opening Pressure		105 ~ 125 kPa (1.05 ~ 1.25 kg/cm², 14.93 ~ 17.77 psi)
Reservoir Tank Capacity		0.3 L (0.26 Imp qt, 0.32 US qt)
(From Low to Full Level)		(0.28 L (0.25 Imp qt, 0.30 US qt))
Water Pump:		
Type		Single suction centrifugal pump
Reduction Ratio		81/41 ~ 48/49 (2.126)
Thermostat:		
Opening Temperature		80 ~ 84°C (176 ~ 183°F)

Model	FZR400SP
Crankcase Tightening Sequence.	

Crankcase (Upper)



Crankcase (Lower)



MAINTENANCE SPECIFICATIONS SPEC

TIGHTENING TORQUE

Part to be tightened	Bolt name	Thread size	Q'ty	Tightening torque Nm	Tightening torque m·kg	Tightening torque ft·lb	Remarks
Camshaft cap	Flange bolt	M 6	24	10	1.0	7.2	
Cylinder head	Nut	M 9	12	37	3.7	27	
Spark plug	—	M10	4	12.5	1.25	9.0	
Cylinder head cover	Bolt	M 6	8	10	1.0	7.2	
Cylinder (drain)	Bolt	M 6	2	7	0.7	5.1	
Connecting rod	Nut	M 7	8	23	2.3	17	
Camshaft sprocket	Bolt	M 7	4	24	2.4	17	
Timing chain tensioner	Bolt	M 6	2	10	1.0	7.2	
	Bolt	M11	1	20	2.0	14	
Chain tensioner guide (intake)	Bolt	M 6	1	10	1.0	7.2	
Pipe 2	Bolt	M 6	2	10	1.0	7.2	
Thermo unit cover	Bolt	M 6	2	10	1.0	7.2	
	Flange bolt	M 6	2	7	0.7	5.1	
Radiator	Flange bolt	M 6	4	7	0.7	5.1	
Joint	Bolt	M 6	4	10	1.0	7.2	
Water pump cover	Bolt	M 6	4	10	1.0	7.2	
Pipe 1	Bolt	M 6	2	10	1.0	7.2	
Oil pump cover	Screw	M 6	1	7	0.7	5.1	
Oil pump assembly	Bolt	M 6	3	10	1.0	7.2	
Oil strainer housing	Bolt	M 6	2	10	1.0	7.2	
Oil pan	Bolt	M 6	14	10	1.0	7.2	
Drain bolt	—	M14	1	43	4.3	31	
Oil delivery pipe	Union bolt	M10	1	20	2.0	14	
	Bolt	M 6	1	10	1.0	7.2	
Oil filter	—	M20	1	17	1.7	12	
Oil filter housing	Union bolt	M20	1	63	6.3	45	
Carburetor joint	Bolt	M 6	8	10	1.0	7.2	
	Screw	M 5	4	5	0.5	3.6	
Air filter case	Flange bolt	M 6	1	7	0.7	5.1	
Exhaust pipe	Nut	M 6	8	10	1.0	7.2	
(COT	Bolt	M 6	4	10	1.0	7.2	
Muffler	Bolt	M 8	1	20	2.0	14	
EX-UP	Bolt	M 6	3	10	1.0	7.2	
Pulley	Bolt	M 5	1	5	0.5	3.6	
Exhaust joint	Bolt	M 8	3	20	2.0	14	
Exhaust pipe and muffler	Bolt	M 8	1	20	2.0	14	
EX-UP cover	Bolt	M 6	3	10	1.0	7.2	
Crank case upper and lower	Bolt	M 8	13	24	2.4	17	
	Bolt	M 6	21	12	1.2	8.7	
Breather plate 2	Screw	M 6	2	7	0.7	5.1	
	Screw	M 6	4	7	0.7	5.1	
AC magneto cover	Bolt	M 6	5	10	1.0	7.2	
Crankcase cover 1	Bolt	M 6	5	10	1.0	7.2	
	Screw	M 5	1	4	0.4	2.9	

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque Nm	m·kg	ft·lb	Remarks
Bearing plate	Bolt	M 6	4	10	1.0	7.2	
Crankcase cover 2	Bolt	M 6	7	10	1.0	7.2	
Plug (to crankcase 2)	—	M16	1	8	0.8	5.8	
Crankcase cover 3	Bolt	M 6	10	10	1.0	7.2	
	Screw	M 5	4	4	0.4	2.9	
Cover 1	Screw	M 6	1	7	0.7	5.1	
Plug (to crankcase 2)	—	M16	1	25	2.5	18	
Starter clutch assembly	Flange bolt	M10	1	80	8.0	58	
Starter clutch outer	Bolt	M 8	3	30	3.0	22	
Pressure plate	Bolt	M 5	5	6	0.6	4.3	
Clutch boss	Nut	M18	1	70	7.0	50	
Push lever assembly	Screw	M 5	2	4.5	0.45	3.3	
Push rod	Nut	M 8	1	16	1.6	11	
Drive sprocket	Nut	M18	1	70	7.0	50	
Stopper plate	Flange bolt	M 6	1	10	1.0	7.2	
Shift arm	Flange bolt	M 6	1	10	1.0	7.2	
Shift rod	Nut	M 6	2	10	1.0	7.2	
Stopper lever	Bolt	M 6	1	10	1.0	7.2	
Side plate	Screw	M 5	1	4	0.4	2.9	
AC magneto rotor	Bolt	M10	1	80	8.0	58	
Stator	Bolt	M 6	3	10	1.0	7.2	
Pick up	Screw	M 5	2	5	0.5	3.6	
Starter motor	Flange bolt	M 6	2	10	1.0	7.2	
Neutral switch	Screw	M 6	2	4	0.4	2.9	
Oil pressure switch	—	—	1	12	1.2	8.7	
Thermo switch assembly	—	M16	1	22.5	2.25	16.3	
Thermo unit	—	—	1	15	1.5	11	
Oil pressure lead	Bolt	M 4	1	1	0.1	0.7	

CHASSIS

Model		FZR400SP
Steering System:		
Steering Bearing Type		Taper Roller Bearing
Front Suspension:		
Front Fork Travel		120 mm (4.72 in)
Front Spring Free Length		359 mm (14.1 in)
<Limit>		<354 mm (13.9 in)>
Spring Rate:	K1	6.5 N/mm (0.65 kg/mm, 36.4 lb/in)
Stroke	K1	0.0 ~ 120 mm (0.0 ~ 4.72 in)
Optional Spring		No
Oil Capacity		433 cm³ (15.2 Imp oz, 14.6 US oz)
Oil Level		106 mm (4.17 in)
		From top of inner tube fully compressed without spring
Oil Grade		Fork oil 10W or equivalent
Rear Suspension:		
Shock Absorber Travel		70 mm (2.8 in)
Spring Free Length		205 mm (8.07 in)
Fitting Length		190 mm (7.5 in)
Spring Rate	K1	60 N/mm (6 kg/mm, 336 lb/in)
Stroke	K1	0.0 ~ 70 mm (0.0 ~ 2.8 in)
Optional Spring		No
Enclosed Gas Pressure		
Standard		2,000 kPa (20 kg/cm², 284 psi)
Swingarm:		
Free Play Limit		1.0 mm (0.039 in) at swingarm end Move swingarm end side to side
Front Wheel:		
Type		Cast wheel
Rim Size		J17 × MT3.50
Rim Material		Aluminum
Rim Runout Limit	Radial	1.0 mm (0.039 in)
	Lateral	0.5 mm (0.020 in)
Rear Wheel:		
Type		Cast wheel
Rim Size		J17 × MJ4.50
Rim Material		Aluminum
Rim Runout Limit	Radial	1.0 mm (0.039 in)
	Lateral	0.5 mm (0.020 in)
Drive Chain:		
Type/Manufacturer		RK428SMO/TAKASAGO
No. of Links		128
Chain Free Play		15 ~ 20 mm (0.59 ~ 0.79 in)

Model	FZR400SP
Front Disc Brake	
Type	Dual
Disc Outside Diameter × Thickness	298 × 4 mm (11.7 × 0.16 in)
Pad Thickness Inner	5.5 mm (0.22 in)
< Limit > *	< 0.5 mm (0.02 in) >
Pad Thickness Outer	5.5 mm (0.22 in)
< Limit > *	< 0.5 mm (0.02 in) >
Master Cylinder Inside Diameter	14 mm (0.55 in)
Caliper Cylinder Inside Diameter	34.0 + 27.0 mm (1.34 + 1.06 in)
Brake Fluid Type	DOT #4
	If DOT #4 is not available, DOT #3 can be used.
Rear Disc Brake	
Type	Single
Disc Outside Diameter × Thickness	210 × 5 mm (8.27 × 0.20 in)
Pad Thickness Inner	5.5 mm (0.22 in)
< Limit > *	< 0.5 mm (0.02 in) >
Pad Thickness Outer	5.5 mm (0.22 in)
< Limit > *	< 0.5 mm (0.02 in) >
Master Cylinder Inside Diameter	14 mm (0.55 in)
Caliper Cylinder Inside Diameter	38.18 mm (1.50 in)
Brake Fluid Type	DOT #4
	If DOT #4 is not available, DOT #3 can be used.
Brake Lever and Brake Pedal	
Brake Pedal Position	50 mm (1.97 in)
	Below top of footrest.

TIGHTENING TORQUE

Part to be tightened	Thread size	Tightening torque Nm	m·kg	ft·lb	Remarks
Handle crown and inner tube	M 8	22	2.2	17	
Handle crown and steering shaft	M22	110	11.0	80	
Handlebar and inner tube	M 8	22	2.2	17	
Handlebar and handle crown	M 6	13	1.3	9.4	
Steering shaft and ring nut		6	0.6	4.3	See note
Under bracket and inner tube	M10	38	3.8	27	
Brake hose joint and under bracket	M 6	10	1.0	7.2	
Handle crown and main switch	M 6	10	1.0	7.2	
Front master cylinder	M 6	4	0.4	2.9	
Brake hose and union bolt	M10	26	2.6	19	
Upper cowl and stay	M 6	4	0.4	2.9	
Upper cowl and lower cowl	M 5	3	0.3	2.2	
Front flasher light and stay	M 8	16	1.6	11	
Engine mounting bolt (front)	M10	40	4.0	2.9	
(rear upper)	M10	55	5.5	40	
(rear lower)	M10	55	5.5	40	
(front pinion bolt)	M 8	23	2.3	17	
Frame and rear frame	M 8	33	3.3	24	
Frame and engine bracket (rear)	M 8	33	3.3	24	
Pivot shaft nut	M18	90	9.0	6.5	
Relay arm and frame	M10	40	4.0	29	
Relay arm and arm	M10	40	4.0	29	
Rear arm and arm	M10	40	4.0	29	
Rear shock and relay arm	M10	40	4.0	29	
Rear shock and bracket	M10	40	4.0	29	
Frame and rear shock bracket	M16	52	5.2	37	
Chain case	M 6	7	0.7	5.1	
Seal garde	M 6	7	0.7	5.1	
Rear brake hose holder	M 6	7	0.7	5.1	
Fuel tank	M 6	7	0.7	5.1	
Fuel cock	M 6	7	0.7	5.1	
Fuel sender	M 6	7	0.7	5.1	
Reservoir tank	M 6	7	0.7	5.1	
Rear fender	M 6	7	0.7	5.1	
Rear flasher	M 8	16	1.6	11	
Front fork cap bolt		23	2.3	17	
Front fork locknut	M 8	15	1.5	11	
Front fork damper bolt		40	4.0	29	
Front wheel axle holder	M 8	20	2.0	14	
Front wheel shaft	M16	75	7.5	54	
Rear wheel shaft and nut	M18	105	10.5	75	
Rear wheel shaft and locknut	M18	45	4.5	32	
Front caliper and front fork	M10	35	3.5	25	
Rear caliper and bracket	M10	35	3.5	25	
Rear caliper bracket		55	5.5	40	

Part to be tightened	Thread size	Tightening torque Nm	m·kg	ft·lb	Remarks
Brake caliper retaining pin	M 8	10	1.0	7.2	
Brake disc and hub	M 8	20	2.0	14	
Rear Wheel sprocket and hub	M 8	43	4.3	31	
Bleed screw and caliper	M 8	6	0.6	4.3	
Sidestand bolt	M10	46	4.6	33	
Sidestand locknut	M10	39	3.9	28	
Bracket footrest and frame	M 8	22	2.2	16	
Rear master cylinder and frame	M 8	22	2.2	16	
Rear brake reservoir tank and frame	M 6	4	0.4	2.9	

NOTE:

1. First, tighten the ring nut approximately 38 Nm (3.8 m·kg, 27 ft·lb) by using the torque wrench, then loosen the ring nut one turn.
2. Retighten the ring nut to specification.

ELECTRICAL

Model	FZR400SP
Voltage	12V
Ignition System:	
Ignition Timing (B.T.D.C.)	10° at 1,200 r/min
Advanced Timing (B.T.D.C.)	37° at 3,500 r/min
Advancer Type	Electrical type
T.C.I.:	
Pickup Coil Resistance	80.8 ~ 121.2Ω at 20°C (68°F)
(Color)	(White·Red – White·Black)
T.C.I. Unit Manufacturer	BB7208/HITACHI
Ignition Coil:	
Model/Manufacturer	CM12-50/HITACHI
Minimum Spark Gap	6 mm (0.24 in)
Primary Winding Resistance	1.8 ~ 2.2Ω at 20°C (68°F)
Secondary Winding Resistance	9.6 ~ 14.4 Ω at 20°C (68°F)
Spark Plug Cap:	
Type	Resin type
Resistance	10 kΩ at 20°C (68°F)
Charging System:	
Type	A.C. magneto generator

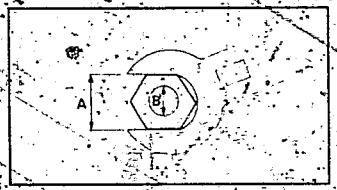
Model	FZR400SP
A.C. Generator:	
Model/Manufacturer	FL-118-17/HITACHI
Nominal Output	14V 20.5A at 5,000 r/min
Stator Coil Resistance	0.31 ~ 0.41Ω at 20°C (68°F) (White—White)
Rectifier/Regulator:	
Model/Manufacturer	NIPPON DENSO
Type	Semi conductor—Short circuit type
Voltage Regulator:	
No load Regulated Voltage	14.3 ~ 15.3V
Rectifier:	
Capacity	25A
Withstand Voltage	240V
Battery:	
Specific Gravity	1.320
Electrical Starter System:	
Type	Constant mesh type
Starter Motor:	
Model/Manufacturer	3HE/YAMAHA
Output	0.7 kW
Brush—Overall Length	12.5 mm (0.49 in)
<Limit>	<4 mm (0.16 in)>
Commutator Dia.	28.0 mm (1.10 in)
Wear Limit	27.0 mm (1.06 in)
Mica Undercut	0.7 mm (0.028 in)
Starter Relay:	
Model/Manufacturer	A104-128/HITACHI
Amperage Rating	100A
Horn:	
Type/Quantity	Plane type/1 pc.
Model/Manufacturer	MF12/NIKKO
Maximum Amperage	1.5A

Model	FZR400SP
Flasher Relay (Relay Assembly):	
Type	Condenser type
Model/Manufacturer	FZ230SD/NIPPON DENSO
Self-Canceling Device	No
Flasher Frequency	60 ~ 120 cyl/min
Wattage	15W × 4 + 3.4W
Starting Circuit Cut-Off Relay:	
Model/Manufacturer	3EN/OMRON
Coil/Winding Resistance	202 ~ 247Ω
Diode	Yes
Electric Fan:	
Model/Manufacturer	NA-AL81/NIPPON DENSO
Thermostat Switch:	
Model/Manufacturer	2EL/N THERMOSTAT
Function Temperature	95°C (203°F): ON
	80.5 ~ 83.5°C (177 ~ 182°F): OFF
Thermo Unit:	
Model/Manufacturer	11H/NIPPON SEIKI
Coil Winding Resistance	153.9Ω at 50°C (122°F)
	47.5 ~ 52.8Ω at 80°C (176°F)
	26.2 ~ 29.3Ω at 100°C (212°F)
	16.1Ω at 120°C (248°F)
Circuit Breaker:	
Type	Fuse
Amperage for Individual Circuit × Quantity:	
MAIN	30A/1 pc.
HEAD	20A/1 pc.
IGNITION	10A/1 pc
SIGNAL	10A/1 pc
FAN	10A/1 pc.
RESERVE	30A/1 pc., 20A/1 pc., 10A/1 pc.

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 thred diameter

DEFINITION OF UNITS

Unit	Read	Definition	Measure
mm	millimeter	10⁻³ meter	Length
cm	centimeter	10⁻² meter	Length
kg	kilogram	10³ gram	Weight
N	Newton	1 kg · m/sec²	Force
Nm	Newton meter	N · m	Torque
m-kg	Meter kilogram	m · kg	Torque
Pa	Pascal	N/m²	Pressure
N/mm	Newton per millimeter	N/mm	Spring rate
L	Liter		Volume or capacity
cm³	Cubic centimeter		
r/min	Revolutions per minute		Engine speed

LUBRICATION POINT AND GRADE OF LUBRICANT

ENGINE

Lubrication Point	Lubricant Type
Oil seal lips	
O-ring	
Bearing	
Piston surface	
Piston pin	
Connecting rod (Big and small end)	
Connecting rod bolt	
Crankshaft journal	
Camshaft cam lobe/journal	
Valve stem (IN. EX.)	
Valve stem end (IN. EX.)	
Water pump impeller shaft	
Oil pump rotor (Inner/outer) shaft	
Cylinder head (Bolt thread)	
Vavle lifter outside	
Camshaft cap (Bolt thread)	
Cylinder sleeve (O-ring)	Silicon grease
Starter idler gear shaft	
Push lever assembly	
Transmission gear (Wheel/pinion)	
Axle (Main/drive)	
Shift cam	
Shift fork/guide bar	
Shift shaft assembly	
Shift boss (Inner)	
Matching surface (Cylinder head and cylinder head cover)	Yamaha Bond No. 1215
Crankcase matching surface	Yamaha Bond No. 1215

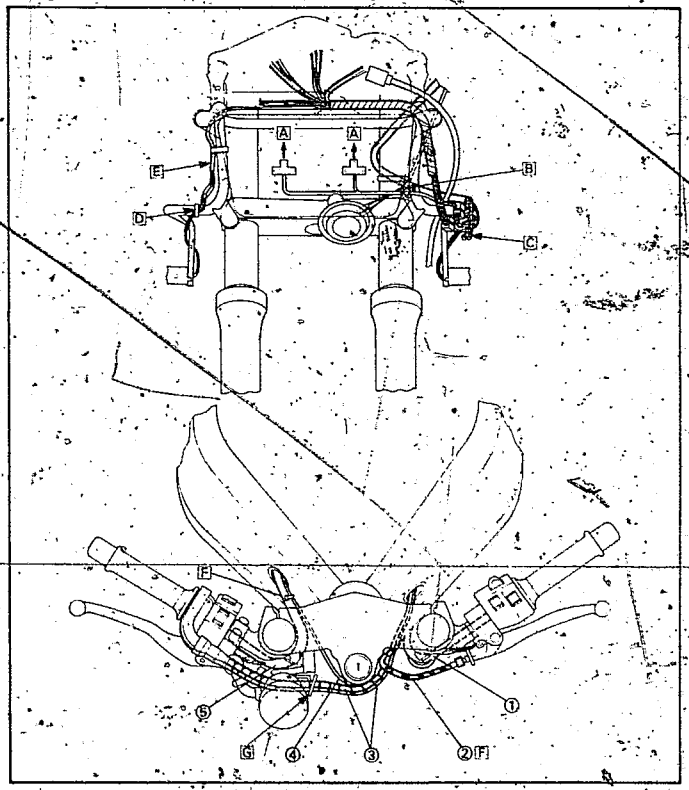
CHASSIS

Lubrication Point	Lubricant Type
Gear unit (Speedometer)	SE
Front wheel oil seal lips	SE
Rear wheel oil seal lips	SE
Bush (Swingarm) and thrust cover	SE
Oil seal lips (Swingarm) and bearing	SE
Pivot shaft (Swingarm)	SE
Bearing (Relay arm and rear shock absorber)	SE
Bearing (Relay arm and frame)	SE
Bearing (Relay arm and connecting rod)	SE
Bearing (Connecting rod and swingarm)	SE
Shift pedal shaft	SE
Bearing (Steering head)	SE
Tube guide (Throttle grip) inner surface	SE
Brake lever, sliding surface	SE
Clutch lever, sliding surface	SE
Clutch cable end	SE
Side stand bolt, sliding surface	SE
Swingarm	SE
Relay arm	SE
Brake pedal and rear master cylinder	SE

CABLE ROUTING

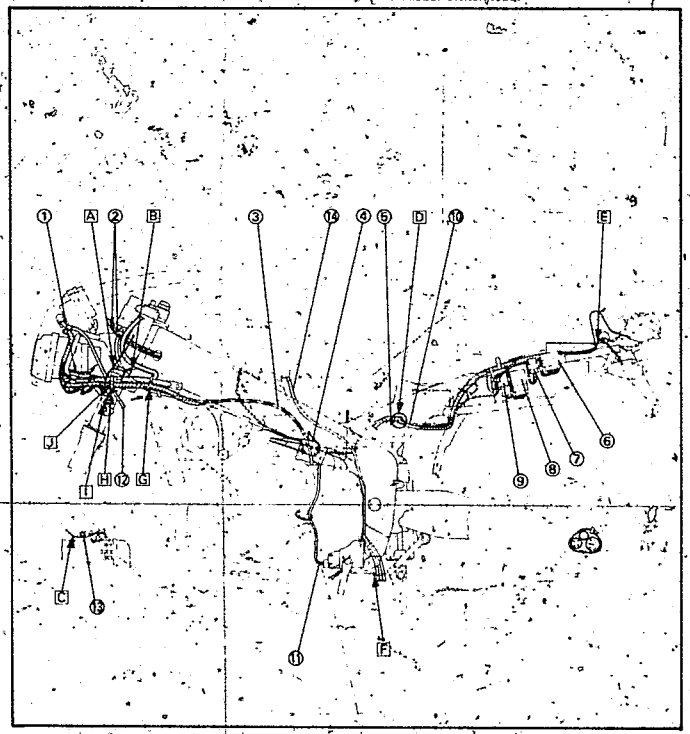
① Handlebar switch lead (left)
② Clutch cable
③ Throttle cable
④ Main switch lead
⑤ Handlebar switch lead (right)

[A] To headlight.
[B] To horn.
[C] To front flasher light (left).
[D] Clamp the flasher light lead.
[E] To front flasher light (right).
[F] Through inside of throttle cable to under the frame.
[G] Through the throttle cables.



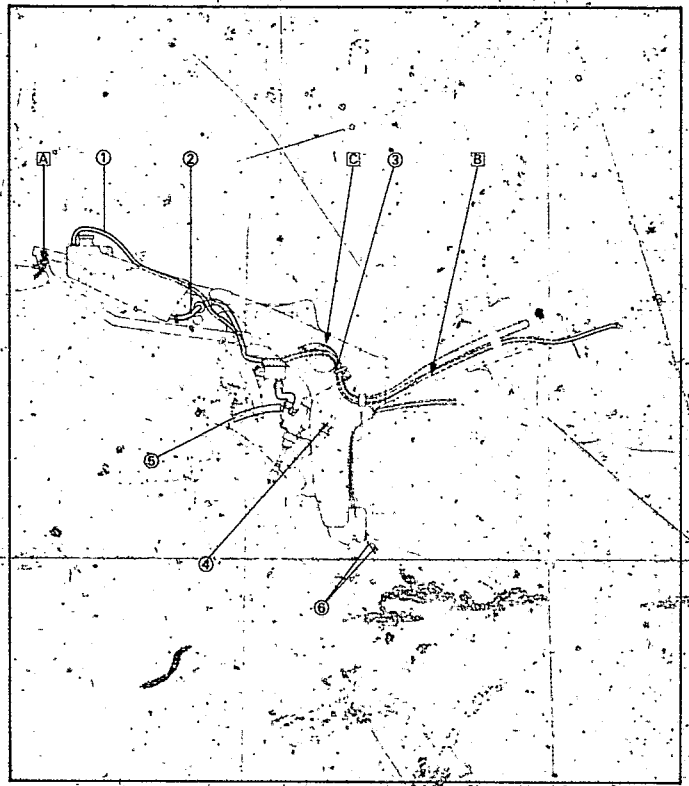
① Headlight lead
② Throttle cable
③ Clutch cable
④ Starter
⑤ Cross tube
⑥ Fuel box
⑦ Main fuse
⑧ Relay
⑨ Flasher relay
⑩ EX-UP lead
⑪ Sidestand switch lead
⑫ Speedometer cable
⑬ Air cleaner drain hose

Ⓐ Clamp the horn lead.
Ⓑ Connect the fuel tank reserve switch.
Ⓒ Through to clutch cable over the cable guide.
Ⓓ Through to the main harness, radiator reservoir hose, over flow hose, ground lead, EX-UP lead and starter motor (+) lead over the cross tube.
Ⓔ Clamp the flasher lead and tail light lead.
Ⓕ Clamp the air filter breather hose, fuel tank breather hose, and over flow hose.
Ⓖ Clamp the main harness and handlebar switch lead (left).
Ⓗ Through the guide.
Ⓘ Through the flasher leads (left and right) under the bracket hole.
Ⓙ Clamp the flasher lead, main harness and handlebar switch lead.

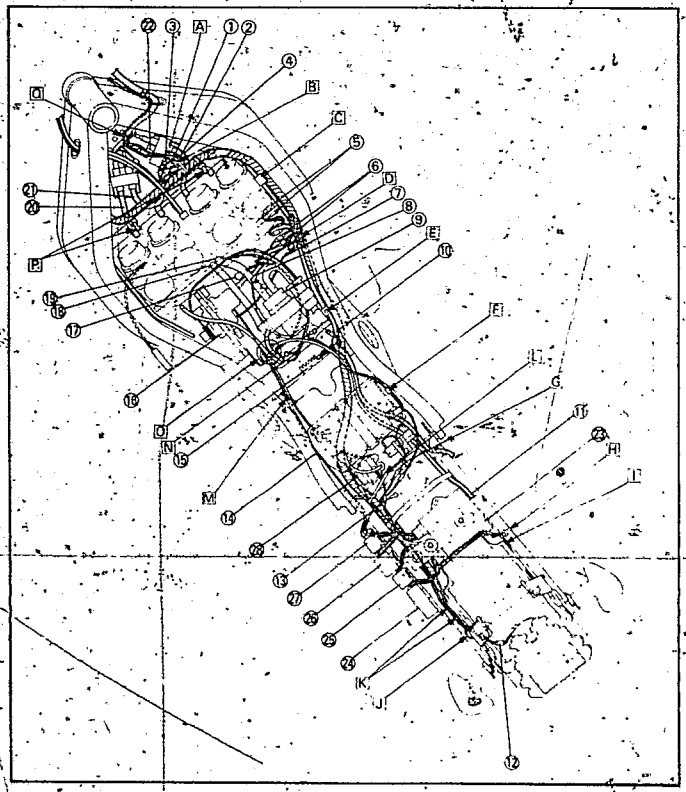


① Reservoir tank over flow hose
② Reservoir hose
③ Brake switch lead
④ Rear brake switch
⑤ Brake hose
⑥ EX-UP cable

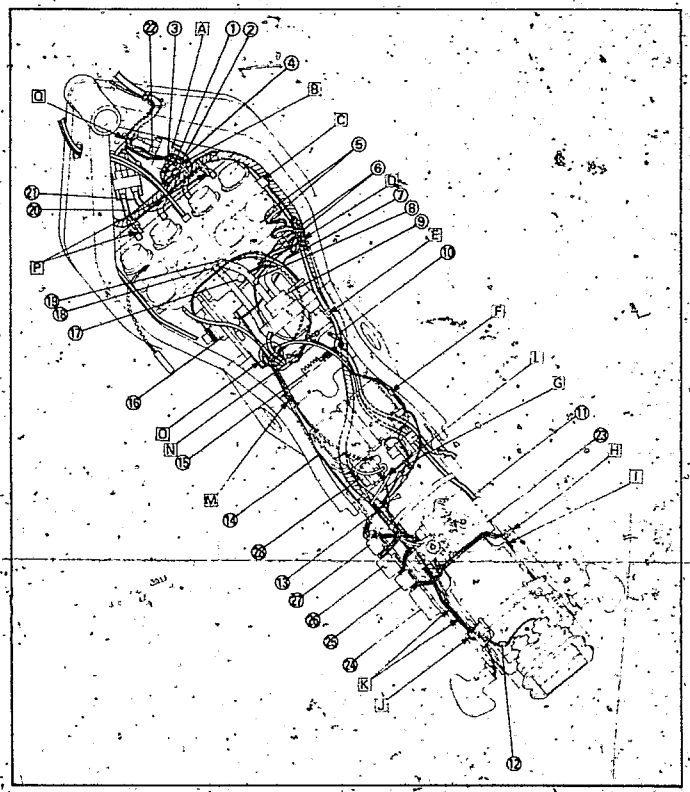
Ⓐ Clamp the flasher lead (right).
Ⓑ Through the reservoir hose inside of tank rail.
Ⓒ Clamp the brake switch leads and main harness.



① Main switch coupler (red)
② Handlebar switch coupler (white)
③ High tension cord #2
④ High tension cord #3
⑤ Thermo switch/Thermo unit
⑥ AC magneto coupler
⑦ Sidestand lead
⑧ Fuel pump lead
⑨ Fuel pump
⑩ Rear brake switch coupler
⑪ Over flow hose
⑫ Tail light coupler
⑬ EX-UP test terminal
⑭ EX-UP lead
⑮ Regulator
⑯ EX-UP motor
⑰ Starter motor ⊕ lead
⑱ Air filter breather hose
⑲ Fuel hose (to carburetor)
⑳ High tension cord #1
㉑ High tension cord #4
㉒ Ignition coil
㉓ Ignitor unit
㉔ Fuse box
㉕ Main fuse
㉖ Relay
㉗ Flasher relay
㉘ Starter relay



Ⓐ To fan.
Ⓑ Clamp the handlebar lead (right), main switch lead, fan lead and main harness.
Ⓒ Clamp the main harness and radiator reservoir hose.
Ⓓ Clamp the main harness, sidestand lead, AC magneto lead, thermo switch lead and fuel pump lead.
Ⓔ Clamp the main harness and radiator reservoir hose.
Ⓕ Clamp the ground lead.
Ⓖ Clamp the ground lead and resister lead
Ⓗ Clamp the flasher lead
Ⓘ To the rear flasher light (right).
Ⓙ Clamp the flasher lead and tail light lead.
Ⓚ To the rear flasher light (left).
Ⓛ Clamp the main harness and starter lead.
Ⓜ Clamp the EX-UP lead and starter motor lead.
Ⓝ Pass through the EX-UP cables
Ⓞ Clamp the air filter hose breather hose over flow hose, EX-UP lead and starter motor lead
Ⓟ Clamp the main harness to the frame.
Ⓠ Clamp the main switch lead and handlebar switch lead (right).



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CHAPTER 3.
PERIODIC INSPECTION AND ADJUSTMENT

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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/LUBRICATION INTERVALS

Unit: km (miles)

ITEM	REMARKS	BREAK-IN 1,000 (600)	EVERY 6,000 (4,000) or 6 months	EVERY 12,000 (8,000) or *12 months
Valve(s)*	Check valve clearance. Adjust if necessary	EVERY 24,000 (16,000)		
Spark plug(s)	Check condition. Clean or replace if necessary.		○	○
Air filter	Clean. Replace if necessary		○	○
Carburetor*	Check idle speed/synchronization/starter operation. Adjust if necessary	○	○	○
Fuel line*	Check fuel hose and vacuum pipe for cracks or damage. Replace if necessary		○	○
Fuel filter*	Check condition. Replace if necessary			○
Engine oil	Replace. (Warm engine before draining oil)	○	○	○
Engine oil filter*	Replace.			○
Brake*	Check operation/fluid leakage/See NOTE Correct if necessary		○	○
Clutch	Check operation. Adjust if necessary		○	○
Swingarm pivot*	Check swingarm assembly for looseness. Correct if necessary. Moderately repack every 24,000 (16,000) or 24 months ***			○
Rear suspension link pivots*	Check operation. Apply grease lightly every 24,000 (16,000) or 24 months.***			○
Wheels*	Check balance/damage/runout Repair if necessary		○	○
Wheel bearings*	Check bearings assembly for loseness/damage. Replace if damaged		○	○
Steering bearings*	Check bearings assembly for looseness Correct if necessary. Moderately repack every 24,000 (16,000) or 24 months.**	○		○
Front forks*	Check operation/oil leakage Repair if necessary	○	○	○
Rear shock absorber*	Check operation/oil leakage Repair if necessary.		○	○
Cooling system	Check coolant leakage. Repair if necessary Replace coolant every 24,000 (16,000) or 24 months		○	○
Drive chain	Check chain slack/alignment. Adjust if necessary. Clean and lube	EVERY 500 (300)		
Fittings/Fasteners*	Check all chassis fittings and fasteners. Correct if necessary		○	○
Sidestand	Check operation. Repair if necessary		○	○
Sidestand switch*	Check operation Clean or replace if necessary.		○	○

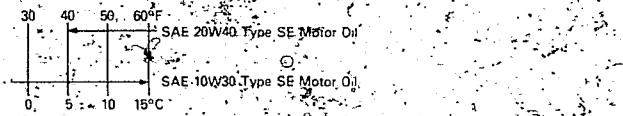
* It is recommended that these items be serviced by a Yamaha dealer
** Lightweight lithium-soap base grease.
*** Molybdenum disulfied grease

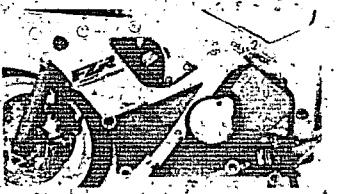
NOTE:

Brake system:

1. When disassembling the master cylinder or caliper cylinder, replace the brake fluid. Normally check the brake fluid level and add the fluid as required.
2. We recommended that, on the inner parts of the master cylinder and caliper cylinder, replace the oil seals every two years.
3. We recommended that replace the brake hoses every four years, or if cracked or damaged

Engine oil.





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COWLING

REMOVAL

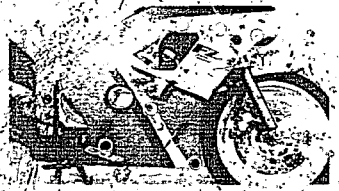
Lower cowl

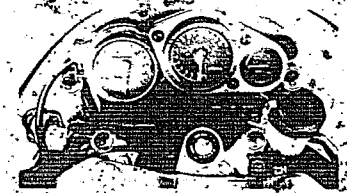
1. Remove
   - Covers (left and right) 1

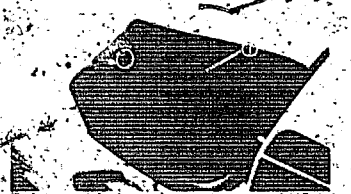
NOTE:
When remove the left cover, disconnect the fuel reserve switch 2 coupler.

2. Remove
   - Front flashier light (left)

3. Removes
   - Speedometer cable 1
   - Lower cowl (left) 2







4. Remove
   - Front flashier light (right)
   - Lower cowl (right) 1
   - Inner panel 2

Upper cowl

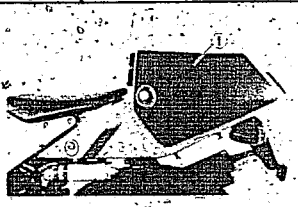
1. Remove
   - Rear view mirrors (left and right) 1

2. Remove
   - Upper cowl 1

3. Disconnect
   - Headlight coupler 1
   - Headlight unit 2

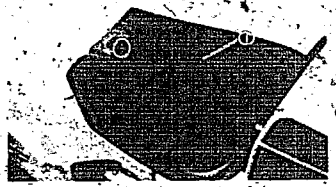
Tail cover

1. Remove
   - Seat 1

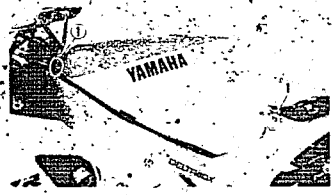


2. Remove:
- Tail cover 1

NOTE:
Before remove the tail cover, disconnect the tail/brake coupler



Fuel tank
1. Remove
- Seat

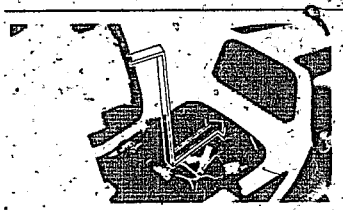


2. Remove:
- Fuel tank installing bolts 1

3. Turn the fuel cock "OFF"

4. Disconnect:
- Breather hose 1
- Fuel hose 2
- Fuel sender coupler 3

5. Remove:
- Fuel tank



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INSTALLATION
Reverse the "REMOVAL" procedure. Note the following points.
1. Install:
- Seat

NOTE:
When installing the seat, insert the lobe on the rear into the stay on the frame.

2. Install:
- Flasher lights

NOTE:
Install the flasher light having a chocolate color lead on the left side and install the flaser light having a dark green color lead on the right side.

(B53200)

ENGINE

VALVE CLEARANCE ADJUSTMENT

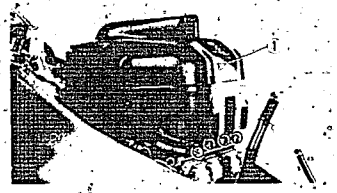
NOTE:

- The valve clearance should be adjusted when the engine is cool to the touch.
- The piston must be at Top Dead Center (TDC) on compression stroke to check or adjust the valve clearance.

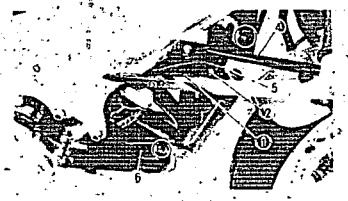
1. Remove:
   - Lower cowl
   - Fuel tank

   Refer to the "COWLING" section.

2. Drain the coolant.
   Refer to the "COOLANT REPLACEMENT" section.

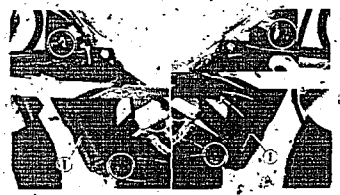


3. Remove:
   - Air filter case 1

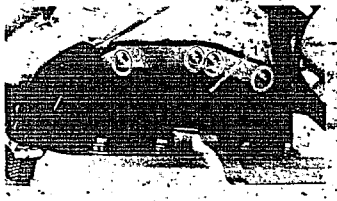


4. Remove:
   - Radiator hose 1
     (Radiator-Thermostat housing)
   - Hose 2
     (Radiator-Joint)
   - Radiator hose 3
     (Radiator-Water pump cover)
   - Reserve tank hose 4
   - Hose 5
     (Radiator-Oil filter)

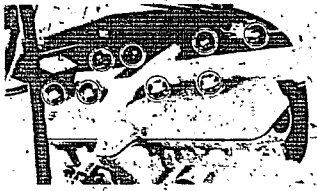
5. Remove:
   - Fan motor coupler 1



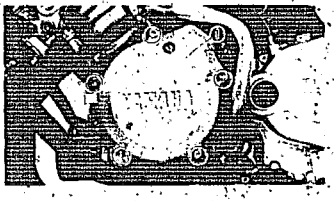
6. Remove:
   - Radiator 1



7. Remove:
   - Cover 1
   - Plug cap



8. Remove:
   - Cylinder head cover 1

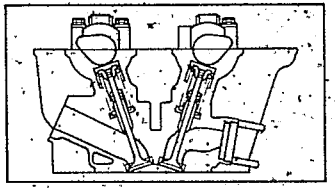


9. Remove:
   - Flywheel magneto cover 1

10. Check:
- Valve clearance
  Out of Specification → Adjust

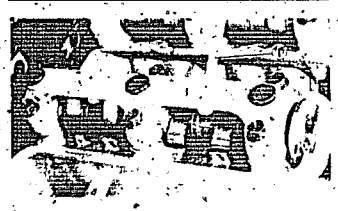
Valve clearance (cold):	
Intake valve	0.11 ~ 0.20 mm (0.0043 ~ 0.0079 in)
Exhaust valve	0.21 ~ 0.30 mm (0.0083 ~ 0.0118 in)

Checking steps:
- Turn the crankshaft counterclockwise with a wrench
- Align the "I" mark with the crankcase matching surface - 1 when #1 piston is at TDC on compression stroke.



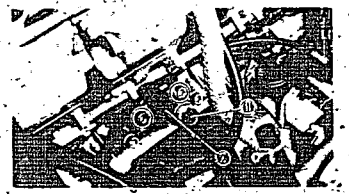
- Turn the crankshaft 180 degrees counterclockwise from #1 cylinder TDC on compression stroke.

NOTE:
TDC on compression stroke can be found when the cam lobes are opposite each other as shown.



- Measure the valve clearance by using a feeler gauge - 1.

NOTE:
- Record the measured reading if the clearance is incorrect.
- Measure valve clearance in the following sequence



Measuring sequence:
#1 → #2 → #4 → #3

11. Remove:
- Camchain tensioner bolt - 1
- Camchain tensioner - 2

12. Remove:
- Chain guide (exhaust) - 1
- Chain guide (upper) - 2
- Camshaft caps - 3
- Camshafts

NOTE:
- Refer to "ENGINE DISASSEMBLY-CYLINDER HEAD,CYLINDER AND PISTON" section.
- Fasten the wire to the cam chain to prevent it from falling into the crankcase

13. Adjust:
- Valve clearance

Adjustment steps:
- Remove the valve lifter - 1 and pad - 2 by using the valve lapper - 3

Valve lapper:	P/N 90890-04101

NOTE:
- Place a piece of rag in the cam chain room to prevent the pad from falling into the crankcase.
- Remove the rag after adjustment

- Select the proper valve adjusting pad from the following chart.

INTAKE

B MEASURED CLEARANCE	A INSTALLED PAD NUMBER																								
	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
0.00 ~ 0.02				120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225
0.03 ~ 0.07			120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230
0.08 ~ 0.10		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235
0.11 ~ 0.20	C RECOMMENDED CLEARANCE																								
0.21 ~ 0.22	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	
0.23 ~ 0.27	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240		
0.28 ~ 0.32	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240			
0.33 ~ 0.37	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240				
0.38 ~ 0.42	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240					
0.43 ~ 0.47	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240						
0.48 ~ 0.52	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240							
0.53 ~ 0.57	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240								
0.58 ~ 0.62	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240									
0.63 ~ 0.67	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240										
0.68 ~ 0.72	175	180	185	190	195	200	205	210	215	220	225	230	235	240											
0.73 ~ 0.77	180	185	190	195	200	205	210	215	220	225	230	235	240												
0.78 ~ 0.82	185	190	195	200	205	210	215	220	225	230	235	240													
0.83 ~ 0.87	190	195	200	205	210	215	220	225	230	235	240														
0.88 ~ 0.92	195	200	205	210	215	220	225	230	235	240															
0.93 ~ 0.97	200	205	210	215	220	225	230	235	240																
0.98 ~ 1.02	205	210	215	220	225	230	235	240																	
1.03 ~ 1.07	210	215	220	225	230	235	240																		
1.08 ~ 1.12	215	220	225	230	235	240																			
1.13 ~ 1.17	220	225	230	235	240																				
1.18 ~ 1.22	225	230	235	240																					
1.23 ~ 1.27	230	235	240																						
1.28 ~ 1.32	235	240																							
1.33 ~ 1.37	240																								

EXAMPLE.

VALVE CLEARANCE (cold)

0.11 ~ 0.20 mm (0.004 ~ 0.008 in)

Installed is 148 (Rounded off number is 150)

Measured clearance is 0.24 mm (0.009 in)

Replace 148 pad with 160 pad

EXHAUST

B MEASURED CLEARANCE	A INSTALLED PAD NUMBER																								
	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
0.00 ~ 0.02						120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215
0.03 ~ 0.07					120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220
0.08 ~ 0.12				120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225
0.13 ~ 0.17			120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230
0.18 ~ 0.20		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235
0.21 ~ 0.30	C RECOMMENDED CLEARANCE																								
0.31 ~ 0.32	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	
0.33 ~ 0.37	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240		
0.38 ~ 0.42	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240			
0.43 ~ 0.47	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240				
0.48 ~ 0.52	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240					
0.53 ~ 0.57	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240						
0.58 ~ 0.62	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240							
0.63 ~ 0.67	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240								
0.68 ~ 0.72	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240									
0.73 ~ 0.77	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240										
0.78 ~ 0.82	175	180	185	190	195	200	205	210	215	220	225	230	235	240											
0.83 ~ 0.87	180	185	190	195	200	205	210	215	220	225	230	235	240												
0.88 ~ 0.93	185	190	195	200	205	210	215	220	225	230	235	240													
0.93 ~ 0.97	190	195	200	205	210	215	220	225	230	235	240														
0.98 ~ 1.02	195	200	205	210	215	220	225	230	235	240															
1.03 ~ 1.07	200	205	210	215	220	225	230	235	240																
1.08 ~ 1.12	205	210	215	220	225	230	235	240																	
1.13 ~ 1.17	210	215	220	225	230	235	240																		
1.18 ~ 1.22	215	220	225	230	235	240																			
1.23 ~ 1.27	220	225	230	235	240																				
1.28 ~ 1.32	225	230	235	240																					
1.33 ~ 1.37	230	235	240																						
1.38 ~ 1.42	235	240																							
1.43 ~ 1.47	240																								

EXAMPLE:

VALVE CLEARANCE (cold)

0.21 ~ 0.30 mm (0.008 ~ 0.012 in)

Installed is 175

Measured clearance is 0.35 mm (0.014 in)

Replace 175 pad with 185 pad

Pad range	Pad availability: 25 increments
No. 120 1.20 mm (0.047 in)	Pads are stepped in 0.05 mm (0.002 in) increments
No. 240 1.200 mm (0.094 in)	

NOTE:

Thickness of each pad is marked on the pad face that contacts the valve lifter (not the cam).

- Round off the hundredths digit of the original pad number to the nearest 0.05 mm increment.

Hundredths digit → Rounded valve
0 or 2 → 0
5 → (NOT ROUNDED OFF)
8 → 10

EXAMPLE:

Original pad number 173 (1.73 mm)

Rounded off digit 175

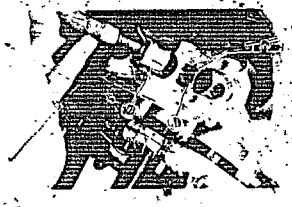
NOTE:

Pads can only be selected in 0.05 mm (0.002 in) increments.

- Locate the previously installed pad number on the chart. Locate the measured valve clearance on the chart. The point where these coordinates intersect is the new pad number.

NOTE:

Use the new pad number as a guide only. The number must be verified.

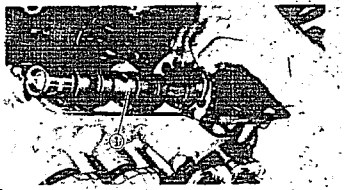


- Install the new pad and valve lifter.

NOTE:

- Apply molybdenum disulfide grease to the pad.

• Valve lifter must be rotated smoothly by a finger.



14. Install:
• Camshafts
• Timing chain
• Camshaft caps
• Chain guide (exhaust side)
• Camchain chain tensioner
• Chain guide (upper)

	Bolt (camshaft caps, camchain tensioner, chain guide): 10 Nm (1.0 m · kg, 7.2 ft · lb) **Cap bolt (camchain tensioner): 15 Nm (1.5 m · kg, 11 ft · lb)**

NOTE:
• Install the exhaust camshaft first
• Align the matching marks.
• Refer to "ENGINE ASSEMBLY AND ADJUSTMENT CYLINDER HEAD, CYLINDER AND PISTONS" section.
• Apply molybdenum disulfide grease to the camshaft caps
• Tighten the bolts (camshaft cap) in a crisscross pattern from inside.
• Turn the crankshaft counterclockwise several turns for the installed parts to settle into the correct position.

CAUTION:
The bolts (camshaft cap) must be tightened evenly; or damage to the cylinder head, camshaft caps and cam will be result.

15. Measure
• Valve clearance

Verification steps:
• Follow the valve clearance measurement steps.
• If the clearance is incorrect, repeat all adjustment steps until the proper clearance is obtained.

16. Install:
Reverse removal steps.
• Cylinder head cover
• Radiator assembly

	Bolt (cylinder head cover): 10 Nm (1.0 m · kg, 7.2 ft · lb)

17. Install
• Air cleaner case
• Fuel tank
• Seat
• Lower cowl
Refer to the "COWLING" section.

CARBURETOR SYNCHRONIZATION

NOTE:
Valve clearance should be adjusted properly before synchronizing the carburetors.

CARBURETOR SYNCHRONIZATION

INSP ADJ

1. Place the motorcycle on a level surface.

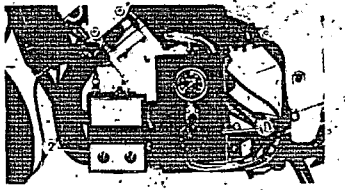
NOTE:
Place the motorcycle on its centerstand if a centerstand is equipped.
If not, place a suitable stand under the motorcycle.

2. Start the engine and let it warm up for several minutes.
3. Remove:
- Fuel tank
  Refer to the "COWLING" section.
- Screws 1

4. Install:
- Attachment 1

	Attachment: P/N 90890-03060

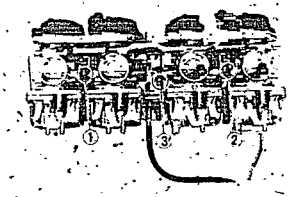
5. Attach:
- Inductive tachometer 1 (to #1 spark plug lead)
- Vacuum gauge 2



	Inductive tachometer: P/No. 90890-03113 **Vacuum gauge:** P/No. 90890-03094

6. Check:
- Engine idling speed
  Out of specification → Adjust.
  Refer to "ENGINE IDLING SPEED ADJUSTMENT" section.

	Engine idling speed: 1,250 – 1,350 r/min



7. Adjust:
- Carburetor synchronization

Adjustment steps:
- Synchronize carburetor No.1 to carburetor No.2 by turning synchronizing screw 1 until both gauges read the same.
- Race the engine for less than a second, two or three times and check the synchronization again.
- Repeat the above steps to synchronize carburetor No.4 to carburetor No.3 by turning synchronizing screw 2 until both gauges read the same.
- Repeat the same steps to synchronize carburetor No.2 to carburetor No.3 by turning synchronizing screw 3 until both gauges read the same.

Vacuum pressure at idle speed:
30.59 – 35.91 kPa (230 – 270 mm Hg, 9.04 – 10.64 in Hg)

NOTE:
The difference between both carburetors should be 1.33 kPa (10 mm Hg, 0.4 in Hg) or less.

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

9. Stop the engine and detach the measuring equipment and install the screws 1.

10. Adjust:
- Throttle cable free play
Refer to "THROTTLE CABLE FREE PLAY ADJUSTMENT" section.

Free play
3 ~ 7 mm (0.12 ~ 0.28 in)

11. Install:
- Fuel tank
Refer to the "COWLING" section.

YB532003
TIMING CHAIN ADJUSTMENT
Adjustment free.

YB532004
IDLING SPEED ADJUSTMENT
NOTE:
The carburetor synchronization should be adjusted properly before adjusting the idling speed.

1. Start the engine and let it warm up for several minutes.

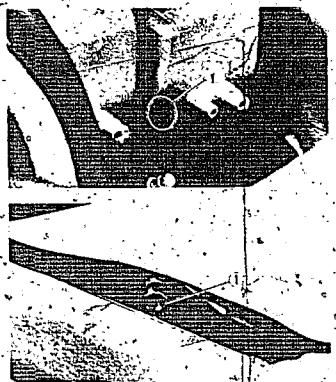
2. Remove:
- Fuel tank
Refer to the "COWLING" section.

3. Attach:
- Inductive tachometer 1 (to the spark plug lead).

Inductive tachometer:
P/No. 90890-03113

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

Engine idling speed:
1,250 ~ 1,350 r/min



5. Adjust:
- Engine idling speed

Adjustment steps:
- Turn the Pilot air screw 1 in until it is lightly seated.
- Turn out the pilot air screw for the specified number of turns.

Pilot air screw: 2-1/2 turns out

- Turn the throttle stop screw 1 in or out until specified idling speed is obtained.

Turning in → Idling speed increased.
Turning out → Idling speed decreased.

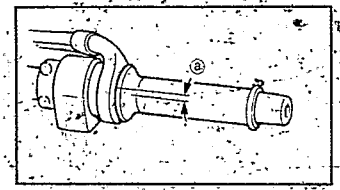
6. Adjust:
- Throttle cable free play
Refer to "THROTTLE CABLE FREE PLAY ADJUSTMENT" section.

Free play:
3 ~ 7 mm (0.12 ~ 0.28 in)

7. Install:
• Fuel tank

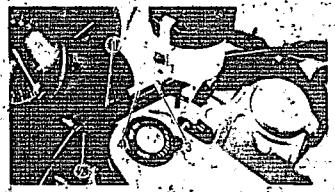
YB532005
THROTTLE CABLE ADJUSTMENT

NOTE:
Engine idling speed and carburetor synchronization should be adjusted properly before adjusting the throttle cable free play.



1. Check:
• Throttle cable free play ⓐ
Out of specification → Adjust.

Free play:
3 ~ 7 mm (0.12 ~ 0.28 in)
At throttle grip end



2. Adjust:
• Throttle cable free play

Adjustment steps:

NOTE:
When accelerating, throttle cable #1 ① is pulled and throttle cable #2 ② is pushed.

• Loosen the locknut ③ on throttle cable #1.
• Turn the adjuster ④ in or out until the specified free play is obtained.

Turning in → Free play is increased.
Turning out → Free play is decreased.

• Tighten the locknuts.

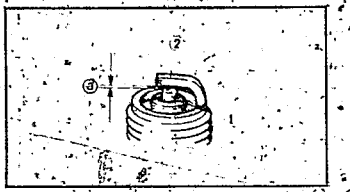
⚠ WARNING
After adjusting, turn the handlebar to the right and left, making sure that the engine idling speed does not change.

YB532006
SPARK PLUG INSPECTION

1. Remove:
• Spark plug cap
• Spark plug

2. Inspect:
• Spark plug type
Incorrect→Replace.

Standard spark plug:
CR8EA(N.G.K.) or CR9EA(N.G.K.)
U24ESR-N(N.D.) or U27ESR-N(N.D.)



3. Inspect:
• Electrode ①
Wear/Damage→Replace.
• Insulator ②
Abnormal color→Replace.
Normal color is a medium-to-light tan color.

4. Clean the spark plug with a spark plug cleaner or wire brush.

5. Measure:
• Plug gap ⓐ
Use a Wire Gauge or Feeler Gauge.
Out of specification→Re-gap.

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

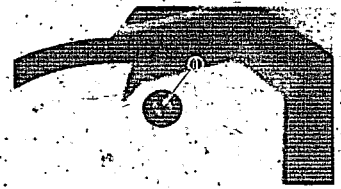
6. Tighten:
• Spark plug

	Spark plug: 12.5 Nm (1.25 m • kg, 9.0 ft.lb)

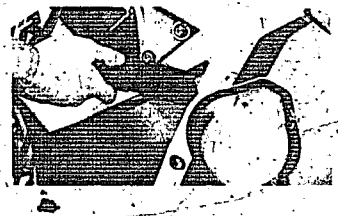
NOTE:
• Before installing a spark plug, clean the gasket surface and plug surface.

7. Install:
• Spark plug cap

YB532007
IGNITION TIMING CHECK
NOTE:
Carburetor synchronization, engine idling speed and throttle cable free play should be adjusted properly before checking the ignition timing.



1. Remove:
• Timing plug ①

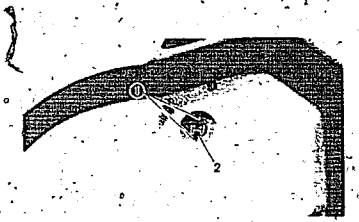


2. Attach:
• Timing light and inductive tachometer
(To the spark plug lead for #1 cylinder)

	Timing light: P/N 90890-03141 Inductive tachometer: P/N 90890-03113

3. Check:
• Ignition timing

Checking steps:
● Warm up the engine and keep it at the specified speed.



	Engine speed: 1,250~1,350 r/min.

● Visually check the stationary pointer ① to verify it is within the required firing range ② indicated on the flywheel.
Incorrect firing range→Check flywheel and/or pickup assembly.

4. Install:
• Timing plug

YB532008
COMPRESSION PRESSURE MEASUREMENT
NOTE:
Insufficient compression pressure will result in performance loss.

1. Remove:
• Lower cowl
Refer to the "COWLING" section.

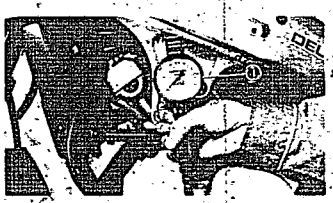
2. Check:
• Valve clearance
Out of specification→Adjust.
Refer to the "VALVE CLEARANCE ADJUSTMENT" section.

COMPRESSION PRESSURE MEASUREMENT INSP ADJ

3. Start the engine and let it warm up for several minutes.

4. Stop the engine.

5. Remove:
- Spark plug



6. Attach:
- Compression gauge ①

	Compression gauge: P/N. 90890-03081

7. Measure
- Compression pressure

Above the maximum pressure:
Inspect cylinder head, valve surfaces, and piston crown for carbon deposits.
Below the minimum pressure:
Squirt a few drops of oil into affected cylinder and measure again.
- Follow the table below.

Compression pressure (With oil applied into cylinder)	
Reading	Diagnosis
Higher than without oil	Worn or damaged pistons
Same as without oil	Defective ring(s), valves, cylinder head gasket or piston is possible.

Compression pressure (at sea level):
Standard:
1,100 kPa (11.0 kg/cm², 156 psi)
Minimum:
900 kPa (9.0 Kg/cm², 128 psi)

Measurement steps:

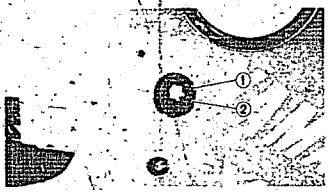
- Crank over the engine with the throttle wide-open until the compression reading on the gauge stabilizes.

⚠WARNING
When cranking the engine, ground all spark plug leads to prevent sparking.

8. Repeat the previous steps for the other cylinders.

NOTE:
The difference of compression pressure between the highest and lowest cylinder compression readings should be 100 kpa (1 kg/cm², 14 psi) or less.

9. Install:
- Lower cowl



YB532009
ENGINE OIL LEVEL INSPECTION

NOTE:
Position the motorcycle straight up when inspecting the oil level.

1. Place the motorcycle on a level surface.

NOTE:
Place the motorcycle on its centerstand if a centerstand is equipped. If not, place a suitable stand under the motorcycle.

2. Inspect
- Oil level
  Oil level should be between maximum 1 and minimum 2 marks.
  Oil level low → Add oil to proper level.

	Recommended oil: **At 5°C (40°F) or higher:** **SAE 20W40 type SE motor oil** **At 15°C (60°F) or lower:** **SAE 10W30 type SE motor oil**

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.

3. Start the engine and let it warm up for several minutes.

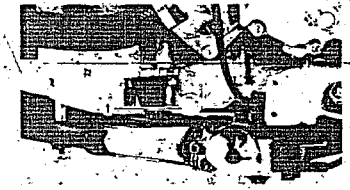
4. Stop the engine and inspect the oil level once again.

NOTE:
Wait a few minutes until the oil settles before inspecting the oil level.

YB532010
ENGINE OIL REPLACEMENT

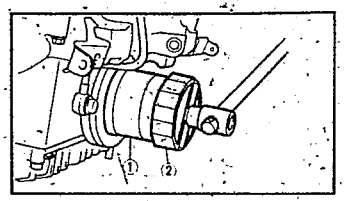
1. Start the engine and let it warm up for several minutes.

2. Stop the engine and place an oil pan under the engine.



3. Remove:
- Lower cowl
Refer to the "COWLING" section.

4. Remove:
- Oil filler plug
- Drain plug 1
Drain the crankcase of its oil.



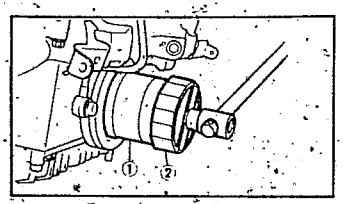
5. If the oil filter is replaced with oil change, remove the following parts and reinstall them.

Replacement steps:
- Remove the oil filter element 1 using the oil filter wrench 2.

	Oil filter wrench: **P/N 90890-01426**

- Apply the engine oil lightly to O-ring of new oil filter.

NOTE:
Make sure the O-ring is positioned properly.



- Install the new oil filter 1 using the oil filter wrench 2.

	Oil filter wrench: **P/N 90890-04126**
	Oil filter: **17 Nm (1.7 m · kg, 12 ft · lb)**

6. Install:
• Drain plug

	Drain plug: 43 Nm (4.3 m · kg, 31 ft · lb)

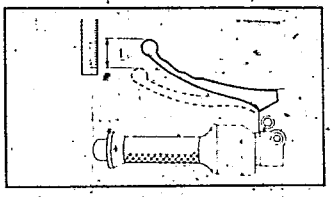
NOTE:
Check the gasket (drain plug). If damaged, replace it with a new one.

7. Fill:
• Engine oil

	Oil quantity: without oil filter change 2.6 L (2.3 Imp.qt, 2.7 US.qt) with oilfilter change 2.9 L (2.6 Imp.qt, 3.1 US.qt)

Refer to the "ENGINE OIL LEVEL INSPECTION" section.

8. Install:
• Lower cowl



YB5J20

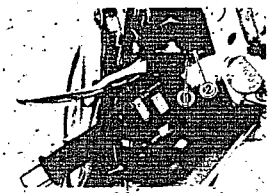
CLUTCH ADJUSTMENT

Cable Free Play Adjustment

1. Check:
• Clutch cable free play ⓐ
Out of specification → Adjust.

	Free play: 10 ~ 15 mm (0.4 ~ 0.6 in) At clutch lever end

2. Adjust:
• Clutch cable free play



Adjustment steps:
• Loosen the locknut(s) 1.
• Turn the adjuster(s) 2 in or out until the specified free play is obtained.

Turning in → Free play is increased.
Turning out → Free play is decreased.

• Tighten the locknut(s).

NOTE:
If specified cable free play cannot be obtained by above steps, follow mechanism adjustment to achieve specified free play

Mechanism Adjustment

1. Remove.
• Lower cowl
Refer to the "COWLING" section.

2. Adjust
• Mechanism free play

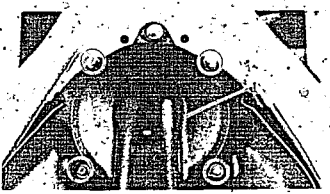
Adjustment steps:
• Loosen the locknut 1.
• Turn in the adjuster 2 until lightly touched.
• Turn out the adjuster 1/4.
• Tighten the locknut.

3. Install:
• Lower cowl

4. Adjust:
• Clutch cable free play

YB532012
AIR FILTER CLEANING

1. Remove:
• Fuel tank
Refer to the "COWLING" section.

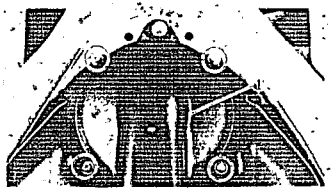


2. Remove:
• Air filter cover 1
• Air filter element

CAUTION:
Never operate the engine with the air filter element removed. Unfiltered air will cause rapid wear of engine parts and possible engine damage. Additionally, operation without the filter element will affect carburetor tuning with subsequent poor performance and possible engine overheating.

3. Inspect:
• Air filter element
Damaged → Replace.

4. Clean:
• Air filter element
Blow out the dust in the element from the outer surface using compressed air.



5. Install:
• Air filter element
• Air filter case cover 1

NOTE:
When installing the element in its case, be sure its sealing surface matches the sealing surface of the case so there is no air leak.

6. Install:
• Fuel tank

YB532013
CARBURETOR JOINT INSPECTION

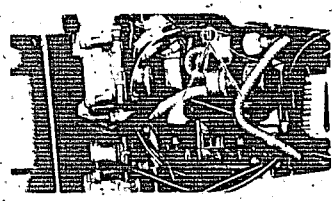
1. Remove
• Fuel tank
Refer to the "COWLING" section.

2. Inspect:
• Carburetor joints 1
Cracks/Damage → Replace.
Refer to the "CHAPTER 6-CARBURETION" section.

3. Install:
• Fuel tank

YB532014
FUEL LINE INSPECTION

1. Remove:
• Fuel tank
Refer to the "COWLING" section



2. Inspect:
• Fuel hose 1
Crack/Damage → Replace.

3. Install:
• Fuel tank

YB532015
EXHAUST SYSTEM INSPECTION

1. Remove:
- Lower cowl

Refer to the "COWLING" section.

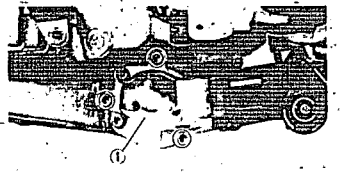
2. Inspect:
- Exhaust pipe(s) ①
- Muffler(s) ②

Cracks/Damage→Replace.
- Gasket(s) ③

Exhaust gas leaks→Replace.

	Bolt (exhaust pipe): 10 Nm (1.0 m · kg, 7.2 ft · lb) **Bolt (muffler):** 20 Nm (2.0 m · kg, 14 ft · lb)

3. Install:
- Lower cowl



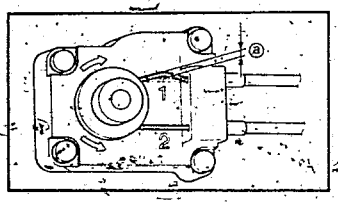
YB532020
EX-UP CABLE

1. Remove:
- Lower cowl

Refer to the "COWLING" section.
- Ex-up valve cover ①

2. Check:
- Ex-up operation

Turn the main switch ON. →
Ex-up valve operated one cycle.



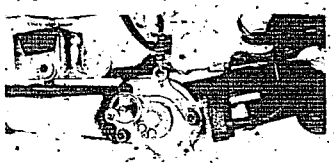
3. Check:
- Ex-up cable free play ⓐ

Out of specification → Adjust

	Ex-up cable free play: 1.5 mm (0.06 in) or less

4. Adjust:
- Ex-up cable free play

Adjusting steps:
- Remove the seat and fuel tank.
- Insert the pin (ϕ4) in the pulley and housing hole.
- Loosen the locknut ①.
- Turn the adjuster ② clockwise.
- Turn the adjuster counterclockwise until become it harder.
- Turn the adjuster 1/4 clockwise.
- Tighten the locknut.
- Remove the pin (ϕ4).
- Install the fuel tank and seat.



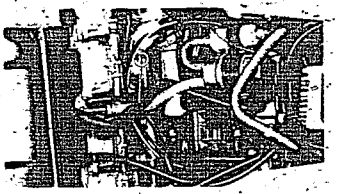
5. Install:
- Ex-up valve cover
- Lower cowl

	Bolt (ex-up valve cover): 10 Nm (1.0 m · kg, 7.2 ft · lb)

YB532016
CRANKCASE BREATHER HOSE INSPECTION

1. Remove:
- Fuel tank

Refer to the "COWLING" section.



2. Inspect:
• Crankcase breather hose ①
Crank/Damage → Replace.

3. Install:
• Fuel tank

EB532017

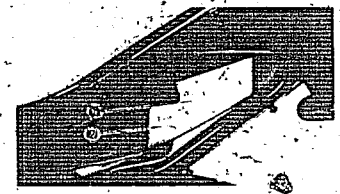
COOLANT LEVEL INSPECTION

NOTE:
Position the motorcycle straight up when inspecting the coolant level.

1. Place the motorcycle on a level surface.

NOTE:
Place the motorcycle on its centerstand if a centerstand is equipped. If not, place a suitable stand under the motorcycle.

2. Remove:
• Tail cover
Refer to the "COWLING" section.



3. Inspect:
• Coolant level
Coolant level should be between maximum ① and minimum ② marks.
Coolant level low →
Add soft water (tap water) to proper level.

CAUTION:
Hard water or salt water is harmful to the engine parts. You may use boiled water or distilled water, if you can't get soft water.

4. Start the engine and let it warm up for several minutes.

5. Stop the engine and inspect the coolant level once again.

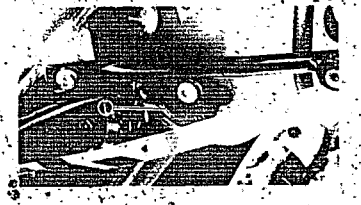
NOTE:
Wait a few minutes until the coolant settles before inspecting the coolant level.

6. Install:
• Tail cover

EB532018

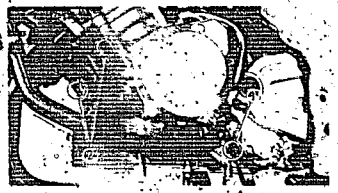
COOLANT REPLACEMENT

1. Remove:
• Lower cowl
Refer to the "COWLING" section.



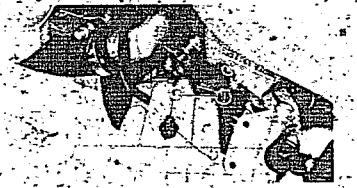
2. Remove:
• Radiator cap

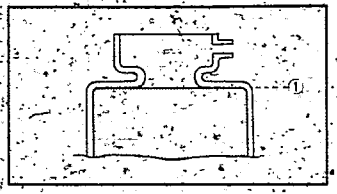
⚠WARNING
Do not remove the radiator cap when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury. When the engine has cooled, open the radiator cap by following this procedure: Place a thick rag or towel over the radiator cap. Slowly rotate the cap counterclockwise to the detente. This allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.



3. Remove:
• Drain bolt ① (water pump cover)
• Drain bolts ② (cylinder)
• Gaskets (drain bolt)
Drain the radiator and engine of its coolant.

4. Inspect:
• Gasket (drain bolt)
Damage → Replace.





5. Install:
- Gaskets ① (drain bolt)
- Drain bolts (water pump cover and cylinder).

	Drain bolt: 8 Nm (0.8 m · kg, 5.8 ft · lb)

6. Fill:
- Radiator
- Engine
(to specified level ①)

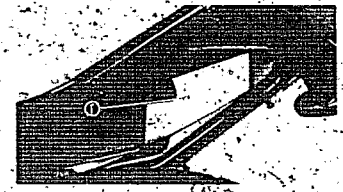
	Recommended coolant: High quality ethylene glycol anti-freeze containing corrosion inhibitors for aluminum engine inhibitors

	Coolant and water (soft water) Mixed ratio: 50%/50% Total amount: 2.18 L (1.9 Imp qt, 2.3 US qt) Reservoir tank capacity: 0.3 L (0.26 Imp qt, 0.32 US qt)

Handling notes of coolant:
The coolant is harmful so it should be handled with special care.

⚠WARNING:
- When coolant splashes in your eye. Thoroughly wash your eye with water and see your doctor.
- When coolant splashes on your clothes. Quickly wash it away with water and then with soap.
- When coolant is swallowed. Quickly make him vomit and take him to a doctor.

CAUTION:
- Hard water or salt water is harmful to the engine parts. Use boiled or distilled water if you can't get soft water.
- Do not use water containing impurities or oil.
- Take care so that coolant does not splash on painted surfaces. If it splashes, wash it away with water.
- Do not mix more than one type of ethylene glycol antifreeze containing corrosion inhibitors for aluminum engines.



7. Install:
- Radiator cap

8. Connect:
- Hose (reservoir tank)

9. Fill:
- Reservoir tank
(to maximum level ①)

10. Start the engine and let it warm up for several minutes.

11. Stop the engine and inspect the level. Refer to the "COOLANT LEVEL INSPECTION" section.

NOTE:
Wait a few minutes until the coolant settles before inspecting the coolant level.

12. Install:
- Lower cowl

YB532019

COOLING SYSTEM INSPECTION

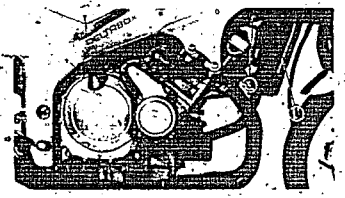
1. Remove:
- Lower cowl

Refer to the "COWLING" section.

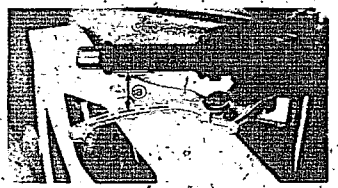
2. Inspect:
- Radiator ①
- Inlet hose ②
- Outlet hose ③

Cracks/Damage → Replace.

Refer to the "COOLING SYSTEM" section in the CHAPTER 5.



3. Install.
- Lower cowl



YB533001

CHASSIS

FRONT BRAKE LEVER POSITION ADJUSTMENT

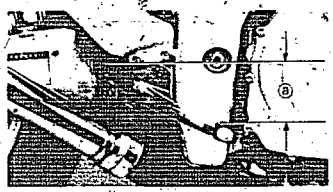
1. Adjust:
- Brake lever position (distance ⓐ from handle grip to front brake lever)

Adjusting steps:
- Turn the adjuster ① while pushing the front brake lever toward until the desired lever position is obtained.

Adjuster position #1	Distance ⓐ is the largest
Adjuster position #4	Distance ⓐ is smallest

⚠ WARNING

After adjusting the front brake lever position (distance), make sure the pin on the brake lever holder is firmly inserted in the hole in the adjuster.



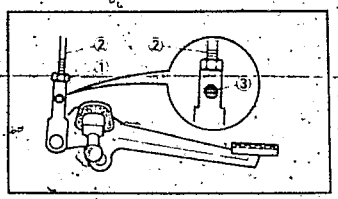
YB533002

REAR BRAKE ADJUSTMENT

1. Check:
- Brake pedal height ⓐ

Out of specification → Adjust.

	Brake pedal height: **50 mm (2.0 in)** **Below top of footrest**



2. Adjust:
- Brake pedal height

Adjustment steps:
- Loosen the locknut(s) ①
- Turn the adjuster(s) ② in or out until the specified pedal height is obtained.

Turning in→Pedal height is lower.
Turning out→Pedal height is upper.

CAUTION:
After adjusting the brake pedal height, visually check the adjuster and through the hole ③ of the joint holder. The adjuster end must appear within this hole.

• Tighten the locknut(s).

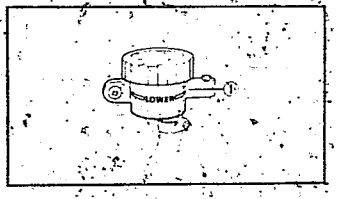
CAUTION:
Make sure that the brake does not drag after adjusting it.

⚠ WARNING
A soft or spongy feeling in the brake pedal can indicate the presence of air in the brake system. This air must be removed by bleeding the brake system before the motorcycle is operated. Air in the system will cause greatly diminished braking capability and can result in loss of control and an accident. Inspect and bleed the system if necessary.

3. Adjust:
• Brake light switch
Refer to the "BRAKE LIGHT SWITCH ADJUSTMENT" section.

YB533003
BRAKE FLUID LEVEL INSPECTION
NOTE:
Position the motorcycle straight up when inspecting the fluid level.

1. Place the motorcycle on a level surface.
NOTE:
Place the motorcycle on its centerstand if a centerstand is equipped. If not, place a suitable stand under the motorcycle.



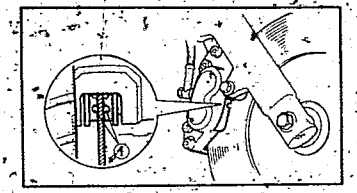
2. Inspect:
• Fluid level
Fluid level is under "LOWER" level line ① →
Fill to proper level.

Recommended fluid: DOT #4 If DOT #4 is not available, DOT #3 can be used.

NOTE:
When inspecting the fluid level of the reservoir at the handlebars, make sure the master cylinder top is horizontally level.

CAUTION:
The fluid may corrode painted surfaces or plastic parts. Always clean up spilled fluid immediately.

⚠ WARNING
• Use only the designated quality fluid. Otherwise, the rubber seals may deteriorate causing leakage and poor brake performance.
• Refill with the same type of fluid. Mixing fluids may result in a harmful chemical reaction leading 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 fluid and may result in vapor lock.



YB533004

BRAKE PAD INSPECTION

1. Activate the brake lever or brake pedal.
2. Inspect:
- Brake pad
  Wear indicator ① nearly contacting brake disc → Replace brake pads as a set.
  Refer to the "BRAKE PAD REPLACEMENT" section in the CHAPTER 7.

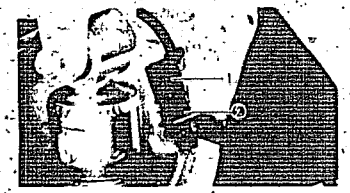
YB533005

BRAKE LIGHT SWITCH ADJUSTMENT

NOTE:

The brake light switch is operated by movement of the brake pedal.
Proper adjustment is achieved when the brake light comes on just before the brake begins to take effect.

1. Check:
- Brake light operating timing
  Incorrect→Adjust.



2. Adjust:
- Brake light operating timing

Adjustment steps:
- Hold the main body ① of the switch with your hand so that it does not rotate, and turn the adjuster in or out ② until the operating timing is correct.

YB533006

AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)

⚠ WARNING

Bleed the brake system if:
- **The system has been disassembled.**
- **A brake hose has been loosened or removed.**
- **The brake fluid is very low.**
- **The brake operation is faulty.**

A loss of braking performance may occur if the brake system is not properly bled.

1. Bleed:
- Brake fluid

Air bleeding steps:
a. Add proper brake fluid to the reservoir.
b. Install the diaphragm. Be careful not to spill any fluid or allow the reservoir to overflow.
c. Connect the clear plastic tube ① tightly to the caliper bleed screw.
d. Place the other end of the tube into a container.
e. Slowly apply the brake lever or pedal several times.
f. Pull the lever in or push down on the pedal. Hold the lever or pedal in position.
g. Loosen the bleed screw and allow the lever or pedal to travel towards its limit.
h. Tighten the bleed screw when the lever or pedal limit has been reached, then release the lever or pedal.

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

i. Repeat steps (e) to (h) until the air bubbles have been removed from the system.

NOTE:

If bleeding is difficult, it may be necessary to let the brake fluid system stabilize for a few hours. Repeat the bleeding procedure when the tiny bubbles in the system have disappeared.

j. Add brake fluid to proper level.

⚠WARNING:
Check the operation of the brake after bleeding the brake system.

YB533007
DRIVE CHAIN SLACK ADJUSTMENT

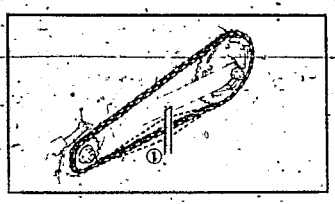
NOTE:
Before checking and/or adjusting, rotate the rear wheel several revolutions and check slack at several points to find the tightest point. Check and/or adjust the chain slack with the rear wheel in this "tightest" position.

CAUTION:
Too little of chain slack will overload the engine and other vital parts. Keep the slack within the specified limits.

⚠WARNING:
Securely support the motorcycle so there is no danger of it falling over.

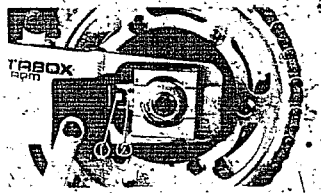
1. Place the motorcycle on a level place and hold it in an upright position.

NOTE:
Both wheels should be on the ground without the rider on it.



2. Check:
- Drive chain slack ⓐ
Out of specification → Adjust.

Drive chain slack:
15~20 mm (0.59~0.79 in)
with both wheels on ground without rider



3. Loosen:
- Locknut ① (rear wheel axle)
- Axle nut ②
- Bolt ③ (brake caliper bracket)

4. Adjust:
- Drive chain slack

Adjustment steps:
- Loosen the locknut(s) ①.
- Turn the adjuster(s) ② in or out until the specified slack is obtained.

Turning in→Slack is increased.
Turning out→Slack is decreased.

NOTE:
Turn each adjuster exactly the same amount to maintain correct axle alignment. (There are marks on each side of swingarm and on each chain puller. Use them to check for proper alignment.)

- Tighten the axle nut to specification while pushing up on the chain to zero slack.

Axle nut:
105 Nm (10.5 m · kg, 75 ft · lb)

- Tighten the locknut(s).

5. Tighten:
- Bolt (brake caliper bracket)
- Locknut (rear wheel axle)

Bolt (brake caliper bracket):
35 Nm (3.5 m · kg, 25 ft · lb)
Locknut (rear wheel axle):
45 Nm (4.5 m · kg, 32 ft · lb)

Y8533008

DRIVE CHAIN LUBRICATION

The chain consists of many parts that work with each other. If the chain is not maintained properly, it will wear out rapidly. Therefore, form the habit of periodically servicing the chain. This service is especially necessary when riding in dusty conditions.
This motorcycle has a drive chain with small rubber O-rings between the chain plates. Steam cleaning, high-pressure washes, and certain solvents can damage these O-rings. Use only kerosene to clean the drive chain. Wipe it dry and thoroughly lubricate it with SAE 30 — 50W motor oil. Do not use any other lubricants on the drive chain. They may contain solvents that could damage the O-rings.

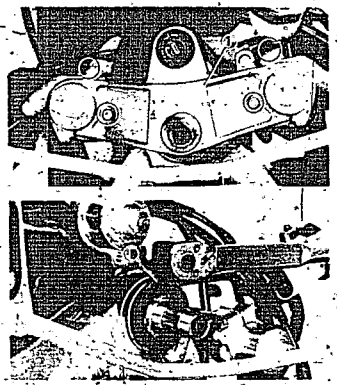
Recommended lubricant:
SAE 30 — 50 W Motor Oil or chain lubricants suitable for "O-ring" chains.

Y8533009

STEERING HEAD ADJUSTMENT

⚠WARNING:
Securely support the motorcycle so there is no danger of it falling over.

1. Elevate the front wheel by placing a suitable stand under the engine.
2. Check:
   - Steering assembly bearings
   Grasp the bottom of the forks and gently rock the fork assembly back and forth.
   Looseness→Adjust steering head.
3. Remove:
   - Front wheel
   Refer to the "FRONT WHEEL" section in CHAPTER 7.



4. Adjust:
   - Steering head

Adjustment steps:
- Remove the handle crown ①, and special washer.
- Remove the ring nut (upper) and rubber washer.
- Tighten the ring nut (lower) using the ring nut wrench ①.

NOTE:
Set the torque wrench to the Ring nut wrench so that they form a right angle.

Ring nut wrench:
P/N 90890-01403

Ring nut (initial tightening):
38 Nm (3.8 m · kg, 27 ft · lb)

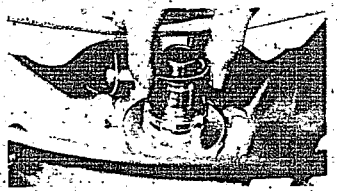
- Loosen the ring nut one turn.
- Retighten the ring nut using the Ring nut wrench.

⚠WARNING:
Avoid over-tightening.

Ring nut (final tightening):
6 Nm (0.6 m · kg, 4.3 ft · lb)

NOTE:
Recheck the steering head by turning the steering from left to right.
If steering is bound, remove the steering stem assembly and inspect the steering bearing. Refer to the "STEERING HEAD" section in the CHAPTER 7.

- Install the rubber washer and ring nut (upper).



● Finger tighten the ring nut (upper), then align the slot of both ring nuts. If not aligned, hold the ring nut (lower) and tighten the other until they are aligned.

NOTE:
Make sure the special washer tab is placed in the slots.

● Install the handle crown.

	Bolt (steering shaft): 110 Nm (11 m · kg, 80 ft · lb) **Pinch bolt (handle crown):** 22 Nm (2.2 m · kg, 17 ft · lb)

5. Install:
• Front wheel
Refer to the "FRONT WHEEL" section in CHAPTER 7.

YB533010
FRONT FORK INSPECTION

⚠ WARNING
Securely support the motorcycle so there is no danger of it falling over.

1. Place the motorcycle on a level place.
2. Check:
• Inner tube
Scratch/Damage→Replace.
• Oil seal
Excessive oil leakage→Replace.

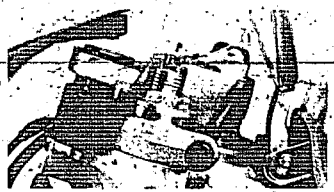
3. Hold the motorcycle in upright position and apply the front brake.

4. Check:
• Operation
Pump the front fork up and down several times.
Unsmooth operation→Repair
Refer to the "FRONT FORK" section in CHAPTER 7.

YB533011
FRONT FORK ADJUSTMENT

⚠ WARNING
- **Always adjust each fork to the same setting. Uneven adjustment can cause poor handling and loss of stability.**
- **Securely support the motorcycle so there is no danger of it falling over.**

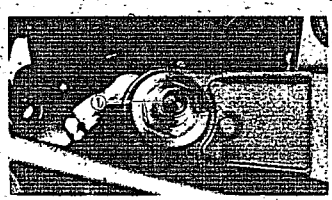
Spring preload
1. Adjust:
• Spring preload
Turn the adjuster ① in or out.



Turning in → Spring preload is harder.
Turning out → Spring preload is softer.

Adjuster position:
Standard: 6
Minimum: 8
Maximum: 1

CAUTION:
- Grooves are provided to show the adjusting level.
- Always keep the adjustment level equal on both forks.
- Never turn the adjuster beyond the maximum or minimum setting.



Rebound damping
1. Adjust:
- Rebound damping
Turn the adjuster ① in or out.

Turning in → Rebound damping is harder.
Turning out → Rebound damping is softer.

Adjuster position:
Standard: 8 clicks out
Minimum: 10 clicks out
Maximum: 1 click out from full turn in

CAUTION:
- Always keep the adjustment level equal on both forks.
- Never attempt to turn the adjuster beyond the maximum or minimum setting.

Compression damping
1. Adjust:
- Compression damping
Turn the adjuster ① in or out.

Turning in → Compression damping is harder.
Turning out → Compression damping is softer.

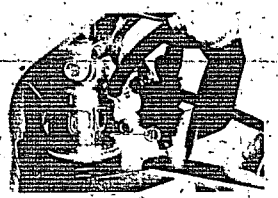
Adjuster position:
Standard: 8 clicks out
Minimum: 10 clicks out
Maximum: 1 click out from full turn in

CAUTION:
- Always keep the adjustment level equal on both forks.
- Never attempt to turn the adjuster beyond the maximum or minimum setting.

YB53012

REAR SHOCK ABSORBER ADJUSTMENT

⚠WARNING
Securely support the motorcycle so there is no danger of it falling over.

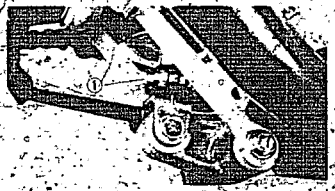


Spring preload
1. Adjust:
- Spring preload
Turn the adjuster ① in or out.

Turning in → Spring preload is harder.
Turning out → Spring preload is softer.

Adjuster position:
Standard: 3
Minimum: 1
Maximum: 7

CAUTION:
Never turn the adjuster beyond the maximum or minimum setting.

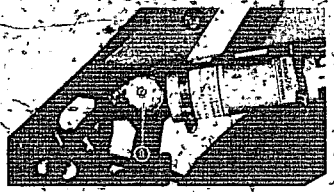


Rebound damping
1. Adjust:
• Rebound damping
Turn the adjuster ① in or out.

Turning in → Rebound damping is harder.
Turning out → Rebound damping is softer.

Adjuster position:
Standard: 10 clicks out
Minimum: 24 clicks out
Maximum: 1 click out from full turn in

CAUTION:
Never turn the adjuster beyond the maximum or minimum setting.

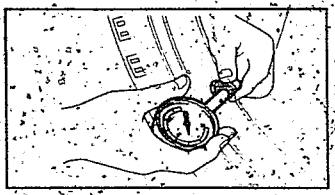


Compression damping
1. Adjust:
• Compression damping
Turn the adjuster ① to in or out.

Turning in → Compression damping is harder.
Turning out → Compression damping is softer.

Adjuster position:
Standard: 5 clicks in
Minimum: 1 click in from full turn out
Maximum: 20 clicks in

CAUTION:
Never turn the adjuster beyond the maximum or minimum setting.



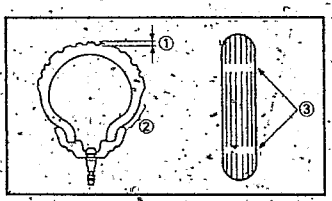
YB53301A
TIRE INSPECTION
1. Measure:
• Tire pressure
Out of specification → Adjust.

⚠ WARNING
• Tire inflation pressure should be checked and adjusted when the temperature of the tire equals the ambient air temperature. Tire inflation pressure must be adjusted according to total weight of cargo, rider, and accessories (fairing, saddlebags, etc. if approved for this model), and vehicle speed.
• Proper loading of your motorcycle is important for the handling, braking, and other performance and safety characteristics of your motorcycle. Do not carry loosely packed items that can shift. Securely pack your heaviest items close to the center of the motorcycle, and distribute the weight evenly from side to side. Properly adjust the suspension for your load, and check the condition and pressure of your tires. NEVER OVERLOAD YOUR MOTORCYCLE. Make sure the total weight of the cargo, rider, and accessories (fairing, saddlebags, etc. if approved for this model) does not exceed the maximum load of the motorcycle. Operation of an overloaded motorcycle could cause tire damage, an accident, or even injury.

Basic weight: With oil and full fuel tank	185 kg (408 lb)
Maximum load*	100 kg (220 lb)

Cold tire pressure	Front	Rear
Up to Maximum load*	200kPa (2.0kg/cm², 28 psi)	250kPa (2.5kg/cm², 36 psi)

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



2. Inspect:
- Tire surfaces
  Wear/Damage→Replace.

Minimum tire tread depth:
(front and rear):
1.0 mm (0.04 in)

(1) Tread depth
(2) Side wall
(3) Wear indicator

⚠WARNING

- It is dangerous to ride with a worn-out tire. When a tire tread begins to show lines, replace the tire immediately.
- Do not use tubeless tires on a wheel designed for tube type tires only. Tire failure and personal injury may result from sudden deflation.

Tube type wheel → Tube type tire only
Tubeless type wheel → Tube type or tubeless tire

- Be sure to install the correct tube when using tube type tires.

⚠WARNING

After extensive tests, the tires mentioned below have been approved by Yamaha motor Co., Ltd. for this model. No guarantee for handling characteristics can be given if tire combinations other than what is approved are used on this motorcycle. The front and rear tires should be of the same manufacture and design.

FRONT:

Manufacture	Size	Type
MICHELIN	120/60R17 55H	TX11

REAR:

Manufacture	Size	Type
MICHELIN	160/60R17 69H	TX23

⚠WARNING

After mounting a tire, ride conservatively to allow proper tire to rim seating. Failure to do so may cause an accident resulting in motorcycle damage and possible operator injury.

YB533015

WHEEL INSPECTION

1. Inspect:
- Wheels
  Damage/Bends→Replace.

NOTE:

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

⚠ WARNING

Never attempt to make any repairs to the wheel.

YB533016

CABLE INSPECTION AND LUBRICATION

⚠ WARNING

Damaged cable sheath may cause corrosion and interfere with the cable movement. Replace damaged cables as soon as possible.

1. Inspect:
- Cable sheath
  Damage→Replace.

2. Check:
- Cable operation
  Unsmooth operation→Lubricate.

Recommended lubricant:
SAE 10W30 motor oil

NOTE:

Hold cable end upward and apply several drops of lubricant into the cable.

YB533017

LEVER AND PEDAL LUBRICATION

Lubricate the lever and pedal at their pivoting points.

Recommended lubricant:
Lithium soap base grease

YB533018

SIDESTAND LUBRICATION

Lubricate the sidestand at pivoting points.

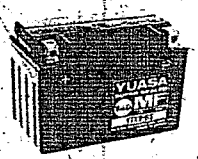
Recommended lubricant:
Lithium soap base grease

YB533019

REAR SUSPENSION LUBRICATION

Lubricate the swingarm and relay arms at their pivoting points.

Recommended lubricant:
Molybdenum disulfide grease



YB534001

ELECTRICAL

BATTERY INSPECTION

NOTE:

Since the MF battery is of a sealed-type construction, it is impossible to measure the specific gravity of the electrolyte in order to check the state of charge in the battery. Therefore, to check the state of charge in the battery, voltage must be measured at the battery terminals.

CAUTION:

CHARGING METHOD

- This battery is sealed type. Never remove sealing caps even when charging. With the sealing cap removed, this balancing will not be maintained, and battery performance will lower gradually.
- Never add water. If distilled water is added, chemical reaction in the battery will not proceed in the normal way, thus making it impossible for the battery to operate regularly.
- The charging time, charging current and charging voltage for the MF battery is different than general type batteries.
  The MF battery should be charged as instructed in the "Charging method". Should the battery be overcharged, the electrolyte level will over extremely. Therefore, use special care when charging the battery.
- Avoid using any electrolyte other than specified. The specific gravity of the MF battery electrolyte is 1.32 at 20 C (68 F). (The specific gravity of the general type battery electrolyte is 1.28.) If the electrolyte whose specific gravity is less than 1.32, the sulfuric acid will decrease and thus low battery performance will result. Should any electrolyte, whose specific gravity is 1.32 or more, be used, the battery plates will corrode and battery life will shorten.

WARNING

Battery electrolyte is dangerous; it contains sulfuric acid and therefore is poisonous and highly caustic.

Always follow these preventive measures:

- Avoid bodily contact with electrolyte as it can cause severe burns and permanent eye injury.
- Wear protective eye gear when handling or working near batteries.

Antidote (EXTERNAL):

- SKIN – Flush with water.
- EYES – Flush with water for 15 minutes and get immediate medical attention.

Antidote (INTERNAL):

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

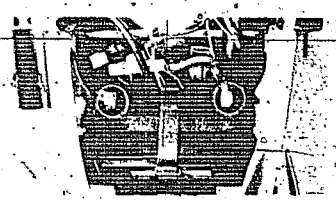
Batteries generate explosive hydrogen gas.

Always follow these preventive measures:

- Charge batteries in a well-ventilated area.
- Keep batteries away from fire, sparks, or open flames (e.g., welding equipment, lighted cigarettes, etc.)
- DO NOT SMOKE When charging or handling batteries.

KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.

1. Remove:
   - Seat

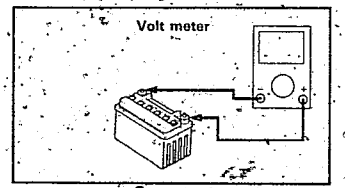


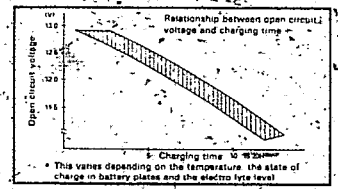
2. Disconnect:
   - Battery leads

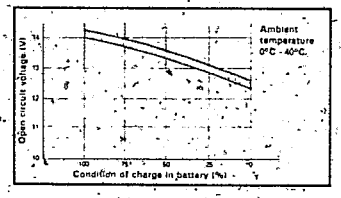
CAUTION:

Disconnect the negative lead first and then disconnect the positive lead.

3. Remove:
   - Battery







4. Check:
- Battery condition

Battery condition checking steps:
- Connect the pocket tester to the battery terminals.

Tester (+) lead → Battery (+) terminal. Tester (−) lead → Battery (−) terminal.

NOTE:

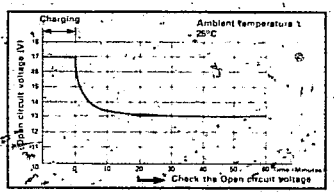
The state of a discharged MF battery can be checked by measuring open circuit voltage (the voltage measured with the positive terminals being disconnected).

Open-circuit voltage	Charging time
12.8 v or higher	No charging is necessary.
12.7 v - 11.5 v	5 - 10 hours
Less than 11.5 v	15 - 20 hours

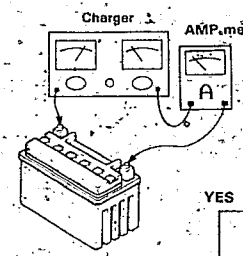
- Battery condition chart as shown.

5. Charging method of MF battery

CAUTION:
- If it is impossible to set the standard charging current, be careful not to overcharge.
- When charging the battery, be sure to remove it from the motorcycle. (If charging has to be done with the battery mounted on the motorcycle for some reason, be sure to disconnect the wire at the negative terminal.)
- Never remove the sealing plug from the MF battery.
- Use special care so that charging clips are in a full contact with the terminal and that they are not shorted. (A corroded clip of the charger may cause the battery to generate heat at the contact area. A weak clip spring may cause sparks.)
- Before removing the clips from the battery terminals, be sure to turn off the power switch of the charger.
- Change in the open-circuit voltage of the MF battery after being charged is shown below. As shown in the figure, the open-circuit voltage is stabilized 30 minutes after charging has been completed. Therefore, to check the condition of the battery, measure the open-circuit voltage 30 minutes after has been completed.



Charging method using a variable-current (voltage) type charger



Measure the open-circuit voltage prior to charging

NOTE
Voltage should be measured 30 minutes after the machine is stopped

Connect a charger and AMP meter to the battery and start charging.

NOTE
Set the charging voltage at 16-17v (If the setting is lower charging will be insufficient if too high the battery will be over charged)

Make sure the current is higher than the standard charging current written on the battery.

YES

NO

By turning the charging voltage adjust dial, set the charging voltage at 20 - 25 v

Adjust the voltage so that current is at standard charging level.

Monitor the amperage for 3-5 minutes to check if the standard charging current is reached

1A or less

1A or more

NO

If the current is more than 1 amp, adjust the voltage to 16 - 17 v and continue charging.

Set the timer according to the charging time suitable for the open-circuit voltage.

After 5 minutes, adjust the voltage to 16 - 17 v, and continue charging.

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

In case that charging requires more than 5 hours, it is advisable to check the charging current after a lapse of 5 hours. If there is any change in the amperage, readjust the voltage to obtain the standard charging current

Measure the battery open-circuit voltage after having left the battery unused for more than 30 minutes.
12.8 v or more --- Charging is complete
12.7 v or less --- Recharging is required
Under 12.0 v --- Replace the battery

Charging method using a constant-voltage type charger

Measure the open-circuit voltage prior to charging.

NOTE
Voltage should be measured 30 minutes after the machine is stopped

Connect a charger and AMP meter to the battery, and start charging.

Make sure the current is higher than the standard charging current written on the battery.

YES

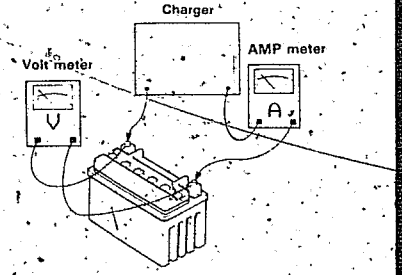
NO

Charge the battery until the battery's charging voltage is 16 volts or more

NOTE
Set the charging time at 20 hours (maximum)

This type of battery charger can not charge the MF battery. A variable voltage charger or a constant current charger is recommended

Check the open-circuit voltage after having left the battery for 30 minutes after charging
12.8 v or more---Charging is complete
12.7 v or less---Recharging is necessary
Under 12 v---Replace the battery



Charging method using a constant current type charger (Exclusive for MF Battery)

Measure the open-circuit voltage prior to charging

NOTE: Voltage should be measured 30 minutes after the machine is stopped

Connect a charger and AMP meter to the battery, and start charging.

After one hour of charging, make sure the rated charging current of the charger is flowing by checking AMP meter.

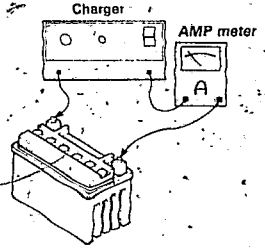
YES

Since the charging current is constant, the charging time varies depending on the battery capacity.
Set the charging time according to the instructions specified for the charger.

Measure the battery open-circuit voltage after having left the battery unused for more than 30 minutes
12.8 v or more---Charging is complete.
12.7 v or less---Recharging is required
Under 12.0 v---Replace the battery

NO

If rated current is not flowing, replace the battery.



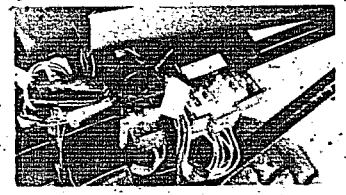
YB534002

FUSE INSPECTION

CAUTION:
Always turn off the main switch when checking or replacing a fuse. Otherwise, short-circuiting may occur.

1. Remove:
- Tail cover

Refer to the "COWLING" section.



2. Inspect:
- Fuse

Inspection steps:
- Connect the Pocket tester to the fuse and check it for continuity.

NOTE:
Set the tester selector to "Ω×1" position.

Pocket tester:
P/N 90890-03112

- If the tester is indicates at . Replace the fuse.

3. Replace:
- Blown fuse

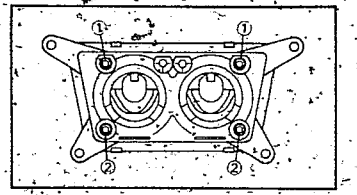
Replacement steps:
- Turn off the ignition.
- Install a new fuse of proper amperage.
- Turn on the switches to verify operation of the effected electrical device.
- If the fuse immediately blows again, check

the electrical circuit.

⚠WARNING

Never use a fuse with a rating other then specified. Never use other material in place of a fuse. An improper fuse may cause damage to the electrical system, to possibly cause a fire, the lighting and/or ignition.

4. Install:
- Tail cover



*8534003

HEADLIGHT BEAM ADJUSTMENT

1. Adjust:
- Headlight beam (horizontally)

Turn the adjuster (1) in or out.

Right side:

Turning in → Headlight beam moves right.
Turning out → Headlight beam moves left.

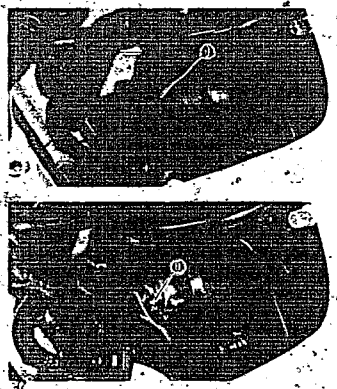
Left side:

Turning in → Headlight beam moves left.
Turning out → Headlight beam moves right.

2. Adjust
- Headlight beam (vertically)

Turn the adjuster (2) in or out.

Turning in → Headlight beam moves higher.
Turning out → Headlight beam moves lower.



*8534004

HEADLIGHT BULB REPLACEMENT

1. Remove:
- Cover (1)

2. Remove:
- Bulb holder (1)
- Bulb

NOTE:

Unhook the bulb holder and remove the defective bulb.

⚠WARNING

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

3. Install:
- Bulb (new)

Secure the new bulb with the bulb holder.

CAUTION:

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

4. Install:
- Cover

ENG 4

CHAPTER 4.
ENGINE OVERHAUL

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- AIR FILTER E-3
- CARBURETOR E-3
- BATTERY LEADS E-4
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- MUFFLER E-4
- OIL FILTER E-5
- CLUTCH CABLE E-5
- DRIVE SPROCKET E-5
- LEADS E-5
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- VALVE SEAT E-14
- VALVE AND VALVE GUIDE E-15
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- TIMING CHAIN TENSIONER F-2
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- PISTON PIN F-4
- CRANKSHAFT AND CONNECTING ROD F-4
- STARTER CLUTCH AND GEARS F-6
- PRIMARY DRIVE F-6
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- SHIFT SHAFT F-16
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- OIL STRAINER AND OIL PAN G-1
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- AC MAGNETO G-1
- STARTER CLUTCH G-3
- CLUTCH G-4
- WATER PUMP G-5
- CYLINDER AND PISTON G-5
- CYLINDER HEAD AND CAMSHAFT G-7
- TIMING CHAIN TENSIONER G-9
- CYLINDER HEAD COVER G-9
- REMOUNTING ENGINE G-10

YB541001
ENGINE OVERHAUL
ENGINE REMOVAL

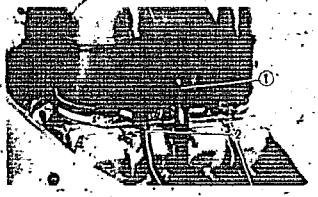
NOTE:
It is not necessary to remove the engine in order to remove the following components:
- Cylinder head
- Cylinder
- Piston
- Clutch
- Oil pump
- Water pump
- AC magneto

YB541002
COWLING
1. Remove:
- Lower cowl
- Upper cowl
- Fuel tank

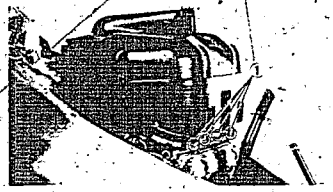
Refer to the "COWLING" section in the CHAPTER 3.

2. Drain:
- Engine oil
- Coolant

Refer to the "ENGINE OIL REPLACEMENT/ COOLANT REPLACEMENT" section in the CHAPTER 3.

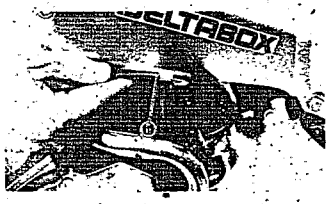


YB541003
AIR FILTER
1. Disconnect:
- Crankcase breather hose ①
- Drain hose ②

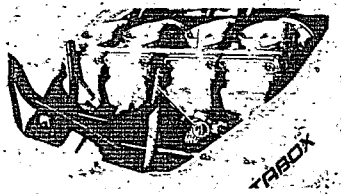


2. Loosen:
- Clamp ① (air filter joint)

3. Remove:
- Air filter case



YB541004
CARBURETOR
1. Disconnect:
- Starter cable ①

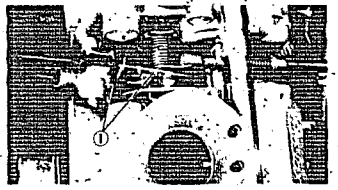


2. Remove:
- Fuel hose ①

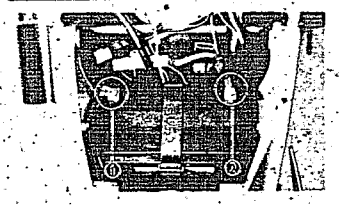
3. Loosen:
- Clamp (carburetor joint)

4. Remove:
- Carburetors (from intake manifold)

NOTE:
Cover the carburetor with a clean rag to prevent dirt or foreign material from entering the carburetor.



5. Remove:
- Throttle cables ①



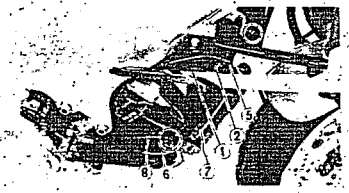
YB541005

BATTERY LEADS

1. Disconnect:
   - Battery leads

CAUTION:

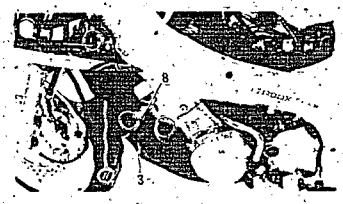
Disconnect the negative lead ① first and then disconnect the positive lead ②.

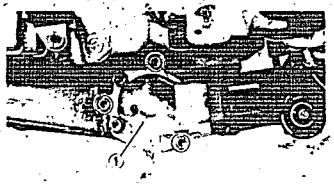


YB541006

RADIATOR

1. Remove:
   - Radiator hose ① (radiator-thermostat housing)
   - Radiator hose ② (radiator-joint)
   - Radiator hose ③ (radiator-waterpump cover)
   - Fan motor coupler ④
   - Reservoir hose ⑤
   - Radiator hose ⑥ (radiator-oil filter)
   - Radiator ⑦
   - Radiator stay ⑧

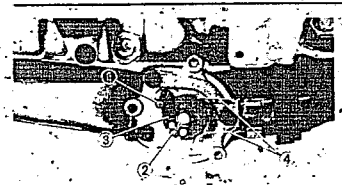




YB541007

MUFFLER

1. Remove:
   - Ex-up cover ①



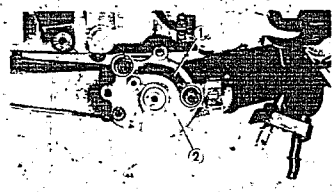
2. Insert the pin (ϕ4) ① into the pulley hole.

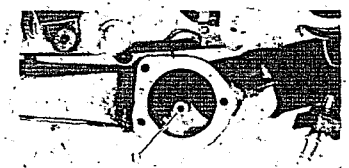
3. Remove:
   - Bolt ② (pulley)

4. Remove:
   - Pulley ③

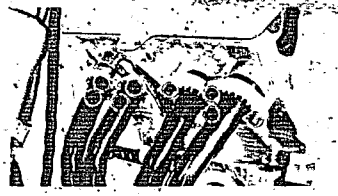
5. Disconnect:
   - Pulley cables ④

6. Remove:
   - Blacket ①
   - Housing ②
   - Gasket

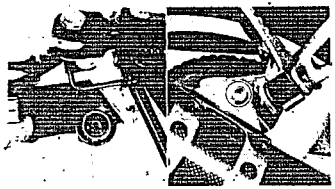


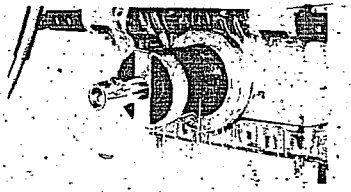


7. *Remove:*
   - Ex-up valve ①
   - Bush



8. Remove:
   - Muffler assembly

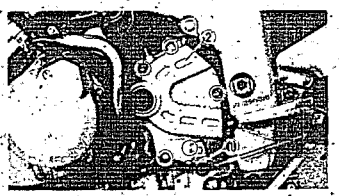




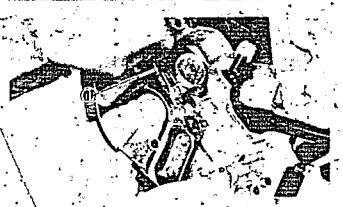
YB5541008
OIL FILTER
1. Remove:
- Oil filter ①

Use the oil filter wrench.

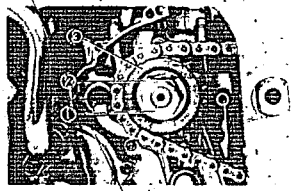
	Oil filter wrench: P/N 90890-01426



YB5541009
CLUTCH CABLE
1. Remove:
- Shift arm ①
- Crankcase cover ② (left)
- Spacer



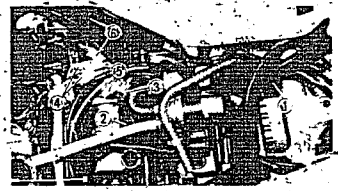
2. Disconnect:
- Clutch cable ①



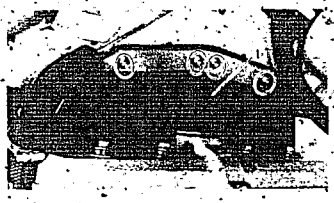
YB5541010
DRIVE SPROCKET
1. Straighten:
- Lock washer tab

2. Remove:
- Nut ①
- Lock washer ②
- Drive sprocket ③

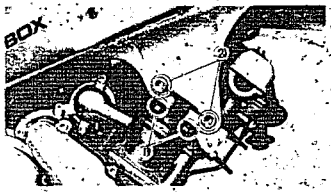
NOTE:
Loosen the nut while applying the rear brake.



YB5541011
LEADS
1. Disconnect:
- Ground lead ①
- Starter motor lead ②
- Oil pressure switch/Neutral switch coupler ③
- AC magneto coupler ④
- Sidestand switch coupler ⑤
- Thermo switch/Thermo unit coupler ⑥



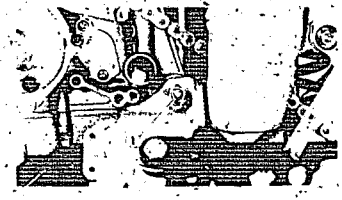
2. Remove:
- Cover ①
- Spark plug cap



YB5541012
ENGINE REMOVAL
1. Loosen:
- Pinch bolts ① (engine mount bolt)

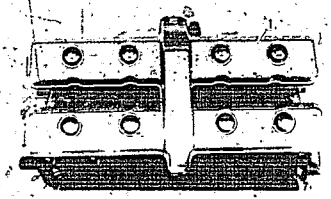
2. Remove:
- Mounting bolts ② (front—upper)

3. Remove:
- Mounting bolt ① (rear-upper)
- Collar ②



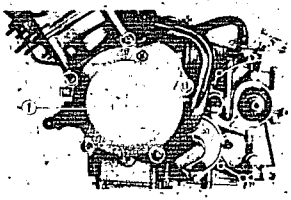
4. Remove:
- Mounting bolt ① (rear-lower)

YB542001
ENGINE DISASSEMBLY
CYLINDER HEAD COVER, CAMSHAFT AND CYLINDER HEAD
NOTE:
With the engine mounted, the cylinder head cover, camshaft and cylinder head can be maintained by removing the following parts.
- Lower cowl
- Fuel tank
- Radiator

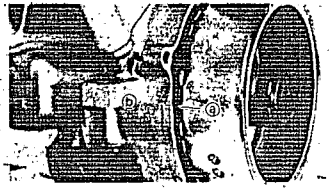


1. Remove:
- Cylinder head cover ①

NOTE:
Working in a crisscross pattern, loosen the bolts 1/4 turn each. Remove them after all are loosened.

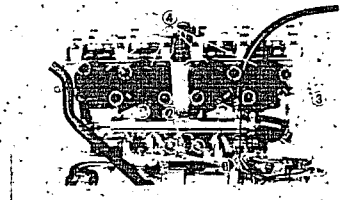


2. Remove:
- Magneto cover (1)

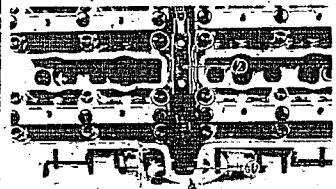


3. Align:
- "T" mark
(with crankcase surface)

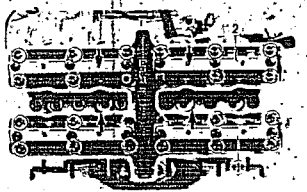
NOTE:
Turn the crankshaft counterclockwise and align the "T" mark ⓓ on the AC magneto rotor with the crankcase matching surface ⓑ when #1 piston is at TDC on compression stroke.



4. Remove:
- Camchain tensioner cap bolt 1
- Camchain tensioner 2
- Thermostat housing 3
- Carburetor joint 4



5. Remove:
- Chain guide 1 (upper)
- Chain guide 2 (exhaust)

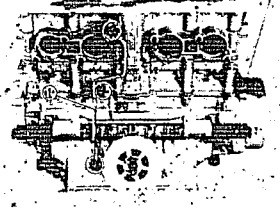


6. Remove:
- Camshaft caps 1 (intake)
- Camshaft caps 2 (exhaust)

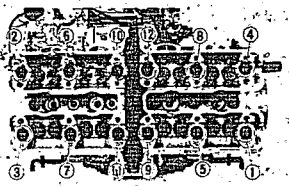
NOTE:
Remove the camshaft cap bolts from out side to in side.

7. Remove:
- Camshafts 1

NOTE:
Fasten a safety wire ① to the timing chain to prevent it from falling into the crankcase



8. Remove:
- Oil delivery pipe



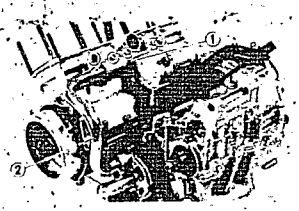
9. Remove:
- Nuts (cylinder head)

NOTE:
- Loosen the bolts in their proper loosening sequence.
- Follow numerical order shown in photo. Start by loosening each nut 1/2 turn until all are loose.

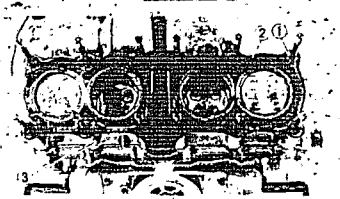
YB542002

CYLINDER AND PISTON

NOTE:
With the engine mounted, the cylinder and piston can be maintained by removing the following parts.
- Lower cowl
- Fuel tank
- Radiator
- Cylinder head



1. Remove:
- Joint (1)
- Pipe (2)



2. Remove:
- Dowel pins (1)
- Cylinder head gasket (2)
- Cylinder (3)
- Dowel pins
- Cylinder gasket

3. Remove:
- Piston pin clips
- Piston pins (2)
- pistons (3)

NOTE:
- Before removing piston pin clips, cover crankcase with a clean rag to prevent clips from falling into crankcase cavity.
- Before removing the piston pin, debur the clip grooved and pin hole area. If the piston pin groove is deburred and piston pin is still difficult to remove, use piston pin puller.
- Put identification mark on the each piston head for reference during reinstallation.

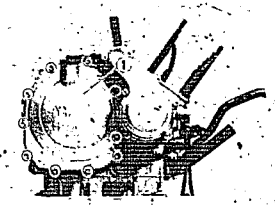
	Piston pin puller: P/N 90890-01304

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

YB542003

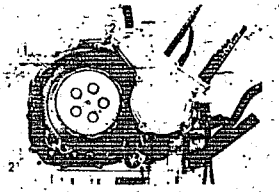
CLUTCH

NOTE:
With the engine mounted, the clutch assembly can be maintained by the following parts.
- Lower cowl

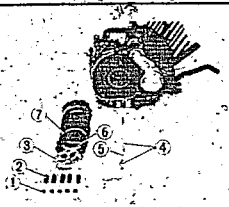


1. Remove:
- Crankcase cover (1) (right)

NOTE:
Working in a crisscross pattern, loosen the bolts 1/4 turn each. Remove them after all are loosened.



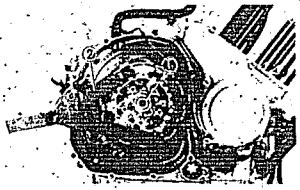
2. Remove:
- Gasket (1) (crankcase cover)
- Dowel pins (2)



3. Remove:
- Bolts ①
- Clutch springs ②
- Pressure plate ③
- Push rod ④
- Ball ⑤
- Friction plates ⑥
- Clutch plates ⑦

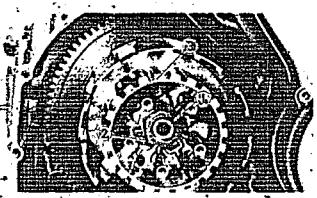
NOTE:
Working in a crisscross pattern, loosen the bolts 1/4 turn each. Remove them after all are loosened.

4. Straighten:
- Lock washer tab



5. Loosen:
- Nut ①. (clutch boss)

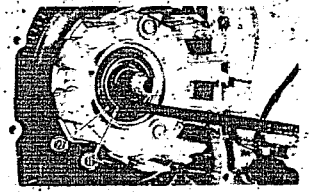
NOTE:
Loosen the nut (clutch boss) while holding the clutch boss with universal clutch holder ②.



	Universal clutch holder: **P/N 90890-04086**

6. Remove:
- Nut (clutch boss) ①
- Lock washer ②
- Clutch boss ③

7. Remove:
- Thrust plate ①



8. Remove:
- Spacer ①
- Bearing ②

NOTE:
Remove the spacer using the slide hammer bolt (M6) ③ and weight.

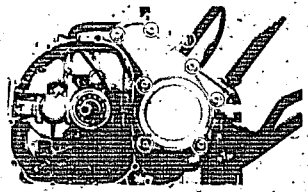
	Slide hammer bolt (M8): **P/N 90890-01083** **Weight:** **P/N 90890-01084**

9. Remove:
- Clutch housing ①
- Thrust plate ②
- Collar ③

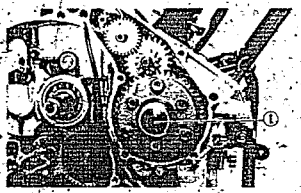
YB542004

STARTER CLUTCH

NOTE:
With the engine mounted, starter clutch can be maintained by removing the following parts.
- Lower cowl
- Magneto cover



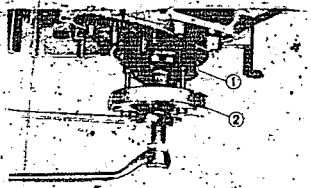
1. Remove
- Starter clutch cover ①
- Dowel pins
- Gasket



2. Remove:
- Bolt ① (starter clutch)

NOTE:
Loosen the bolt (starter clutch) while hold the rotor with the sheave holder.

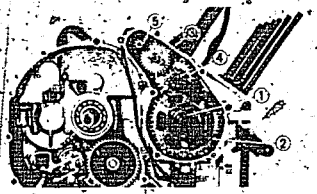
	Sheave holder: P/N 90890-01701



3. Remove:
- Starter clutch ①

Use the flywheel puller ②.

	Flywheel puller: P/N 90890-01362

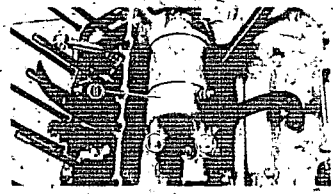


4. Remove:
- Woodruff key ①
- Starter clutch gear ②
- Idle gear ③
- Idle gear ④
- Starter motor gear ⑤

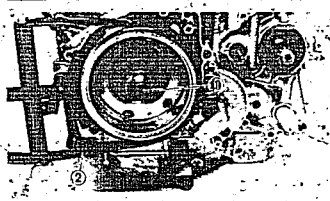
YB542005

A.C. MAGNETO

NOTE:
With the engine mounted, A.C. magneto and starter motor can be maintained by removing the following parts.
- Lower cowl
- Fuel tank



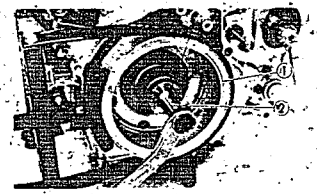
1. Remove:
- Starter motor ①



2. Remove:
- Bolt (rotor) ①
- Washer

NOTE:
Loosen the bolt (rotor) ① while holding the rotor by the sheave holder ②.

	Sheave holder: P/N 90890-01701



3. Remove:
- Rotor ①
- Woodruff key

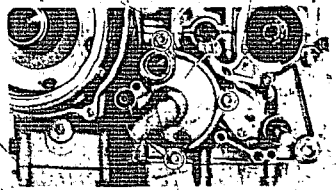
NOTE:
Remove the rotor ① using the sheave holder and rotor puller ②.

	Rotor puller: P/N 90890-01080

YB542006

WATER PUMP

NOTE:
With the engine mounted, the water pump can be maintained by the following parts.
- Lower cowl
- Shift arm
- Crankcase cover (left)
- AC magneto

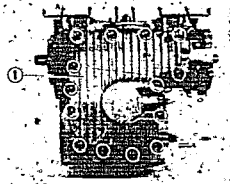


1. Remove:
- Water pump housing cover ①
- O-ring

2. Remove:
• Water pump housing ①

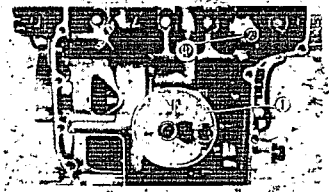
YB542007
OIL PAN AND OIL STRAINER

NOTE:
With the engine mounted, the oil pan, oil filter and oil strainer can be maintained by removing the following parts.
• Lower cowl
• Muffler

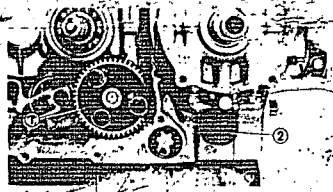


1. Remove:
• Oil pan ①
• Dowel pins
• Gasket

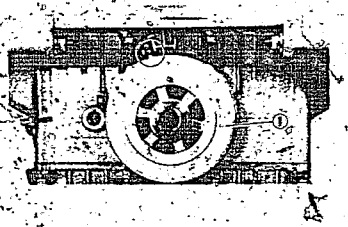
NOTE:
Working in a crisscross pattern, loosen the bolts 1/4 turn each. Remove them after all are loosened.



2. Remove:
• Oil strainer
• Oil strainer housing ①
• Relief valve ②



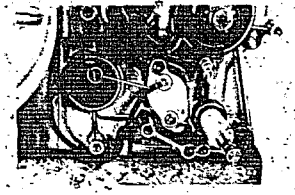
3. Remove:
• Oil pump ①
• Dowel pin
• Gasket
• Oil pressure switch ②



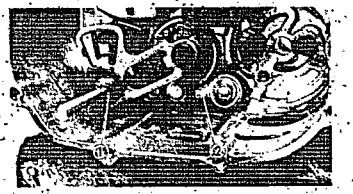
4. Remove:
• Oil filter housing ①

YB542008
SHIFT SHAFT

NOTE:
With the engine mounted, the shift shaft can be maintained by the following parts.
• Lower cowl
• Shift arm
• Crankcase cover (right)
• Clutch assembly



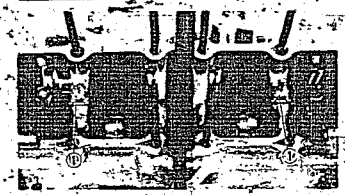
1. Remove:
• Neutral switch ①



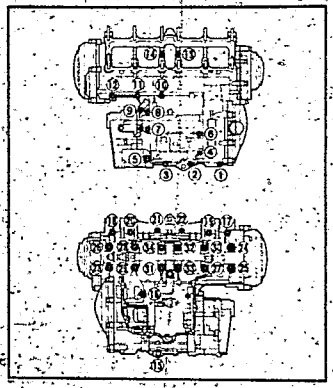
2. Remove:
• Shift shaft ①
• Stopper lever ②
• Spring

YB542009
CRANKCASE

1. Remove:
• Oil seal guide ①

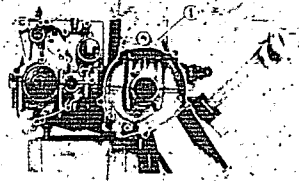


2. Remove:
• Nozzle ①



3. Remove:
• Bolts (crankcase)

NOTE:
- Loosen the bolts 1/4 turn each and remove them after all are loosened.
- Loosen the bolts starting with the highest numbered one.
- The embossed numbers in the crankcase (lower) designate the tightening sequence.

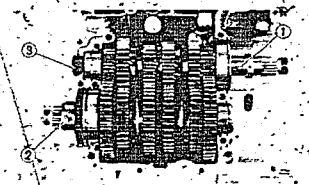


4. Remove:
• Lower crankcase ①

CAUTION:
Use a soft hammer to tap on the case half. Tap only on reinforced portions of the case. Do not tap on the gasket mating surface. Work slowly and carefully. Make sure that the case halves separate evenly.

5. Remove:
• Main journal bearing ①
(from lower crankcase)

NOTE:
Identify each plane bearing position very carefully so that it can be reinstalled in its original place.

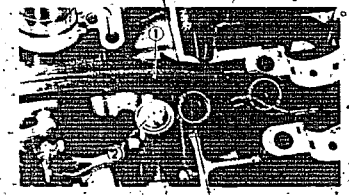


YB542010
TRANSMISSION
1. Remove:
• Main axle ①
• Drive axle ②
• Oil seal ③

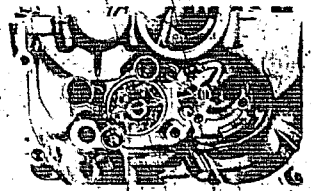
YB542011
CRANKSHAFT
1. Remove:
• Crankshaft ①

2. Remove:
• Main journal bearing ①
(from upper crankcase)

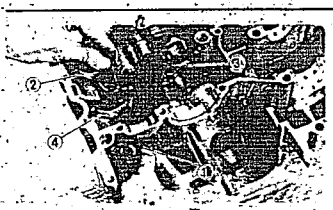
NOTE:
Identify each plane bearing position very carefully so that it can be reinstalled in its original place.



3. Remove:
• Chain guide ①
• Orifice ②



YB542012
SHIFT FORK AND SHIFT CAM
1. Remove:
• Stopper plate ①



2. Remove:
- Shift guide bar ①
- Shift fork 1 ②
- Shift fork 2 ③
- Shift fork 3 ④

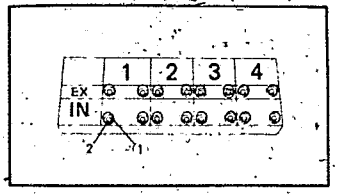
3. Remove:
- Shift cam ①

Y8542013

VALVE

NOTE:

Before removing the internal parts (valve, valve spring, valve seat etc.) of the cylinder head.
The valve sealing should be checked.



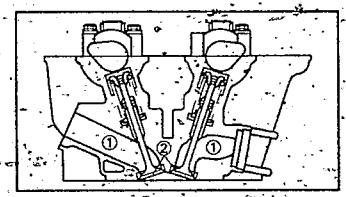
1. Remove:
- Lifters ①
- Pads ②

NOTE:

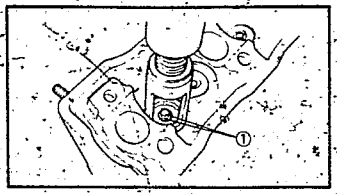
Identify each lifter and pad position very carefully so that it can be reinstalled in its original place.

2. Check:
- Valve sealing

Leakage at valve seat → Inspect the valve face, valve seat and valve seat width
Refer to the "INSPECTION AND REPAIR – VALVE SEAT".



Checking steps:
- Pour a clean solvent ① into the intake and exhaust ports
- Check the valve sealing.
  There should be no leakage at the valve seat ②

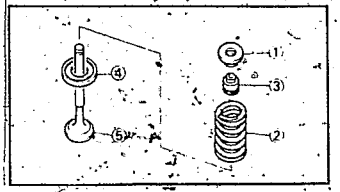


3. Remove:
- Valve cotters ①

NOTE:

Remove the valve cotters while compressing the valve spring with the valve spring compressor.

	Valve spring compressor: P/N 90890-04109 **Attachment:** P/N 90890-04114



4. Remove:
- Valve retainers ①
- Valve spring ②
- Oil seal ③
- Spring seat ④
- Valve ⑤

NOTE:

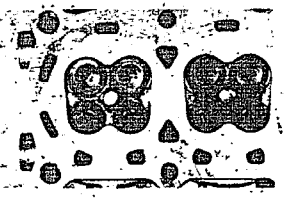
Identify each part position very carefully so that it can be reinstalled in its original place.

Y8542014

OIL PUMP

1. Remove:
- Rotor housing ①
- Dowel pins

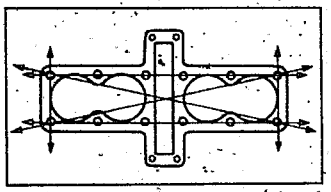
2. Remove:
- Outer rotor ①
- Inner rotor ②
- Pin ③
- Washer ④
- Oil pump cover ⑤
- Driven gear shaft ⑥



YB543001
INSPECTION AND REPAIR
CYLINDER HEAD
1. Eliminate:
- Carbon deposits
(from combustion chamber)
Use a rounded scraper

NOTE:
Do not use a sharp instrument and avoid damaging or scratching:
- Spark plug threads
- Valve seat

2. Inspect:
- Cylinder head
Scratches/Damage → Replace.
- Water jacket
Crust of minerals/Rust → Eliminate



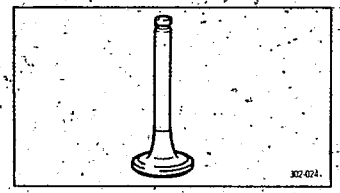
3. Measure:
- Cylinder head warpage
Out of specification → Resurface.

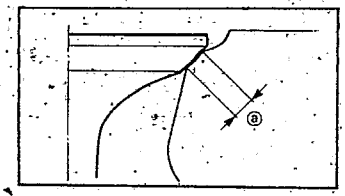
	Warpage limit: 0.05 mm (0.002 in)

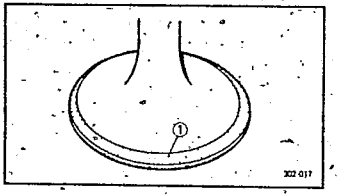
Warpage measurement and resurfacement step:
- Attach a straight edge and a thickness gauge on the cylinder head.
- Measure the warpage.
- If the warpage is out of specification, resurface the cylinder head.
- Place a 400 ~ 600 grit wet sandpaper on the surface plate, and resurface the head

using a figure-eight sanding pattern.

NOTE:
Rotate the head several times to avoid removing too much material from one side.







YB543002
VALVE SEAT
1. Eliminate:
- Carbon deposit
(from valve face and valve seat)

2. Inspect:
- Valve seat
Pitting/Wear → Refuse the valve seat.

3. Measure:
- Valve seat width ⓐ
Out of specification → Reface valve seat.

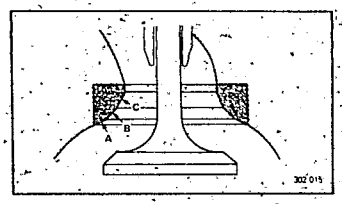
Valve seat width:	
Intake	0.9~1.1 mm (0.035~0.043 in)
Exhaust	0.9~1.1 mm (0.035~0.043 in)

Measurement steps:
- Apply the Mechanic's bluing dye (Dykem) ① to the valve face.
- Install the valve into the cylinder head.
- Press the valve through the valve guide and onto the valve seat to make a clear pattern.
- Measure the valve seat width. Wherever the valve seat and valve face made contact, bluing will have been removed.
- If the valve seat width is too wide, too narrow, or seat has not centered, the valve seat must be refaced.

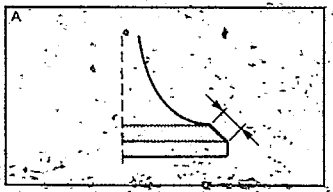
4. Reface:
- Valve seat
Use a 30°, 45° and 60° valve seat cutter.

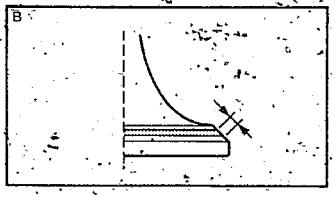
Valve seat cutter:	YM-91043

CAUTION:
When twisting cutter, keep an even downward pressure (4~5 kg) to prevent chatter marks.



Cut section as follows	
Section	Cutter
A	30°
B	45°
C	60°



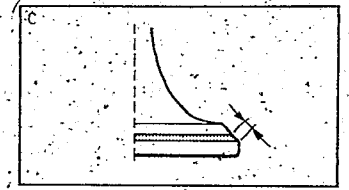


Refacing steps:
A Valve seat is centered on valve face but it is too wide.

Valve seat cutter set		Desire result
Use lightly	30° cutter 45° cutter	To reduce valve seat width to 1.0 mm (0.039 in).

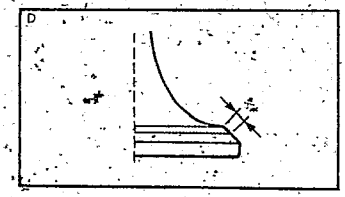
B Valve seat is in the middle of the face but it is too narrow.

Valve seat cutter set		Desired result
Use	45° cutter	To achieve a uniform valve seat width of 1.0 mm (0.039 in).



C Valve seat is too narrow and it is near valve margin.

Valve seat cutter set		Desired result
Use	First: 30°cutter Second: 45°cutter	To center the seat and to achieve its width of 1.0 mm (0.039 in).

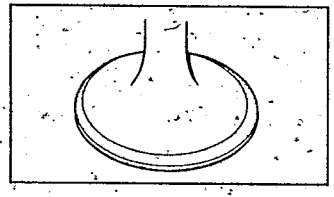


D Valve seat is too narrow and it is located near the bottom edge of the valve face.

Valve seat cutter set		Desired result
Use	First: 60° cutter Second: 45° cutter	To center the seat and increase its width.

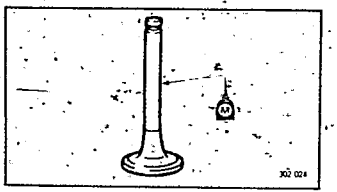
5. Lap:
- Valve face
- Valve seat

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



Lapping steps:
- Apply a coarse lapping compound to the valve face.

CAUTION:
Be sure no compound enters the gap between the valve stem and guide.



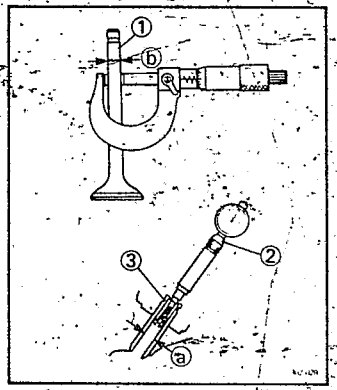
- Apply a molybdenum disulfide oil to the valve stem.
- Install the valve into the cylinder head.
- Turn the valve until the valve face and valve seat are evenly polished, then clean off all compound.

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

- Apply fine lapping compound to the valve face and repeat the above steps.

NOTE:
Be sure to clean off all compound from the valve face and valve seat after every lapping operation.

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



YB543003

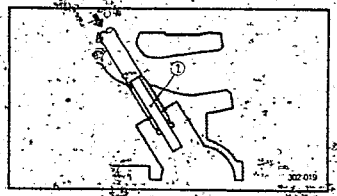
VALVE AND VALVE GUIDE

1. Measure:
- Stem-to-guide clearance

Stem-to-guide clearance =
Valve guide inside diameter ④ −
Valve stem diameter Ⓓ

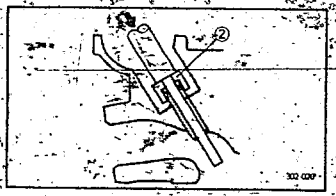
Out of specification → Replace valve guide.

Stem-to-guide clearance:
Intake:
0.010 ~ 0.037 mm
(0.0004 ~ 0.0015 in)
〈Limit〉: 0.08 mm (0.0031 in)
Exhaust:
0.025 ~ 0.052 mm
(0.0010 ~ 0.0020 in)
〈Limit〉: 0.10 mm (0.0039 in)

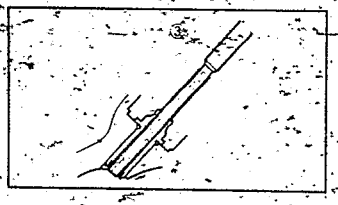


2. Replace:
• Valve guide

Replacement steps:
NOTE:
Heat the cylinder head in an oven to 100°C (212°F) to ease guide removal and installation and to maintain correct interference fit.



• Remove the valve guide using the valve guide remover ①.
• Install the valve guide (new) using the valve guide installer ② and valve guide remover ①.
• After installing the valve guide, bore the valve guide using the valve guide reamer ③ to obtain proper stem-to-guide clearance.

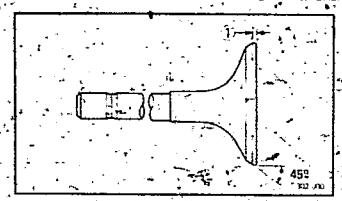


	Valve guide remover (4 mm): P/N 90890-04111 Valve guide installer (4 mm): P/N 90890-04112 Valve guide reamer (4 mm): P/N 90890-04113

NOTE:
Reface the valve seat after replacing the valve guide.

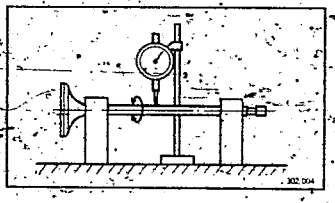
3. Eliminate:
• Carbon deposit
(from valve face)

4. Inspect:
• Valve face
Pitting/Wear → Grind the face.
• Valve stem end
Mushroom shape or diameter larger than rest of stem → Replace.



5. Measure:
• Margin thickness ⓐ
Out of specification → Replace.

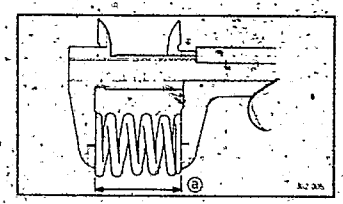
	Margin thickness: Limit: 0.6 mm (0.024 in)



6. Measure:
• Runout (valve stem)
Out of specification → Replace.

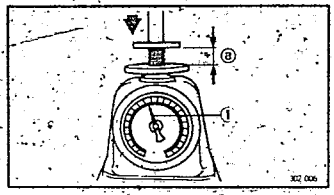
	Runout: Less than 0.01 mm (0.0004 in)

NOTE:
• Always replace the guide if the valve is replaced.
• Always replace the oil seal if the valve is removed.



FB4-3004
VALVE SPRING
1. Measure:
• Free length ⓐ (valve spring)
Out of specification → Replace.

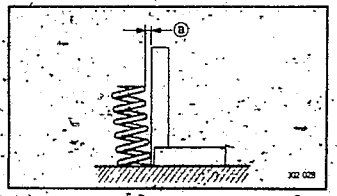
	Free length (valve spring): Intake: 38.00 mm (1.496 in) Exhaust: 38.00 mm (1.496 in)



2. Measure:
- Compressed force (valve spring) ①
  Out of specification → Replace.

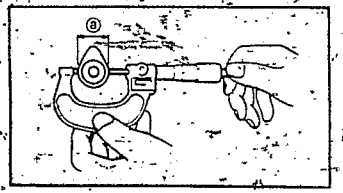
ⓐ Installed length

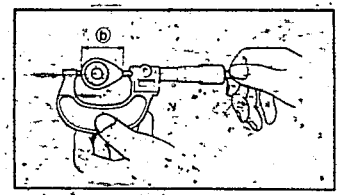
Compressed force:
Intake
14.3 kg (31.5 lb)
at 35.5 mm (1.4 in)
Exhaust
14.3 kg (31.5 lb)
at 35.5 mm (1.4 in)



3. Measure:
- Spring tilt ⓐ
  Out of specification → Replace.

Spring tilt:
Less than 1.8 mm (0.071 in)



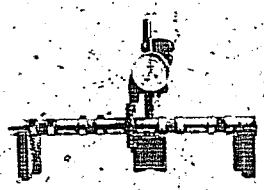


YB5A13005
CAMSHAFT
1. Inspect:
- Cam lobs
  Pitting/Scratches/Blue discoloration → Replace.

2. Measure:
- Cam lobes length ⓐ and ⓑ
  Out of specification → Replace

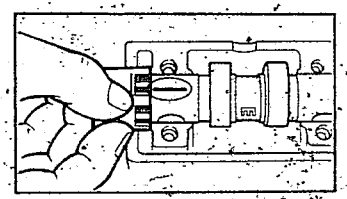
Cam lobes length:
Intake
ⓐ 25.005 mm (0.984 in)
ⓑ 32.50 mm (1.280 in)

Cam lobes length:
Exhaust
ⓐ 24.96 mm (0.983
ⓑ 32.20 mm (1.268 in)



3. Measure:
- Runout (camshaft)
  Out of specification → Replace.

Runout (camshaft):
Less than 0.03 mm (0.0012 in)



4. Measure:
- Camshaft-to-cap clearance
  Out of specification → Measure bearing diameter (camshaft).

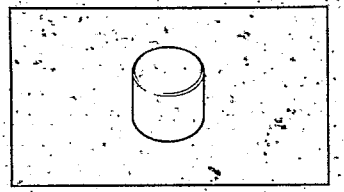
Camshaft-to-cap clearance:
0.08 mm (0.0031 in)

Measurement steps:
- Install the camshaft onto the cylinder head.
- Position a strip of Plastigauge onto the camshaft.
- Install the dowel pins and camshaft caps.

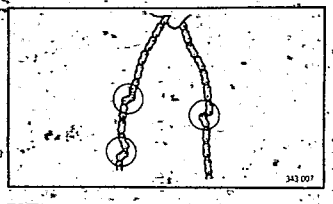
Bolt (camshaft cap):
10 Nm (1.0 m · kg, 7.2 ft · lb)

NOTE:
- Tighten the camshaft caps in a crisscross pattern from innermost to outer.
- Do not turn the camshaft when measuring clearance with the Plastigauge.

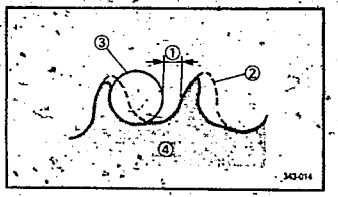
- Remove the camshaft caps and measure width of the Plastigauge.



YB543006
VALVE LIFTER
1. Inspect:
- Valve lifters
Scratches/Damage → Replace both lifters and cylinder head.

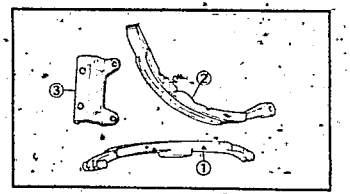


YB543007
TIMING CHAIN, SPROCKET AND CHAIN GUIDE
1. Inspect:
- Timing chain
Stiff/Cracks → Replace timing chain and sprocket as a set.

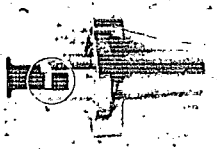


2. Inspect:
- Cam sprocket
Wear/Damage → Replace cam sprocket and timing chain as a set.

① 1/4 tooth
② Correct
③ Roller
④ Sprocket



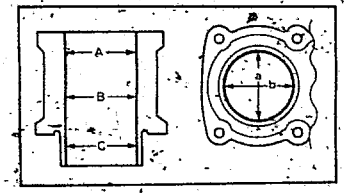
3. Inspect:
- Chain guide ① (exhaust side)
- Chain guide ② (intake side)
- Chain guide ③ (upper)



YB543022
TIMING CHAIN TENSIONER
1 Check:
- One-way cam operation
Unsmooth operation → Replace.

2. Inspect:
- All parts
Damage/Wear → Replace.

YB543008
CYLINDER AND PISTON
1. Inspect:
- Cylinder and piston walls
Vertical scratches → Rebore or replace cylinder and piston.



2. Measure:
- Piston-to-cylinder clearance

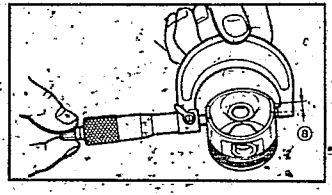
Measurement steps:
First step:
- Measure the cylinder bore "C" with a cylinder bore gauge.

NOTE:
Measure the cylinder bore "C" in parallel to and at right angle to the crankshaft. Then, find the average of the measurements.

Cylinder bore "C"	56.000 ~ 56.005 mm (2.2047 ~ 2.2049 in)
(Wear limit)	(56.55 mm (2.226 in))
Taper limit "T"	0.05 mm (0.0020 in)

"C"=Maximum D
"T"=(Maximum D_2 or D_3)−(Maximum D_5 or D_6)

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



Second step:

● Measure the piston skirt diameter "P" with a micrometer.

ⓐ 3 mm (0.12 in) from the piston bottom edge.

	Piston size P
Standard	55.940~55.955 mm (2.202~2.203 in)
Oversize	56.440~56.455 mm (2.222~2.223 in)

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

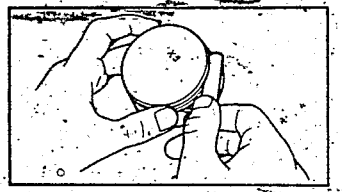
Third step:

● Calculate the piston-to-cylinder clearance with following formula:

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

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

Piston-to-cylinder clearance:
0.045~0.065 mm
(0.0018~0.0026 in)
Limit: 0.15 mm (0.0059 in)



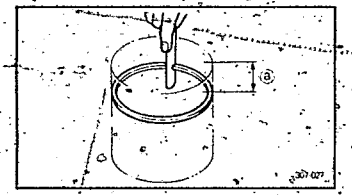
YB543009

PISTON RING

1. Measure:
• Side clearance
Out of specification → Replace piston and piston ring as a set.

NOTE:
Clean carbon from piston ring grooves and rings before measuring side clearance.

Side clearance:
Top ring
0.03~0.07 mm
(0.0012~0.0028 in)
2nd ring
0.02~0.06 mm
(0.0008~0.0024 in)



2. Position:
• Piston ring
(into the cylinder)

NOTE:
Push the ring with the piston crown so that the ring will be at a right angle to cylinder bore.

ⓐ 5 mm (0.2 in)

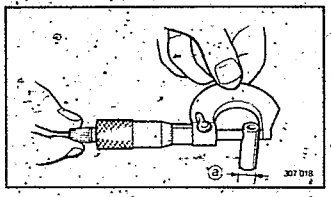
3. Measure:
• End gap
Out of specification → Replace.

NOTE:
You cannot measure end gap on expander spacer of oil control ring. If oil control ring rails show excessive gap, replace all three rings.

End gap:
Top ring
0.15~0.30 mm
(0.006~0.012 in)
2nd ring
0.15~0.30 mm
(0.006~0.012 in)
Oil ring
0.2~0.7 mm (0.008~0.028 in)

YB543010
PISTON PIN

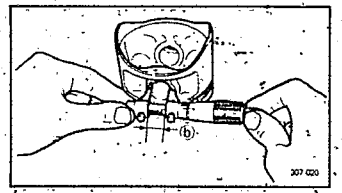
1. Inspect:
* Piston pin
  Blue discoloration/groove → Replace, then inspect lubrication system.



2. Measure:
* piston pin-to-piston clearance

Measurement steps:
* Measure the piston pin outside diameter ⓐ.
  If out of specification, replace the piston pin.

Outside diameter (piston pin):
14.991~15.000 mm
(0.5902~0.5906 in)

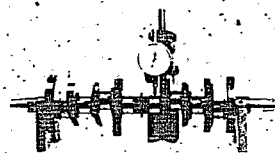


* Measure the piston inside diameter ⓑ.
* Calculate the piston pin-to-piston clearance with following formula:

Piston pin-to-piston clearance = Bore size (piston pin) ⓑ − Outside diameter (piston pin) ⓐ

* If out of specification, replace the piston.

Piston pin-to-piston clearance:
0.045~0.065 mm
(0.0018~0.0026 in)
Limit:0.15 mm (0.0059 in)

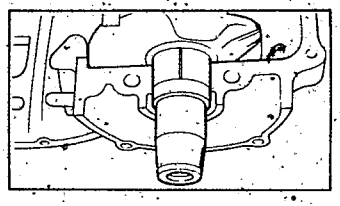


YB543011
CRANKSHAFT AND CONNECTING ROD

1. Measure:
* Runout (crankshaft)
  Out of specification → Replace.

Runout:
Less than 0.03 mm (0.0012 in)

2. Inspect:
* Main journal surfaces
* Crank pin surfaces
* Bearing surfaces
  Wear/Scratches → Replace.

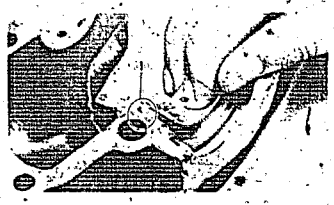


3. Measure:
* Oil clearance (main journal)
  Out of specification → Replace bearing.

Oil clearance:
0.025~0.043 mm
(0.0010~0.0017 in)

Measurement steps:

CAUTION:
Do not interchange the bearings. They must be installed in their original positions, or the correct oil clearance may not be obtained causing engine damage.



* Clean the bearings, main journals and bearing portions of the crankcase.
* Place the crankcase (upper) on a bench in an upside down position.
* Install the upper half of the bearings and crankshaft into the crankcase(upper).

NOTE:
Align the projection ⓘ of the bearing with the notch in the crankcase.

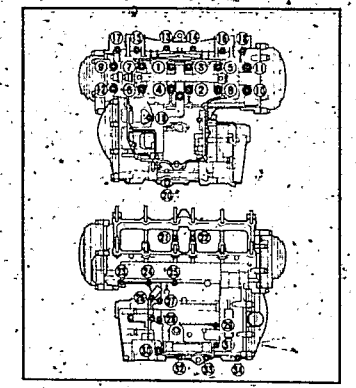
- Put a piece of Plastigauge® on the each main journal.

NOTE:
Do not put the Plastigauge® over the oil hole in the main journal of the crankshaft.

- Install lower half of the bearings into the crankcase (lower) and assembly the crankcase halves.

NOTE:
- Align the projection of the bearing with the notch in the crankcase.
- Do not move the crankshaft until the oil clearance measurement has been completed.

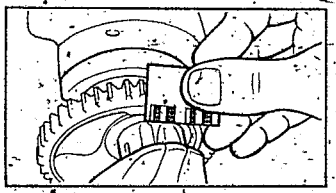
- Tighten the bolt to specification in tightening sequence cast on the crankcase.



	M8 (① ~ ⑫ and ⑳): 24 Nm (2.4 m · kg, 17 ft · lb) M6 (⑬ ~ ⑲ and ㉑ ~ ㉔): 12 Nm (1.2 m · kg, 8.7 ft · lb)

NOTE:
Lubricate the threads of bolts (M8 and M6) with engine oil.

- Remove the crankcase (lower) and lower half of the bearings.
- Measure the compressed Plastigauge® width on each main journal.
If oil clearance is out of specification, select a replacement bearing.



4. Measure:
- Oil clearance (crank pin)
Out of specification → Replace bearing.

	Oil clearance: 0.043~0.066 mm (0.0017~0.0026 in)

Measurement steps:

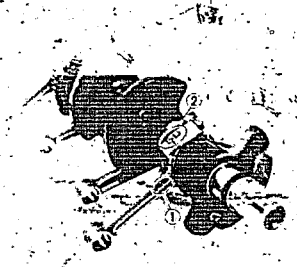
CAUTION:
Do not interchange the bearings and connecting rod. They must be installed in their original positions, or the correct oil clearance may not be obtained causing engine damage.

- Clean the bearings, crank pins and bearing portions of the connecting rods.
- Install the upper half of the bearing into the connecting rod and lower half of the bearing into the connecting rod cap.

NOTE:
Align the projection of the bearing with the groove of the cap and connecting rod.

- Put a piece of Plastigauge® on the crank pin.
- Assemble the connecting rod halves.

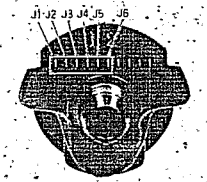
NOTE:
- Do not move the connecting rod or crankshaft until the oil clearance measurement has been completed.
- Lubricate molybdenum disulfide grease to the bolt threads and nut seats.
- Make sure the "Y" marks ① on the connecting rods face toward left side crankshaft.
- Make sure that the letters ② on both components align to from a perfect character.

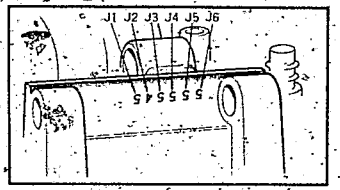


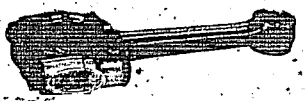
- Tighten the nuts in 2~3 steps.

	Nut: 23 Nm (2.3 m · kg, 17 ft · lb)

- Remove the connecting rods and bearings.
- Measure the compressed plastigauge® width on each crank pin.
If oil clearance is out of specification, select a replacement bearing.







5. Select:
- Main journal bearing (J_1~J_6)
- Crank pin bearing (P_1 and P_4)

Selection of bearings:

Example 1: Main journal bearing

● If the numerals "4" and "1" are respectively shown on the crankcase J_1 and crankwed J_1, the bearing size of J_1 is:

Bearing size of J_1:
Crankcase J_1 – Crankwed J_1 = 5 – 1 = 4 (Green)

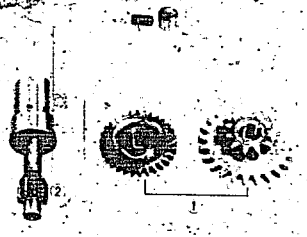
BEARING COLOR CODE	
1	Blue
2	Black
3	Brown
4	Green
5	Yellow

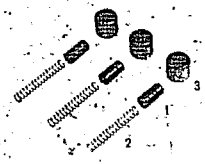
Example 2: Crank pin bearing

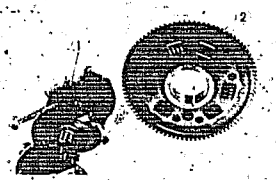
- If the numerals "5" and "1" are respectively shown on the connecting rod P_1 and crankwed P_1, the bearing size of P_1 is:

Bearing size of P_1:
Connecting rod P_1 – Crankwed P_1 = 4 – 1 = 3 (Brown)

BEARING COLOR CODE	
1	Blue
2	Black
3	Brown
4	Green







Y8554301

STARTER CLUTCH AND GEARS

1. Inspect:
- Starter clutch
  Push the dowel pin to arrow direction.
  Unsmooth operation → Replace starter clutch assembly.

2. Inspect:
- Starter clutch gear teeth
- Idle gear teeth ①
- Starter motor gear teeth ②
  Burrs/Chips/Roughness/Wear → Replace.

3. Inspect:
- Mounting boss (starter clutch gear) ③
  Pittings/Damage → Replace.

4. Inspect:
- Spring cap ①
- Spring ②
- Roller ③
  Wear/Damage → Replace.

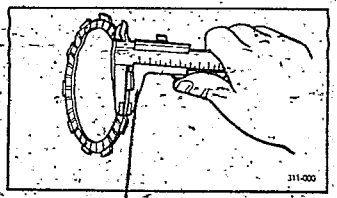
Y8543013

PRIMARY DRIVE

1. Inspect:
- Primary drive gear teeth ①
- Primary driven gear teeth ②
  Wear/Damage → Replace both gears.
  Excessive noise during operation → Replace both gears.

Y8543014
CLUTCH

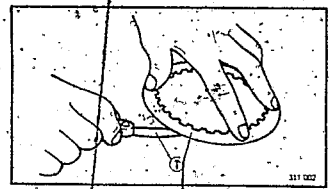
1. Inspect:
- Friction plate
Damage/Wear → Replace friction plate as a set.



2. Measure:
- Friction plate thickness
Out of specification → Replace friction plate as a set.
Measure at all four points.

Thickness:
2.9~3.1 mm (0.114~0.122 in)
(Limit: 2.8 mm (0.11 in))

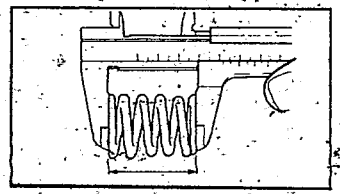
3. Inspect:
- Clutch plate
Damage → Replace clutch plate as a set.



4. Measure:
- Clutch plate warpage
Out of specification → Replace clutch plate as a set.
Use a surface plate and feeler gauge ①.

Warp limit:
Less than 0.1 mm (0.004 in)

5. Inspect:
- Clutch spring
Damage → Replace as a set.

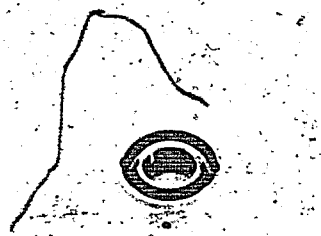


6. Measure:
- Clutch spring free length
Out of specification → Replace spring as a set.

Free length(clutch spring):
40.05 mm (1.59 in)
(Limit: 38.0 mm (1.50 in))

7. Inspect:
- Dogs on the clutch housing
Pitting/Wear/Damage → Deburr or replace.
- Clutch housing bearing
Wear/Damage → Replace clutch housing.

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

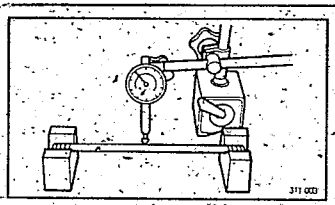


8. Inspect:
- Clutch boss splines
Pitting/Wear/Damage → Replace clutch boss.

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

9. Inspect:
- Spacer
Wear/Damage → Replace.

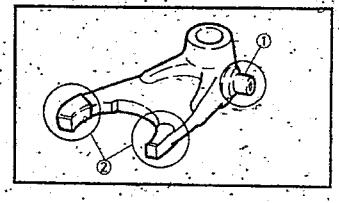
10. Inspect:
- O-ring ①
- Push rod #1 ②
- Push rod #2 ③
- Ball ④
Wear/Crack/Damage → Replace.



11. Measure:
- Push rod #2
  Out of specification → Replace.

Bending limit:
0.3 mm (0.012 in)

12. Inspect:
- Push cam ①
- Return spring ②
  Wear/Damage → Replace.



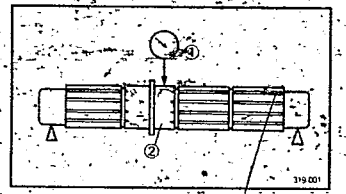
Y8543015
TRANSMISSION AND SHIFTER
1. Inspect:
- Shift fork cam follower ①
- Shift fork pawl ②
  Scoring/Bends/Wear/Damage → Replace.

2. Inspect:
- Guide bar
  Roll the guide bar on a flat surface.
  Bends → Replace.

⚠ WARNING:
Do not attempt to straighten a bend guide bar.

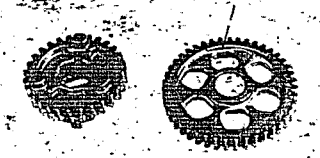
3. Check:
- Shift fork movement
  (on its guide bar)
  Unsmooth operation → Replace the fork and guide bar.

4. Inspect:
- Shift cam grooves
  Wear/Damage/Scratches → Replace.
- Shift cam segment ①
  Wear/Damage → Replace.
- Shift cam bearing ②
  Pitting/Damage → Replace.

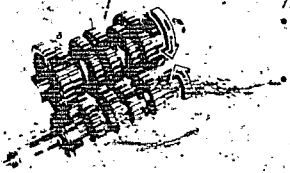


5. Measure:
- Axle runout ①
  Use centering device and dial gauge ②
  Out of specification → Replace bent axle.

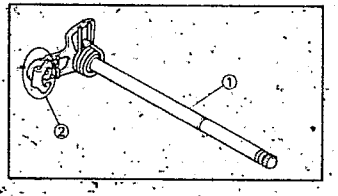
Runout limit:
0.02 mm (0.0008 in)



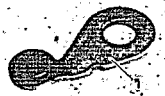
6. Inspect:
- Gear teeth
  Blue discoloration/Pitting/Wear → replace.
- Mated dogs
  Rounded edges/Cracks/Missing portions → Replace.



7. Check:
- Proper gear engagement (each gear)
  (to its counterpart)
  Incorrect → Reassemble.
- Gear movement
  Roughness → Replace.



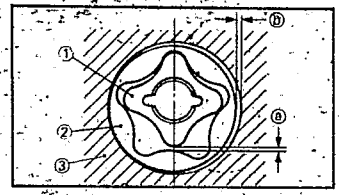
Y8543023
SHIFT SHAFT AND STOPPER LEVER
1. Inspect:
- Shift shaft ①
- Shift pawls ②
  Bends/Wear/Damage → Replace.



2. Inspect:
- Stopper lever ①
  Roller turns roughly → Replace.
  Bends/Damage → Replace.

3. Inspect:
- Return spring (shift shaft) ①
- Return spring (shift pawls)
- Return spring (stopper lever)
  Wear/Damage → Replace.

YB543016
OIL PUMP
1. Inspect:
- Oil pump drive gear
- Oil pump driven gear ①
  Wear/Crack/Damage → Replace.



2. Measure:
- Tip clearance ⓐ
  (between inner rotor ① and outer rotor ②)
- Side clearance ⓑ
  (between outer rotor ② and pump housing ③)
  Out of specifications → Replace oil pump.

	Tip clearance: **0.03~0.08 mm** **(0.0012~0.0031 in)** **Side clearance:** **0.09~0.15 mm** **(0.0035~0.0059 in)**

3. Install:
- Oil pump assembly
  Reverse the "ENGINE DISASSEMBLY—OIL PUMP" section.

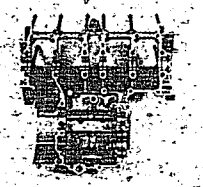
NOTE:
Align the pins in the pump shaft with the groove on the inner rotors dualing assembly.

4. Check:
- Oil pump operation
  Unsmooth operation → Replace.

YB543017
EX-UP
1. Inspect:
- Valve (EXUP) ①
- Housing (valve) ②
- Gasket (steel) ③
  Wear/Cracks/Damage → Replace.
- Bush ④
  Wear → Replace.

YB543018
OIL PIPE AND STRAINER
1. Inspect:
- Oil delivery pipe ①
  Cracks/Damage → Replace.
  Clog → Blow out with compressed air.

2. Inspect:
- Oil strainer ①
  Damage → Replace.



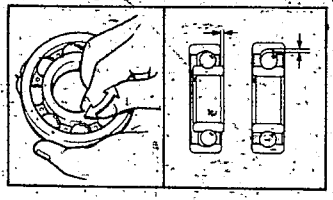
YB543018

CRANKCASE

1. Thoroughly wash the case halves in mild solvent.

2. Clean all the gasket mating surface and crankcase mating surface thoroughly.

3. Inspect:
- Crankcase
  Cracks/Damage → Replace.
- Oil delivery passages
  Clog → Blow out with compressed air.



YB543020

BEARING AND OIL SEAL

1. Inspect:
- Bearings
  Clean and lubricate, then rotate inner race with finger.
  Roughness → Replace.

2. Inspect:
- Oil seals
  Damage/Wear → Replace.

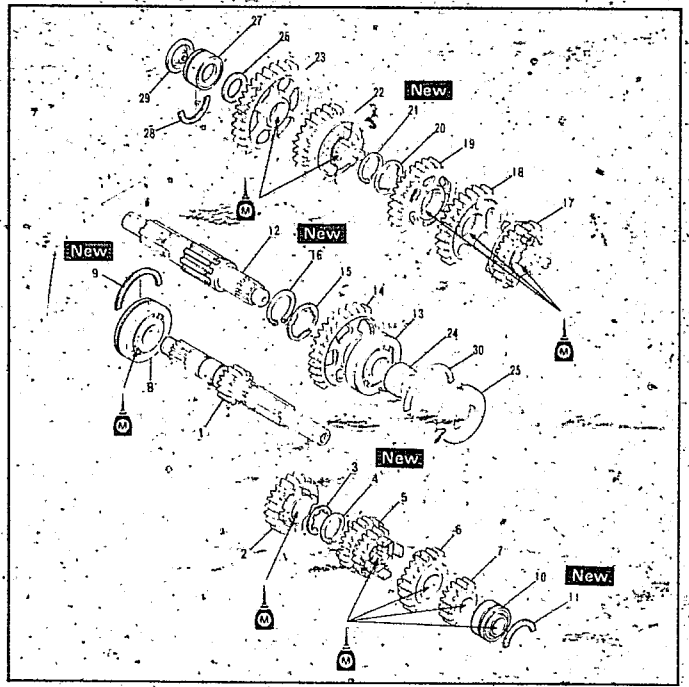
YB543021

CIRCLIP AND WASHER

1. Inspect:
- Circlips
- Washers
  Damage/Looseness/Bends → Replace.

TRANSMISSION

① Main axle
② 5th pinion gear
③ Washer
④ Circlip
⑤ 3rd pinion gear
⑥ 6th pinion gear
⑦ 2nd pinion gear
⑧ Bearing
⑨ Circlip
⑩ Bearing
⑪ Circlip
⑫ Drive axle
⑬ Bearing
⑭ 2nd wheel gear
⑮ Washer
⑯ Circlip
⑰ 6th wheel gear
⑱ 3rd wheel gear
⑲ 4th wheel gear
⑳ Washer
㉑ Circlip
㉒ 5th wheel gear
㉓ 1st wheel gear
㉔ Collar
㉕ Oil seal
㉖ Plate washer
㉗ Bearing
㉘ Circlip
㉙ Nozzle
㉚ Circlip



YB544001
ENGINE ASSEMBLY AND ADJUSTMENT

⚠ WARNING

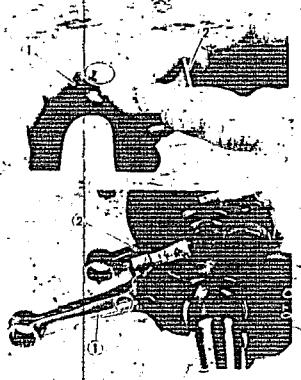
For engine reassembly, replace the following parts with new ones.
- **O-ring**
- **Gasket**
- **Oil seal**
- **Copper washer**
- **Lock washer**
- **Circlip**

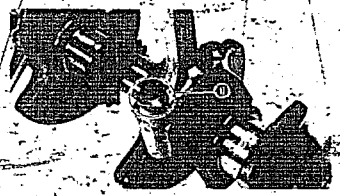
YB544002
CONNECTING RODS

1. Apply:
- Molybdenum disulfide grease (onto threads of bolts and bottom surfaces of nuts)
- Engine oil (onto crank pins, crank pin bearings and inner surfaces of connecting rods)

2. Install:
- Crank pin bearings ①
- Connecting rods ②
- Connecting rod caps (onto crank pins)

NOTE:
- Align the projection of bearing with the groove of the caps and connecting rod.
- Identify each bearing position very carefully so that it can be reinstalled in its original place.
- The stamped "Y" mark on the connecting rods ① should face towards the left side of the crankcase.
- Be sure that the letter ② on both components align to from a perfect character.

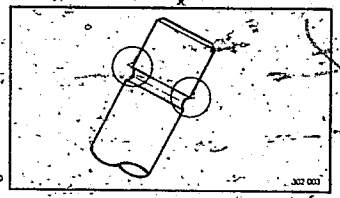




3. Align:
- Bolt head ①
(with connecting rod cap)

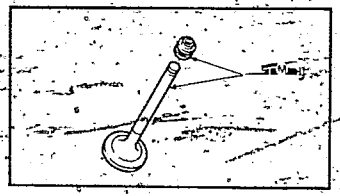
4. Tighten:
- Nuts (connecting rods)

Nut (connecting rod):
23 Nm (2.3 m · kg, 17 ft · lb)

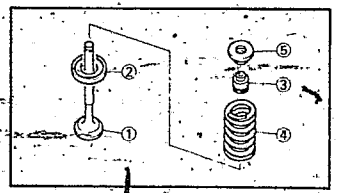


YB544003
VALVE

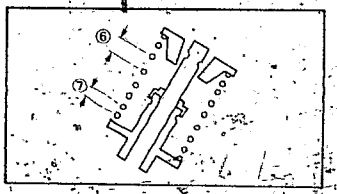
1. Deburr:
- Valve stem end
Use an oil stone to smooth the stem end.



2. Apply:
- Molybdenum disulfide oil (onto valve stem and oil seal)

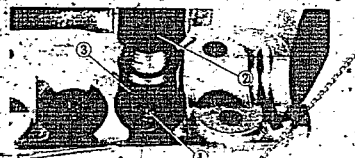


3. Install:
- Valve ①
- Spring seat ②
- Oil seal ③
- Valve spring ④
- Valve retainer ⑤
(into cylinder head)



NOTE:
- Make sure that the each valve is installed in its original place.
- Install the valve spring with larger pitch ⑥ facing upward.

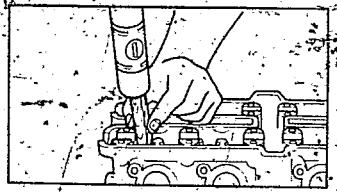
⑦ Smaller pitch



4. Install:
• Valve cotters ①

NOTE:
Install the valve cotters while compressing the valve spring with the valve spring compressor ② and attachment ③.

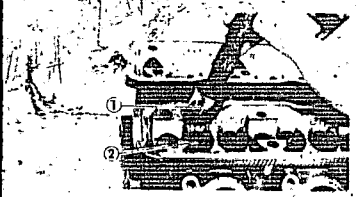
	Valve spring compressor: P/N 90890-04109 **Attachment:** P/N 90890-04114



5. Secure the valve cotter on to the valve stem by tapping it lightly with a piece of wood.

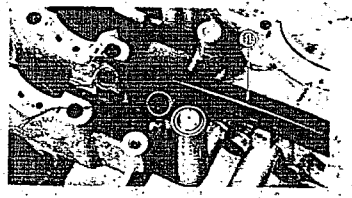
NOTE:
Do not hit so much as to damage the valve.

6. Apply
• Molybdenum disulfide oil
(onto outer surface of valve lifters and pads.)

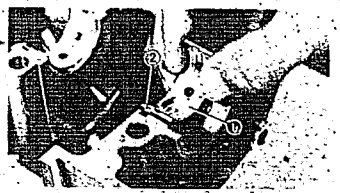


7. Install:
• Valve lifters ①
• Pads ②

NOTE:
• Valve lifter must be rotated smoothly by a finger.
• Each valve lifter and pad position very carefully so that its original place.

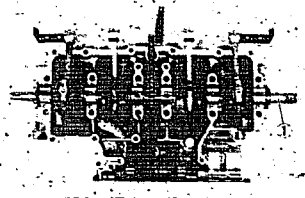


YB544004
CRANKSHAFT
1. Install:
• Chain guide ①



2. Apply:
• Engine oil
(onto main journal bearings)
3. Install:
• Main journal bearings ①
(onto lower crankcase)

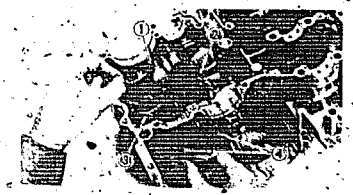
NOTE:
• Align the projection ② of the bearing with the notch in the case.
• Identify each bearing position so that the bearing should be installed in position.



4. Apply:
• Engine oil
(onto main journal of crankcase)

5. Install:
• Crankshaft assembly ①

YB544005
SHIFT FORK AND SHIFT CAM
1. Install:
• Shift cam ①

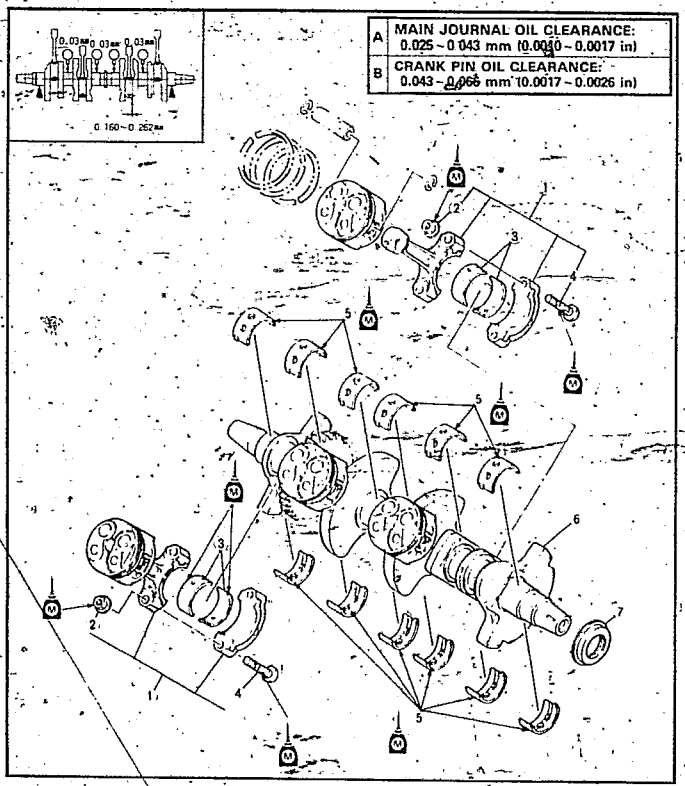


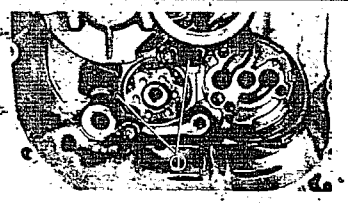
2. Install:
• Shift fork 1 ①
• Shift fork 2 ②
• Shift fork 3 ③
• Guide bars ④

NOTE:
Install the shift forks with the embossed mark on each shift fork facing right side of the engine.

CONNECTING ROD AND CRANKSHAFT

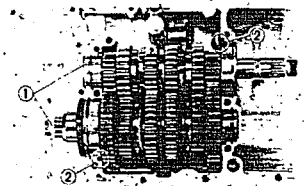
① Connecting rod assembly
② Nut
③ Connecting rod bearing
④ Connecting rod bolt
⑤ Main journal bearing
⑥ Crankshaft
⑦ Oil seal





3. Install:
• Stopper plate ① (shift cam)

	Bolt (stopper plate): 10 Nm (1,0 m · kg, 7.2ft · lb)

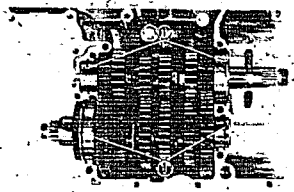


YB544008

TRANSMISSION

1. Install:
• Transmission assembly ①

NOTE:
Align the bearing knock pin ② with the pin slot in the crankcase lower half.



2. Install:
• Stopper ring ①

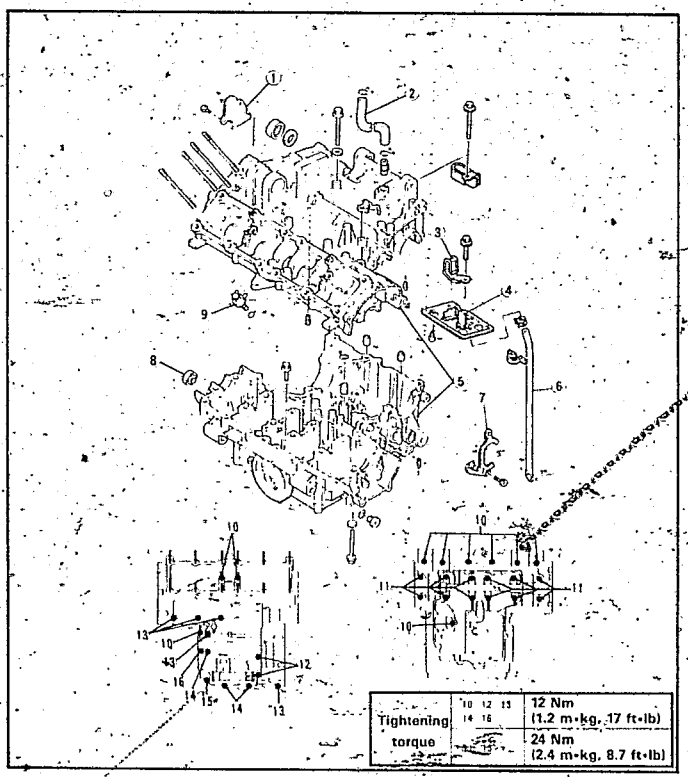
NOTE:
• Be sure the stopper ring is fitted to the bearing and the stopper ring have been positioned in the ring groove.
• Stopper ring is setted between the upper and lower crank case.

3. Check:
• Transmission operation
Unsmooth operation → Repair.

4 Install:
• Oil seal ①

CRANKCASE

① Breather plate
② Breather pipe
③ Clamp
④ Breather plate
⑤ Crankcase assembly
⑥ Hose
⑦ Bearing plate
⑧ Level gauge
⑨ Jet nozzle
⑩ Bolt (6m/m ℓ = 40 mm)
⑪ Bolt (8m/m ℓ = 85 mm)
⑫ Bolt (6m/m ℓ = 90 mm)
⑬ Bolt (6m/m ℓ = 50 mm)
⑭ Bolt (6m/m ℓ = 70 mm)
⑮ Bolt (6m/m ℓ = 70 mm)
⑯ Bolt (6m/m ℓ = 80 mm)



Tightening torque	10 12 13 14 16	12 Nm (1.2 m•kg, 17 ft•lb)
		24 Nm (2.4 m•kg, 8.7 ft•lb)

YB544007

CRANKCASE

1. Apply:
- Engine oil
(onto main journal bearings)

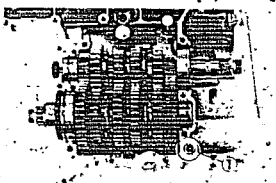
2. Install:
- Main journal bearings ①
(onto upper crankcase)

NOTE:
- Align the projection "a" of the bearing with the notch in the case.
- Identify each bearing position so that the bearing should be installed in position.

3. Apply:
- Sealant
(onto crankcase matching surfaces)

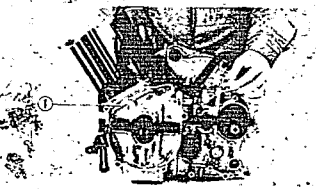
	Yamaha bond No. 1215: P/N 90890-85505

NOTE:
DO NOT ALLOW any sealant to came in contact with the oil gallery or crankshaft bearing. Do not apply sealant to within 2~3 mm (0.08~0.12 in) of the bearings.



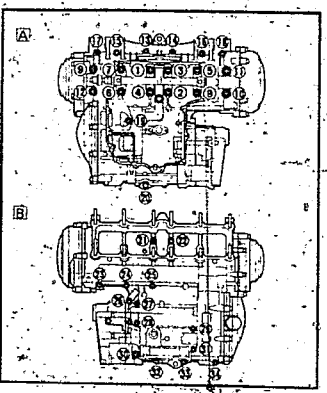
4. Install:
- Dowel pin ①

5. Set shift cam and transmission gears in NEUTRAL position.



6. Install:
• Upper crankcase ①

CAUTION:
Before tightening the crankcase bolts, check the following points:
• Be sure the gear shifts correctly while hand turning the shift cam.



7. Install:
• Bolts (crankcase)

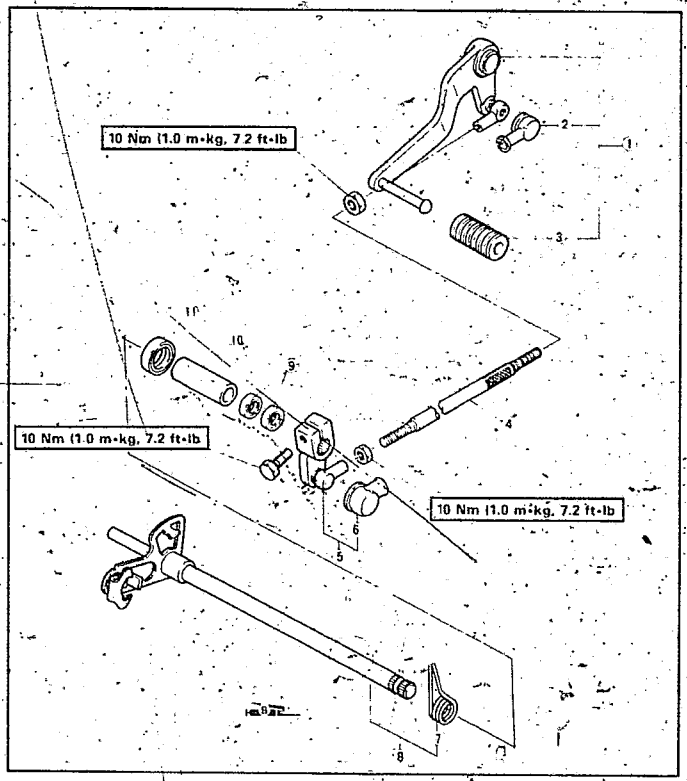
Ⓐ Lower crankcase
Ⓑ Upper crankcase

Bolt (crankcase):
M8 (① ~ ⑫ and ⑳):
24 Nm (2.4 m · kg, 17 ft · lb)
M6 (⑬ ~ ㉙ and ㉛ ~ ㉞):
12 Nm (1.2 m · kg, 8.7 ft · lb)

NOTE:
- Lubricate the threads of bolts (M8 and M6) with engine oil.
- Tighten the bolts starting with the lowest numbered one.
- Install the copper washer on the bolts No. 29.
- Install the cable holder on the bolt No.26 and No.32.
- Install the ground lead on the bolt No.33.

8 Install:
• Oil seal stopper plate ①

SHIFT SHAFT
① Shift pedal assembly
② Dust cover
③ Shift pedal cover
④ Shift rod
⑤ Shift arm
⑥ Dust cover
⑦ Spring
⑧ Shift shaft assembly
⑨ Oil seal
⑩ Spacer
⑪ Oil seal



YB5A1011

SHIFT SHAFT

1. Install:
- Neutral switch (1)

2. Install:
- Spring (1)
- Stopper lever (2)
- Shift shaft (3)

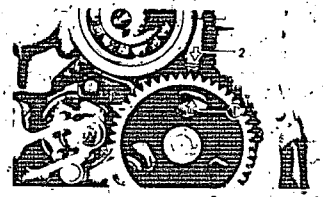
	Bolt (stopper lever): 10 Nm (1.0 m · kg, 7.2 ft · lb): Lactate*

NOTE:
- Mesh the stopper lever with the shift cam stopper.
- Hook the spring ends on the stopper lever and crankcase boss.

YB5A1012

OIL PUMP

1. Install:
- Dowel pin (1)
- Pump cover gasket (2)
- Oil pump assembly

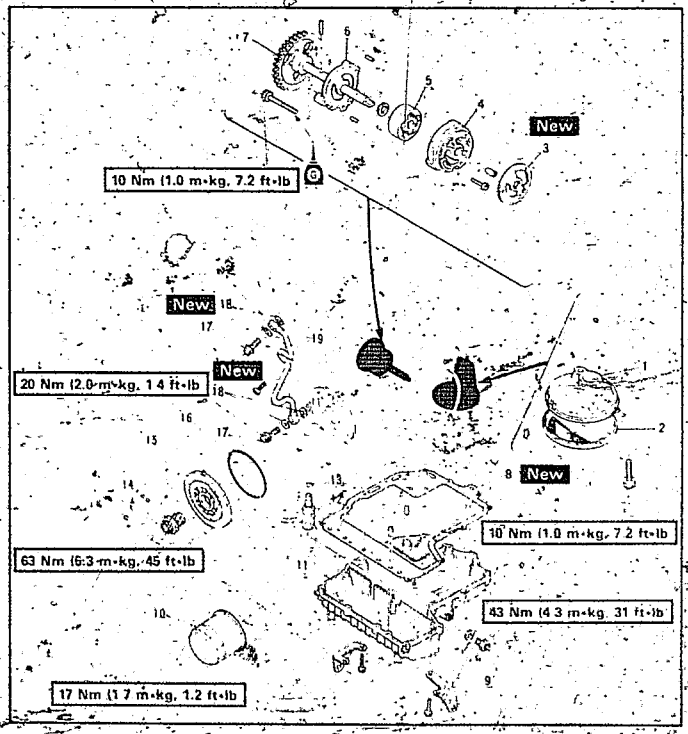


	Bolt (oil pump): 10 Nm (1.0 m · kg, 7.2 ft · lb) Use Loctite*

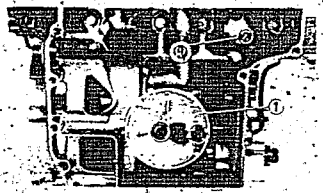
NOTE:
Align the oil pump arrow mark (1) with crankcase arrow mark (2).

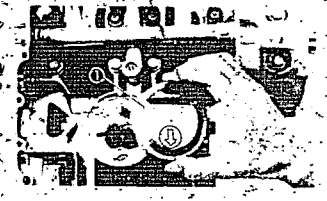
OIL PUMP, OIL STRAINER, OIL PAN

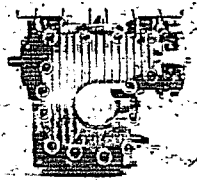
1. Oil strainer housing
2. Oil strainer
3. Gasket
4. Rotor housing
5. Rotor assembly
6. Pump cover
7. Pump shaft assembly
8. Gasket
9. Drain plug
10. Oil filter
11. Oil pan
12. Relief valve
13. O-ring
14. Bypass valve
15. Oil filter housing
16. O-ring
17. Union bolt
18. Copper washer
19. Oil delivery pipe

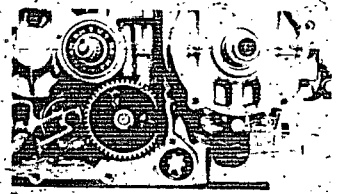


CAUTION:
- Be sure that the oil pump turns smoothly in itself after tightening the bolts.
- Be sure that the oil pump shaft projection mesh with the water pump impeller shaft slot.









YB544013

OIL STRAINER AND OIL PAN

1. Install:
- Relief valve 1
- Oil strainer housing 2

NOTE:
The arrow on the oil strainer housing point to the front of the engine.

Bolt (oil strainer housing): 10 Nm (1.0 m · kg, 7.2 ft · lb)

2. Install:
- Oil strainer 1

NOTE:
The arrow on the oil strainer point to the front of the engine.

3. Install:
- Dowel pins
- Gasket
- Oil pan 1

NOTE:
Tighten the bolts (oil pan) in a crisscross pattern.

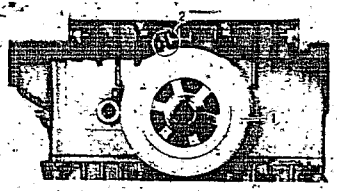
Bolt (oil pan): 10 Nm (1.0 m · kg, 7.2 ft · lb)

4. Install:
- Oil pressure switch 1

Apply the Yamaha bond No.1215 to the thread.

Oil pressure switch: 12 Nm (1.2 m · kg, 8.7 ft · lb)

Yamaha bond No.1215: P/N 90890-85505



5. Install:
- Oil filter housing 1

NOTE:
Mesh the housing cover projection 2 with the crankcase slot.

Bypass valve: 63 Nm (6.3 m · kg, 45 ft · lb)

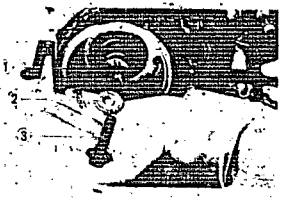
YB544008

STARTER MOTOR

1. Install:
- Starter motor 1

Bolt (starter motor): 10 Nm (1.0 m · kg, 7.2 ft · lb)

NOTE:
Apply the engine oil to the O-ring of the starter motor.



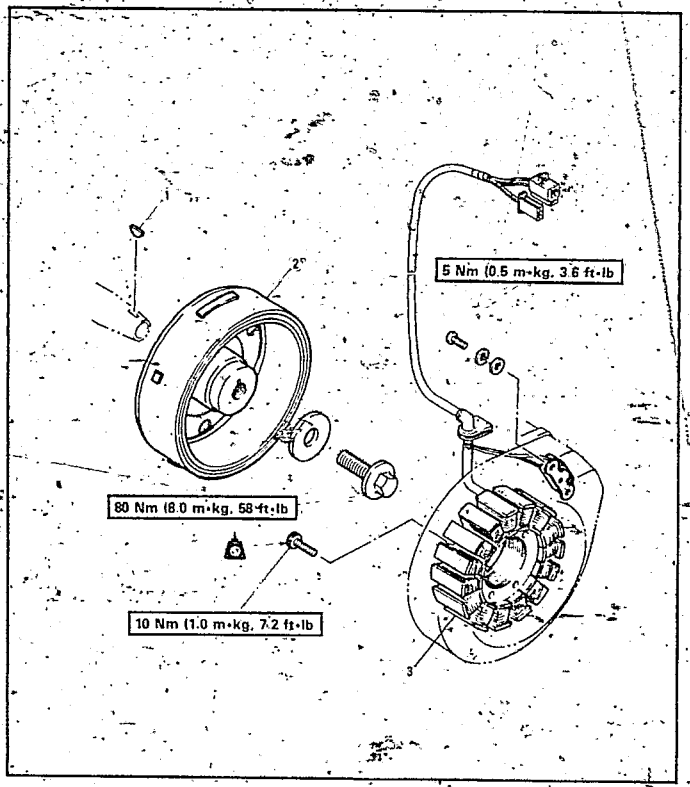
YB54009

AC MAGNETO

1. Install:
- Woodruff key
- Magneto rotor 1
- Washer 2
- Bolt (magneto rotor) 3

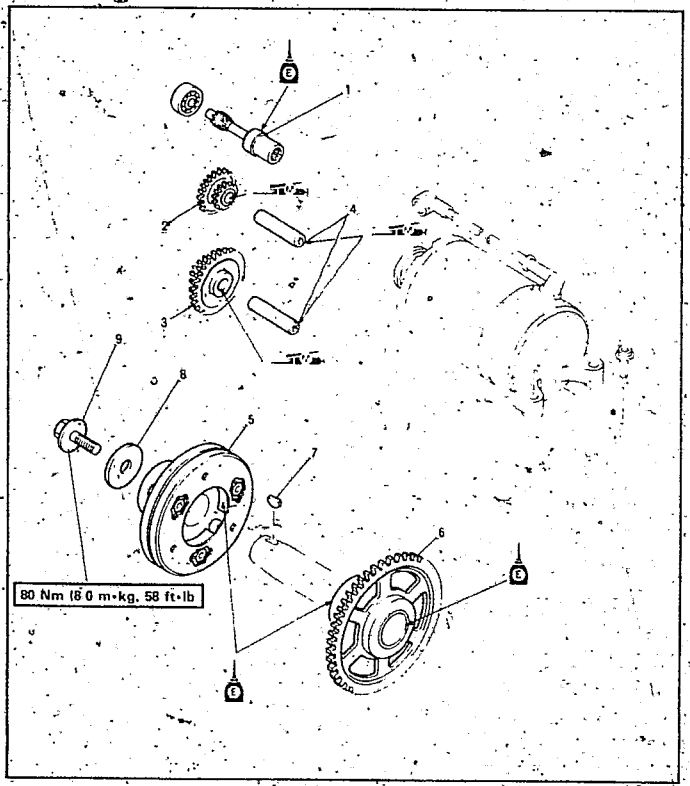
AC MAGNETO

① Woodruff key
② Rotor assembly
③ Stator assembly

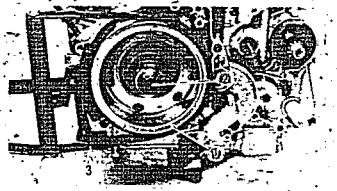


STARTER CLUTCH

① Starter motor gear
② Idle gear 1
③ Idle gear 2
④ Shaft
⑤ Starter clutch assembly
⑥ Starter clutch gear
⑦ Woodruff key
⑧ Plate washer
⑨ Bolt



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



3. Tighten:
- Bolt (magneto rotor)

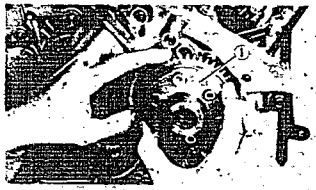
NOTE:
Tighten the bolt (magneto rotor) ② while holding the magneto rotor ① with the sheave holder ③.

Sheave holder: P/N 90890-01701	
Bolt (magneto rotor): 80 Nm (8.0 m · kg, 58 ft · lb)	

YB544010
STARTER CLUTCH
1. Install:
- Starter clutch spring cap ①
- Spring ②
- Roller ③

2. Install:
- Starter motor gear ①

3. Install:
- Starter clutch gear ①
- Woodruff key ②



4. Install:
- Starter clutch ①

NOTE:
When installing the starter clutch, make sure that the woodruff key is properly seated in the keyway of the crankshaft.

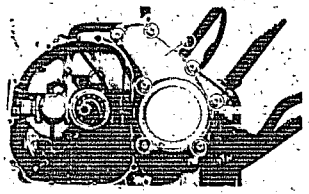
5. Apply:
- Molybdenum disulfide oil (onto the idle gear)

6. Install:
- Idle gear ①
- Idle gear ②

7. Install:
- Plate washer ①
- Bolt ② (starter clutch)

NOTE:
Tighten the bolt while holding the rotor with the sheave holder.

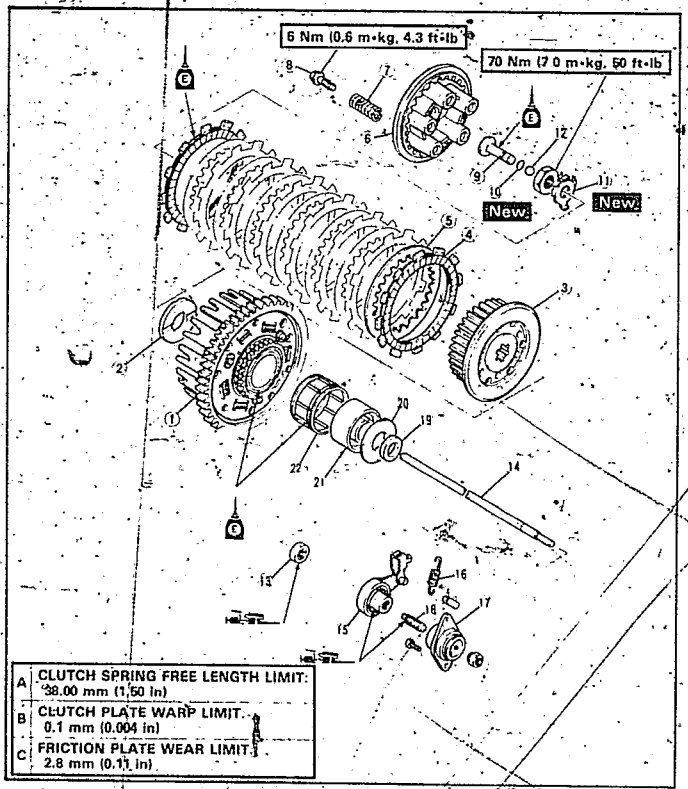
Bolt (starter clutch): 80 Nm (8.0 m · kg, 58 ft · lb)	



8. Install:
- Dowel pins
- Gasket
- Starter clutch cover ①

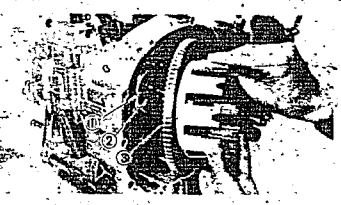
CLUTCH

1. Clutch housing
2. Thrust plate
3. Clutch boss
4. Friction plate
5. Clutch plate
6. Pressure plate
7. Clutch spring
8. Bolt
9. Push rod
10. O-ring
11. Lock washer
12. Ball
13. Push rod seal
14. Push rod
15. Push lever assembly
16. Spring
17. Ball screw housing
18. Set screw
19. Collar
20. Thrust plate
21. Spacer
22. Bearing



A	CLUTCH SPRING FREE LENGTH LIMIT: 38.00 mm (1.50 in)
B	CLUTCH PLATE WARP LIMIT: 0.1 mm (0.004 in)
C	FRICTION PLATE WEAR LIMIT: 2.8 mm (0.11 in)

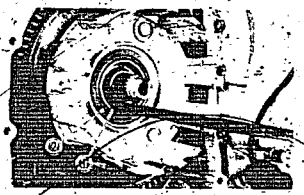
	Bolt (starter clutch cover): 10 Nm (1.0 m • kg, 7.2 ft • lb)*



YB544D14

CLUTCH

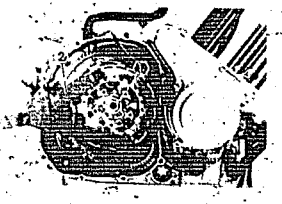
1. Install:
   - Collar (1)
   - Thrust plate (2)
   - Clutch housing (3)



2. Install:
   - Spacer (1)
   - Bearing (2)

3. Install:
   - Thrust plate
   - Clutch boss (1)
   - Lock washer (2) (new)
   - Nut (clutch boss) (3)

NOTE:
Make sure that the tab of the lock washer engages the slot in the clutch boss.



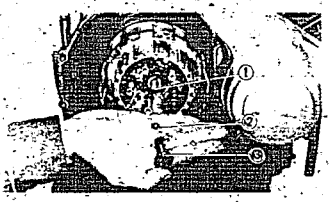
4. Tighten:
   - Nut (clutch boss) (1)

	Nut (clutch boss): 70 Nm (7.0 m • kg, 50 ft • lb)

NOTE:
- Tighten the nut (clutch boss) (1) while holding the clutch housing by the clutch holder (2).

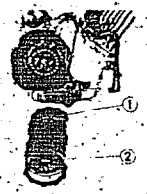
• Bend the lock washer tab along the nut flat.

	Universal clutch holder: P/N 90890-04086

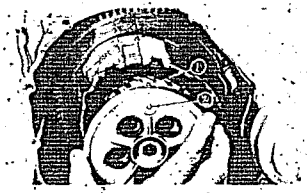


5. Install:
• Push rod #2 ①
• Ball ②
• Push rod #1 ③

NOTE:
Apply the lithium soap base grease to the push rod #2 and ball.

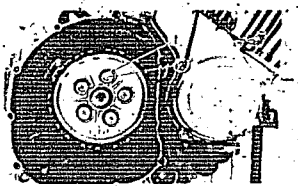


6. Install:
• Friction plate ①
• Clutch plates ②



7. Install:
• Pressure plate

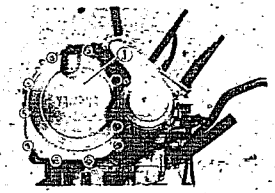
NOTE:
Align the punched mark ① on the clutch boss with the arrow mark ② on the pressure plate.



8. Install:
• Clutch spring ①
• Bolts (clutch spring) ②

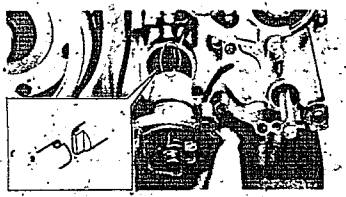
	Bolt (clutch spring): 6 Nm (0.6 m · kg, 4.3 ft · lb)

NOTE:
Tighten the bolts (clutch spring) in stage, using a crisscross pattern.



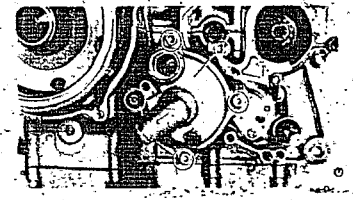
9. Install:
• Dowel pins
• Gasket
• Crankcase cover ① (right)

	Bolt (crankcase cover): 10 Nm (1.0 m · kg, 7.2 ft · lb)



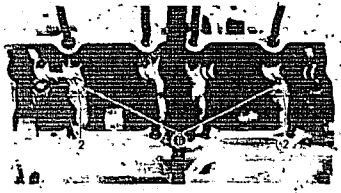
YB544015
WATER PUMP
1. Install:
• Water pump housing

NOTE:
Align the impeller shaft slit with pump shaft projection.



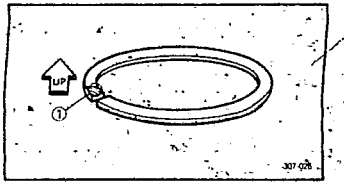
2. Install:
• O-ring
• Water pump cover ①

	Bolt (water pump cover): 10 Nm (1.0 m · kg, 7.2 ft · lb)



YB544016
CYLINDER AND PISTON
1. Install:
• Oil jet nozzles ①
(with O-ring ②)

NOTE:
Apply the engine oil to the O-rings.

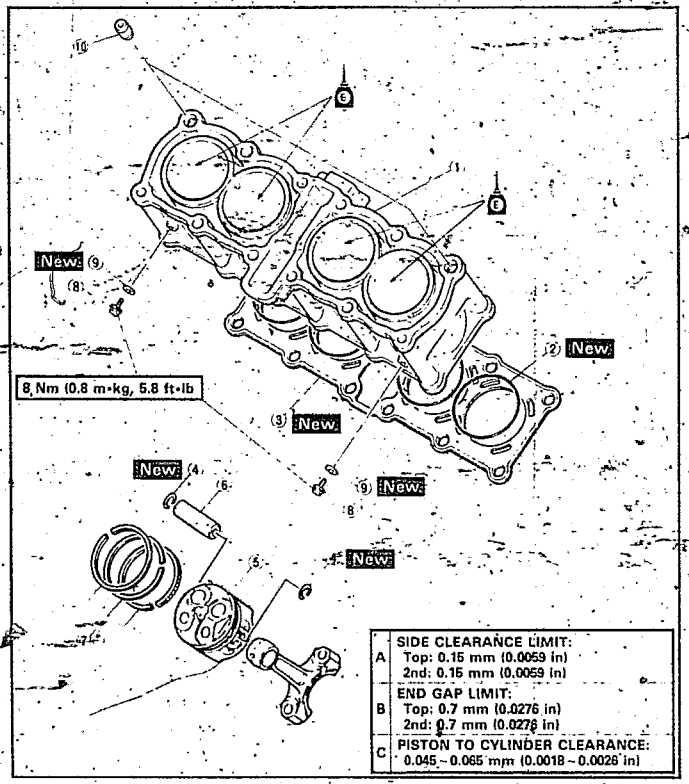


2. Install:
• Piston rings

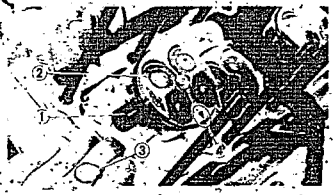
NOTE:
• Be sure to install rings to that manufacturer's marks or numbers are located on the top side of the rings. Oil the pistons and rings liberally.
• Piston ring with 1 mark should be installed into second ring position.

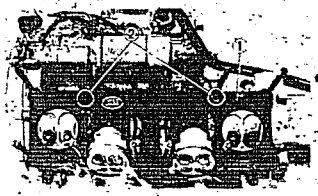
CYLINDER, PISTON, PISTON RING

① Cylinder
② O-ring
③ Gasket
④ Circlip
⑤ Piston
⑥ Piston pin
⑦ Piston ring set
⑧ Drain bolt
⑨ Gasket
⑩ Dowel pin



A	SIDE CLEARANCE LIMIT: Top: 0.15 mm (0.0059 in) 2nd: 0.15 mm (0.0059 in)
B	END GAP LIMIT: Top: 0.7 mm (0.0276 in) 2nd: 0.7 mm (0.0276 in)
C	PISTON TO CYLINDER CLEARANCE: 0.045 – 0.065 mm (0.0018 – 0.0026 in)





3. Install:
- Piston pins ①
- Pistons ②
- Circlips (piston pin) ③

NOTE:
- Apply the engine oil to the piston pins.
- Be sure that the piston allow mark ④ face to exhaust side of the engine.
- Before installing the piston pin circlips, cover the crankcase with a clean rag to prevent the circlip from falling into the crankcase cavity.
- Be sure that the marked piston numbers should be in sequence (1,2,3,4) beginning from the left.

⚠WARNING:
Always use new circlips (piston pin).

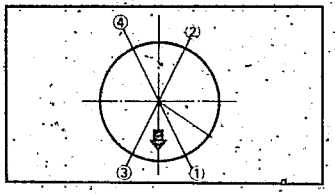
4. Install:
- Gasket (cylinder) ①
- Dowel pins ②

NOTE:
The gasket "3TJ" mark should face upward.

⚠WARNING:
Always use a new gasket (cylinder).

5. Apply:
- Pistons
- Piston rings
- Cylinder

NOTE:
Apply a liberal coating of engine oil.



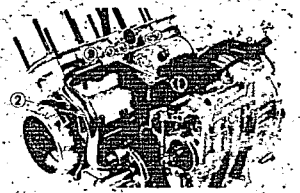
6. Piston:
- Top ring
- 2nd ring
- Oil ring

Offset the piston ring end gaps as shown.
① Top ring end
② Oil ring end (lower)
③ Oil ring end (upper)
④ 2nd ring end

7. Install:
• O-ring (new)

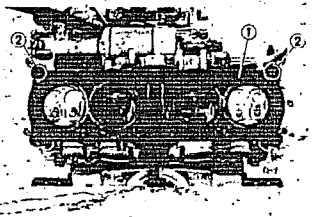
8. Install:
• Cylinder

NOTE:
• Install the #2 and #3 pistons first.
• Pass the cam chain and cam chain guide (exhaust side) through the cam chain cavity.



9. Install:
• Joint ①
• O-ring
• Pipe ②

	Bolt (joint and pipe): 10 Nm (1.0 m • kg, 7.2 ft • lb)



YB544017

CYLINDER HEAD AND CAMSHAFT

1. Install:
• Gasket ① (cylinder head)
• Dowel pins ②

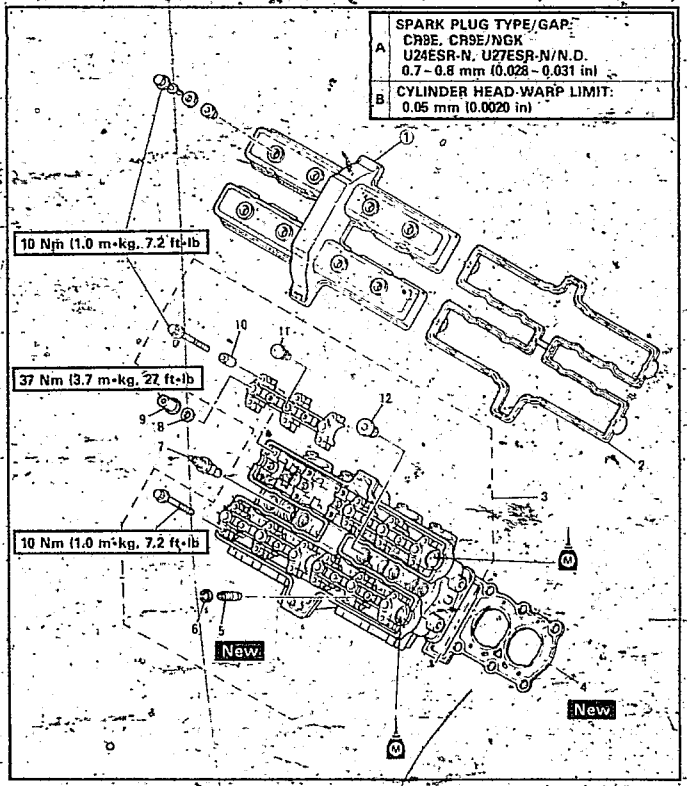
NOTE:
The gasket "UP" mark should face upward as photo.

⚠WARNING
Always use a new gasket (cylinder head).

2. Install:
• Cylinder head

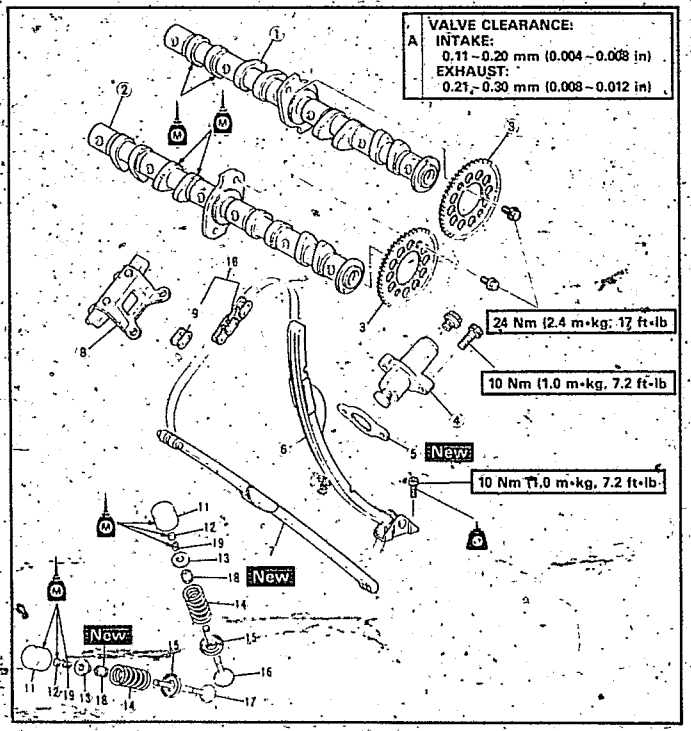
CYLINDER HEAD

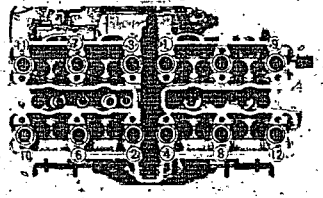
① Cylinder head cover
② Cylinder head cover gasket
③ Cylinder head
④ Cylinder head gasket
⑤ Valve guide
⑥ Circlip
⑦ Spark plug
⑧ Plate washer
⑨ Nut
⑩ Dowel pin
⑪ Plug
⑫ Straight screw plug



CAMSHAFT, CAM CHAIN

① Camshaft (Intake)
② Camshaft (Exhaust)
③ Cam chain sprocket
④ Cam chain tensioner assembly
⑤ Gasket
⑥ Chain guide
⑦ Chain guide
⑧ Chain guide
⑨ Cam chain joint
⑩ Cam chain
⑪ Valve lifter
⑫ Adjusting pad
⑬ Valve spring retainer
⑭ Valve spring
⑮ Valve spring seat
⑯ Intake valve
⑰ Exhaust valve
⑱ Valve stem seal
⑲ Valve cotter

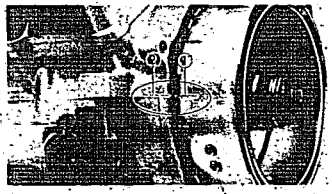




3. Install:
• Nuts ①

	Nut (cylinder head): 37 Nm (3.7 m • kg, 27 ft • lb)

NOTE:
• Apply the engine oil onto the nut threads.
• Tighten the nuts in a crisscross pattern.



4. Turn the crankshaft counterclockwise until the "T" mark ① is aligned with the stationary pointer ②.

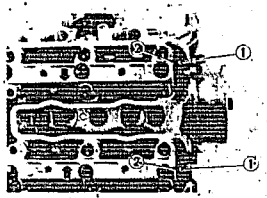
5. Install:
• Exhaust camshaft ①
• Intake camshaft
• Dowel pins

NOTE:
Install the camshaft with the punch mark facing upward.

6. Install:
• Camshaft caps

Apply the engine oil onto the camshaft cap journal.

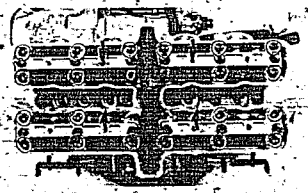
NOTE:
Install the camshaft caps with the arrow marks embossed facing opposite of the engine as photo.

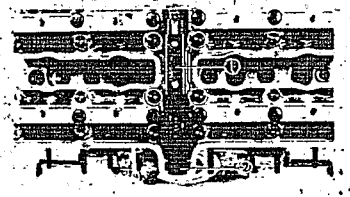


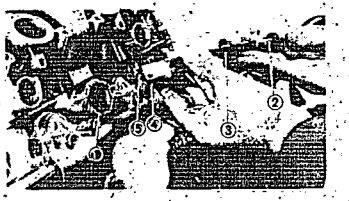
7. Tighten:
• Bolt (camshaft cap)

	Bolt (camshaft cap): 10 Nm (1.0 m • kg, 7.2ft • lb)

NOTE:
• Align the punch marks on the camshaft ① and the camshaft cap ②.
• Tighten the bolts (camshaft cap) in a crisscr-







ross pattern from inside.

CAUTION:
The bolts (camshaft cap) must be tightened evenly, or damage to the cylinder head, camshaft caps and cam will be result.

8. Install:
- Chain guide ① (upper)
- Chain guide ② (exhaust side)

	Bolt (upper chain guide): 10 Nm (1.0 m · kg, 7.2 ft · lb)

YB544018
TIMING CHAIN TENSIONER
1. Install:
- Gasket ①
- Timing chain tensioner

Installation steps:
- Remove the tensioner cap bolt ② and springs ③.
- Release the timing chain tensioner one-way cam ④ and push the tension rod ⑤.
- Install the tensioner with a new gasket ① into the cylinder.

NOTE:
Install the tensioner body so that the "UP" mark face upward.

	Bolt (timing chain tensioner): 10 Nm (1.0 m · kg, 7.2 ft · lb)

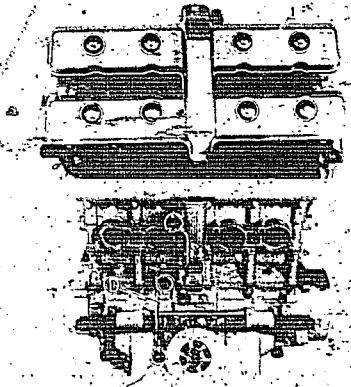
- Install the springs ③ and cap bolt ②.

	Cap bolt (timing chain tensioner): 15 Nm (1.5 m · kg, 11 ft · lb)

2. Check:
- Valve timing
Out of alignment → Adjust.
Refer to "CYLINDER AND CAMSHAFT" section.

3. Check:
- Valve clearance
Out of specification → Adjust.
Refer to "VALVE CLEARANCE ADJUSTMENT" section in the CHAPTER 3.

	Intake valve (cold): 0.11 ~ 0.20 mm (0.0043 ~ 0.0079 in) Exhaust valve (cold): 0.21 ~ 0.30 mm (0.0083 ~ 0.012 in)

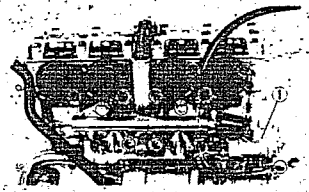


YB544019
CYLINDER HEAD COVER
1. Install:
- Gasket (cylinder head cover)
- Cylinder head cover ①

	Bolt (cylinder head cover): 10 Nm (1.0 m · kg, 7.2 ft · lb)

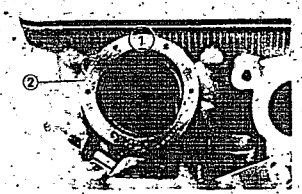
2. Install:
- Oil delivery pipe ①
- Copper washers (new)

	Union bolt: 20 Nm (2.0 m · kg, 14 ft · lb) Bolt: 10 Nm (1.0 m · kg, 7.2 ft · lb)



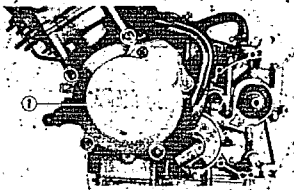
3. Install:
- Thermostat housing ①
- O-ring

	Bolt (thermostat housing): 10 Nm (1.0 m · kg, 7.2 ft · lb)



4. Install:
- Carburetor joint ②

NOTE:
The number should be in sequence (1,2,3,4) beginning from the left.



5. Install:
- Dowel pins
- Gasket (new)
- AC magneto cover ①

	Bolt (AC magneto cover): 10 Nm (1.0 m · kg, 7.2 ft · lb)

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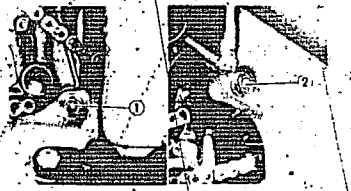
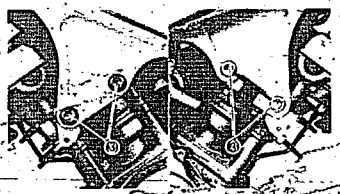
REMOUNTING ENGINE

When remounting the engine, reverse the removal procedure. Note the following points.

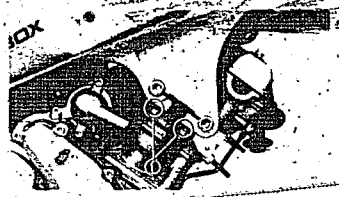


1. Install:
- Mounting bolt (rear-lower) ①
- Mounting bolt (rear-upper) ②
- Mounting bolt (cylinder) ③

NOTE:
Install the all bolts and nuts first, and then tighten the bolts and nuts to specification.

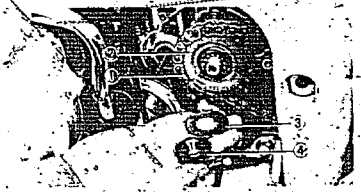


	Engine mounting: Bolt (rear-lower) 48 Nm (4.8 m · kg, 35 ft · lb) Bolt (rear-upper) 55 Nm (5.5 m · kg, 40 ft · lb) Bolt (cylinder) 55 Nm (5.5 m · kg, 40 ft · lb)



2. Tighten:
- Pinch bolt (engine mounting bolt) ①

	Pinch bolt: 23 Nm (2.3 m · kg, 17 ft · lb)



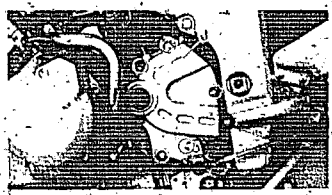
3. Install:
- Drive chain ①
- Drive sprocket ②
- Lock washer ③
- Nut (drive sprocket) ④

	Nut (drive sprocket): 70 Nm (7.0 m · kg, 50 ft · lb)

NOTE:
- Tighten the nut (drive sprocket) while applying the rear brake.
- Bend the lock washer tab along the nut flat.

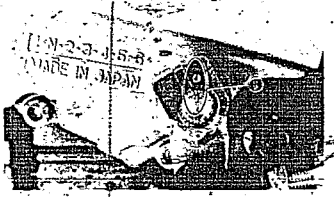
⚠WARNING

Always use a new washer.



4. Install:
- Spacer
- Crankcase cover (left) ①
- Shift arm

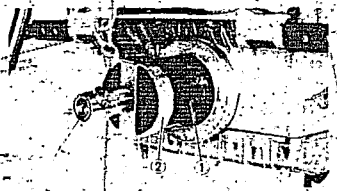
	Bolt (crankcase cover): 10 Nm (1.0 m · kg, 7.2 ft · lb) Bolt (shift arm): 10 Nm (1.0 m · kg, 7.2 ft · lb)



5. Install:
• Shift pedal assembly

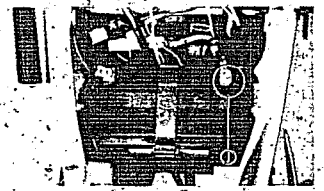
	Bolt (shift pedal): 10 Nm (1.0 m · kg, 7.2 ft · lb)

NOTE:
Align the punch mark ① on the shift shaft and shift arm.



6. Install:
• O-ring
• Oil filter ①
Use the oil filter wrench ②.

	Oil filter: 17 Nm (1.7 m · kg, 12 ft · lb)

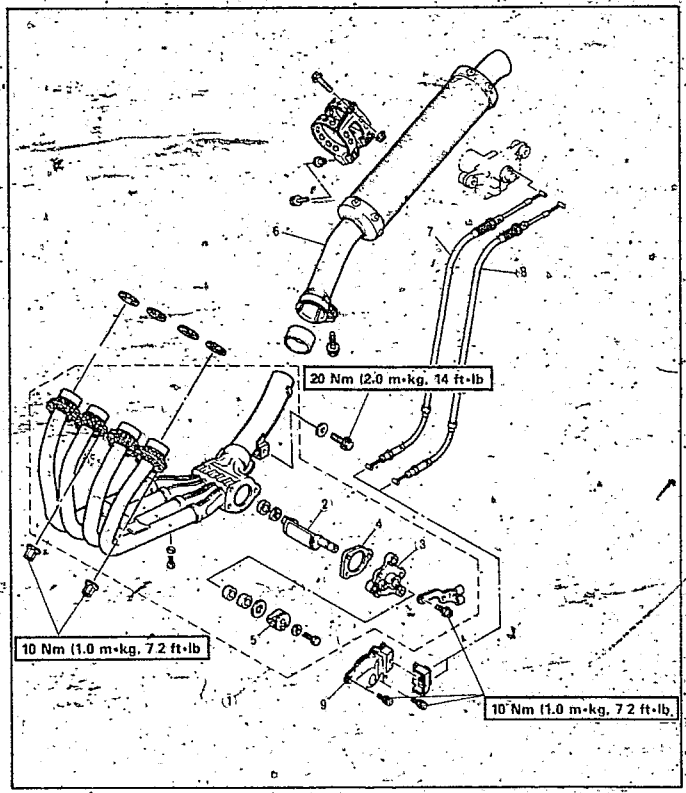


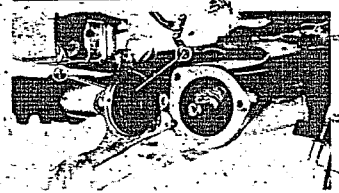
7. Connect:
• Battery leads
NOTE:
Connect the battery positive lead ① first.

8. Install:
• Muffler assembly ①

	Nut (exhaust): 10 Nm (1.0 m · kg, 7.2 ft · lb) Bolt (muffler): 20 Nm (2.0 m · kg, 14 ft · lb)

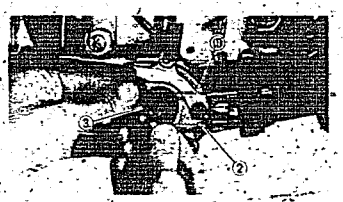
MUFFLER
① Exhaust pipe assembly
② EX UP valve
③ Housing
④ Gasket
⑤ Pulley
⑥ Muffler assembly
⑦ Pulley cable 1
⑧ Pulley cable 2
⑨ EX-UP valve cover





9. Install:
- Gasket ①
- Housing ②

NOTE:
Do not contact projection on the housing with ex-up valve.

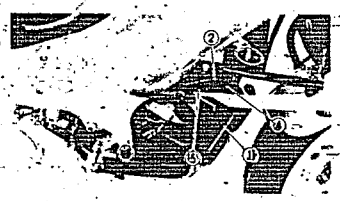


10. Install:
- Pulley

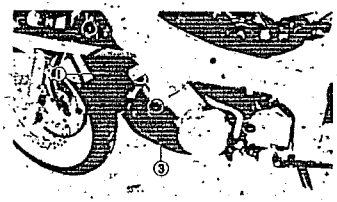
Installing steps:
- Install the pulley cable ①, ② to the pulley ③.
- Install the pulley.
- Insert the pin (ϕ4) to the pulley hole.
- Tighten the pulley bolt.

	Bolt (pulley): 5 Nm (0.5 m · kg, 3.6 ft · lb)

- Remove the pin (ϕ4).
- Adjust the pulley cable free play. Refer to "EX-UP CABLE" in the CHAPTER 3.



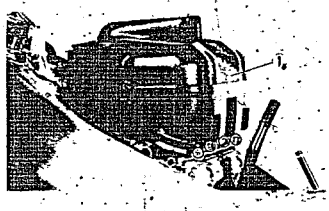
11. Install:
- Radiator ①
- Reservoir hose ②
- Radiator hose ③ (radiator-water pump cover)
- Radiator hose ④ (radiator-joint)
- Radiator hose ⑤ (radiator-thermostat housing)



	Bolt (radiator): 10 Nm (1.0 m · kg, 7.2 ft · lb)

12. Install:
- Carburetor assembly

NOTE:
Make the the carburetors is properly in place.

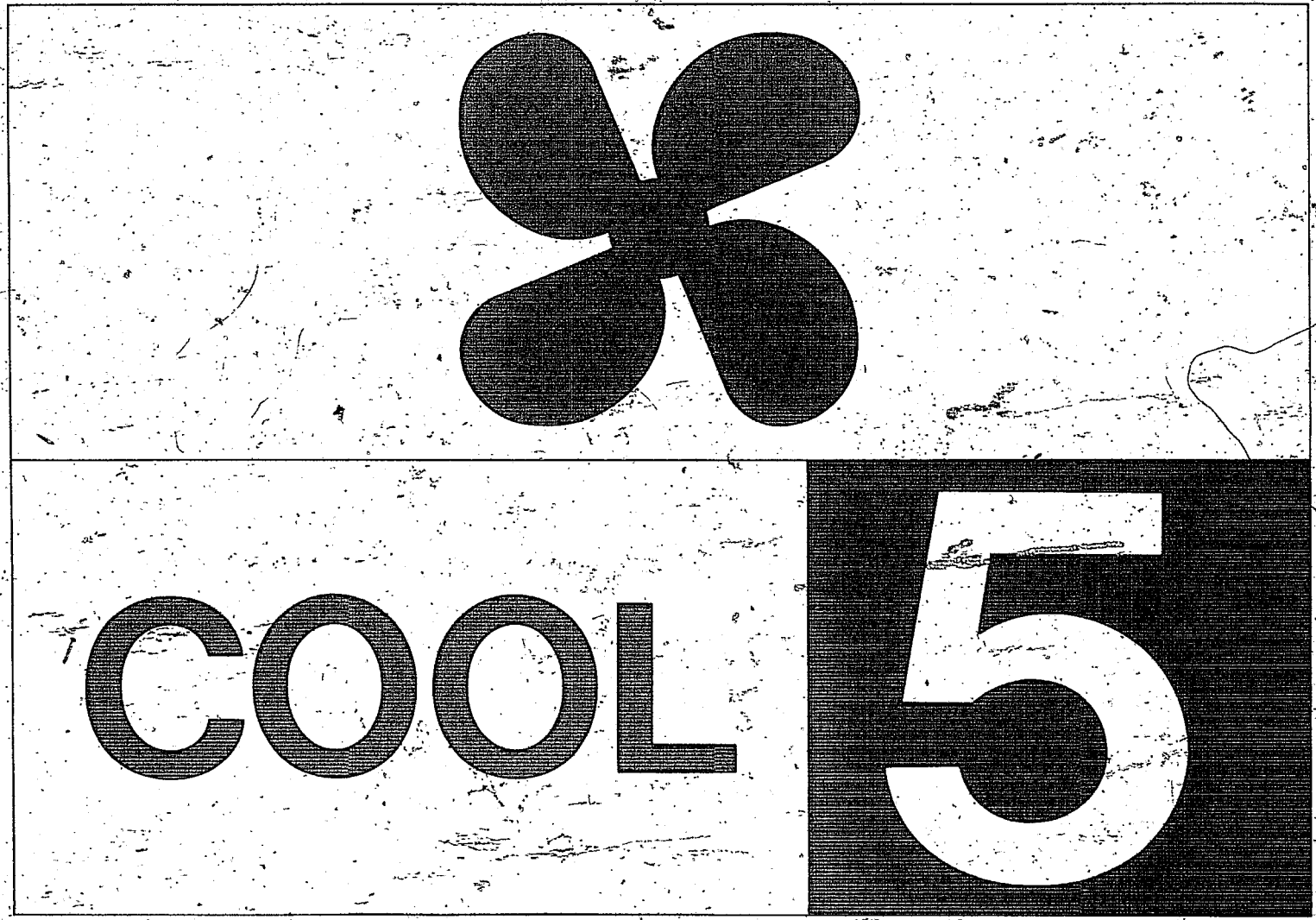


13. Install:
- Air cleaner case ①

	Screw (air filter case): 10 Nm (1.0 m · kg, 7.2 ft · lb)

14. Install:
- Fuel tank
- Upper cowl
- Lower cowl

Refer to the "COWLING" section in the CHAPTER 3.


COOL
5

CHAPTER 5.
COOLING SYSTEM

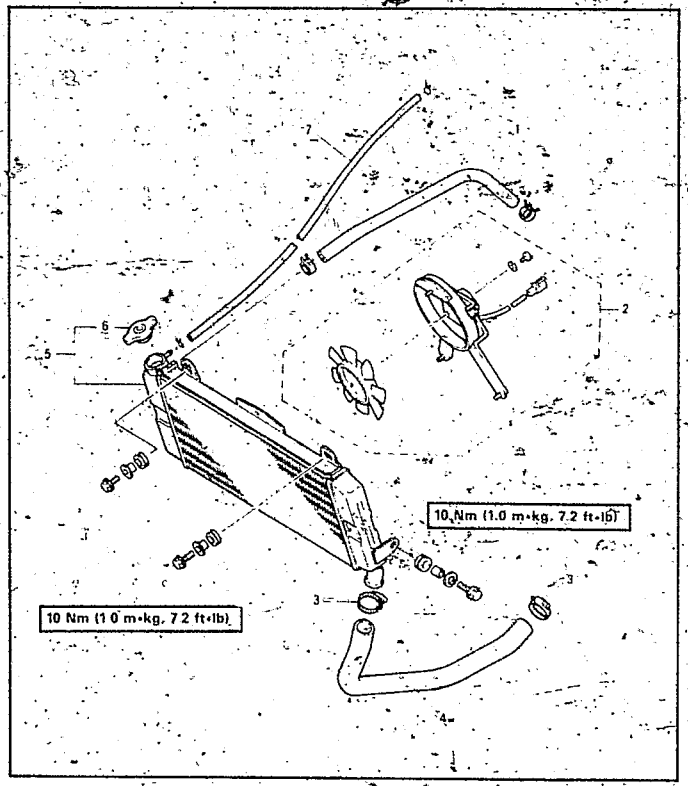
RADIATOR G-16
- REMOVAL G-16
- INSPECTION H-1
- ASSEMBLY H-1

WATER PUMP H-3
- DISASSEMBLY H-3
- INSPECTION H-3
- ASSEMBLY H-4

THERMOSTAT H-5
- REMOVAL H-5
- INSPECTION H-5
- ASSEMBLY H-5

RADIATOR

① Radiator hose (radiator-joint)
② Fan assembly
③ Hose clamp
④ Radiator hose (radiator-water pump cover)
⑤ Radiator assembly
⑥ Radiator cap
⑦ Reservoir hose



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COOLING SYSTEM
RADIATOR

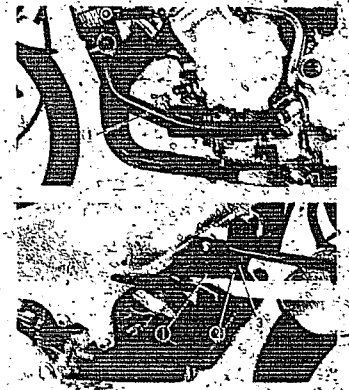
⚠WARNING

Do not remove the radiator cap when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury. When the engine has cooled, open the radiator cap by the following procedure.
Place a thick rag, like a towel, over the radiator cap, slowly rotated the cap counterclockwise to the detente. This procedure allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.

YB551001

REMOVAL

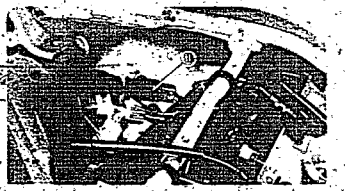
1. Drain:
   • Coolant
   Refer to "CHAPTER 3 COOLANT REPLACEMENT".



2. Remove:
   • Lower cowl
   • Fuel tank
   Refer to the "COWLING" section in the CHAPTER 3.

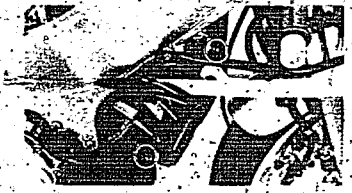
3. Remove:
   • Radiator hose 1 (radiator-water pump cover)

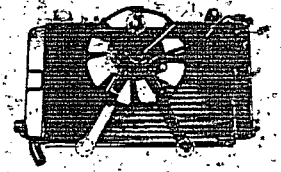
4. Remove:
   • Radiator hose 1 (radiator-thermostat housing)
   • Radiator hose 2 (radiator-joint)
   • Reservoir hose 3



5. Disconnect:
- Fan motor coupler 1

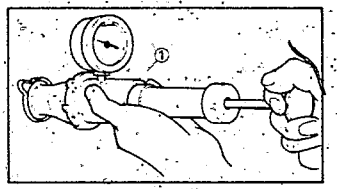
6. Remove:
- Radiator assembly





7. Remove:
- Fan motor assembly 1

B551002
INSPECTION
1. Inspect:
- Radiator
  Obstruction → Blow out with compressed air through rear of radiator
  Flattened fins → Repair.
- Coolant hoses
  Cracks/Damage → Replace



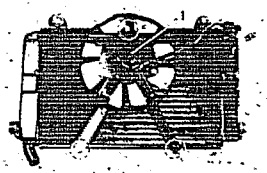
2. Inspect.
- Radiator cap
- Vacuum valve

Inspection steps:
- Measure radiator cap pressure using the radiator cap tester 1
- Check vacuum valve for spring tension and seating condition.

	Radiator cap tester: P/N 90890-01325

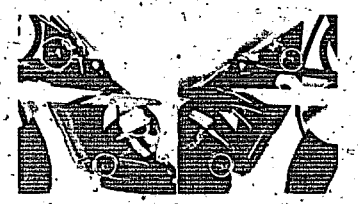
- Valve opens at pressure below specified value or defective → Replace.

Valve opening pressure: 105 ~ 125 kPa (1.05 ~ 1.25 kg/cm², 14.9 ~ 17.8 psi)



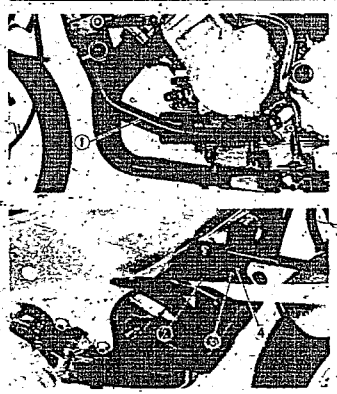
B551003
ASSEMBLY
1. Install:
- Fan motor 1

	Bolt (fan motor): 8 Nm (0.8 m · kg, 5.8 ft · lb)



2. Install
- Radiator assembly

	Bolt (radiator): 10 Nm (1.0 m · kg, 7.2 ft · lb)



3. Connect:
- Fan motor coupler
- Radiator hose 1 (radiator-water pump cover)
- Radiator hose 2 (radiator-thermostat housing)
- Radiator hose 3 (radiator-joint)
- Reservoir hose 4

4. Tighten:
- Drain bolts

	Drain bolt (cylinder,water pump cover): 10 Nm (1.0 m · kg, 7.2 ft · lb)

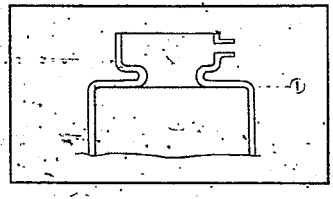
NOTE:
Replace with new copper gaskets.

5. Fill:
- Coolant

Coolant filling steps:
- Fill the coolant into the radiator until the radiator is full.
- Start the engine (coolant level decreases).

CAUTION:
Always check coolant level, and check for coolant leakage before starting engine.

- Add the coolant while engine is running.
- Stop the engine when coolant level stabilizes.
- Add the coolant again to specified level.
- Install the radiator cap



Recommended coolant:
High quality ethylene glycol anti-freeze containing anti-corrosion for aluminum engine inhibitors

	Coolant and water mixed ratio: 50%:50% Total amount: 2.18 L (1.9 Imp qt, 2.3 US qt) Reservoir tank capacity: 0.3 L (0.26 Imp qt, 0.32 US qt) From "LOW" to "FULL" level: 0.28 L (0.25 Imp qt, 0.30 US qt)

CAUTION:
- Hard water or salt water is harmful to the engine. You may use distilled water if you can not get soft water.
- Do not mix more than one type of ethylene glycol anti-freeze containing corrosion for aluminum engine inhibitors.

6. Inspect:
- Cooling system

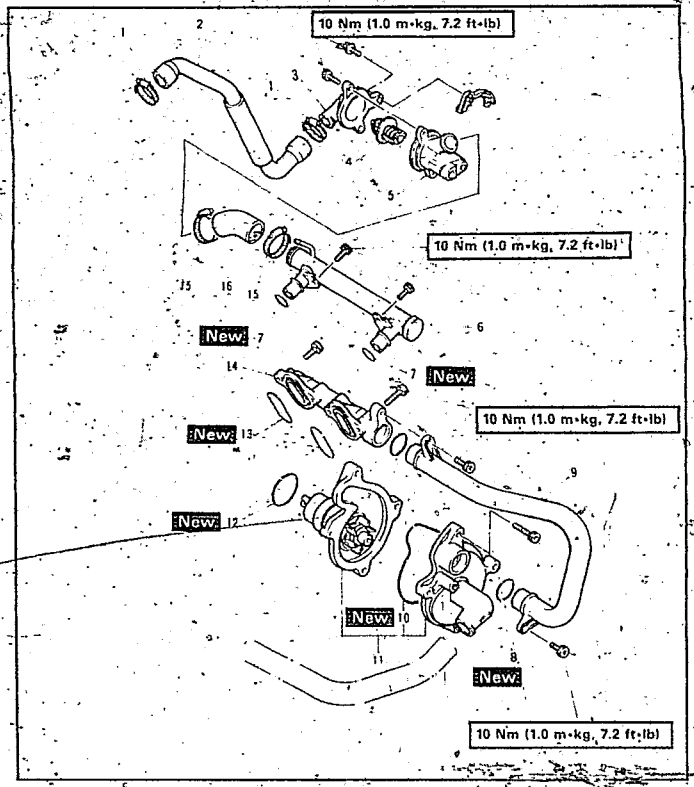
Inspection steps:
- Connect radiator cap tester.
- Apply 1.0 kg/cm² (14 lb/in²) pressure.
- Measure pressure with gauge.
- Decrease of pressure (leaks) → Repair as required.

	Radiator cap tester: P/N 90890-01325

7. Install:
- Fuel tank
- Lower cowl

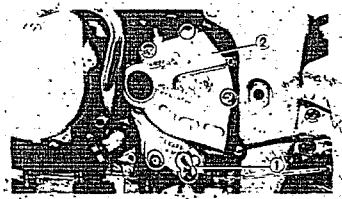
WATER PUMP, THERMOSTAT

① Hose clamp
② Radiator hose (radiator-thermostat)
③ Thermostat cover
④ Thermostat
⑤ Thermostat housing
⑥ Pipe
⑦ O-ring
⑧ O-ring
⑨ Pipe
⑩ O-ring
⑪ Water pump
⑫ O-ring
⑬ O-ring
⑭ Joint
⑮ Hose clamp

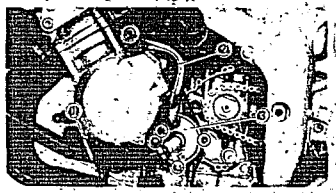


WATER PUMP
DISASSEMBLY

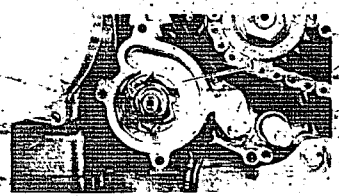
NOTE:
Be sure to drain the coolant and engine oil before disassembly of the cooling system components.



1. Remove:
• Lower cowl
Refer to the "COWLING" section in the CHAPTER 3.



2. Remove:
• Shift arm 1
• Crankcase cover 2 (left)

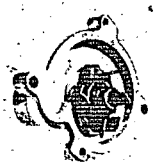


3. Remove:
• Radiator hose 1 (radiator-water pump cover)
• Pipe 2
• Water pump cover 3

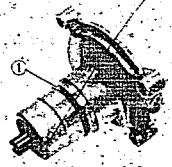
4. Remove:
• Water pump housing 1
• O-ring

5. Eliminate:
• Deposits
From the impeller and water pump housing.

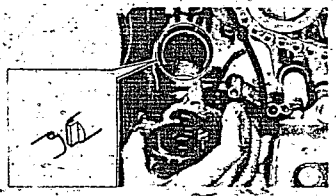
INSPECTION



1. Inspect:
• Impeller shaft
Cracks/Wear/Damage → Replace.

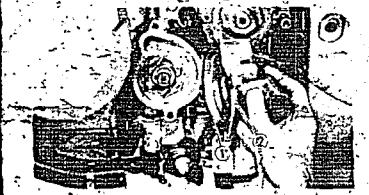


YB552003
ASSEMBLY
Reverse the "DISASSEMBLY" procedure.
1. Install:
• O-ring ① (new)



2. Install:
• Water pump housing

CAUTION:
- **Be sure that the oil pump shaft projection mesh with the water pump impeller shaft slot.**
- **Do not pinch the neutral and sidestand leads.**

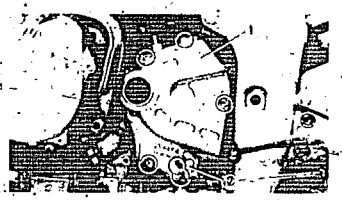


3. Install:
• O-ring ① (new)
• Water pump cover ②

	Bolt (water pump cover): 10 Nm (1.0 m · kg, 7.2 ft · lb)

4. Install:
• O-ring ①
• Pipe ②

	Bolt (pipe): 10 Nm (1.0 m · kg, 7.2 ft · lb)



5. Install:
• Crankcase cover (left) ①
• Shift arm ②

	Bolt (crankcase cover, shift arm): 10 Nm (1.0 m · kg, 7.2 ft · lb)

6. Fill:
• Coolant
Refer to the "COOLANT REPLACEMENT" section in the CHAPTER 3.
• Engine oil
Refer to the "ENGINE OIL REPLACEMENT" section in the CHAPTER 3.

YB553001

THERMOSTAT

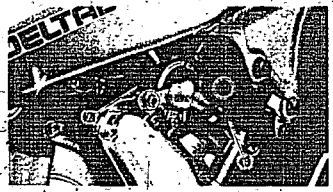
REMOVAL

1. Remove:
- Lower cowl
- Fuel tank

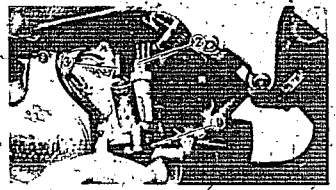
Refer to the "COWLING" section in the CHAPTER 3.

2. Drain:
- Coolant

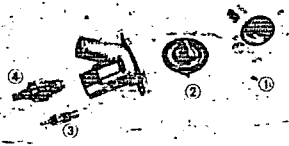
Refer to the "COOLANT REPLACEMENT" section in the CHAPTER 3.



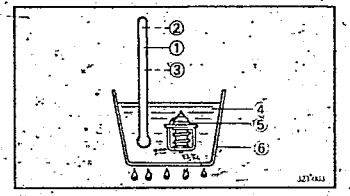
3. Remove:
- Radiator hose (1) (radiator-thermostat housing)
- Radiator hose (thermostat housng-joint)
- Ground lead (2)

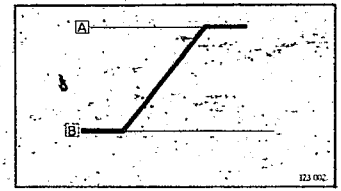


4. Remove:
- Thermostat housing (1)
- Thermo unit lead (2)
- Thermo switch lead (3)



5. Remove:
- Thermostat housing cover (1)
- Thermostat (2)
- Thermo unit (3)
- Thermo switch (4)





1. Thermometer
2. Full open
3. Opening sequence begins
4. Water
5. Thermostat
6. Vessel
A. OPEN
B. CLOSE

YB553007

INSPECTION

1. Inspect:
- Thermostat (5)

Valve dose not open at 80~84°C (176~183°F) → Replace.

Inspection steps:
- Suspend thermostat in a vessel.
- Place reliable thermometer in a water.
- Heat water slowly.
- Observe thermometer, while stirring water continually.

NOTE:

Thermostat is sealed and its setting is specialized work. If its accuracy is in doubt, replace it. A faulty unit could cause serious overheating or overcooling.

2. Inspect:
- O-ring

Wear/Damage → Replace.

YB553003

ASSEMBLY

Reverse the "REMOVAL" precedure.

1. Install:
- Thermostat

NOTE:

Install the bypass hole as shown in the photo.

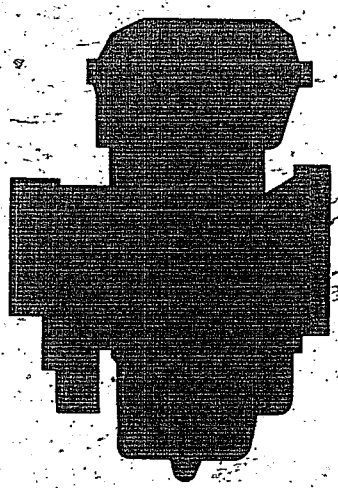
2. Install:
• Thermostat cover

	Bolt (thermostat cover): 10 Nm (1.0 m · kg, 7.2 ft · lb)

3. Install:
• Thermo switch ①
• Thermo unit ②

	Thermo switch, Thermo unit: 14 Nm (1.4 m · kg, 10 ft · lb)

4. Fill:
• Coolant
Refer to the "COOLANT REPLACEMENT" section in the CHAPTER 3.



CARB 6

CHAPTER 6.
CARBURETION

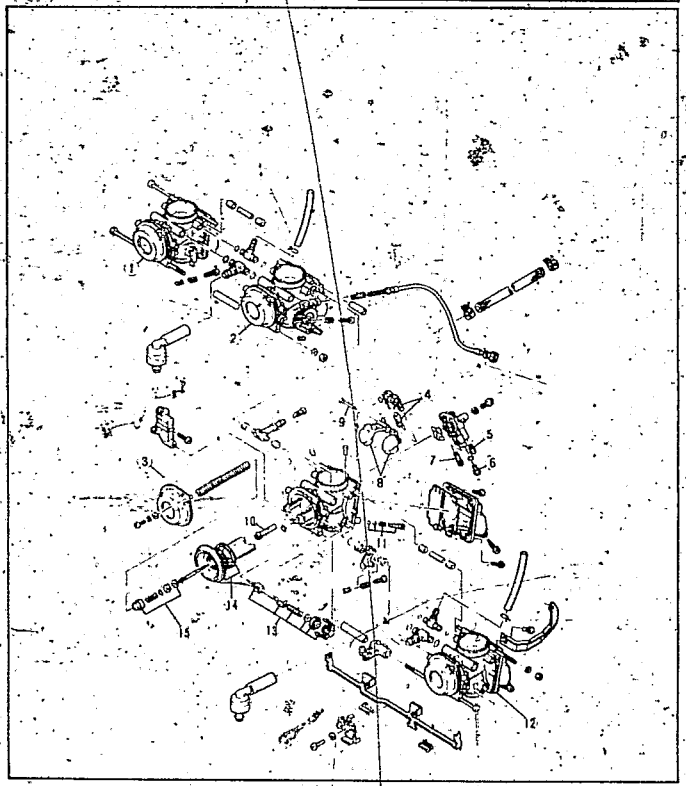
CARBURETOR H-10
REMOVAL H-10
DISASSEMBLY H-11
INSPECTION H-12
ASSEMBLY H-12
INSTALLATION H-14
FUEL LEVEL ADJUSTMENT H-14

CARBURETION

CARBURETOR

① Carburetor assembly
② Carburetor assembly
③ Carburetor assembly
④ Needle valve set
⑤ Starter jet
⑥ Main jet
⑦ Pilot jet
⑧ Float
⑨ Float pin
⑩ Needle jet
⑪ Pilot screw set
⑫ Carburetor assembly
⑬ Starter set
⑭ Diaphragm set
⑮ Jet needle set

SPECIFICATIONS	
ID MARK	3TJ00
MAIN JET	#1.4: #100 #2.3: #97.5
MAIN AIR JET	#70
PILOT JET	#32.5
PILOT AIR JET	#110
JET NEEDLE	#1.4: 5CEW16-3 #2.3 5CKP3-3
PILOT AIR SCREW	2 1/2 Turns out
THROTTLE VALVE	#130
ENGINE IDLE SPEED	1,250 – 1,350 r/min



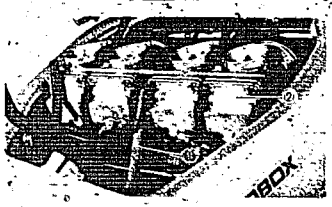
YB581001

REMOVAL

1. Remove:
   - Lower cowl
   - Fuel tank

   Refer to the "COWLING" section in the CHAPTER 3.
   - Air filter case

2. Disconnect:
   - Starter cable ①



3. Remove:
   - Fuel hose ①
   - Carburetor ②

4. Disconnect:
   - Throttle cables ①

5. Remove:
   - Starter cable (from carburetor)

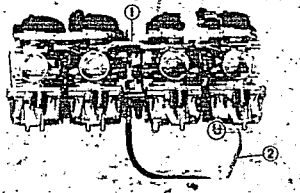
YB561002

DISASSEMBLY

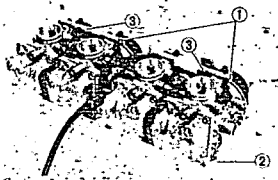
NOTE:

The following parts can be cleaned and inspected without carburetor separation.

- Throttle valve
- Piston valve
- Starter plunger
- Float chamber components



1. Remove:
   - Starter lever (1)
   - Throttle stop screw stay (2)



2. Remove:
   - Connecting shafts (1) (upper)
   - Connecting shaft (2) (lower)
   - Collar (3)

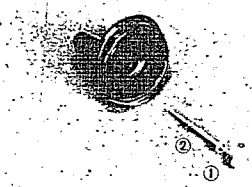
3. Disconnect:
   - Carburetor assembly

4. Remove:
   - Starter plunger (1)

NOTE:

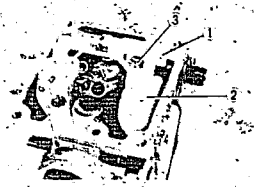
Unhook the hooks from the carburetor body and then pull out the starter plunger.

5. Remove:
   - Vacuum chamber cover (1)
   - Spring (2)
   - Diaphragm assembly (3)
   - O-ring (4)



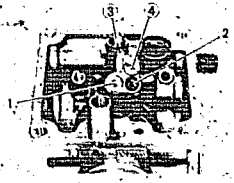
6. Remove:
   - Plug (1)
   - Jet needle (2)

7. Remove:
   - Float chamber
   - Gasket
   - Pilot screw (1)

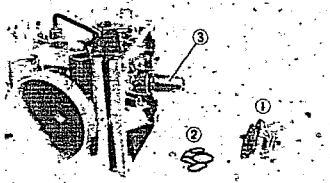


8. Remove:
   - Float pin (1)
   - Float (2)
   - Needle valve (3)

9. Remove:
   - Valve seat (1)
   - O-ring



10. Remove:
    - Main jet (1)
    - Pilot jet (2)
    - Bolt (3)
    - Starter jet (4)

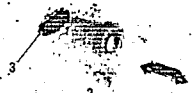


11. Remove:
- Jet housing ①
- O-ring ②
- Needle jet ③
- Throttle valve support

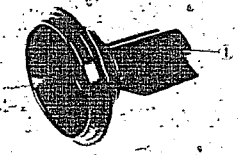
YB561003
INSPECTION
1. Inspect:
- Carburetor body
- Float chamber
- Jet housing
  Cracks/Damage → Replace.
- Fuel passage
  Contamination → Clean as indicated.

Cleaning steps:
- Wash carburetor in petroleum based solvent.
  (Do not use any caustic carburetor cleaning solution.)
- Blow out all passage and jets with compressed air.

2. Inspect:
- Floats
  Damage → Replace.



3. Inspect:
- Needle valve ①
- Valve seat ②
- O-ring ③
  Damage/Wear/Contamination → Replace as a set.



4. Inspect:
- Diaphragm assembly ①
- Throttle valve support
  Scratches/Wear/Damage → Replace.
- O-ring
  Wear/Damage → Replace.

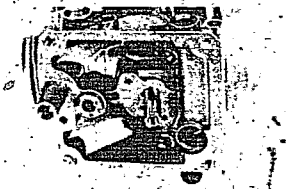
5. Inspect:
- Main jet ①
- Starter jet ②
- Pilot jet ③
- Pilot screw set ④
- Needle jet ⑤
  Bends/Wear/Damage - Replace.
  Contamination → Blow out jets with compressed air.

6. Inspect:
- Jet needle
  Bends/Wear → Replace.

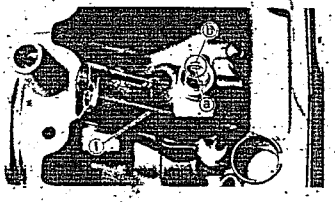
7. Check:
- Free movement
  Insert the throttle valve into the carburetor body, and check for free movement.
  Stick → Replace.

YB561004
ASSEMBLY
Reverse the "DISASSEMBLY" procedures.
Note the following points.

CAUTION:
- **Before reassembling, wash all parts in clean petroleum based solvent.**
- **Always use a new gasket.**

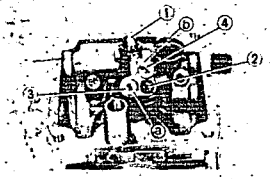


1. Install:
- Throttle valve support
- Needle jet



2. Install:
- O-ring
- Jet housing ①

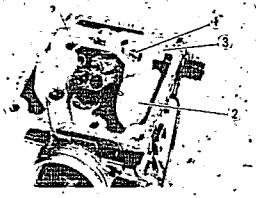
NOTE:
Align the groove ⓐ on the needle jet with the projection ⓑ on the jet housing.



3. Install:
- Bolt ①
- Pilot jet ②
- Main jet ③
- Starter jet ④

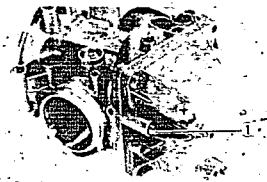
NOTE:
- The jet with a bigger eye is main jet ③. It should be installed on position ⓐ.
- The jet with a smaller eye is starter jet ④. It should be installed on position ⓑ.

4. Install:
- O-ring
- Valve seat ①



5. Install:
- Needle valve ①
- Float ②
- Float pin ③

6. Install:
- O-ring
- Float chmber



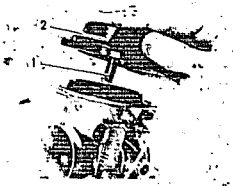
7. Install:
- Pilot screw ①

Installation points:
- Screw in the pilot air screw ① until it is lightly seated.
- Back out by the specified number of turns.

Pilot air screw (turn out): 2-1/2

8. Install:
- Jet needle set (to the diaphragm assembly)

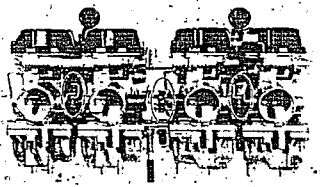
9. Install:
- O-ring ①
- Diaphragm assembly ②



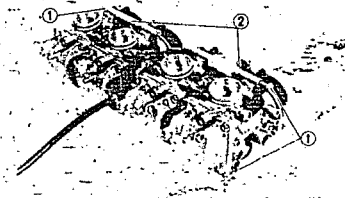
10. Install:
- Spring ①
- Vacuum chamber cover ②

11. Install:
- Starter plunger ①

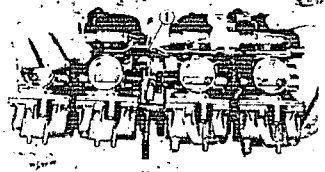
NOTE:
Be sure that the carburetor body projection mesh with the starter plunger slot.



12. Connect:
- Carburetor assemblys



13. Install:
- Connecting shafts ① (upper/lower)
- Collar ②



14. Install:
- Starter lever ①
- Throttle stop screw stay
- Starter cable

YB561005

INSTALLATION

Reverse the "REMOVAL" procedure.
Note the following points.

1. Adjust.
- Carburetor synchronization

Refer to the "CARBURETOR SYNCHRONIZATION" section in the CHAPTER 3

2. Adjust:
- Idle speed

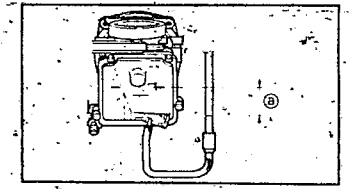
Engine idle speed:
1,250~1,350 r/min

Refer to the "IDLE SPEED ADJUSTMENT" section in the CHAPTER 3.

3. Adjust:
- Throttle cable free play

Throttle cable free play:
3~7 mm (0.12~0.28 in)

Refer to the "THROTTLE CABLE FREE PLAY ADJUSTMENT" section in the CHAPTER 3.



YB561006

FUEL LEVEL ADJUSTMENT

1. Measure:
- Fuel level ⓐ

Out of specification → Adjust.

Fuel level ⓐ:
20.9~21.9 mm (0.82~0.86 in) below the float chamber line

Measurement and adjustment steps:
- Place the motorcycle on a level surface.
- Use a garage jack under the engine to ensure that the carburetor is positioned vertically.

- Connect the fuel level gauge ① to the drain pipe ②.

Fuel level gauge:
P/N 90890-01312

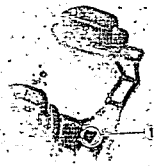
- Loosen the drain screw ③ and warm up the engine for several minutes.

- Hold the gauge vertically next to the float chamber line ④.
- Measure the fuel level ⓐ with the gauge.

NOTE:

Fuel level readings of both side of carburetor line should be equal.

- If the fuel level is incorrect, adjust the fuel level.



- Remove the carburetor.
- Inspect the valve seat and needle valve.
- If either is worn, replace them both.
- If both are fine, adjust float level by bending the float tang ① slightly.
- Install the carburetor.
- Recheck the fuel level.

CHAS 7

CHAPTER 7. CHASSIS

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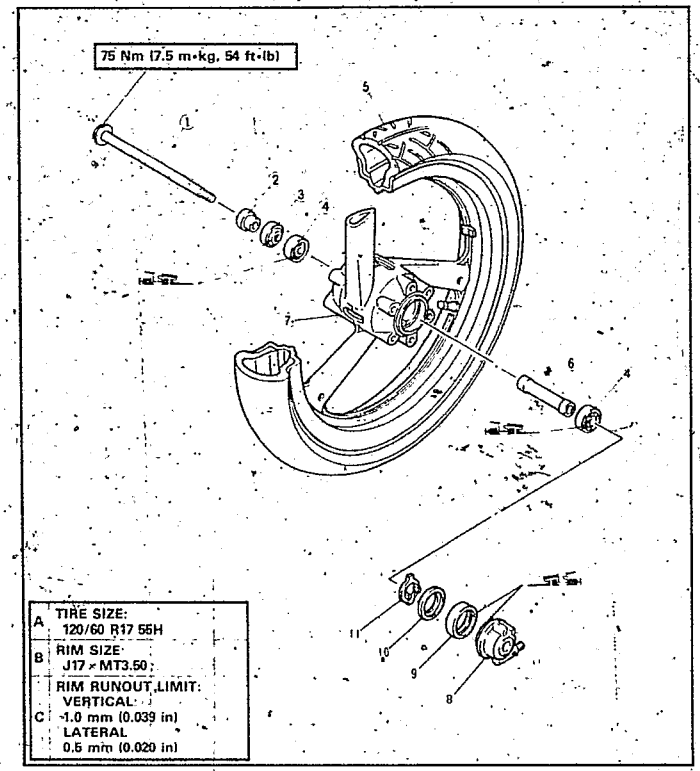
FRONT WHEEL

① Wheel axle
② Collar
③ Oil seal
④ Bearing
⑤ Tire
⑥ Spacer
⑦ Wheel
⑧ Gear unit
⑨ Oil seal
⑩ Meter clutch retainer
⑪ Meter clutch

TIRE AIR PRESSURE (COLD)		
Cold tire pressure	Front	Rear
Up to maximum load*	200 kPa (2.0 kg/cm², 28 psi)	250 kPa (2.5 kg/cm², 36 psi)

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



A	TIRE SIZE: 120/60 R17 55H
B	RIM SIZE: J17 × MT3.50
C	RIM RUNOUT LIMIT: VERTICAL: 1.0 mm (0.039 in) LATERAL 0.5 mm (0.020 in)

Y857100

REMOVAL

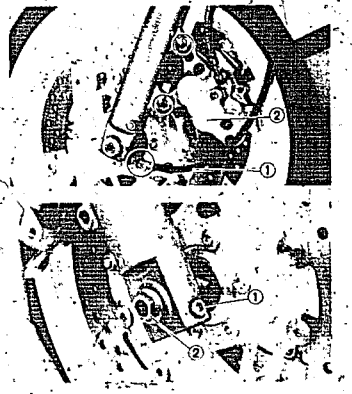
⚠ WARNING

Support the motorcycle securely so there is no danger of it falling over.

1. Remove:
   • Lower cowl
   Refer to the "COWLING" section in the CHAPTER 3.

2. Remove:
   • Muffler assembly
   Refer to the "ENGINE REMOVAL—MUFFLER" section in the CHAPTER 4.

3. Elevate the front wheel by placing a suitable stand under the engine.



4. Disconnect:
   • Speedometer cable ①

5. Remove:
   • Calipers ② (left and right)

6. Loosen:
   • Pinch bolt ①

7. Remove:
   • Axle shaft ②

8. Remove:
   • Front wheel
   • Gear unit (speedometer)
   • Collar

NOTE:

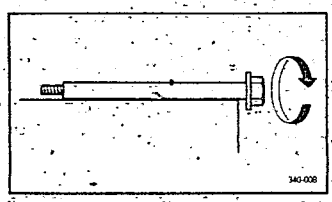
Do not depress the brake lever when the wheel is off the motorcycle otherwise the brake pads will be forced shut.

YB571002

INSPECTION

1. Inspect:
• Tire
Wear/Damage → Replace.
Refer to the "TIRE INSPECTION" section in the CHAPTER 3.

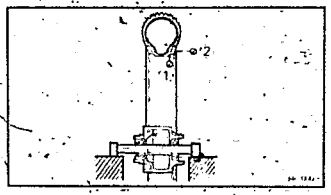
2. Eliminate any corrosion from parts.



3. Inspect:
• Wheel axle
Roll the axle on a flat surface.
Bends → Replace.

⚠WARNING:
Do not attempt to straighten a bent axle.

4. Inspect:
• Wheel
Cracks/Bends/Warpage → Replace.

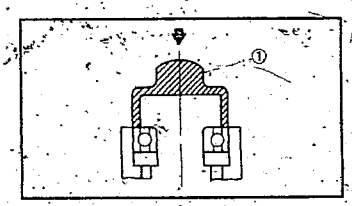


5. Measure:
• Wheel runout
Out of specification → Check the wheel and bearing play.

Rim runout limits:
Vertical ① : 1.0 mm (0.04 in)
Lateral ② : 0.5 mm (0.02 in)

⚠WARNING:
After mounting a tire, ride conservatively to allow proper tire to rim seating. Failure to do so may cause an accident resulting in motorcycle damage and possible operator injury.

6. Check:
• Wheel bearings
Bearings allow play in the wheel hub or wheel turns roughly → Replace.



Replacement steps:
- Clean the outside of the wheel hub.
- Remove the bearing ① using a general bearing puller.
- Install the new bearing.

NOTE:
Use a socket ① that matches the outside diameter of the race of the bearing.

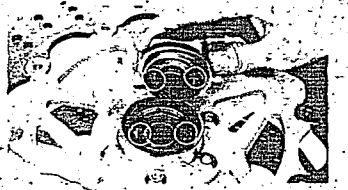
CAUTION:
Do not strike the inner of race balls of the bearing. Contact should be made only with the outer race.

YB571003

INSTALLATION

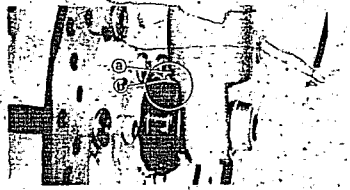
Reverse the "Removal" procedure.
Note the following points.
1. Lubricate:
• Oil seal
• Gear unit

Recommended lubricant:
Lithium soap base grease



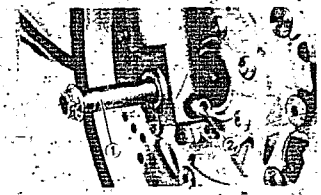
2. Install:
• Gear unit assembly

NOTE:
Make sure the projection inside the gear unit are meshed with the flats in the wheel hub.



3. Install:
• Front wheel assembly

NOTE:
Be sure the boss ⓐ on the outer fork tube correctly engages with the locating slot ⓑ on the gear unit assembly.



4. Tighten:
• Axle shaft ①
• Pinch bolt ②

	Axle shaft: 75 Nm (7.5 m · kg, 54 ft · lb) **Pinch bolt:** 20 Nm (2.0 m · kg, 14 ft · lb)

5. Install:
• Brake caliper

	Bolt (brake caliper): 35 Nm (3.5 m · kg, 25 ft · lb)

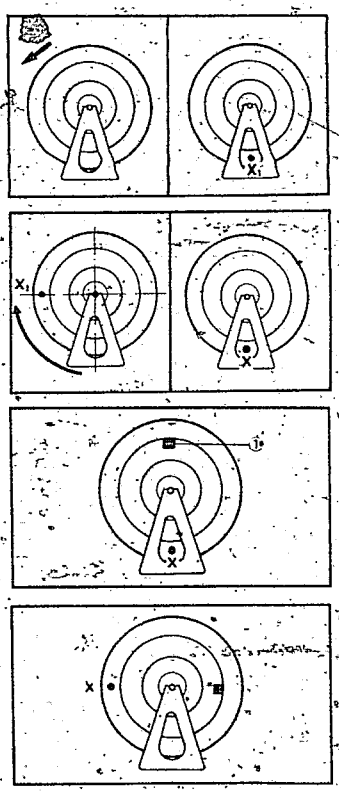
Y6571004

STATIC WHEEL BALANCER ADJUSTMENT

NOTE:
- After replacing the tire and/or rim, wheel balance should be adjusted.
- Adjust the wheel balance with brake disc installed.

1. Remove:
• Balancing weight

2. Set the wheel on a suitable stand.



3. Find:
• Heavy spot

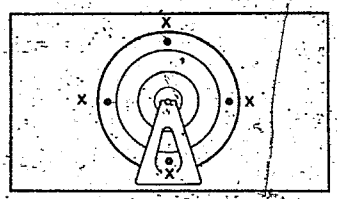
Procedure:
- Spin the wheel and wait for it to rest.
- Put an "X" mark on the wheel bottom spot.
- Turn the wheel so that the "X" mark is 90° up.
- Let the wheel fall and wait for it to rest. Put an "X" mark on the wheel bottom spot.
- Repeat the above steps several times until these marks come to the same spot.
- This spot is the heavy spot "X".

4. Adjust:
• Wheel balance

Adjustment steps:
- Install a balance weight ① on the rim exactly opposite to the heavy spot "X".

NOTE:
Start with the smallest weight.

- Turn the wheel so that the heavy spot is 90° up.
- Check that the heavy spot is at rest there. If not try another weight until the wheel is balanced.

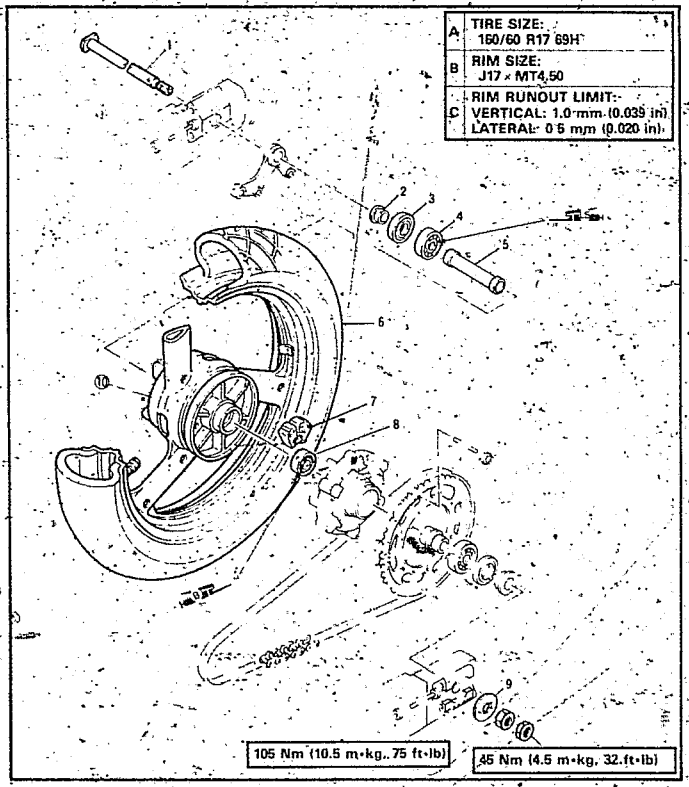


5. Check:
- Wheel balance

Checking steps:
- Turn the wheel so that it comes to each point as shown.
- Check that the wheel is at rest at each point. If not readjust the wheel balance.

REAR WHEEL

① Wheel axle
② Collar
③ Oil seal
④ Bearing
⑤ Spacer
⑥ Rear tire
⑦ Damper
⑧ Bearing
⑨ Plate washer
⑩ Wheel

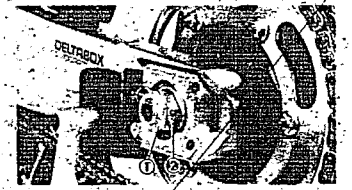


YB572001
REMOVAL

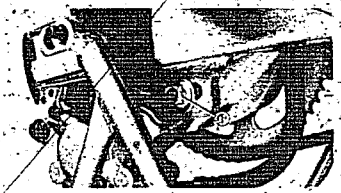
⚠ WARNING

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

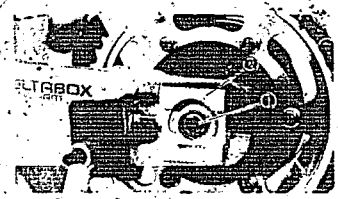
1. Place the motorcycle on the level place.
2. Elevate the rear wheel by placing a suitable stand under the swingarm.



3. Remove:
- Locknut (1) (wheel axle)
- Axle nut (2)



4. Loosen:
- Caliper bracket installing bolt (1)



5. Remove:
- Wheel axle (1)
- Chain puller (2)

6. Remove:
- Rear wheel (1)

NOTE:
- Before removing the rear wheel, push the wheel forward and remove the drive chain.
- Do not depress the brake pedal when the wheel is off the motorcycle as the brake pads will be forced shut.

YB572002
INSPECTION

1. Inspect:
- Tire
- Rear wheel axle
- Wheel
- Wheel bearings
- Oil seals

Refer to the "FRONT WHEEL—INSPECTION".

2. Measure:
- Wheel runout

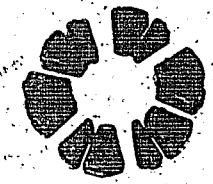
Refer to the "FRONT WHEEL—INSPECTION".

3. Check:
- Wheel balance

Refer to the "FRONT WHEEL—INSPECTION".

4. Inspect:
- Clutch damper

Wear/Damage → Replace.



YB572003
INSTALLATION

Reverse the "Removal" procedure.
Note the following points.

1. Lubricate:
- Rear wheel axle
- Bearings
- Oil seals

Recommended lubricant:
Lithium soap base grease

2. Adjust:
- Drive chain slack

Drive chain slack:
15~20 mm (0.59~0.79 in)

Refer to the "CHAPTER 3—DRIVE CHAIN ADJUSTMENT".

3. Tighten:
- Axle nut (rear wheel axle)
- Locknut (rear wheel axle)
- Bolts (caliper bracket)

Axle nut (rear wheel axle):
105 Nm (10.5 m · kg, 75 ft · lb)
Locknut (rear wheel axle):
45 Nm (4.5 m · kg, 32 ft · lb)
Bolt (caliper bracket):
55 Nm (5.5 m · kg, 40 ft · lb)

STATIC WHEEL BALANCE ADJUSTMENT

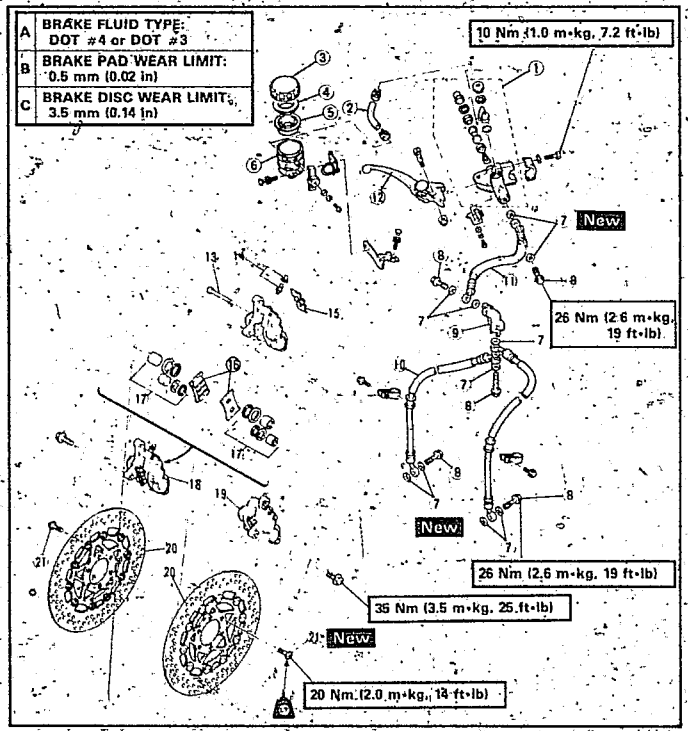
NOTE:
- After replacing the tire and/or rim, wheel balance should be adjusted.
- Adjust the wheel balance with brake disc and wheel hub installed.

1. Adjust:
- Wheel balance

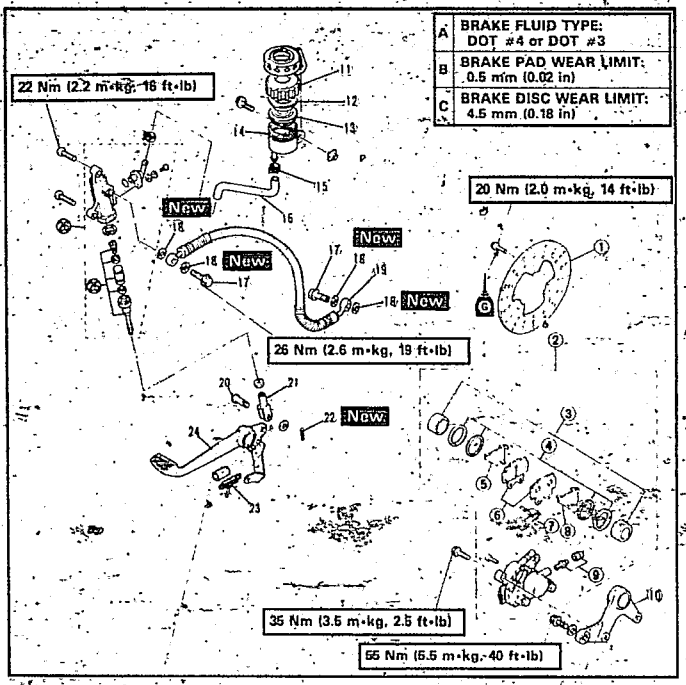
Refer to the "FRONT WHEEL—STATIC WHEEL BALANCE ADJUSTMENT" section.

FRONT AND REAR BRAKE

1. Master cylinder assembly
2. Reservoir hose
3. Reservoir cap
4. Diaphragm bush
5. Diaphragm
6. Reservoir tank
7. Copper washer
8. Union bolt
9. Hose joint
10. Brake hose
11. Brake hose
12. Brake lever
13. Retaining pin
14. Bleed screw set
15. Pad spring
16. Brake pad
17. Piston seal kit
18. Caliper assembly (right)
19. Caliper assembly (left)
20. Brake disc
21. Bolt

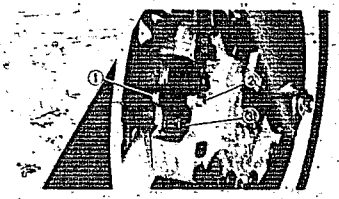


① Brake disc
② Caliper assembly
③ Caliper piston
④ Caliper seal kit
⑤ Shim
⑥ Brake pad
⑦ Pad spring
⑧ Shim
⑨ Bleed screw kit
⑩ Caliper bracket
⑪ Reservoir cap
⑫ Diaphragm bush
⑬ Diaphragm
⑭ Reservoir tank
⑮ Clip
⑯ Reservoir hose
⑰ Union bolt
⑱ Copper washer
⑲ Brake hose
⑳ Pin
㉑ Joint
㉒ Cotter pin
㉓ Spring
㉔ Brake pedal
㉕ Master cylinder kit
㉖ Master cylinder assembly



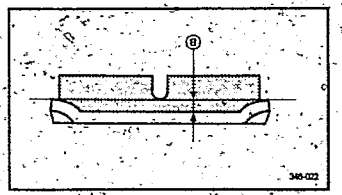
YB573000
CAUTION:
Disc brake components rarely require disassembly. DO NOT:
- **Disassembly components unless absolutely necessary.**
- **Use solvents on internal brake component**
- **Use contaminated brake fluid for cleaning. Use only clean brake fluid.**
- **Allow brake fluid to come in contact with the eyes otherwise eye injury may occur.**
- **Allow brake fluid to contact painted surfaces or plastic parts otherwise damage may occur.**
- **Disconnect any hydraulic connection otherwise the entire system must be disassembly, drained, cleaned, and then properly filled and bled after reassembly.**

YB573001
BRAKE PAD REPLACEMENT
NOTE:
It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.



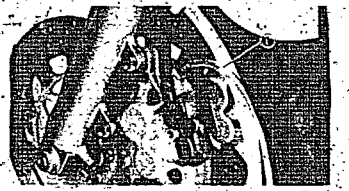
Front brake
1. Remove:
- Clip ①
- Retaining pin ②
- Pad spring ③

3. Remove:
- Brake pad ①



NOTE:
- Replace the pad spring if the pad replacement is required.
- Replace the pads as a set if either is found to be worn to the wear limit.

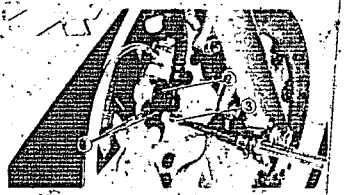
Wear limit a:
0.5 mm (0.02 in)



Installation steps:
- Connect a suitable hose ① tightly to the caliper bleed screw. then, place the other end of this hose into an open container.
- Loosen the caliper bleed screw and push the pistoh into the caliper by your finger.
- Tighten the caliper bleed screw.

Caliper bleed screw:
6.9 Nm (0.6 m · kg, 4.3 ft · lb)

- Install the brake pad (new) of the pad spring (new).

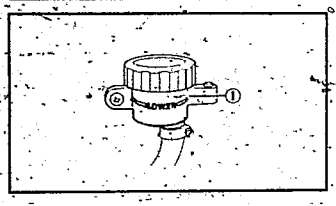


3. Install:
- Brake pad (new) ①
- Pad spring (new) ②
- Retaining pin ③

4. Tighten:
- Retaining pin

Retaining pin:
10 Nm (1.0 m · kg, 7.2 ft · lb)

5. Install:
- Clip



6. Inspect:
- Brake fluid level

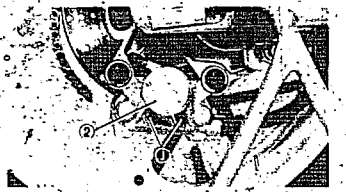
Refer to the "BRAKE FLUID INSPECTION" section in the CHAPTER 3.

① "LOWER" level line

7. Check:
- Brake lever operation

A softy or spongy filling → Bleed brake system.

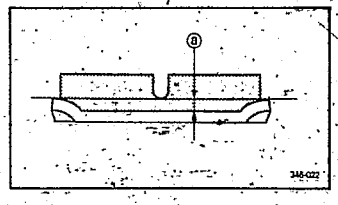
Refer to the "AIR BLEEDING" section in the CHAPTER 7.



Rear brake
1. Loosen:
- Retaining pin ①

2. Remove:
- Caliper body ②

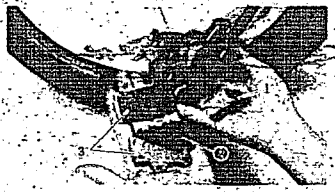
3. Remove:
- Retaining pin ①
- Brake pad ②
- Shim
- Pad spring



NOTE:
- Replace the spring if the pad replacement is required.
- Replace the pads as a set if either is found to be worn to the wear limit.

Wear limit a:
0.5 mm (0.02 in)

• Replace the pad shim if the pad replacement is required.



4. Install:
• Pad spring (new) ①
• Shim (new) ②
• Brake pad (new) ③
• Retaining pin

Installation steps:
● Connect a suitable hose ① tightly to the caliper bleed screw. Then, place the other end of this hose into an open container.
● Loosen the caliper bleed screw and push the piston into the caliper by your finger.
● Tighten the caliper bleed screw.

	Caliper bleed screw: 6 Nm (0.6 m · kg, 4.3 ft · lb)

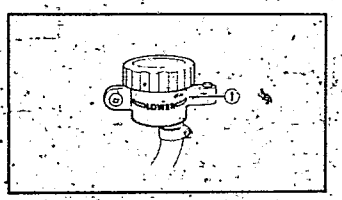
● Install the pad shim (new) to the brake pad (new).
● Install the brake pad (new) and pad spring (new).

5. Install:
• Caliper body

	Bolts (caliper body): 35 Nm (3.5 m · kg, 25 ft · lb)

6. Tighten:
• Retaining pin

	Retaining pin: 10 Nm (1.0 m · kg, 7.2 ft · lb)



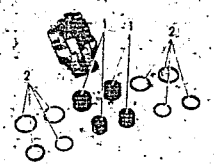
7. Inspect:
• Brake fluid level
Refer to the "BRAKE FLUID INSPECTION" section in the CHAPTER 3.

① "LOWER" level line.

8. Check:
• Brake pedal operation
A soft or spongy filling → Bleed brake system.
Refer to "AIR BLEEDING" section in CHAPTER 7.

YB573002
CALIPER DISASSEMBLY
NOTE:
Before disassembling the front brake caliper or rear brake caliper, drain the brake hose, master cylinder, brake caliper and reservoir tank of their brake fluid.

Front brake
1. Remove:
• Caliper body
• Brake pad
• Pad spring
Refer to the "BRAKE PAD REPLACEMENT" section.



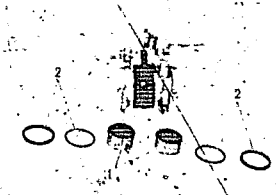
2. Remove:
- Piston ①
- Piston seal ②

Removal steps:
- Blow compressed air into the tube joint opening to force out the piston from the caliper body.

⚠WARNING
- Never try to pry out the piston.
- Cover the piston with a rag. Use care so that piston dose not cause injury as it is expelled from the cylinder.

Rear brake
1. Remove:
- Caliper body
- Brake pads
- Pad spring

Refer to the "BRAKE PAD REPLACEMENT" section.



2. Remove:
- Piston ①
- Piston seal ②

Removal steps:
- Blow compressed air into the tube joint opening to force out the piston from the caliper body.

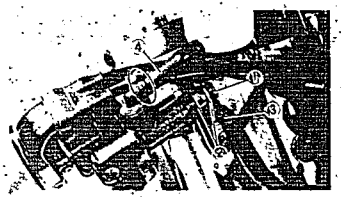
⚠WARNING
- Never try to pry out the piston.
- Cover the piston with a rag. Use care so that piston does not cause injury as it is expelled from the cylinder.

1B573003

MASTER CYLINDER DISASSEMBLY

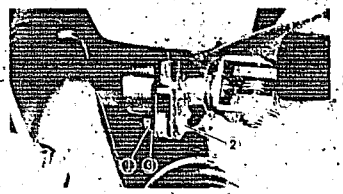
NOTE:
Before disassembling the front or rear brake master cylinders, drain the hose, master cylinder, brake caliper and reservoir tank of their brake fluid.

Front brake
1. Remove:
- Brake lever ①
- Brake switch ②

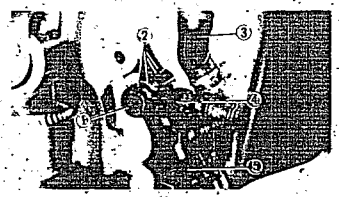


2. Remove:
- Union bolt ①
- Copper washer ②
- Brake hose ③
- Reservoir hose ④

3. Remove:
- Master cylinder bracket ①
- Master cylinder ②



Rear brake
1. Remove:
- Cotter pin ①
- Pin ②
- Washer ③



2. Remove:
- Union bolt ①
- Copper washer ②
- Reservoir hose ③
- Brake hose ④
- Master cylinder ⑤

EB573004

INSPECTION AND REPAIR

Recommended brake component replacement schedule:

Brake pads	As required
Piston seal, dust seal	Every two years
Brake hoses	Every fore years
Brake fluid	Replace only when brakes are disassembled

⚠WARNING

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

A

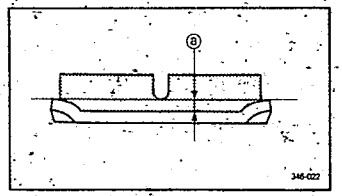
1. Inspect:
- Caliper piston ①
  Scratches/Rust/Wear → Replace caliper assembly.
- Caliper cylinder ②
  Wear/Scratches → Replace caliper assembly.

A Front
B Rear

B

⚠WARNING

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

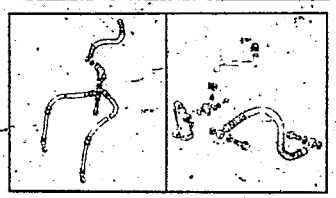


2. Measure:
- Brake pad thickness ⓐ
  Out of specification → Replace

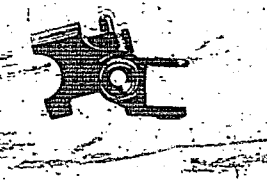
Pad wear limit:
0.5 mm (0.02 in)

NOTE:

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



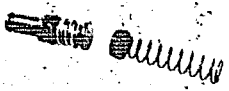
3. Inspect:
- Brake hose
  Cracks/Damage → Replace.



4. Inspect:
- Master cylinder body
  Scratches/Wear → Replace.

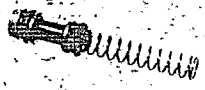
NOTE:

Clean all passage with new brake fluid.



5. Inspect:
- Master cylinder kit
  Scratches/Wear → Replace.

A Front brake
B Rear brake



YB573000

ASSEMBLY

⚠ WARNING

- All internal parts should be cleaned in new brake fluid only.
- Internal parts should be lubricated with brake fluid when installed.

	Brake fluid: DOT #4 If DOT #4 is not available, DOT #3 can be used.

- Replace the piston seals whenever a caliper is disassembled.

Front brake

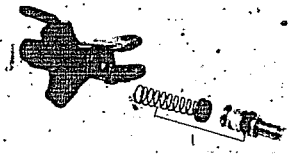
1. Install:
   - Piston seal 1
   - Piston 2

2. Install:
   - Brake pad
   - Pad spring
   - Retaining pin

   Refer to the "BRAKE PAD REPLACEMENT" section.

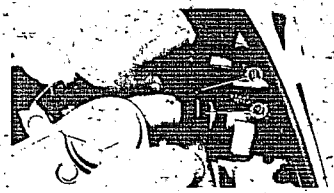
3. Install:
   - Brake caliper 1

	Bolt (brake caliper): 35 Nm (3.5 m · kg, 25 ft · lb)



4. Install:
   - Master cylinder kit 1

5. Install:
   - Circlip 1
   - Master cylinder boot 2

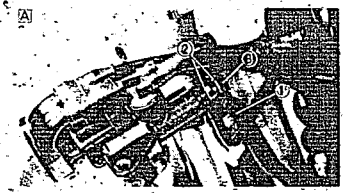


6. Install:
   - Master cylinder

NOTE:

- Install the master cylinder bracket with the "UP" mark facing upward.
- Align the punch mark on the handlebar with the matching surface of the master cylinder.
- Tighten first the upper bolt, then the lower bolt.

	Bolt (master cylinder bracket): 10 Nm (1.0 m · kg, 7.2 ft · lb)



7. Install:
- Brake hose ①
- Copper washers ②
- Union bolts ③

	Union bolt: 26 Nm (2.6 m · kg, 19 ft · lb)

A Master cylinder
B Brake caliper

CAUTION:
When installing the brake hose to the caliper, lightly touch the pipe with the projection on the caliper and master cylinder.

⚠ WARNING
Always use new copper washers.

8. Install:
- Brake switch ①
- Brake lever ②

NOTE:
Apply lithium soap base grease to pivot shaft of brake lever.

9. Fill:
- Brake fluid

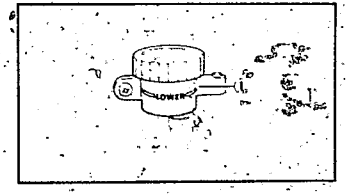
	Recommended brake fluid: DOT #4 If DOT #4 is not available, DOT #3 can be used.

CAUTION:
Brake fluid may erode painted surface or plastic parts. Always clean up spilled fluid immediately.

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

10. Air bleed:
- Brake system

Refer to the "AIR BLEEDING" section.



11. Inspect:
- Brake fluid level

Fluid level is under "LOWER" level line 1
→ Replenish.
Refer to the "BRAKE FLUID INSPECTION" section in the CHAPTER 3.

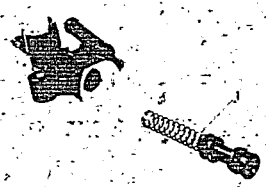
Rear brake
1. Install:
- Piston seal 1
- Piston 2

2. Install:
- Pad spring
- Brake pad
- Retaining pin

Refer to the "BRAKE PAD REPLACEMENT" section.

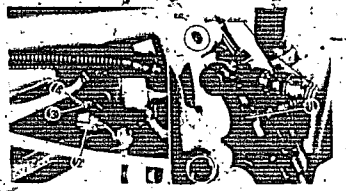
3. Install:
- Brake caliper

	Bolts (brake caliper): 35 Nm (3.5 m · kg, 25 ft · lb)



4. Install:
- Master cylinder kit 1

5. Install:
- Circlip 1
- Nut 2
- Joint 3



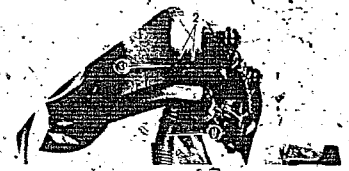
6. Install:
- Master cylinder 1
- Shaft 2
- Plain washer 3
- Cotter pin 4

	Bolt (master cylinder): 22 Nm (2.2 m · kg, 16 ft · lb)

⚠WARNING

Always use new cotter pin.

A



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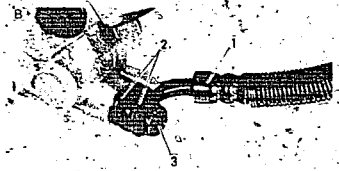


7. Install:
- Brake hose 1
- Copper washers 2
- Union bolt 3

	Union bolt: 26 Nm (2.6 m · kg, 19 ft · lb)

A. Master cylinder
B. Brake caliper

CAUTION:

When installing the brake hose, lightly touch the brake pipe with the projections on the caliper and master cylinder.

⚠WARNING

Always use new copper washers.

8. Fill:
- Brake fluid

	Recommended brake fluid: DOT #4 If DOT #4 is not available, DOT #3 can be used.

CAUTION:

Brake fluid may erode painted surface or plastic parts. Always clean up spilled fluid immediately.

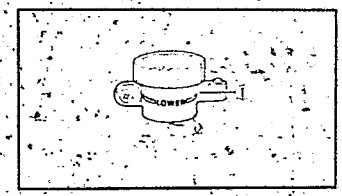
⚠WARNING

- Use only the designated quality brake fluid; otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid; mixing fluid may result in a harmful chemi

cal reaction and lead to poor performance.
- Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid and may result in vapor lock.

9. Air bleed:
- Brake system

Refer to the "AIR BLEEDING" section in the CHAPTER 7.



10. Inspect:
- Brake fluid level

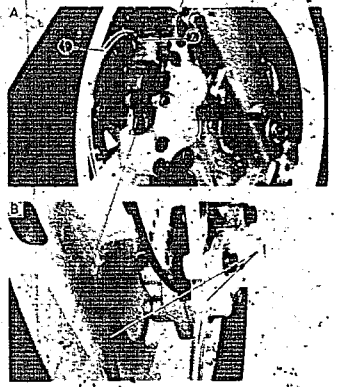
Fluid level is under "LOWER" level line 1
→ Replenish.
Refer to the "BRAKE FLUID INSPECTION" section in the CHAPTER 3.

YB573006
AIR BLEEDING

⚠WARNING:

Bleed the brake system if:
- **The system has been disassembled.**
- **A brake hose has been loosened or removed.**
- **The brake fluid is very low.**
- **The brake operation is faulty.**

A dangerous loss of braking performance may occur if the system is not properly bled.



1. Bleed:
- Brake fluid

Air bleeding steps:
- Add proper brake fluid to the reservoir.
- Install the diaphragm. Be sure careful not to spill any fluid or allow the reservoir to overflow.
- Connect the clear plastic tube 1 tightly to the caliper bleed screw.

A Front
B Rear

- Place the other end of the tube into a container.
- Slowly apply the brake lever or pedal several times.
- Pull the lever in or push down on the pedal; hold the lever or pedal in position.
- Loosen the bleed screw and allow the lever or pedal to travel toward its limit.
- Tighten the bleed screw when the lever or pedal limit has been reached; then release the lever or pedal.

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

- Repeat above steps until of the air bubbles have been removed from the system.

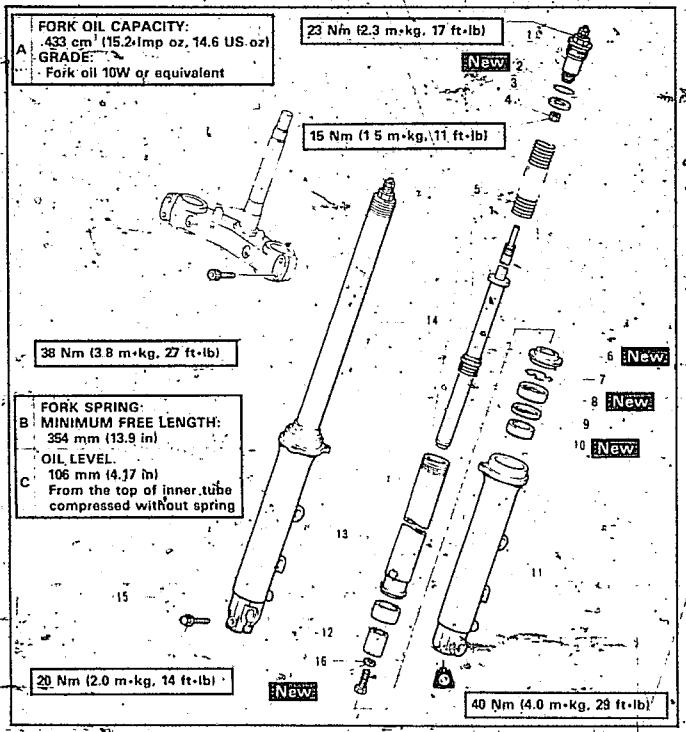
NOTE:

If bleeding is difficult, it may be necessary to let the brake fluid system stabilize for a few hours. Repeat the bleeding procedure when the tiny bubbles in the system have disappeared.

- Add brake fluid to the level line on the reservoir.

FRONT FORK

① Cap bolt
② O-ring
③ Spring seat
④ Lock nut
⑤ Fork spring
⑥ Dust seal
⑦ Stopper ring
⑧ Oil seal
⑨ Plate washer
⑩ Slide metal
⑪ Outer tube
⑫ Oil lock piece
⑬ Inner tube
⑭ Damper rod assembly
⑮ Front fork assembly (right)
⑯ Washer



YB574001

REMOVAL

⚠WARNING

Support the motorcycle securely so there is no danger of it falling over.

1. Remove:
   - Lower cowl
   - Upper cowl

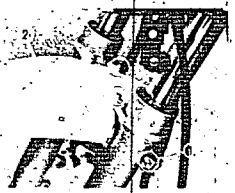
   Refer to the "COWLING" section in the CHAPTER 3.
   - Muffler assembly

   Refer to the "ENGINE REMOVAL—MUFFLER" section in the CHAPTER 4.

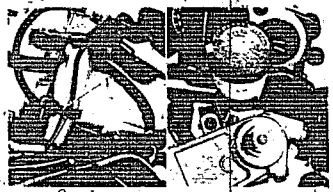
2. Elevate the front wheel by placing a suitable stand under the engine.

3. Remove:
   - Front wheel

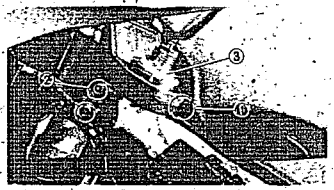
   Refer to the "FRONT WHEEL—REMOVAL" section



4. Remove:
   - Holders 1 (brake hose)
   - Front fender 2



5. Remove:
   - Horn lead holder 1
   - Reservoir tank stay 2



6. Loosen:
- Pinch bolts ① (handle crown)
- Pinch bolts ② (handlebar)
- Cap bolts ③

7. Loosen:
- Pinch bolts ① (lower bracket)

⚠WARNING:
Support the fork before loosening the pinch bolt.

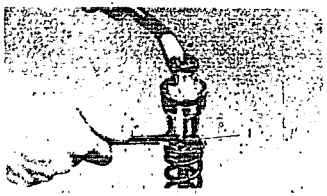
8. Remove:
- Front fork

YB574002

DISASSEMBLY

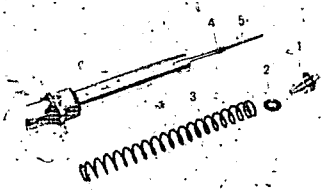
1. Trun in the rebound damping-adjuster fully.

2. Remove:
- Inner tube from cap bolt.

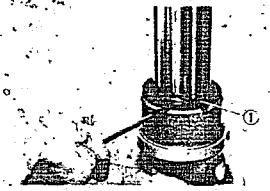


3. Loosen:
- Locknut ①

NOTE:
When loosen the locknut, hold the spring preload adjuster.



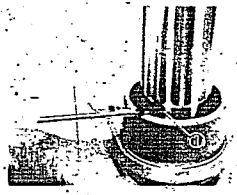
4. Remove:
- Cap bolt ①
- Spring seat ②
- Fork spring ③
- Lock nut ④
- Push rod ⑤



5. Drain:
- Fork oil

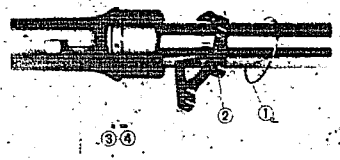
6. Remove:
- Dust seal ①

NOTE:
Use a thin screwdriver, and be careful not to scratch the inner fork tube.



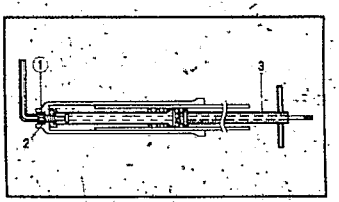
7. Remove:
- Stopper ring ①

NOTE:
Use a thin screw driver, and be careful not to scratch the inner fork tube.



8. Remove:
- Circlip ①
- Front fender bracket ②
- Ball ③
- Spring ④

NOTE:
Do not lose the ball and spring.



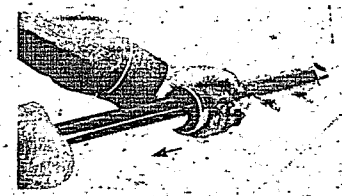
9. Remove
- Bolt (damper rod) ①
- Washer ②

NOTE:
Hold the damper rod to loosen the bolt (damper rod) by the damper rod holder ③

	Damper rod holder: P/N 90890-01425

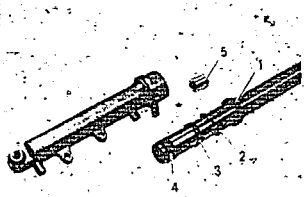
10. Remove:
- Damper rod assembly

11. Remove
- Inner fork tube



Removal steps:
- Hold the fork leg horizontally.
- Clamp the caliper mounting boss of the outer tube securely in a vise with soft jaws.
- Pull out the inner fork tube from the outer tube by forcefully, but carefully, with drawing the inner tube.

CAUTION:
- **Excessive force will damage the oil seal and/or the bushes. Damaged oil seal and bushing must be replaced.**
- **Avoid bottoming the inner tube in the outer tube during the above procedure, as the oil lock piece will be damaged.**



12. Remove:
- Oil seal (1)
- Washer (2)
- Slide metal (3)
- Piston metal (4)
- Oil lock piece (5)

YB574003

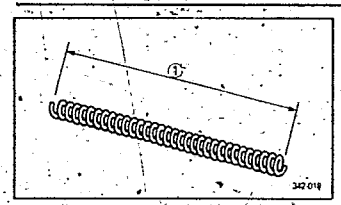
INSPECTION

1. Inspect:
- Inner fork tube (1)
- Damper rod holder (2)

Scratches/Bends/Damages → Replace.

WARNING

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



2. Measure:
- Fork spring (large) free length (a)

Out of specification → Replace.

Fork spring (large) free length:
359 mm (14.1 in)
Minimum free length:
354 mm (13.9 in)

3. Inspect:
- Push rod (1)

Wear/Damage → Replace.
Contamination → Blow out oil passages with compressed air.

4. Inspect:
- Oil lock piece (1)
- O-ring (2) (cap bolt)

Damage → Replace.

YB574004

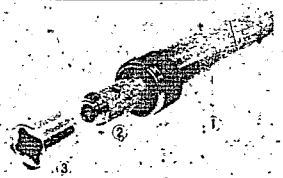
ASSEMBLY

Reverse the "DISASSEMBLY" procedure. Note the following points.

NOTE:
- In front fork reassembly, be sure to use following new parts:
- Guide bush
- Slide bush
- Oil seal
- Dust seal
- Make sure all components are clean before reassembly.

1. Install:
- Piston metal (1)

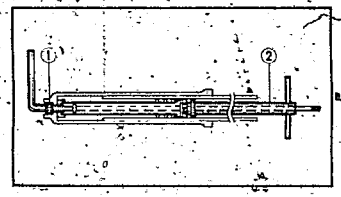
to the inner tube.



2. Install:
- Inner tube ①
- Damper rod ②
- Oil lock piece ③

to the outer tube.

CAUTION:
Allow the damper rod to slide slowly down the inner fork tube until it protrudes from the bottom, being careful not to damage the inner fork tube.

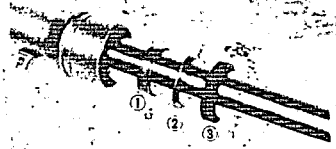


3. Install:
- Copper washer (new)
- Bolt (damper rod)

4. Tighten:
- Bolt ① (damper rod)

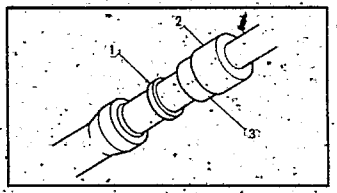
Use the damper rod holder ② to lock the damper rod.

	Damper rod holder: P/N 90890-01425
	Bolt (damper rod): 40 Nm (4.0 m · kg, 29 ft · lb) Loctite®



5. Install:
- Slide metal ①
- Washer ②
- Oil seal ③

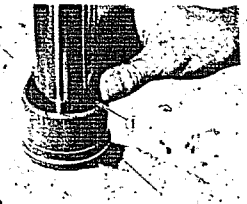
Use the fork seal driver weight ④ and adapter ⑤.



	Fork seal driver weight: P/N 90890-01367 Adapter: P/N 90890-01374

CAUTION:
Be sure that the oil seal numbered side face upward.

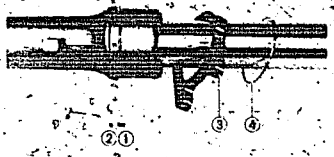
NOTE:
Before installing the oil seal, apply the lithium soap base grease onto the oil seal lips.



6. Install:
- Stopper ring ①

NOTE:
Fit the stopper ring correctly in the groove in the outer tube.

- Dust seal

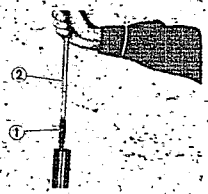


7. Install:
- Spring ①
- Ball ②
- Front fender bracket ③
- Circlip ④

8. Fill:
- Front fork oil

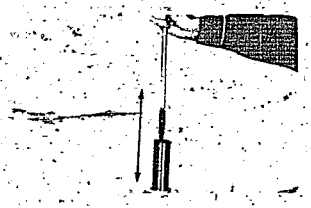
until top of inner tube end.

	Fork oil grade: Fork oil 10WT or equivalent



9. Install:
- Rod puller attachment ①
- rod puller ②

Rod puller attachment: P/N 90890-01436 Rod puller: P/N 90890-01437	

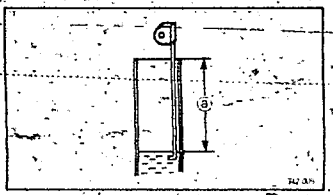


10. Stroke the damper rod assembly about 10 times or more.

11. Fill:
- Fork oil

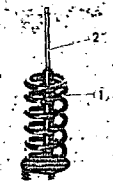
until top of inner tube.

12. Stroke the inner tube about 150 mm (5.9 in) slowly.

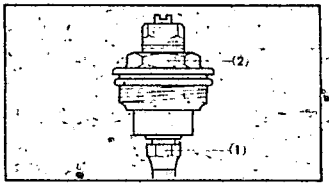


13. Measure:
- Fork oil level

Oil level ⓐ 106 mm (4.17 in) From the top of inner tube compressed without spring	



14. Install:
- Fork spring ①
- Push rod ②
- Locknut
- Spring seat



15. Install:
- O-ring ①
- Cap bolt ②

NOTE:
- Before installing the cap bolt, apply the grease to the O-ring.
- Temporarily tighten the cap bolt with your finger.

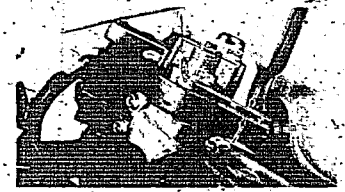
16. Tighten:
- Locknut ①

Hold the spring preload adjuster and then tighten the locknut.

Locknut: 15 Nm (1.5 m · kg, 11 ft · lb)	

17. Install:
- Inner tube

NOTE:
Temporarily tighten the inner tube.



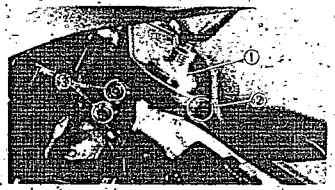
YB5N005
INSTALLATION
Reverse the "REMOVAL" procedure.
Note the following points.
1. Install:
- Front fork

Temporary tighten the pinch bolts.

NOTE:
Position the inner fork tube end in such a way that it is 5 mm (0.2 in) with the top of the handle crown.

2. Tighten:
- Pinch bolts ①, (under bracket)

Pinch bolt (under bracket): 38 Nm (3.8 m · kg, 27 ft · lb)	



3. Tighten:
- Cap bolt ①
- Pinch bolts ② (handle crown)
- Pinch bolt ③ (handlebar)

	Cap bolt: 23 Nm (2.3 m · kg, 17 ft · lb) Pinch bolt (handle crown): 22 Nm (2.2 m · kg, 17 ft · lb) Pinch bolt (handlebar): 22 Nm (2.2 m · kg, 17 ft · lb)

4. Install:
- Brake caliper

	Bolt (brake caliper): 35 Nm (3.5 m · kg, 25 ft · lb)

5. Install:
- Front wheel

	Wheel shaft: 75 Nm (7.5 m · kg, 54 ft · lb) Pinch bolt (wheel shaft): 20 Nm (2.0 m · kg, 14 ft · lb)

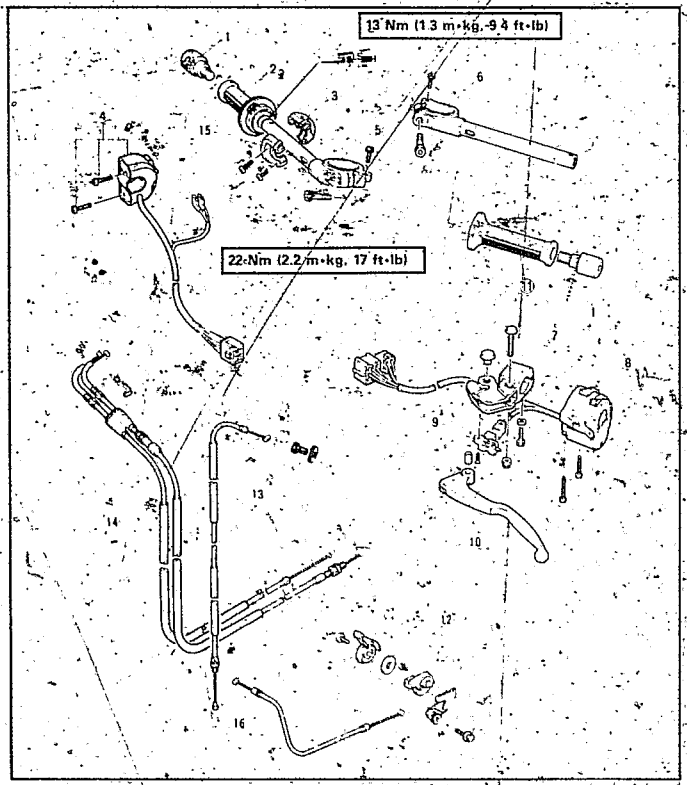
Refer to the "FRONT WHEEL – INSTALLATION" section.

6. Adjust:
- Front fork setting

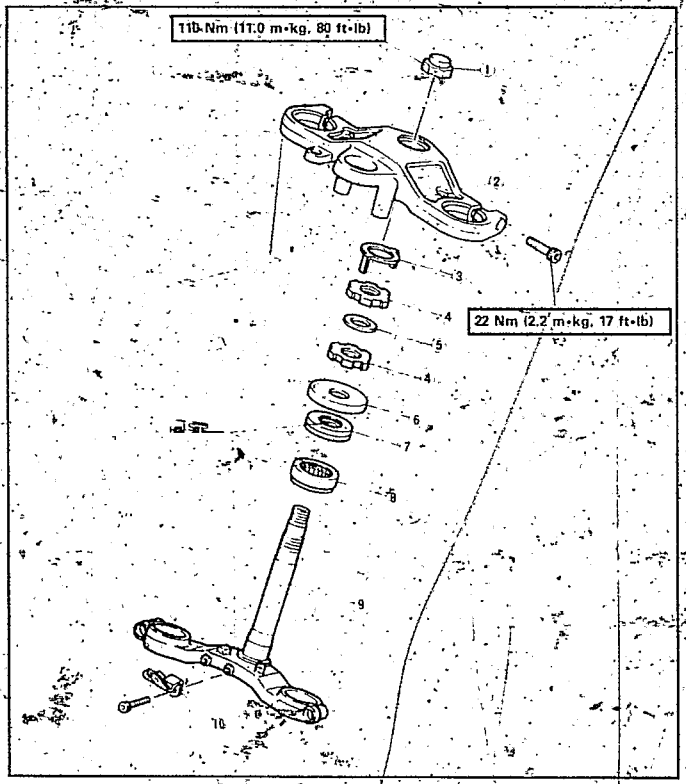
Refer to the "FRONT FORK ADJUSTMENT" section in the CHAPTER 3.

STEERING HEAD AND HANDLEBAR

① Grip end
② Throttle grip assembly
③ Upper holder
④ Handlebar switch (right)
⑤ Handlebar (right)
⑥ Handlebar (left)
⑦ Clutch lever holder
⑧ Handlebar switch (left)
⑨ Clutch switch
⑩ Clutch lever
⑪ Grip
⑫ Starter assembly
⑬ Clutch cable
⑭ Throttle cable
⑮ Lower holder
⑯ Starter cable



① Nut
② Handle crown
③ Special washer
④ Ring nut
⑤ Rubber washer
⑥ Ball race cover
⑦ Bearing
⑧ Bearing
⑨ Under bracket
⑩ Stay



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REMOVAL

⚠ WARNING

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

1. Remove:
- Lower cowl
- Upper cowl

Refer to the "COWLING" section in the CHAPTER 3.
- Muffler assembly

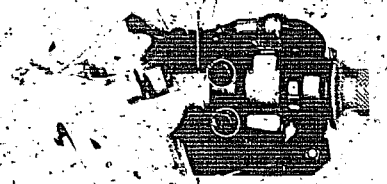
Refer to the "ENGINE REMOVAL—MUFFLER" section in the CHAPTER 4.

2. Elevate the front wheel by placing a suitable stand under the engine.

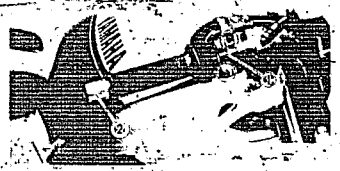
3. Remove:
- Front wheel

Refer to the "FRONT WHEEL—REMOVAL" section.
- Front fork

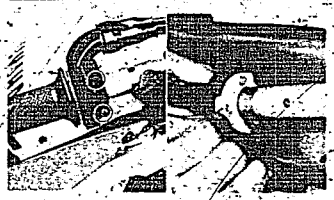
Refer to the "FRONT FORK—REMOVAL" section.



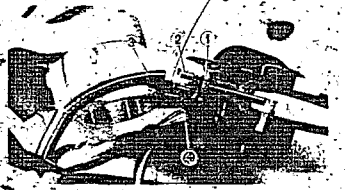
4. Remove:
- Master cylinder ①



5. Remove:
- Handlebar switch ① (right)

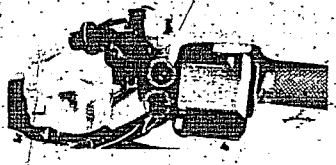


6. Remove:
• Throttle grip

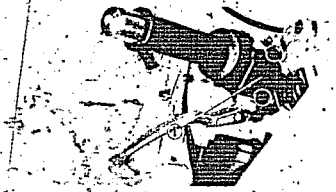


7. Loosen:
• Locknut (1) (clutch cable)
• Adjuster (2) (clutch cable)

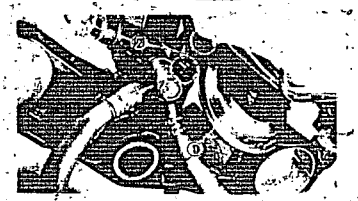
8. Remove:
• Clutch cable (3)
• Clutch switch (4)



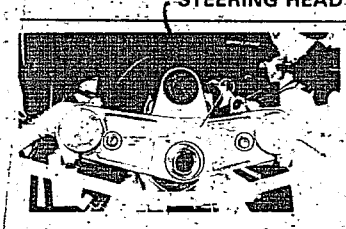
9. Remove:
• Clutch lever assembly (1)



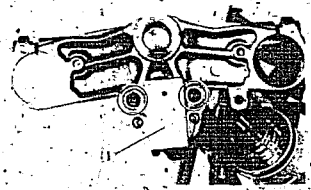
10. Remove:
• Handlebar switch (1) (left)



11. Remove:
• Horn (1)
• Brake hose joint (2)



12. Remove:
• Handle crown (1)



13. Remove:
• Main switch (1)

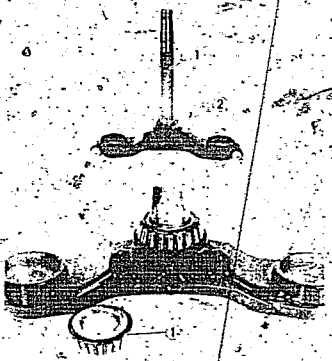
14. Remove:
• Special washer (1)
• Ring nut (2)
• Rubber washer
• Ring nut (3)
• Bearing cover
• Bearing (upper)

NOTE:
Remove the ring nut by the ring nut wrench.

	Ring nut wrench: P/N 90890-01403

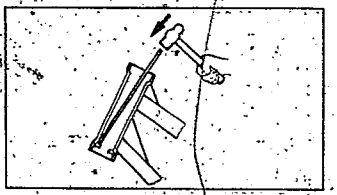
⚠ WARNING
Support the lower bracket so that it may not fall down.

15. Remove:
- Lower bracket ①
- Bearing ② (lower)

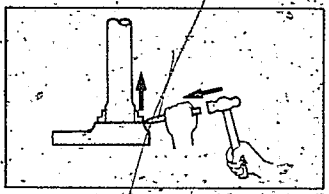


YB575002
INSPECTION
1. Wash the bearings with a solvent.

2. Inspect:
- Bearing ①
Pitting/Damage → Replace.

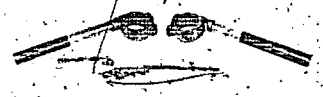


Replacement steps:
- Remove the bearing races using a long rod ① and hammer as shown.
- Remove the bearing race on the steering stem using the floor chisel ② and the hammer as shown.
- Install the new dust seal and races.



NOTE:
Always replace bearings, races and dust seal as a set.

3. Inspect:
- Handlebars
Bends/Cracks/Damage → Replace.



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

Replacement steps:
- Remove the handlebar grip and lever holder.
- Install the lever holder to a new handlebar.
- Apply a light coat of an adhesive for rubber on the left handlebar end.
- Install the handlebar grip.

NOTE:
Wipe off excess adhesive with a clean rag.

⚠ WARNING
Leave the handlebar intact until the adhesive becomes dry enough to make the grips and handlebar stuck securely.

4. Inspect:
- Lower bracket ①
Damage/Crack → Replace.

YB575003
INSTALLATION
Reverse the "REMOVAL" procedure.
Note the following points.

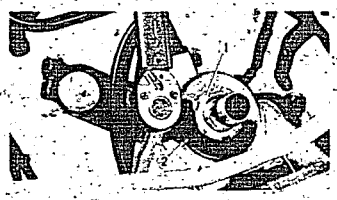
1. Lubricate:
- Bearing (upper and lower)
- Bearing races

Recommended lubricant:
Wheel bearing grease

2. Install:
- Bearing (lower) (onto steering stem)
- Steering stem

CAUTION:
Hold the steering stem until it is secured.

- Bearing (upper)
- Bearing cover
- Ring nut



3. Tighten:
- Ring nut (1)

Tightening steps:
- Tighten the ring nut using the ring nut wrench (2).

	Ring nut wrench: P/N 90890-01403

NOTE:
Set the torque wrench to the ring nut wrench so that they form a right angle.

	Ring nut wrench (initial tightening): 38 Nm (3.8 m · kg, 27 ft · lb)

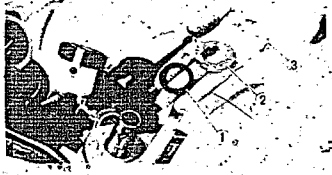
- Loosen the ring nut one turn.
- Retighten the ring nut using the ring nut wrench.

⚠ WARNING:
Avoid over-tightening.

	Ring nut (final tightening): 6 Nm (0.6 m · kg, 4.3 ft · lb)

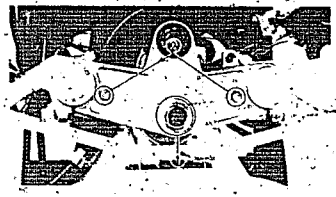
- Check the steering stem by turning it lock to lock. If there is any binding, remove the steering stem assembly and inspect the steering bearings.
- Install the rubber washer (1).
- Install the ring nut (upper) (2).

NOTE:
The tapered side of the ring nut must face downward.



- Finger tighten the ring nut, then align the slots of both ring nuts. If not aligned, hold the lower ring nut and tighten the other until they are aligned.
- Install the special washer (3).

NOTE:
Make sure that the special washer tab is placed in the slots.



4. Install:
- Handle crown
- Handlebars

NOTE:
Temporary tighten the steering fitting bolt (1) and handlebar fitting bolt (2).

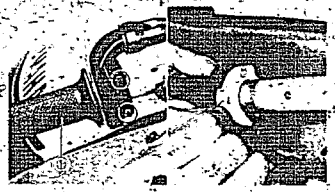
5. Install:
- Front fork

Refer to the "FRONT FORK – INSTALLATION" section.

	Pinch bolt (lower bracket): 38 Nm (3.8 m · kg, 27 ft · lb) Pinch bolt (handle crown): 22 Nm (2.2 m · kg, 17 ft · lb)

6. Tighten.
- Steering fitting bolt
- Handlebar fitting bolt

	Steering fitting bolt: 110 Nm (11.0 m · kg, 80 ft · lb) Handlebar fitting bolt: 13 Nm (1.3 m · kg, 9.4 ft · lb)



7. Install:
- Throttle grip (1)
- Handlebar switch (right)

8. Install:
- Brake master cylinder

Refer to the "FRONT BRAKE—ASSEMBLY" section.

9. Install:
- Clutch cable

NOTE:
Apply a light coat of lithium soap base grease onto the clutch cable end.

10. Install:
- Front wheel

Refer to the "FRONT WHEEL—INSTALLATION" section.

	Wheel shaft: **75 Nm (7.5 m · kg, 54 ft · lb)** **Pinch bolt (wheel shaft):** **20 Nm (2.0 m · kg, 14 ft · lb)**

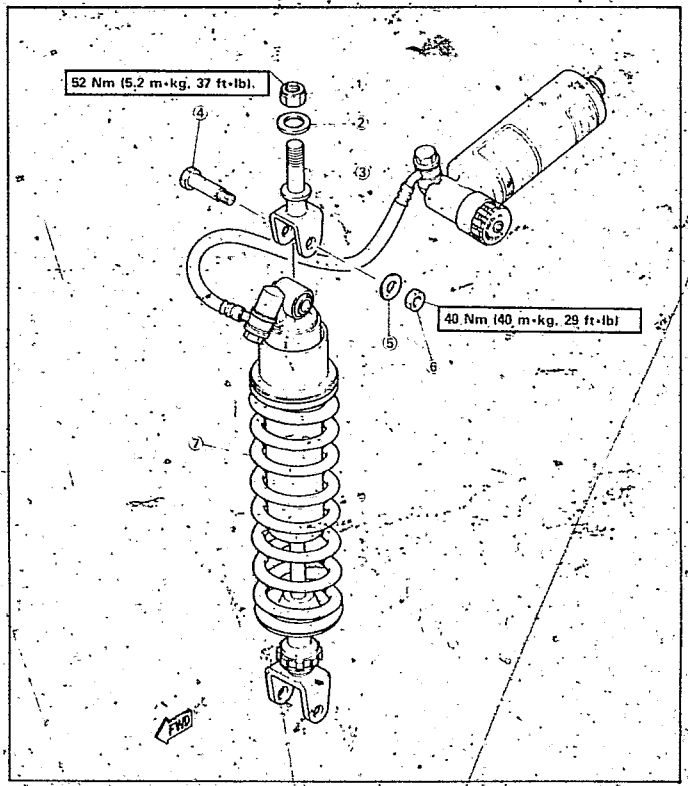
11. Adjust:
- Clutch cable free play

	Free play: **10– 15 mm (0.4–0.6 in)** **at lever end**

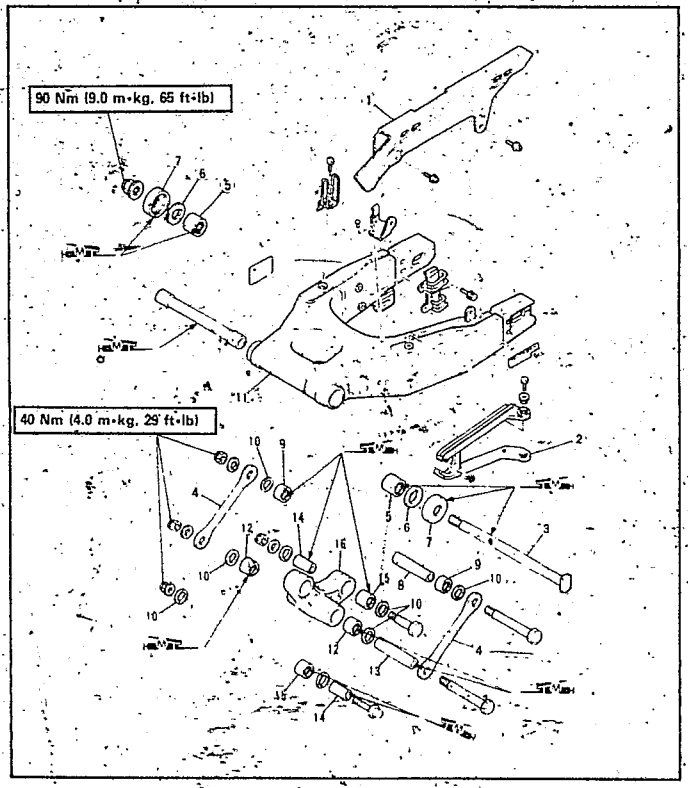
Refer to "CLUTCH ADJUSTMENT" section in CHAPTER 3.

REAR SHOCK ABSORBER AND SWINGARM

1. Nut
2. Spacer
3. Bracket
4. Bolt
5. Plate washer
6. Nut
7. Rear shock absorber ass'y



① Chain case
② Chain protector
③ Pivot shaft
④ Connecting arm
⑤ Bearing
⑥ Plate washer
⑦ Cover
⑧ Collar
⑨ Bearing
⑩ Oil seal
⑪ Rear arm
⑫ Bearing
⑬ Collar
⑭ Collar
⑮ Bearing
⑯ Relay arm

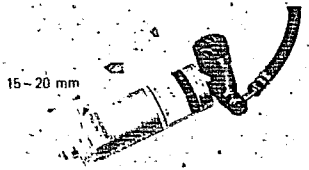


YB576001
HANDLING NOTE

⚠ WARNING

This shock absorber contains highly pressurized nitrogen gas. Read and understand the following information before handling the shock absorber. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling.

- **Do not tamper with or attempt to open the cylinder assembly.**
- **Do not subject shock absorber to an open flame or other high heat source. this may cause the unit to explode due to excessive gas pressure.**
- **Do not deform or damage the cylinder in any way. Cylinder damage will result in poor damaging performance.**
- **Take care not to scratch the contact surface of the piston rod with the cylinder; or oil could leak out.**
- **When scrapping the shock absorber, refer to the "NOTES ON DISPOSAL" section.**



YB576002
NOTES ON DISPOSAL

Disposal steps:

- Gas pressure must be released before disposing of shock absorber. To do so, drill a 2~3 mm (0.08~0.12 in) hole through the cylinder wall at a point 15~20 mm (0.6~0.8 in) from the end of the gas chamber.

⚠ WARNING

Wear eye protection to prevent eye damage from escaping gas and/or metal chips.

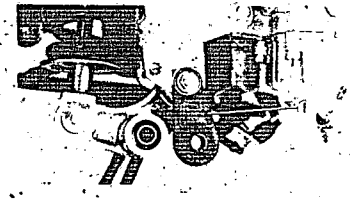
YB576003
REMOVAL
Rear shock absorber

⚠ WARNING
Securely support the motorcycle so there is no danger of it falling over.

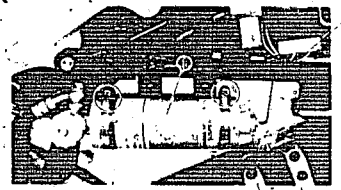
1. Remove:
- Lower cowl
  Refer to the "COWLING" section in the CHAPTER 3.
- Muffler assembly
  Refer to the "ENGINE REMOVAL—MUFFLER" section in the CHAPTER 4.

2. Elevate the rear wheel by placing a suitable stand under the engine.

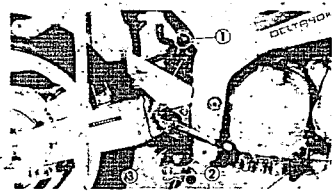
3. Remove:
- Rear wheel
  Refer to the "REAR WHEEL" section.



4. Remove:
- Connecting arm (1)



5. Remove:
- Subtank assembly (1)



6. Remove:
- Bolt (1) (shock absorber—top)
- Bolt (2) (shock absorber—lower)
- Rear shock absorber (3)

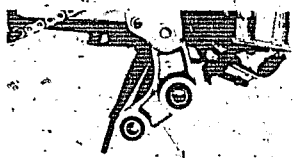
Swingarm

⚠ WARNING
Securely support the motorcycle so there is no danger of it falling over.

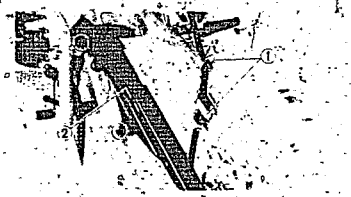
1. Remove:
- Lower cowl
  Refer to the "COWLING" section in the CHAPTER 3.
- Muffler assembly
  Refer to the "ENGINE REMOVAL—MUFFLER" section in the CHAPTER 4.

2. Elevate the rear wheel by placing a suitable stand under the engine.

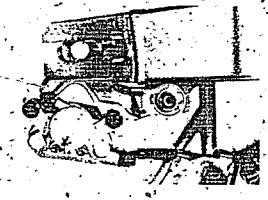
3. Remove:
- Rear shock absorber
  Refer to the "REAR SHOCK ABSORBER" section.



4. Remove:
- Relay arm (1)



5. Remove:
- Brake hose holder 1
- Chain case 2



6. Remove:
- Caliper bracket 1

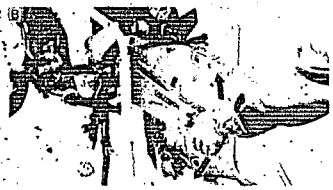
7. Check:
- Swingarm free play

Inspection steps:
- Check the tightening torque of the pivot shaft (swingarm) securing nut.

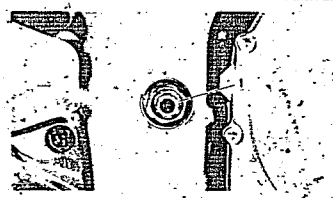
	Nut (swingarm—pivot shaft): 90 Nm (9.0 m · kg, 65 ft · lb)

- Check the swingarm side play A by moving it from side to side.
If side play is noticeable, check the inner collar, bearing, washer and thrust cover.

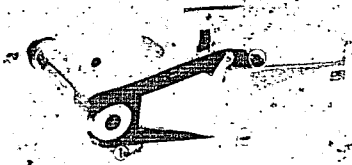
	Side play (at end of swingarm): 1.0 mm (0.04 in)



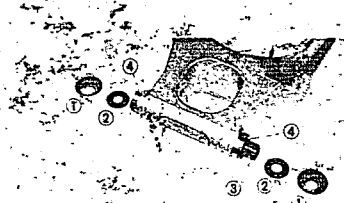
- Check the swingarm vertical movement B by moving it up and down.
If vertical movement is tight, binding or rough, check the inner collar, bearing, washer and thrust cover.



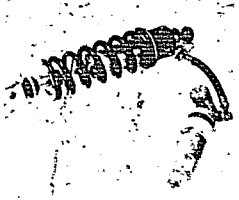
8. Remove:
- Pivot shaft 1
- Rear arm



9. Remove:
- Chain protector 1

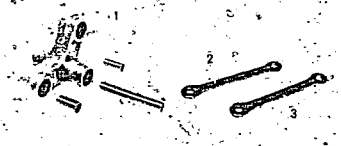


10. Remove:
- Cover 1
- Plate washer 2
- Bush 3
- Bearing 4



YB578004
INSPECTION
1. Inspect
- Shock absorber
Oil leaks/Damage → Replace

2. Inspect:
- Swingarm
Bends/Cracks/Damage → Replace



3. Inspect:
- Relay arm 1
- Connecting arm 1 2
- Connecting arm 2 3

Bends/Cracks/Damage → Replace.

4. Inspect:
- Bush
  Scratches/Damage → Replace.
- Bearing
  Pitting/Damage → Replace.

YB575006

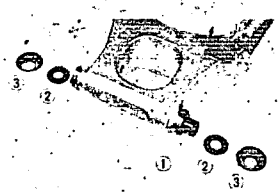
INSTALLATION

Swingarm

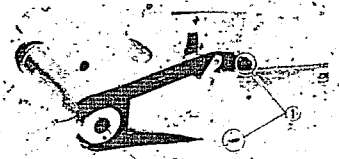
Reverse the "REMOVAL" procedure.
Note the following points.

1. Lubricate:
- Bearings
- Inner collars
- Thrust washers
- Pivot shaft

	Recommended lubricant: **Molybdenum disulfide grease**

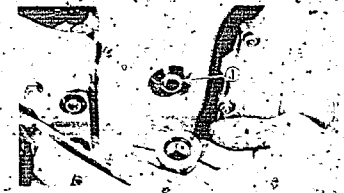


2. Install:
- Bush 1
- Thrust washer 2
- Cover 3



3. Tighten:
- Bolt 1 (chain protector)

	Bolt 1 (chain protector): **7 Nm (0.7 m · kg, 5.1 ft · lb)**

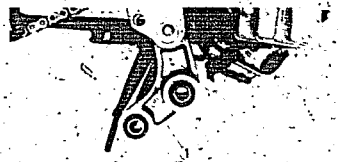


4. Install:
- Rear arm
- Pivot shaft

Apply lithium soap base grease

5. Tighten:
- Nut 1 (pivot shaft)

	Nut (pivot shaft): **90 Nm (9.0 m · kg, 65 ft · lb)**



6. Tighten:
- Nut 1 (relay arm)

	Nut (relay arm): **40 Nm (4.0 m · kg, 29 ft · lb)**

7. Install:
- Rear shock absorber
- Connecting arm

	Nut (rear shock absorber, connecting arm): **40 Nm (4.0 m · kg, 29 ft · lb)**

Refer to the "REAR SHOCK ABSORBER INSTALLATION" section.

8. Adjust:
- Drive chain slack

	Drive chain slack: **15 – 20 mm (0.59 – 0.79 in)**

Refer to the "DRIVE CHAIN SLACK ADJUSTMENT" section in the CHAPTER 3.

9. Install:
- Rear wheel

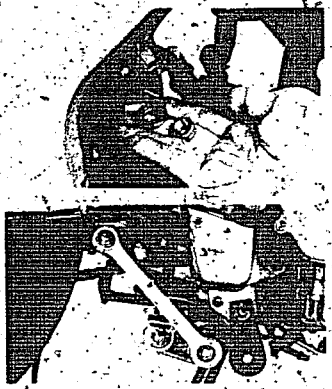
	Nut (rear wheel axle): 105 Nm (10.5 m · kg, 75 ft · lb) Locknut (rear wheel axle): 45 Nm (4.5 m · kg, 32 ft · lb)

Refer to the "REAR WHEEL—INSTALLATION" section.

Rear shock absorber

Reverse the "REMOVAL" procedure. Note the following points.

1. Lubricate:
- Bearings
- Oil seal
- Collars
- Bushings



	Recommended lubricant: Molybdenum disulfide grease

2. Install:
- Rear shock absorber

	Nut (rear shock absorber): 40 Nm (4.0 m · kg, 29 ft · lb)

3. Install:
- Connecting arm

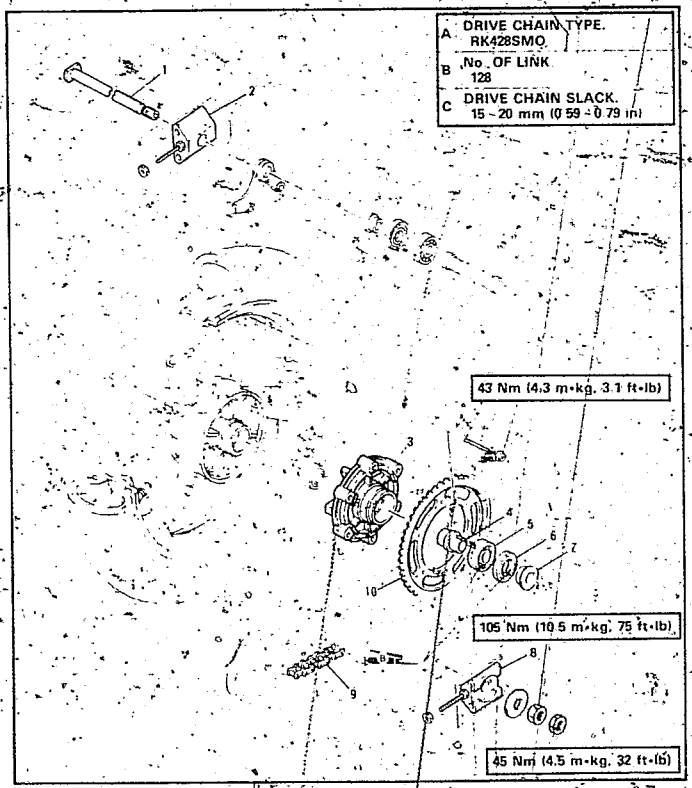
	Nut (connecting arm—relay arm): 40 Nm (4.0 m · kg, 29 ft · lb) Nut (connecting arm—frame): 40 Nm (4.0 m · kg, 29 ft · lb)

4. Adjust:
- Rear shock absorber setting

Refer to the "REAR SHOCK ABSORBER ADJUSTMENT" section in the CHAPTER 3.

DRIVE CHAIN AND SPROCKET

1. Wheel axle
2. Chain puller
3. Clutch hub
4. Collar
5. Bearing
6. Oil seal
7. Collar
8. Chain puller
9. Drive chain
10. Rear wheel sprocket



YB577000

NOTE:
Before removing the drive chain and sprockets, drive chain slack and 10-link length of drive chain should be measured.

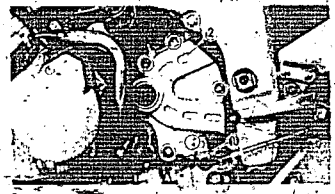
YB577001

REMOVAL

⚠WARNING:
Securely support the motorcycle so there is no danger of it falling over.

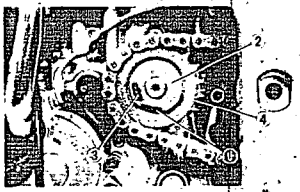
1. Remove:
- Lower cowl
  Refer to the "COWLING" section in the CHAPTER 3.
- Muffler
  Refer to the "ENGINE REMOVAL—MUFFLER" section in the CHAPTER 4.

2. Elevate the rear wheel by placing a suitable stand under the engine.



3. Remove:
- Shift pedal ①
- Crankcase cover ② (left)

4. Loosen:
- Drive chain
  Refer to the "DRIVE CHAIN SLACK ADJUSTMENT" section in the CHAPTER 3.

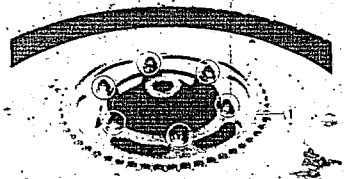


5. Straighten:
- Lock washer tab ①

6. Remove:
- Nut (drive sprocket) ②
- Lock washer ③
- Drive sprocket ④

NOTE:
Loosen the nut (drive sprocket) while applying the rear brake.

7. Remove:
- Rear wheel
  Refer to the "REAR WHEEL" section.
- Swingarm
- Drive chain
  Refer to the "REAR SHOCK ABSORBER AND SWINGARM" section.

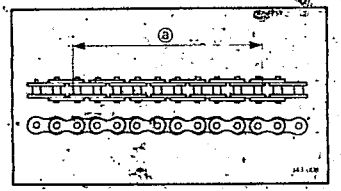


8. Remove:
- Driven sprocket ①

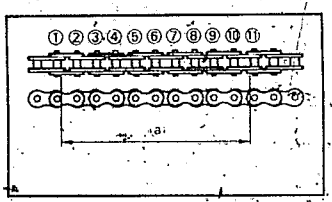
YB577002

INSPECTION

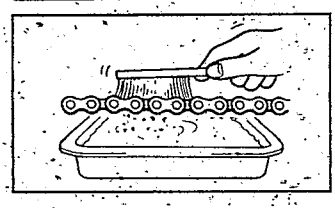
1. Measure:
- 10-link length ⓐ (drive chain)
  Out of specification → Replace drive chain



10-link length limit: 150.0 mm (5.91 in)

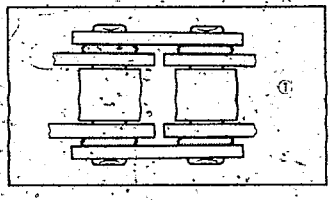


NOTE:
- For measurement make the chain tense by finger.
- 10-link length is a measurement between the insides of the ① and ⑪ rollers as shown.
- Two or three different 10-link length should be measured.

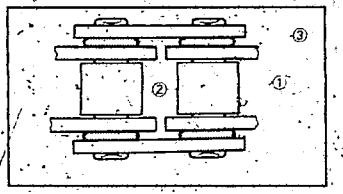


2. Clean:
- Drive chain

Place it in kerosene, and brush off as much dirt as possible. Then remove the chain from the kerosene and dry the chain.



CAUTION:
This motorcycle has a drive chain with small rubber O-rings ① between the chain plates. Steam cleaning, high-pressure washers, and certain solvent can damage these O-rings. Use only kerosene to clean the drive chain.



3. Inspect:
- O-ring ① (drive chain)

Damage → Replace drive chain.
- Rollers ②
- Side plates ③

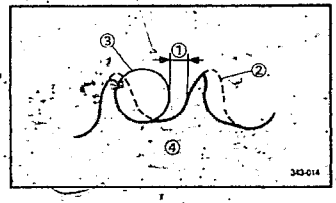
Damage/Wear → Replace drive chain.

4. Lubricate:
- Drive chain

Drive chain lubricant:
"SAE 30 ~ 50 W motor oil or, chain lubricants suitable for "O-ring" chains.

5. Inspect:
- Drive chain stiffness

Stiff → Clean and lubricate or replace.



6. Inspect:
- Drive sprocket
- Driven sprocket

More than 1/4 teeth wear → Replace sprocket.
Bent teeth → Replace sprocket.

② Correct
③ Roller
④ Sprocket

Replacement steps:
- Straighten the lock washer tabs and remove the driven sprocket.
- Install a new driven sprocket and lock washers.

⚠ WARNING
Always use new lock washers.

Nut (driven sprocket):
43 Nm (4.3 m · kg, 31 ft · lb)

- Bend the washer tabs along the nut flats.

YB5710034

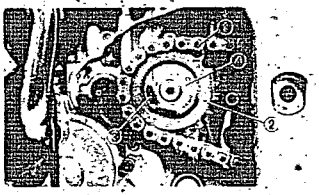
INSTALLATION

Reverse the "REMOVAL" procedure. Note the following points.

1. Install:
- Drive chain
- Swingarm

Refer to the "REAR SHOCK ABSORBER AND SWINGARM" section.
- Rear wheel

Refer to the "REAR WHEEL" section.



2. Install:
- Drive chain ①
- Drive sprocket ②
- Lock washer ③
- Nut (drive sprocket) ④

	Nut (drive sprocket): 70 Nm (7.0 m · kg, 50 ft · lb)

NOTE:
Tighten the nut (drive sprocket) while applying the rear brake.

⚠WARNING:
Always use a new lock washer.

3. Install:
- Rear wheel

Refer to the "REAR WHEEL—INSTALLATION" section in the CHAPTER 6.

	Nut (wheel shaft): 105 Nm (10.5 m · kg, 75 ft · lb) Locknut (wheel shaft): 45 Nm (4.5 m · kg, 32 ft · lb)

4. Adjust:
- Drive chain slack

Refer to the "DRIVE CHAIN SLACK ADJUSTMENT" section in the CHAPTER 3.

	Drive chain slack: 15~20 mm (0.59~0.79 in)

CAUTION:
Too small chain slack will overload the engine and other vital parts; keep the slack within the specified limits.

⚠WARNING:
Always use a new cotter pin on the axle nut.

5. Install:
- Crankcase cover (left)
- Shift pedal

	Bolt (crankcase cover): 10 Nm (1.0 m · kg, 7.2 ft · lb) Bolt (shift pedal): 10 Nm (1.0 m · kg, 7.2 ft · lb)

ELEC 8

CHAPTER 8. ELECTRICAL

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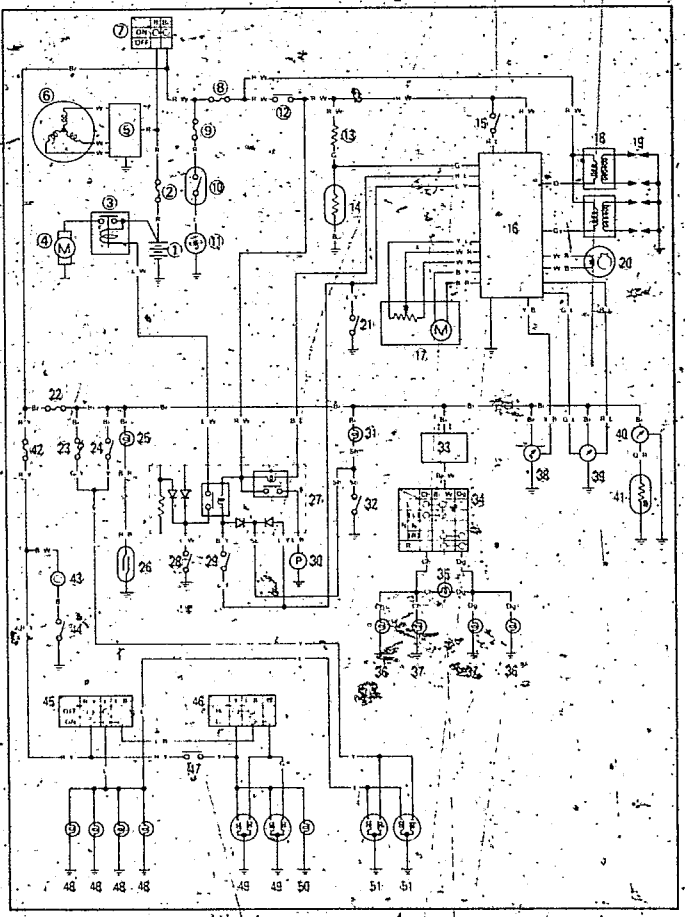
ELECTRICAL

FZR400SP CIRCUIT DIAGRAM



1. Battery
2. Fuse (main)
3. Starter relay
4. Starter motor
5. Rectifier/regulator
6. AC magneto
7. Main switch
8. Fuse (ignition)
9. Fuse (fan)
10. Thermo switch
11. Fan motor
12. "ENGINE STOP" switch
13. Resistor
14. Fuel sender
15. Reserve switch
16. Ignitor
17. EXUP
18. Ignition coil
19. Spark plug
20. Pick up
21. Sidestand switch
22. Fuse (signal)
23. Front brake switch
24. Rear brake switch
25. "OIL" warning indicator light
26. Oil pressure switch
27. Relay
28. "START" switch
29. Clutch switch
30. Fuel pump
31. "NEUTRAL" indicator light
32. Neutral switch
33. Flasher relay
34. "TURN" signal switch
35. "TURN" indicator light
36. Front flasher light
37. Rear flasher light
38. Tachometer
39. Speedometer
40. Engine temperature gauge
41. Thermo unit
42. Fuse (headlight)
43. Horn
44. "HORN" switch
45. "LIGHTS" switch
46. "LIGHTS" (Dimmer) switch
47. "PASS" switch
48. Meter light
49. Headlight
50. "HIGH BEAM" indicator light
51. Tail/Brake light

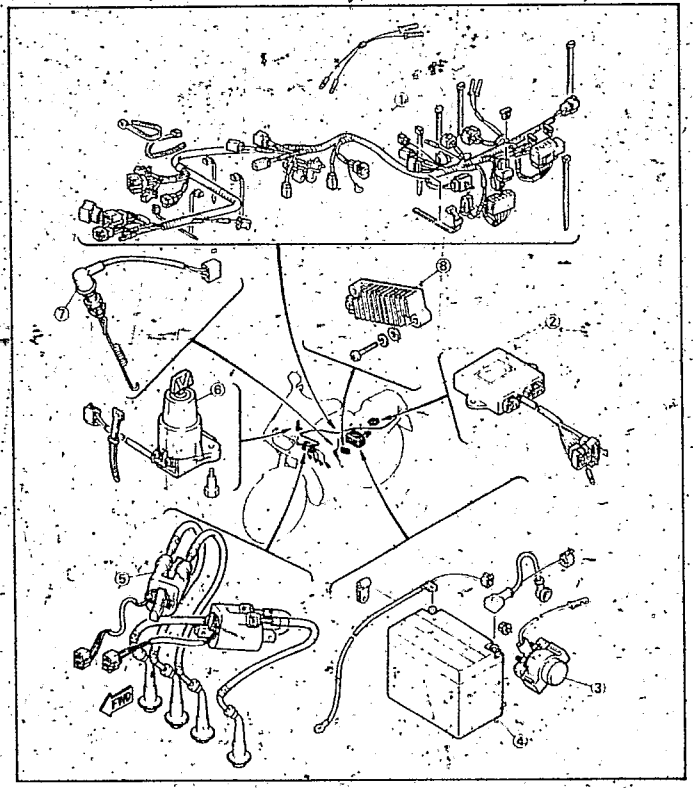
COLOR CODE

B	Black	W	White	L/W	Blue/White
Br	Brown	Y	Yellow	L/Y	Blue/Yellow
Ch	Chocolate	B/L	Black/Blue	R/B	Red/Black
Dg	Dark green	B/R	Black/Red	R/G	Red/Green
G	Green	B/W	Black/White	R/L	Red/Blue
Gy	Gray	B/Y	Black/Yellow	R/Y	Red/Yellow
L	Blue	Br/W	Brown/White	R/W	Red/White
O	Orange	G/L	Green/Blue	W/B	White/Black
P	Pink	G/R	Green/Red	W/R	White/Red
R	Red	G/Y	Green/Yellow	Y/B	Yellow/Black
Sb	Sky blue	L/B	Blue/Black	Y/L	Yellow/Blue

ELECTRICAL COMPONENTS

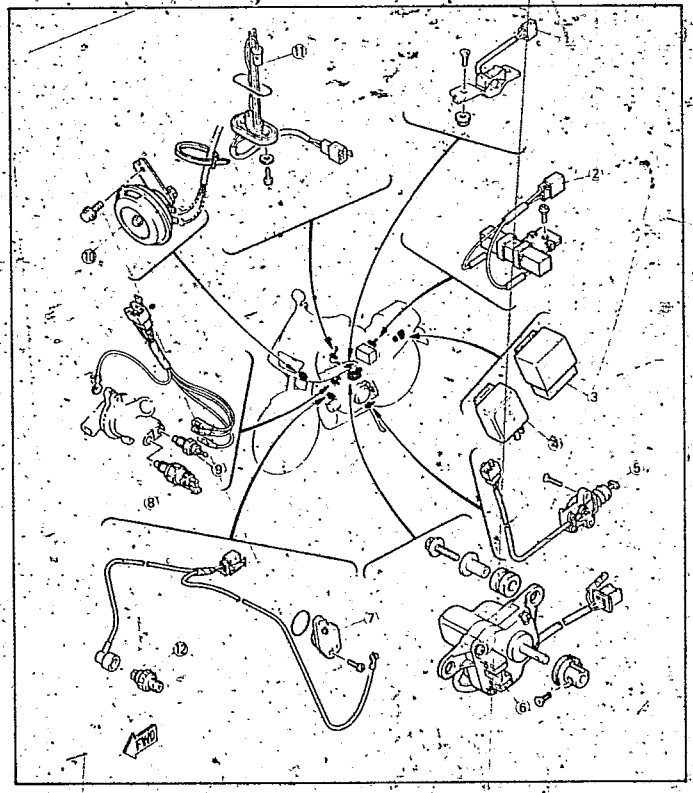
1. Wireharness
2. Digital ignitor unit
3. Starter relay
4. Battery
5. Ignition coil
6. Main switch
7. Rear brake switch
8. Rectifier/regulator

BATTERY:
CAPACITY: 12V 8AH



1. Reserve switch
2. Resistor
3. Relay
4. Flasher relay
5. Sidestand switch
6. Ex-up servomotor
7. Neutral switch
8. Thermo switch
9. Thermo unit
10. Horn
11. Fuel sender
12. Oil pressure switch

SPECIFICATIONS	RESISTANCE
IGNITION COIL	
PRIMARY	1.8 – 2.2Ω at 20°C (65°F)
SECONDARY	9.6 – 14.4 kΩ at 20°C (68°F)
PICKUP COIL	80.8 – 121.2Ω at 20°C (68°F)



YB581000

CHECKING OF SWITCHES

Check the switches for the continuity between the terminal to determine correct connection.

Read the following for switch inspection.

YB581001

SWITCH CONNECTION AS SHOWN IN MANUAL

The manual contains a connection chart as shown left showing the terminal connections of the switches (e.g., main switch, handlebar switch, bracket switch, lighting switch etc.)

The extreme left column indicates the switch positions and the top line indicates the colors of leads connected with the terminals in the switch component.

"○—○" indicates the terminals between which there is a continuity of electricity; i.e., a closed circuit at the respective switch positions

In this chart:
"R and Br" and "L/W and L/R" are continuous with the "ON" switch position.

"B and B/W" is continuous with the "OFF" switch position.

"B and B/W" is continuous with the "LOCK" switch position.

"B and B/W" and "R and L/R" are continuous with the "P" switch position.

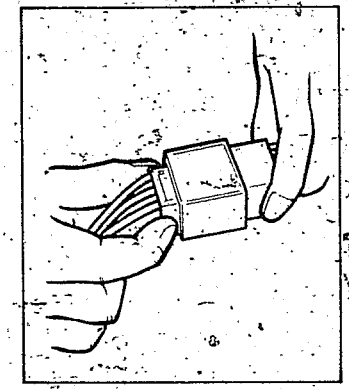
	B	B/W	R	Br	L/W	L/R
ON			○	○	○	○
OFF	○	○				
LOCK	○	○				
P	○	○	○			○

YB581002

CHECKING SWITCH FOR TERMINAL CONNECTION

Before checking the switch, refer to the connection chart as shown above and check for the correct terminal connection (closed circuit) by the color combination.

To explain how to check the switch, the main switch taken for example in the following.

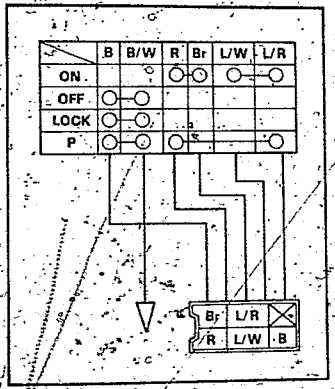


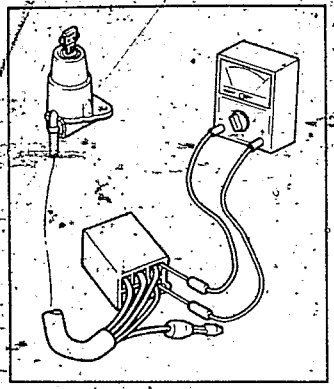
1. Disconnect the main switch coupler from the wireharness.

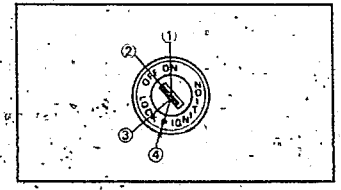
CAUTION:
Never disconnect the main switch coupler by pulling the leads. Otherwise, leads may be pulled off the terminals inside the coupler.

2. Inspect whether any lead is off the terminal inside the coupler. If it is, repair it.

NOTE:
If the coupler is clogged with mud or dust, blow it off by compressed air.







3. Use the connection chart to check the color combination for continuity (a closed circuit). In this example, the continuity is as follows.

"R and Br" and "L/W and L/R" are continuous with the "ON" switch position.

"B and B/W" is continuous with the "OFF" switch position.

"B and B/W" is continuous with the "LOCK" switch position.

"B and B/W" and "R and L/R" are continuous with the "P" switch position.

Please note that these is no continuity (an open circuit) at all for the color combinations other than the above.

4. Check the switch component for the continuity between "R and Br".

Checking steps:

- Turn the switch key to the "ON", "OFF", "LOCK" and "P" several times.
- Set the pocket tester selector to the "Ω x 1".
- Connect the tester (+) lead to the "R" lead terminal in the coupler and the (−) lead to the "Br" lead terminal.

NOTE:

Use thin probes for checking the continuity. Otherwise, the probes may contact other terminals inside the coupler.

- Check the continuity between "R" and "Br" at the respective switch position of "ON" (1), "OFF" (2), "LOCK" (3), and "P" (4). There must be continuity (the tester indicating "0") at the "ON" switch position, and there must be no continuity (the tester indicating "∞") at "OFF", "LOCK", or "P". There is something wrong between "R" and "Br" if there is no continuity at the "ON" position or if there is some continuity

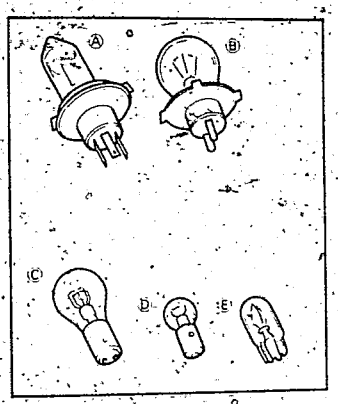
either at the "OFF" or "LOCK" or "P".

NOTE:

Check the switch for continuity several times.

5. Next go on to checking of the continuity between "B" and "B/W", "L/W and L/R", and "R and L/R" at the respective switch positions, as in the same manner mentioned above.

6. If there is something wrong with any one of the combinations, replace the switch component.



YB582000
CHECKING OF BULBS (FOR HEADLIGHT, TAIL/BRAKE LIGHT, FLASHER LIGHT, METER LIGHT, ETC.)

Check the bulb terminal continuity for the condition of the bulb.

YB582001
KINDS OF BULBS
The bulbs used in the motorcycle are classified as shown left by the shape of the bulb socket.

Ⓐ and Ⓑ are many used for the headlight.

Ⓒ is mainly used for the flasher light and tail /brake light.

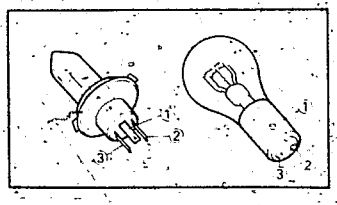
Ⓓ and Ⓔ are mainly used for the meter light and other indicator lights.

YB582002
CHECKING BULB CONDITION
1. Remove the bulb

NOTE:
- Bulbs of the Ⓐ and Ⓑ type uses a bulb holder. Remove the bulb holder before removing the bulb itself. Most of the bulb holder for this type can be removed by turning them counterclockwise.
- Most of the bulbs of Ⓒ and Ⓓ type can be removed from the bulb sockets by pushing and turning them counterclockwise.
- Bulbs of the Ⓔ type can be removed from the bulb sockets by simply pulling them out

CAUTION:
Be sure to hold the socket firmly when removing the bulb. Never pull the lead. Otherwise, the lead may be pulled off the terminal in the coupler.

⚠ WARNING:
Keep flammable products or your hands away from the headlight bulb while it is on. It will be hot. Do not touch the bulb until it cools down.



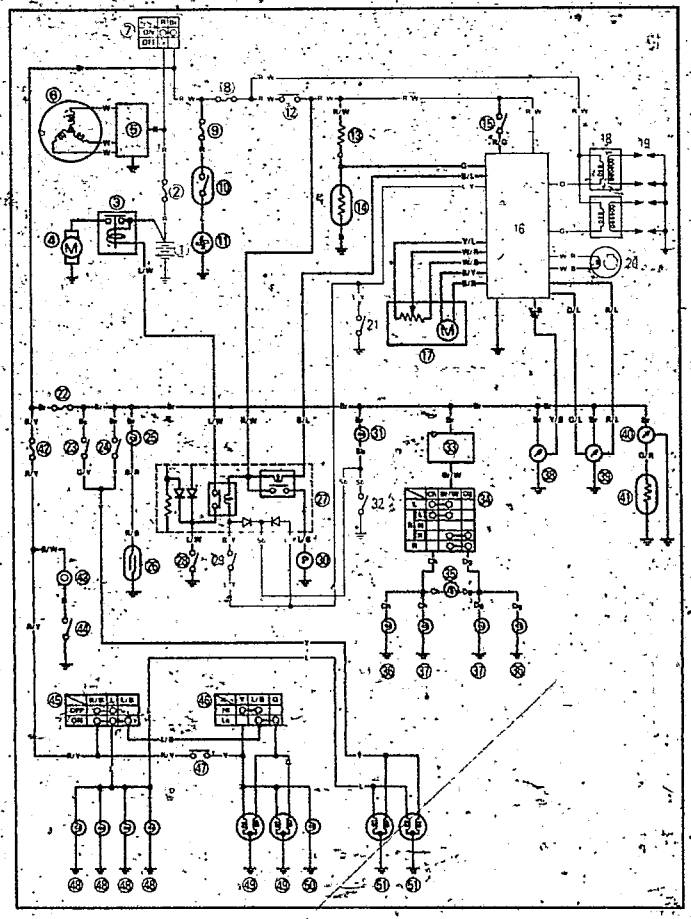
2. Check the bulb terminals for continuity.

Checking steps:
- Set the pocket tester selector to the "Ω×1".
- Connect the tester lead to the respective bulb terminals. Take for example a 3-terminal bulb as shown left. First check the continuity between the 1 and 2 terminal by connecting the tester (+) lead to the 1 terminal and the tester (−) lead to the 2 terminal. Then check the continuity between the 1 and 3 terminals by connecting the tester (+) lead still to the 1 terminal and the tester (−) lead to the 3 terminal. If the tester shown "∞" in either case, replace the bulb.

3. Check the bulb socket by installing a proven bulb to it. As in the checking of bulbs, connect the pocket tester leads to the respective leads of the socket and check for continuity in the same manner as mentioned above.

IGNITION SYSTEM

CIRCUIT DIAGRAM

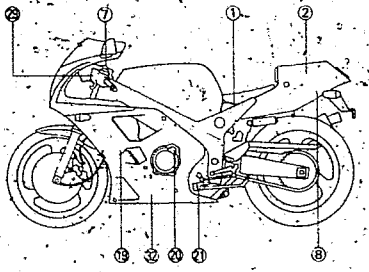


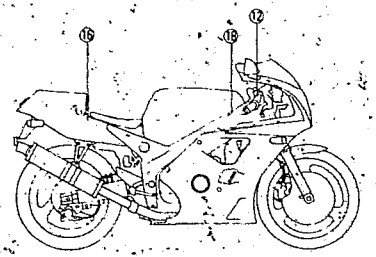
Aforementioned circuit diagram shows ignition circuit in circuit diagram.

NOTE:

For the color codes, see page 8-2.

① Battery
② Fuse (main)
⑦ Main switch
⑧ Fuse (ignition)
⑫ "ENGINE STOP" switch
⑯ Ignitor
⑱ Ignition coil
⑲ Spark plug
⑳ Pick up
㉑ Sidestand switch
㉔ Clutch switch
㉜ Neutral switch





TROUBLESHOOTING

IF IGNITION SYSTEM SHOULD BECOME INOPERATIVE (NO SPARK OR INTERMITTENT SPARK)

Procedure

Check;

1. Fuse (main and ignition)
2. Battery
3. Spark plug
4. Ignition spark gap
5. Spark plug cap resistance
6. Ignition coil resistance
7. Main switch
8. "ENGINE STOP" switch
9. Neutral switch
10. Sidestand switch
11. Diode (relay unit)
12. Pickup coil resistance
13. Wiring connection (Entire ignition system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Tail cover
  3) Fuel tank
  4) Air filter case
- Use the following special tools in this troubleshooting

Ignition checker: 90890-06754	Pocket tester: 90890-03112

1. Fuse (main and ignition)
- Remove the fuses.
- Connect the pocket tester (Ω ×1) to the fuses.
- Check the fuses for continuity.

NOCONTINUITY → Replace fuse(s)

CONTINUITY ↓

2. Battery
- Check the battery condition.

Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

INCORRECT →
- Clean battery terminals.
- Recharge or replace battery.

CORREST ↓

*

3. Spark plug
- Check the spark plug condition.
- Check the spark plug type.
- Check the spark plug gap.

Refer to the "SPARK PLUG INSPECTION" section in the CHAPTER 3.

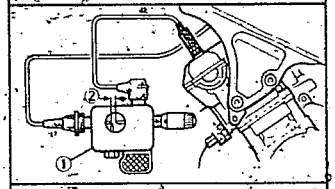
Standard spark plug:
CR8E (NGK), CR9E (NGK), U24ESR-N (N.D.), U27ESR-N (N.D.)

Spark plug gap:
0.7–0.8 mm (0.028–0.031 in)

INCORRECT → Repair or replace spark plug.

CORRECT ↓

4. Ignition spark gap
- Disconnect the spark plug cap from spark plug.
- Connect the ignition checker ① as shown.
  ② Spark gap
- Turn the main switch to "ON".



- Check the ignition spark gap.
- Start engine, and increase spark gap until misfire occurs.

Minimum spark gap:
6.0 mm (0.24 in)

MEETS SPECIFICATION → Ignition system is good

OUT OF SPECIFICATION OR NO SPARK ↓

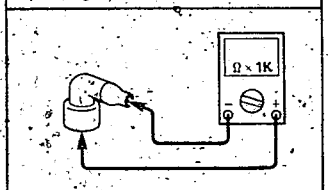
*

IGNITION SYSTEM ELEC

*

5 Spark plug cap resistance

- Remove the spark plug cap
- Connect the pocket tester (Ω × 1k) to the spark plug cap.



- Check the spark plug cap for specificated resistance.

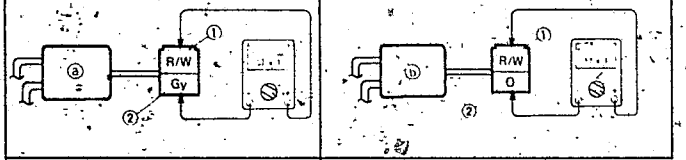
Spark plug cap resistance:
9–11 kΩ at 20°C (68°F)

MEETS SPECIFICATION

6. Ignition coil resistance

- Disconnect the ignition coil coupler from the wireharness.
- Connect the pocket tester (Ω × 1) to the ignition coil

Ignition coil (for #2 and #3) ⓐ	Ignition coil (for #1 and #4) ⓑ
Tester (+) lead→Red/White 1 terminal Tester (–) lead→Gray 2 terminal	Tester (+) lead→Red/White 1 terminal Tester (–) lead→Orange 2 terminal

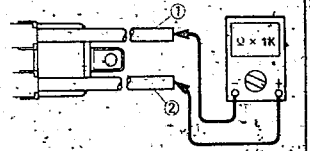


- Check the primary coil for specificated resistance.

Primary coil resistance:
1.8–2.2Ω at 20°C (68°F)

- Connect the pocket tester (Ω × 1k) to the ignition coil

Tester (+) lead→Spark plug lead 1
Tester (–) lead→Spark plug lead 2



- Check the secondary coil for specificated resistance.

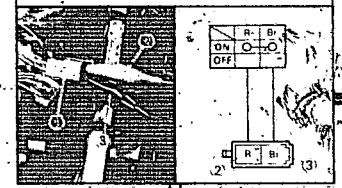
Secondary coil resistance:
9.6–14.4 kΩ at 20°C (68°F)
(Spark plug lead - Spark plug lead)

OUT OF SPECIFICATION → Replace ignition coil

BOTH MEET SPECIFICATIONS

7. Main switch

- Disconnect the main switch coupler 1 from the wireharness.
- Check the switch component for the continuity between "Red 2" and Brown 3". Refer to the "CHECKING OF SWITCHES" section

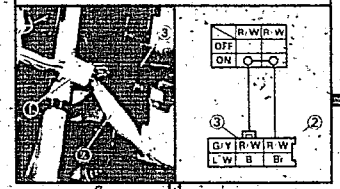


INCORRECT → Replace main switch.

CORRECT

*

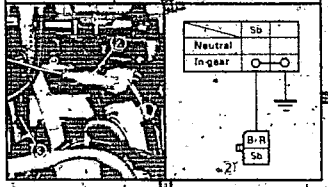
8. "ENGINE STOP" switch
- Disconnect the handlebar switch (right) coupler from ① the wireharness.
- Check the switch component for the continuity between "Red/White ② and Red/White ③". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT → Replace handlebar switch (right)

CORRECT ↓

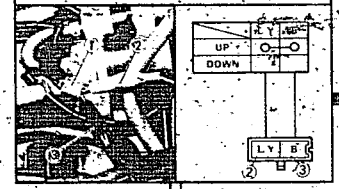
9. Neutral switch
- Disconnect the neutral switch coupler ① from the wireharness.
- Check the switch component for the continuity between "Sky blue ② and ground". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT → Replace neutral switch

CORRECT ↓

10. Sidestand switch
- Disconnect the sidestand switch coupler ① from the wireharness.
- Check the switch component for the continuity between "Blue/Yellow ② and Black ③". Refer to the "CHECKING OF SWITCHES" section.



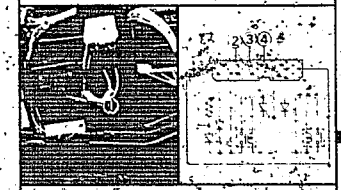
INCORRECT → Replace sidestand switch.

CORRECT ↓

11. Diode (relay unit)
- Disconnect the relay unit ① from the wireharness.
- Connect the pocket tester (Ω × 1) to the relay unit terminal.

Tester (+) lead → Blue/Yellow terminal ②
Tester (−) lead → Skyblue terminal ③

Tester (+) lead → Black/Yellow terminal ②
Tester (−) lead → Skyblue terminal ③



- Check the relay unit for continuity.

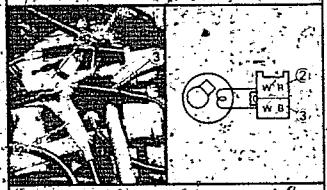
NOCONTINUITY → Replace relay unit

CONTINUITY ↓

12. Pickup coil resistance

- Disconnect the pickup coil 1P coupler from the wireharness.
- Connect the pocket tester (Ω × 100) to the pickup coil terminal.

Tester (+) lead – White/Red ② terminal
Tester (–) lead – White/Black ③ terminal



- Check the pickup coil for specificated resistance.

Pickup coil resistance
80–121.2Ω at 20°C (68°F)
White/Red – White/Black

OUT OF SPCIFICATION →

Replace pickup coil.

MEET SPECIFICATION ↓

POOR CONNECTION →

13. Wiring connection

Check the entire ignition system for connections.
Refer to the "WIRING DIAGRAM" section.

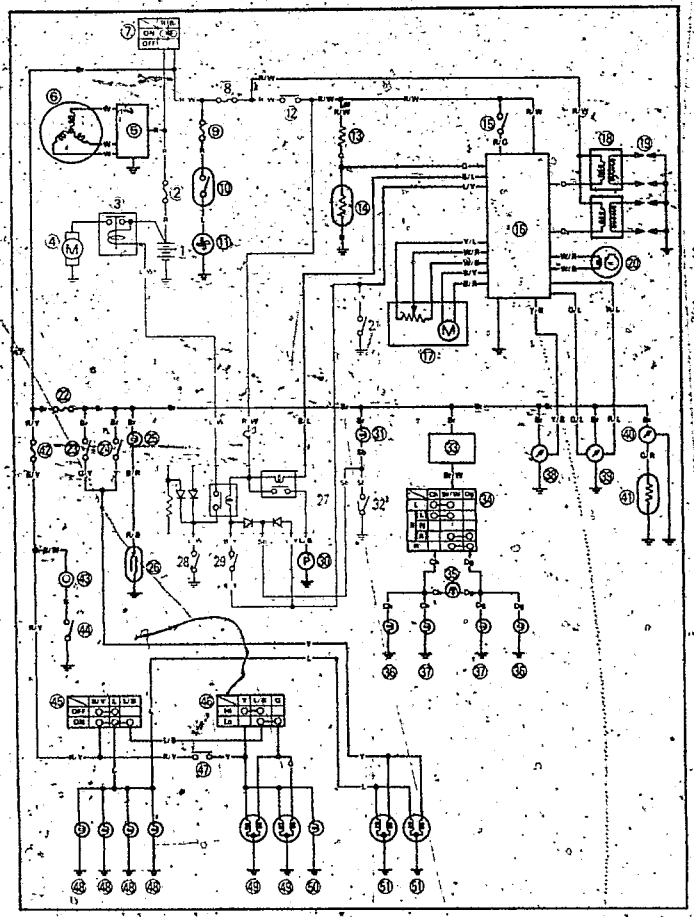
Correct.

CORRECT ↓

Replace digital igniter unit.

ELECTRICAL STARTING SYSTEM

CIRCUIT DIAGRAM

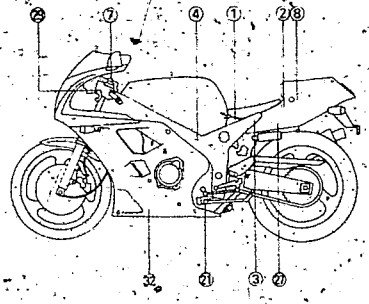


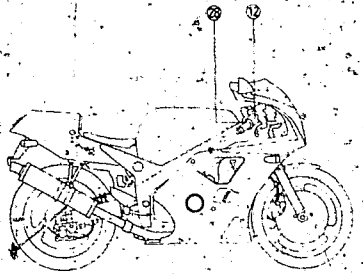
Aforementioned circuit diagram shows electrical starting circuit in circuit diagram.

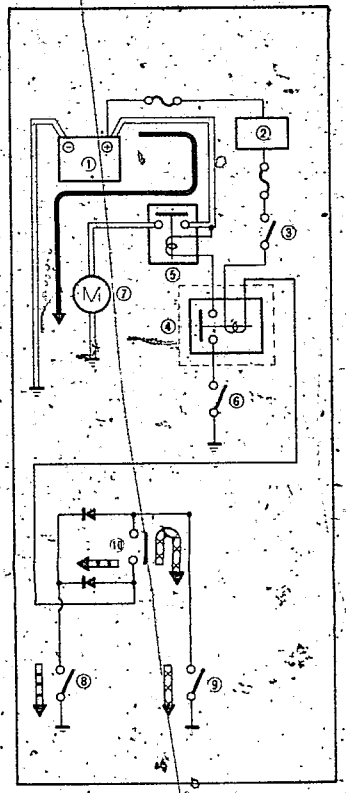
NOTE:

For the color codes, see page 8-2.

1. Battery
2. Fuse (main)
3. Starter relay
4. Starter motor
7. Main switch
8. Fuse (ignition)
12. "ENGINE STOP" switch
21. Sidestand switch
27. Relay
28. "START" switch
29. Clutch switch
32. Neutral switch







YB584001
STARTING CIRCUIT OPERATION

The starting circuit on this model consist of the starter motor, starter relay, and the relay unit (starting circuit cut-off relay). If the "ENGINE STOP" switch and the main switch are both closed, the starter motor can operate only if:

The transmission is in neutral (the neutral switch is closed).
or if
The clutch lever is pulled to the handle bar (the clutch switch is closed) and the sidestand is up (the sidestand switch is closed).

The starting circuit cut-off relay prevents the starter from operating when neither of these conditions has been met. In this instance, the starting circuit cut-off relay is open so current cannot reach the starter motor.

When one of both of the above conditions have been met, however, the starting circuit cut-off relay is closed, and the engine can be started by pressing the starter switch.

WHEN THE TRANSMISSION IS IN NEUTRAL
WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED IN

1. Battery
2. Main switch
3. "ENGINE STOP" switch
4. Starting circuit cut-off relay
5. Starter relay
6. "START" switch
7. Starter motor
8. Neutral switch
9. Sidestand switch
10. Clutch switch

TROUBLESHOOTING

STARTER MOTOR DOES NOT OPERATE.

Procedure
Check;
1. Fuse (main and ignition)
2. Battery
3. Starter motor
4. Starter relay
5. Starting circuit cut-off relay
6. Main switch
7. "ENGINE STOP" switch
8. Neutral switch
9. Sidestand switch
10. Clutch switch
11. "START" switch
12. Wiring connection (Entire electric starting system)

NOTE:
Remove the following parts before troubleshooting
1) Seat
2) Tail cover
3) Fuel tank
4) Air filter case

- Use the following special tool in this troubleshooting

Pocket tester:
90890-03112

1. Fuse (main and ignition)
- Remove the fuses.
- Connect the pocket tester (Ω × 1) to the fuses.
- Check the fuses for continuity.

NOCONTINUITY → Replace fuse(s)

CONTINUITY ↓

2. Battery
Check the battery condition.
Refer to the "BATTERY INSPECTION" section in the CHAPTER 3

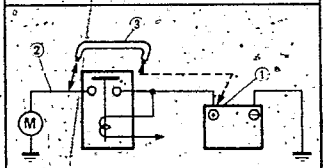
INCORRECT →
- Clean battery terminals.
- Recharge or replace battery.

CORRECT ↓

*

3. Starter motor

- Connect the battery positive terminal (1) and starter motor cable (2) using a jumper lead (3) *



- Check the starter motor for operation

⚠ WARNING

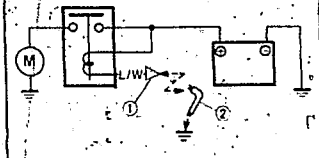
- A wire for the jumper lead must have the equivalent capacity as that of the battery lead or more, otherwise it may cause the jumper lead to be burned.
- This check is likely to produce sparks, so be sure that no flammable gas or fluid is in the vicinity.

DOES NOT MOVE → Repair or replace starter motor.

MOVES ↓

4. Starter relay

- Disconnect the starter relay lead from the wireharness.
- Ground the starter relay lead (Blue/White) (1) to the frame using the jumper lead (2).



- Check the starter motor for operation

DOES NOT MOVE → Replace starter relay.

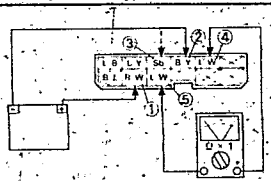
MOVES ↓

5. Starting circuit cut-off relay (relay unit)

- Disconnect the relay unit coupler from the wireharness.
- Connect the pocket tester (Ω × 1) and battery (12V) to the relay unit coupler terminals.

Step 1.
Battery (+) terminal←Red/White (1) terminal.
Battery (−) terminal←Black/Yellow (2) terminal.
Step 2.
Battery (+) terminal←Red/White (1) terminal.
Battery (−) terminal←Skyblue (3) terminal.

Tester (+) lead←Blue/White (4) terminal
Tester (−) lead←Blue/White (5) terminal



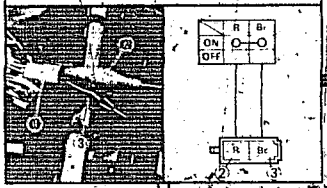
- Check the starting circuit cut-off relay for continuity.

NOCONTINUITY → Replace relay assembly

CONTINUITY ↓

6. Main switch

- Disconnect the main switch coupler (1) from the wireharness.
- Check the switch component for the continuity between "Red (2) and Brown (3)". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT → Replace main switch

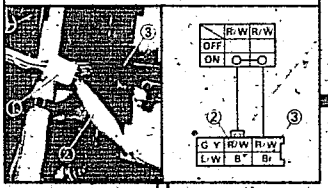
CORRECT ↓

*

*

7. "ENGINE STOP" switch

- Disconnect the handlebar switch (right) coupler ① from the wireharness.
- Check the switch component for the continuity between "Red/White ② and Red/White ③". Refer to the "CHECKING OF SWITCHES" section.

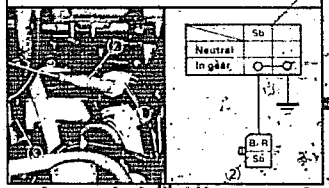


INCORRECT → Replace handlebar switch (right)

CORRECT

8. Neutral switch

- Disconnect the neutral switch lead ① from the wireharness.
- Check the switch component for the continuity between "Sky blue ② and Ground". Refer to the "CHECKING OF SWITCHES" section.

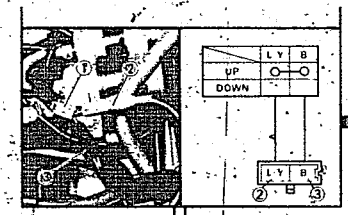


INCORRECT → Replace neutral switch

CORRECT

9. Sidestand switch

- Disconnect the sidestand switch coupler ① from the wireharness.
- Check the switch component for the continuity between "Blue/Yellow ② and Black ③". Refer to the "CHECKING OF SWITCHES" section.

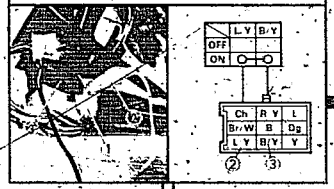


INCORRECT → Replace sidestand switch

CORRECT

10. Clutch switch

- Disconnect the handlebar switch (left) coupler ① from the wireharness.
- Check the clutch switch component for the continuity between "Blue/Yellow ② and Black/Yellow ③". Refer to the "CHECKING OF SWITCHES" section.

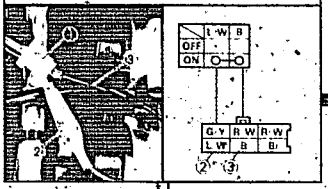


INCORRECT → Replace clutch switch

CORRECT

11. "START" switch

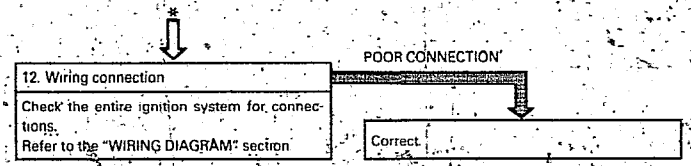
- Disconnect handlebar switch (right) coupler ① from wireharness
- Check the "START" switch component for the continuity between "Blue/White ② and Black ③". Refer to the "CHECKING OF SWITCHES" section.

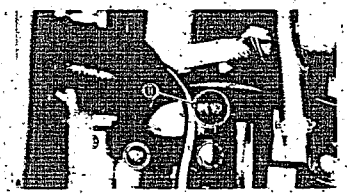


INCORRECT → Replace handlebar switch (right)

CORRECT

*



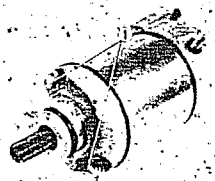


Y6564002

Removal

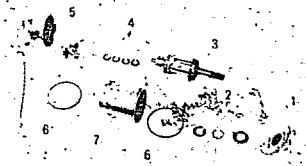
1. Remove:
   - Starter motor

   Refer to the "ENGINE OVERHAUL – ENGINE DISASSEMBLY" section in the CHAPTER 4.

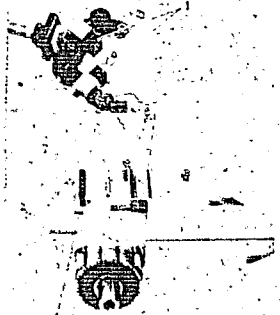


Disassembly

1. Remove:
   - Bolts 1



2. Remove:
   - Bracket 1
   - Washers 2
   - Armature 3
   - Shims 4
   - Bracket 5
   - O-rings 6
   - Yoke 7



3. Remove:
   - Brush 1

Inspection and repair

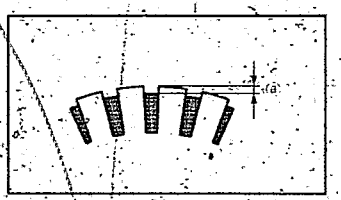
1. Inspect:
   - Commutator

   Dirty → Clean it with #600 grit sandpaper.

2. Measure:
   - Commutator diameter (a)

   Out of specification → Replace starter motor.

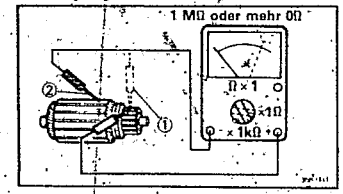
Commutator wear limit:
27 mm (1.06 in)



3. Measure:
- Mica undercut ⓐ
  Out of specification → Scrape the mica to proper value use a hacksaw blade can be ground to fit.

Mica undercut:
0.7 mm (0.028 in)

NOTE:
The mica insulation of the commutator must be undercut to ensure proper operation of commutator.

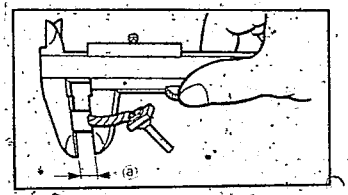


4. Inspect:
- Armature coil (insulation/continuity)
  Defects → Replace starter motor.

Inspecting steps:
- Connect the pocket tester for continuity check ① and insulation check ②.
- Measure the armature resistances.

Armature coil resistance:
Continuity check ①:
0 Ω at 20°C (68°F)
Insulation check ②:
More than 1MΩ at 20°C (68°F)

- If the resistance is incorrect, replace the starter motor.



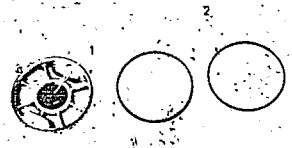
5. Measure:
- Brush length ⓐ
  Out of specification → Replace.

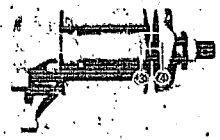
Brush length limit:
4.0 mm (0.16 in)

6. Measure:
- Brush spring force
  Fatigue/Out of specification → Replace as a set.

Brush spring force:
570 g (20.1 oz)

7. Inspect:
- Bearing 1
- Oil seal 2





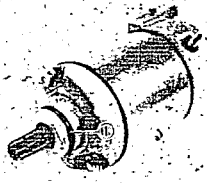
Assembly
Reserve the "Removal" procedure. Note the following points.

1. Install:
- Brush set

NOTE:
Align the projection ① on the brush seat with the slot ② on the housing.

2. Install:
- Yoke ①
- Brackets ②

NOTE:
Align the match marks ① on the yoke with the match marks on the brackets ②.



Installation

1. Install:
   - Starter motor

NOTE:

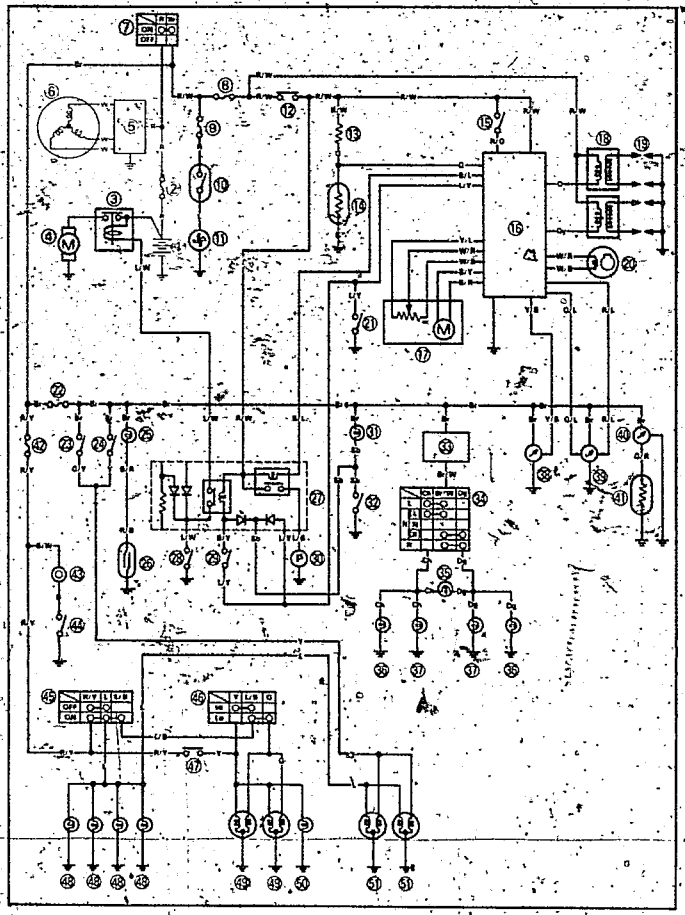
Apply a lightly grease to the O-ring ①.

	Bolt (starter motor): 10 Nm (1.0 m · kg, 7.2 ft · lb)

Refer to the "ENGINE OVERHAUL - ENGINE ASSEMBLY" section in the CHAPTER 4.

CHARGING SYSTEM

CIRCUIT DIAGRAM

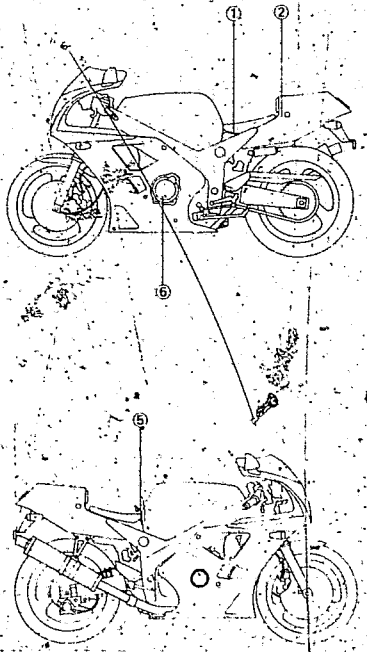


Aforementioned circuit diagram show the charging circuit in the circuit diagram.

NOTE:

For the color codes, see page 8-2.

① Battery
② Fuse (main)
⑤ Rectifier/Regulator
⑥ AC magneto



TROUBLESHOOTING

THE BATTERY IS NOT CHARGED.

Procedure

Check:

1. Fuse (main)
2. Battery
3. Charging voltage
4. Stator coil resistance
5. Wiring connection (Entire charging system)

NOTE:

- Remove the following parts before troubleshooting
  1) Seat
  2) Tail cover
  3) Fuel tank
- Use the following special tool(s) in this troubleshooting.

Inductive tachometer: 90890-03113	Pocket tester: 90890-03112

1. Fuse (main)

- Remove the fuse.
- Connect the pocket tester (Ω × 1) to the fuse.
- Check the fuse for continuity.

NO CONTINUITY → Replace fuse (main).

CONTINUITY ↓

2. Battery

- Check the battery condition.

Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

INCORRECT → • Clean battery terminals. • Recharge or replace battery.

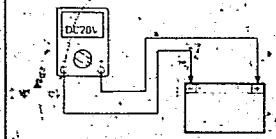
CORRECT ↓

*

3 Charging voltage

- Connect the inductive tachometer to spark plug lead.
- Connect the pocket tester (DC20V) to the battery.

Tester (+) lead→Battery (+) terminal
Tester (−) lead→Battery (−) terminal



- Start the engine and accelerate to about 3,000 r/min.
- Check charging voltage.

Charging voltage: 14.3–15.3V at 3,000 r/min

MEETS SPECIFICATION → Charging circuit is good.

NOTE:

Use a full charged battery.

OUT OF SPECIFICATION ↓

4 Stator coil resistance

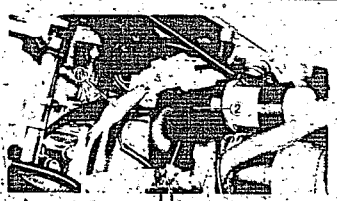
- Remove the generator cover.
- Connect the pocket tester "Ω × 1" to the stator coils.
- Measure the stator coil resistances.

Tester (+) lead→White lead 1
Tester (−) lead→White lead 2

Tester (+) lead→White lead 1
Tester (−) lead→White lead 3

Stator coil resistance: 0.31–0.41 at 20°C (68°F)

OUT OF SPECIFICATION → Replace stator assembly.



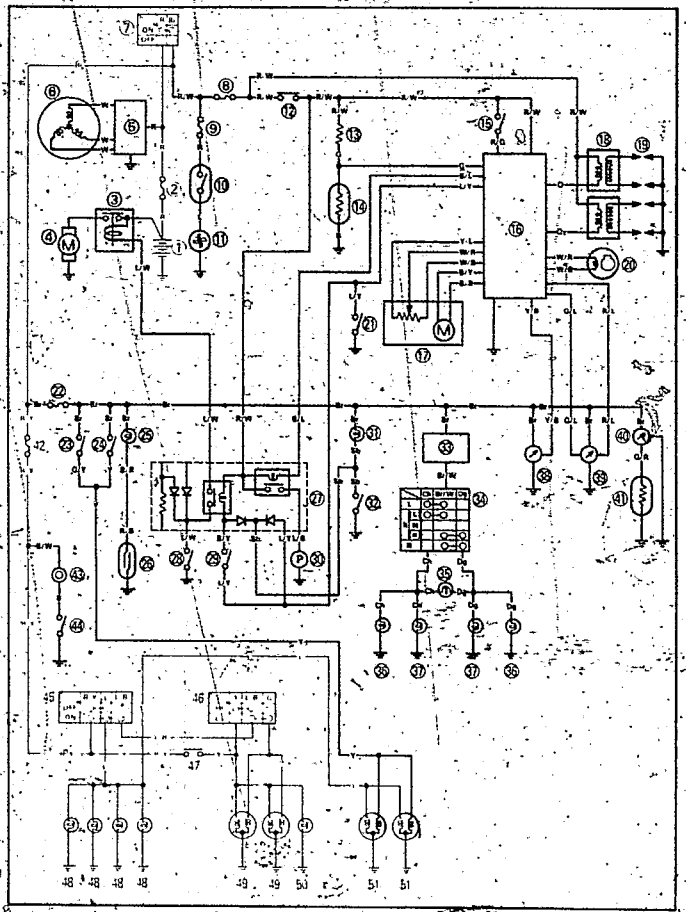
5. Wiring connection
- Check the entire ignition system for connection.
- Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION → Correct

OK ↓

Replace rectifier/regulator.

LIGHTING SYSTEM
CIRCUIT DIAGRAM

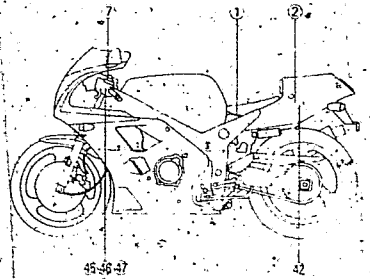


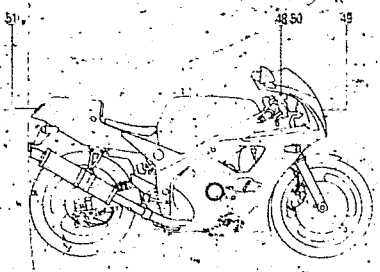
Aforementioned circuit is lighting circuit in circuit diagram

NOTE:

For color codes, see page 8-2

1. Battery
2. Fuse (main)
7. Main switch
42. Fuse (headlight)
45. "LIGHTS" switch
46. "LIGHTS" (Dimmer) switch
47. "PASS" switch
48. Meter light
49. Headlight
50. "HIGH BEAM" indicator light
51. Tail/brake light





TROUBLESHOOTING

HEADLIGHT "HIGH BEAM" INDICATOR LIGHT, TAILLIGHT, AUXILIARY LIGHT AND/OR METER LIGHT DO NOT COME ON.

Procedure

Check:

1. Fuse (main and head)
2. Battery
3. Main switch
4. "LIGHTS" switch
5. "LIGHTS" (Dimmer) switch
6. "PASS" switch
7. Wiring connection (Entire lighting system)

NOTE:

- Remove the following parts before troubleshooting
  1) Seat
  2) Tail cover
  3) Fuel tank
  4) Air filter case
- Use the following special tool(s) in this troubleshooting

Pocket tester:
90890-03112

1. Fuse (main and head)
- Remove the fuses.
- Connect the pocket tester (Ω × 1) to the fuses.
- Check the fuses for continuity.
  Refer to the "FUSE INSPECTION" in the CHAPTER 3.

NO CONTINUITY → Replace fuse(s)

CONTINUITY

2. Battery
- Check the battery condition.
  Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

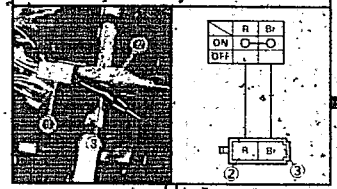
INCORRECT → •Clean battery terminals.
•Recharge or replace battery

CORRECT

*

*

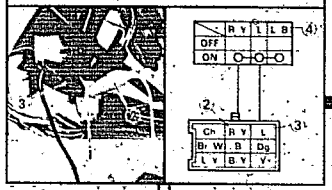
3. Main switch
- Disconnect the main switch coupler (1) from the wireharness.
- Check the switch component for the continuity between "Red (2)" and "Brown (3)". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT → Replace main switch

CORRECT

4. "LIGHTS" switch
- Disconnect the handlebar switch (left) couple (1) from the wireharness.
- Check the switch component for the continuity between "Red/Yellow (2)" and "Blue (3)" and "Red/Yellow (2)" and "Blue/Black (4)". Refer to the "CHECKING OF SWITCHES" section.



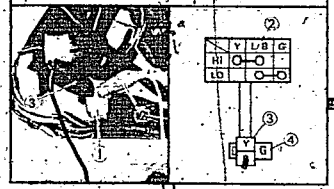
INCORRECT → Replace handlebar switch (left).

*

*

5. "LIGHTS" (dimmer) switch

- Disconnect the handlebar switch (left) coupler ① from the wireharness.
- Check the switch component for the continuity between "Blue/Black ② and Yellow ③" and "Blue/Black ② and Green ④". Refer to the "CHECKING OF SWITCHES" section.

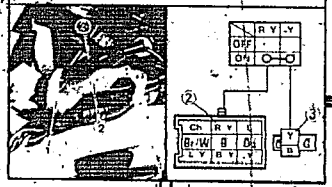


INCORRECT

Replace handlebar switch (left)

6. "PASS" switch

- Disconnect the handlebar switch (left) couplers ① from the wireharness.
- Check the switch component for the continuity between "Red/Yellow ② and Yellow ③" Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

Replace handlebar switch (left)

CORRECT

*

*

7. Wiring connection

- Check the entire lighting system for connections.
  Refer to the "WIRING DIAGRAM" section

POOR CONNECTION

Correct

CORRECT

Check condition of each circuit for lighting system.
Refer to "LIGHTING SYSTEM CHECK" section.

LIGHTING SYSTEM CHECK

1. Headlight and "HIGH BEAM" indicator light do not come on.

1. Bulb and bulb socket

- Check the bulb and bulb socket for continuity.
  Refer to the "CHECKING OF BULBS" section.

NOCONTINUITY → Replace bulb and/or bulb socket.

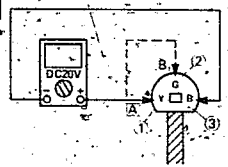
CONTINUITY ↓

2. Voltage

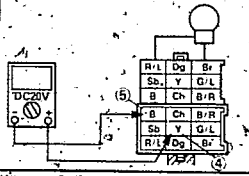
- Connect the pocket tester (DC 20V) to the headlight and "HIGH BEAM" indicator light couplers.

Head light:
Tester (+) lead→Yellow ① or Green ② lead.
Tester (−) lead→Black ③ lead
"HIGH BEAM" indicator light:
Tester (+) lead→Yellow ④ lead
Tester (−) lead→Black ⑤ lead

A



B



A When "LIGHT" (dimmer) switch is "LO" position.
B When "LIGHTS" (dimmer) switch is "HI" position.

OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socket connector is faulty, repair.

- Turn the main switch to "ON".
- Turn the "LIGHTS" switch to "ON".
- Turn the "LIGHTS" (dimmer) switch to "LO" or "HI" position.
  (•Push in the "PASS" switch.)
- Check for voltage (12V) on the "Green" and "Yellow" lead at bulb socket connectors.

MEETS SPECIFICATION (12V) ↓

This circuit is good.

2. Meter light does not come on.

1. Bulb and bulb socket

- Check the bulb and bulb socket for continuity.
  Refer to the "CHECKING OF BULBS" section.

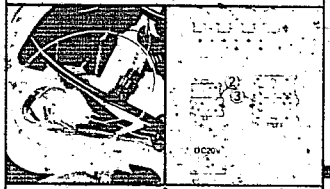
NOCONTINUITY → Replace bulb and/or bulb socket.

CONTINUITY ↓

2. Voltage

- Connect the pocket tester (DC20V) to the bulb socket coupler ①.

Tester (+) lead→Blue ② terminal
Tester (−) lead→Black ③ terminal



- Turn the main switch to "ON".
- Turn the "LIGHTS" switch to "PO" or "ON".
- Check for voltage (12V) on the "Blue" lead at the bulb socket connector.

OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socket connector is faulty, repair.

MEETS SPECIFICATION (12V) ↓

This circuit is good.

LIGHTING SYSTEM ELEC

3. Tailight does not come on

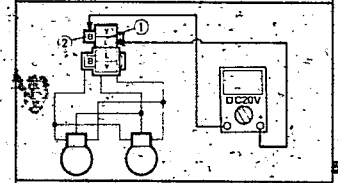
1. Bulb and bulb socket
- Check the bulb and bulb socket for continuity
Refer to the "CHECKING OF BULBS" section.

NO CONTINUITY → Replace bulb and/or bulb socket

CONTINUITY

2. Voltage
- Connect the pocket tester (DC20V) to the bulb socket connector

Tester (+) lead—Blue (1) terminal
Tester (−) lead—Black (2) terminal



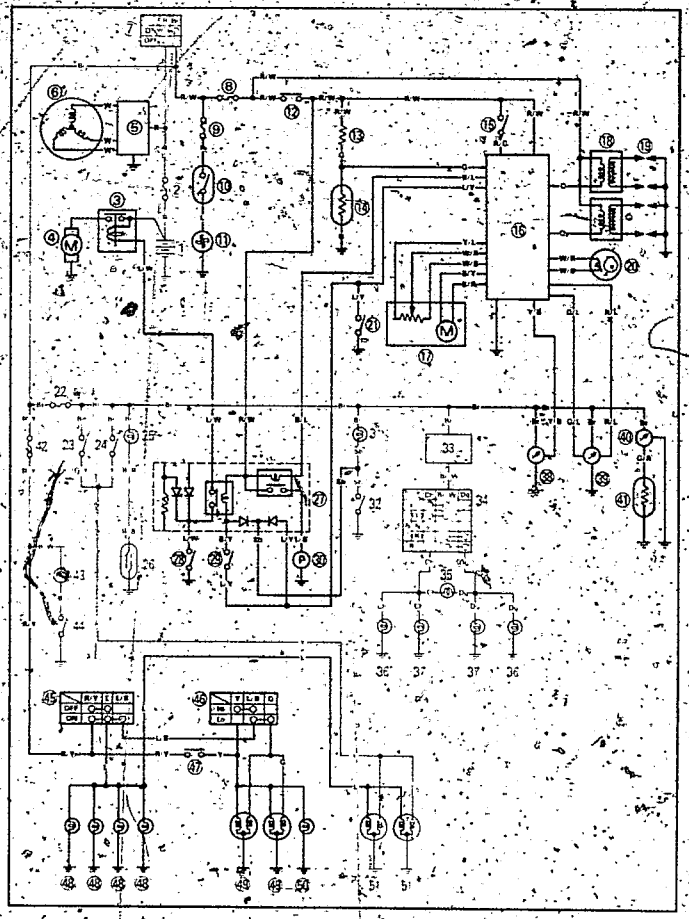
OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socket connector is faulty, repair

- Turn the main switch to "ON".
- Turn the "LIGHTS" switch to "ON".
- Check for voltage (12V) on the "Blue" lead at the bulb socket connector

MEETS SPECIFICATION (12V)

This circuit is good.

SIGNAL SYSTEM
CIRCUIT DIAGRAM



Aforementioned circuit diagram shows the signal circuit in the circuit diagram.

NOTE:

For the color codes, see page 8-2

1. Battery
2. Fuse (main)
7. Main switch
22. Fuse (signal)
23. Front brake switch
24. Rear brake switch
25. "OIL" warning indicator light
26. Oil pressure switch
31. "NEUTRAL" indicator light
32. Neutral switch
33. Flasher relay
34. "TURN" signal switch
35. "TURN" indicator light
36. Front flasher light
37. Rear flasher light
43. Horn
44. "HORN" switch
51. Tail/Brake light

TROUBLESHOOTING

- FLASHER LIGHT, BRAKE LIGHT AND/OR INDICATOR LIGHT DO NOT COME ON.
- HORN DOES NOT SOUND.
- TACHOMETER DOES NOT OPERATE.

Procedure

Check:
1. Fuse (main and signal)
2. Battery
3. Main switch
4. Wiring connection (Entire signal system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Tail cover
  3) Fuel tank
  4) Air filter case
- Use the following special tool in this troubleshooting.

Pocket tester: 90890-03112

1. Fuse (main head and signal)
- Remove the fuses.
- Connect the pocket tester (Ω × 1) to the fuses.
- Check the fuses for continuity. Refer to the "FUSE INSPECTION" in the CHAPTER 3.

NOCONTINUITY → Replace fuse(s)

CONTINUITY ↓

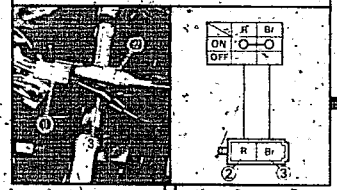
2 Battery
- Check the battery condition. Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

INCORRECT →
- Clean battery terminals.
- Recharge or replace battery.

CORRECT ↓ *

*

3. Main switch
- Disconnect the main switch coupler 1 from the wireharness.
- Check the switch component for the continuity between "Red 2 and Brown 3". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT → Replace main switch

CORRECT ↓

4 Wiring connection

Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION → Correct

CORRECT ↓

Check condition of each circuit for signal system. Refer to "SIGNAL SYSTEM CHECK" section.

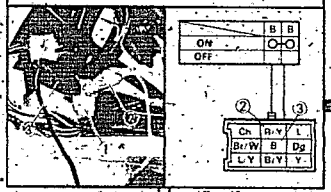
SIGNAL SYSTEM CHECK

1. Horn does not sound

1. "HORN" switch

- Disconnect the handlebar switch (left) coupler ① from the wireharness.
- Check the switch component for the continuity between "Red/Yellow ②" and "Black ③".

Refer to the "CHECKING OF SWITCHES" section.



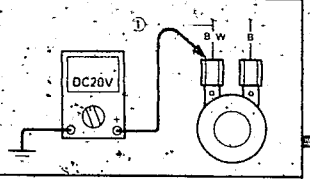
INCORRECT → Replace handlebar switch (left)

CORRECT

2. Voltage

- Connect the pocket tester (DC20V) to the horn lead.

Tester (+) lead→Black/White ① lead
Tester (−) lead→Frame ground



OUT OF SPECIFICATION → Wiring circuit from main switch to horn terminal is faulty, repair

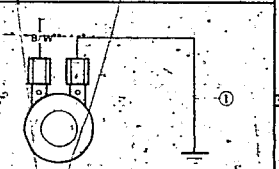
- Turn the main switch to "ON".
- Check for voltage (12V) on the "Black/White" lead at the horn terminal.

MEETS SPECIFICATION (12V)

*

3. Horn

- Disconnect the "Black" lead at the horn terminal.
- Connect a jumper lead ① to the horn terminal and ground the jumper lead.
- Turn the main switch to "ON".



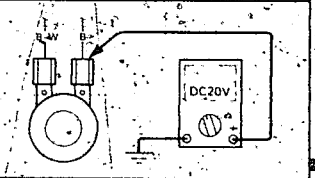
HORN IS SOUNDED → Horn is good

HORN IS NOT SOUNDED

4. Voltage

- Connect the pocket tester (DC20V) to the horn at the "Black" terminal.

Tester (+) lead→Black ① lead
Tester (−) lead→Frame ground



OUT OF SPECIFICATION → Replace horn

- Turn the main switch to "ON".
- Check for voltage (12V) on the "Black" lead at the horn terminal.

MEETS SPECIFICATION (12V) → Adjust or replace horn

2. Brake light does not come on.

1. Bulb and bulb socket

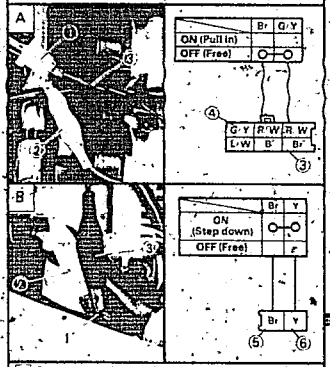
- Check the bulb and bulb socket for continuity.
  Refer to the "CHECKING OF BULBS" section.

NOCONTINUITY → Replace bulb and/or bulb socket.

CONTINUITY ↓

2. Brake switch

- Disconnect the handlebar switch (left) coupler ① and brake switch coupler ② from the wireharness.
- Check the switch component for the continuity between "Brown ③ and Green/Yellow ④", or "Brown ⑤ and Yellow ⑥".
  Refer to the "CHECKING OF SWITCHES" section.



A Front brake switch
B Rear brake switch

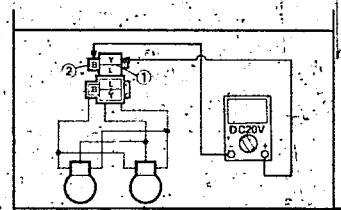
INCORRECT → Replace brake switch

CORRECT ↓

3 Voltage

- Connect the pocket tester (DC20V) to the bulb socket connector.

Tester (+) lead→Yellow (1) lead
Tester (−) lead→Black (2) lead



- Turn the main switch to "ON".
- The brake level is pulled in or brake pedal is stepped down.
- Check for voltage (12V) on the "Yellow" lead at the bulb socket connector.

OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socket connector is faulty, repair.

MEETS SPECIFICATION (12V) ↓

This circuit is good

3. Flasher light and/or "TURN" indicator light do not blink.

1. Bulb and bulb socket

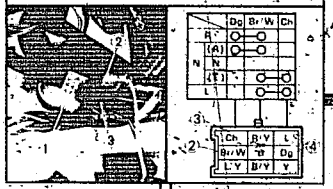
- Check the bulb and bulb socket for continuity.
  Refer to the "CHECKING OF BULBS" section.

NOCONTINUITY → Replace bulb and/or bulb socket

CONTINUITY ↓

2 "TURN" switch

- Disconnect the handlebar switch (left) coupler ① from the wireharness.
- Check the switch component for the continuity between "Brown/White ①" and "Chocolate ③" and "Brown/White ② and Dark green ④". Refer to the "CHECKING OF SWITCHES" section.



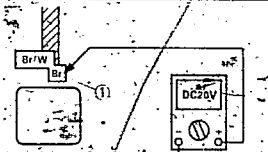
INCORRECT → Replace handlebar switch (left)

CORRECT ↓

3. Voltage

- Connect the pocket tester (DC20V) to the flasher relay.

Tester (+) lead→Brown ① terminal
Tester (−) lead→Ground



- Turn the main switch to "ON".
- Check for voltage (12V) on the "Brown" lead at the flasher relay terminal.

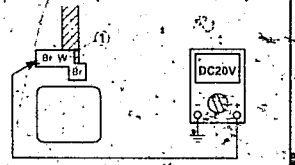
OUT OF SPECIFICATION → Wiring circuit from main switch to flasher relay connector is faulty, repair.

MEETS SPECIFICATION (12V)

4. Voltage

- Connect the pocket tester (DC20V) to the flasher relay.

Tester (+) lead→Brown/White ① terminal
Tester (−) lead→Ground



- Turn the main switch to "ON".
- Check for voltage (12V) on the "Brown/White" lead at the flasher relay terminal.

OUT OF SPECIFICATION → Replace flasher relay

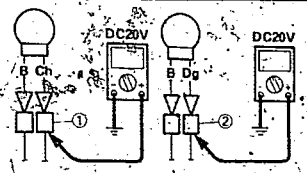
MEETS SPECIFICATION (12V) *

5. Voltage

- Connect the pocket tester (DC20V) to the bulb socket connector.

At flasher light (left).
Tester (+) lead→Chocolate ① lead
Tester (−) lead→Frame ground

At flasher light (right).
Tester (+) lead→Dark green ② lead
Tester (−) lead→Frame ground



- Turn the main switch to "ON".
- Turn the "TURN" switch to "L" or "R".
- Check for voltage (12V) on the "Chocolate" lead or "Dark green" lead at the bulb socket connector.

OUT OF SPECIFICATION → Wiring circuit from "TURN" switch to bulb socket connector is faulty, repair.

MEETS SPECIFICATION (12V)

This circuit is good.

4. "NEUTRAL" indicator light does not come on.

1. Bulb and bulb socket

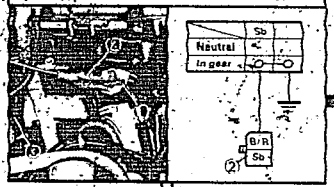
- Check the bulb and bulb socket for continuity.
  Refer to the "CHECKING OF BULBS" section

NOCONTINUITY → Replace bulb and/or bulb socket.

CONTINUITY ↓

2. Neutral switch

- Disconnect the neutral switch coupler ① from the wireharness.
- *Check the switch component for the continuity between "Sky blue ② and Ground"*
  Refer to the "CHECKING OF SWITCHES" section.



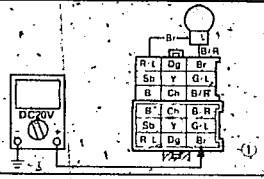
INCORRECT → Replace neutral switch.

CORRECT ↓

3. Voltage

- Connect the pocket tester (DC20V) to the bulb socket connector.

Tester (+) lead→Brown ① terminal
Tester (−) lead→Frame ground



- Turn the main switch to "ON".
- Check for voltage (12V) on the "Brown" lead at bulb socket connector.

OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socket connector is faulty, repair.

MEETS SPECIFICATION (12V) ↓

This circuit is good.

5. "OIL PRESSURE" indicator light does not come on, when engine oil level is low.

1. Bulb and bulb socket

- Check the bulb and bulb socket for continuity.
  Refer to the "CHECKING OF BULBS" section

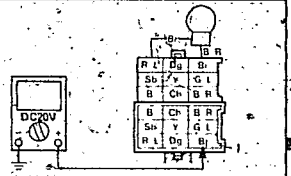
NOCONTINUITY → Replace bulb and/or bulb socket.

CONTINUITY ↓

2. Voltage

- Connect the pocket tester (DC20V) to the bulb socket connector.

Tester (+) lead→Brown ① lead
Tester (−) lead→Frame ground



OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socketed connector is faulty, repair.

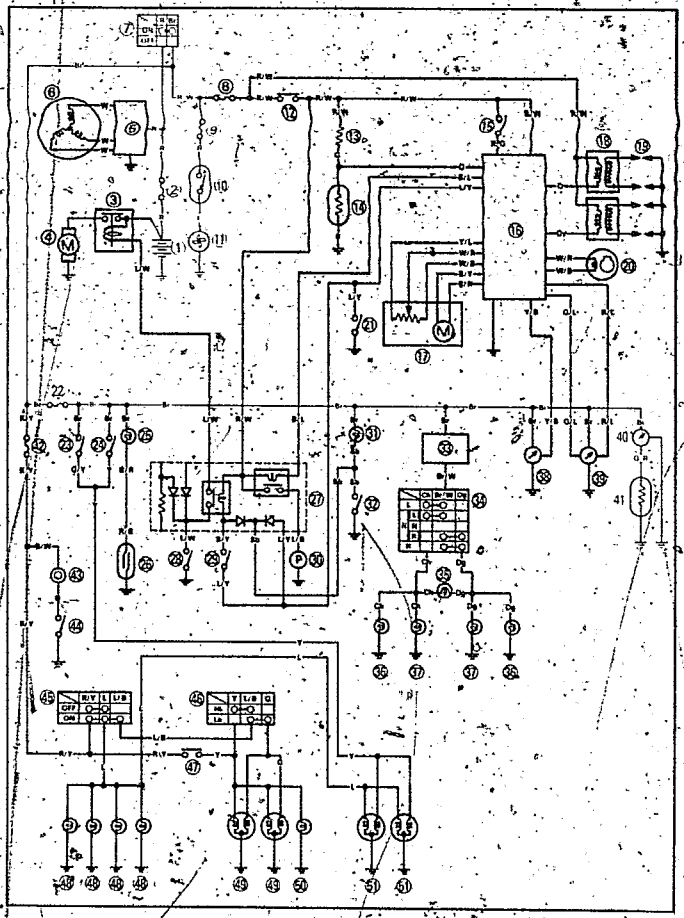
- Turn the main switch to "ON".
- Check for voltage (12V) on the "Brown" lead at bulb socket connector.

MEETS SPECIFICATION (12V) ↓

Replace oil pressure switch.

COOLING SYSTEM

CIRCUIT DIAGRAM

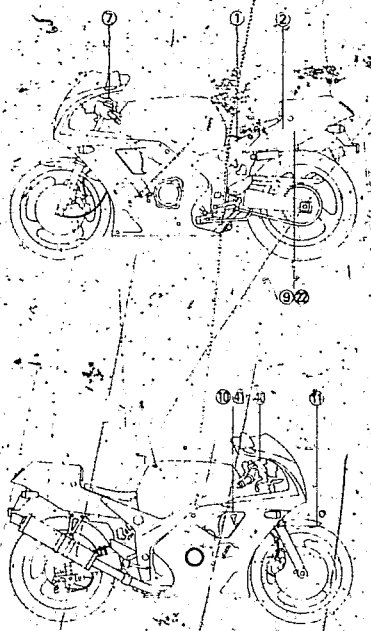


Aforementioned circuit diagram shows the cooling circuit in the circuit diagram

NOTE:

For the color codes see page 8-2.

1. Battery
2. Fuse (main)
7. Main switch
9. Fuse (fan)
10. Thermo switch
11. Fan motor
22. Fuse (signal)
40. *Engine temperature gauge*
41. Thermo unit



TROUBLESHOOTING

FAN MOTOR DOES NOT TURN.

Procedure

Check:

1. Fuse (main, signal and fan)
2. Battery
3. Main switch
4. Fan motor (Test 1)
5. Fan motor (Test 2)
6. Thermo switch
7. Wiring connection (Entire cooling system)

NOTE:

- Remove the following parts before troubleshooting
  1) Seat
  2) Tail cover
  3) Fuel tank
  4) Air filter case
- Use the following special tool in this troubleshooting

Pocket tester: 90890-03112

1. Fuse (main and fan)

- Remove the fuses.
- Connect the pocket tester (Ω × 1) to the fuses.
- Check the fuses for continuity.
  Refer to the "FUSE INSPECTION" in the CHAPTER 3.

NO CONTINUITY → Replace fuse(s)

CONTINUITY ↓

2. Battery

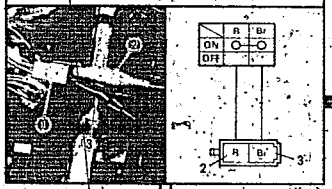
- Check the battery condition.
  Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

INCORRECT →
- Clean battery terminals.
- Recharge or replace battery

CORRECT ↓ *

3. Main switch

- Disconnect the main switch coupler ① from the wireharness.
- Check the switch component for the continuity between "Red 2" and Brown 3".
  Refer to the "CHECKING OF SWITCHES" section.



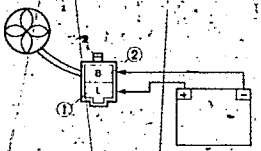
INCORRECT → Replace main switch

CORRECT ↓

4. Fan motor (test 1)

- Disconnect the fan motor coupler.
- Connect the battery (12V) as shown.

Battery (+) lead → Blue 1 terminal
Battery (−) lead → Black 2 terminal



- Check the fan motor for operation.

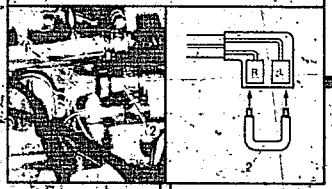
DOES NOT MOVES → Replace fan motor

MOVES ↓ *

COOLING SYSTEM ELEC

5. Fan motor (test 2)

- Disconnect the thermo switch leads ("Red" and "Blue") (1)
- Turn the main switch to "ON"
- Connect the leads with the jumper lead (2) as shown.



DOES NOT MOVE

Wiring circuit from main switch to fan motor leads is faulty, repair.

MOVES

6. Thermo switch

- Remove the thermo switch from the thermostat housing
- Connect the pocket tester (Ω × 1) to the thermo switch (1)
- Immerse the thermo switch in the water (2)
- Check the thermo switch for continuity. Note temperatures while heating the water with the temperature gauge (3)

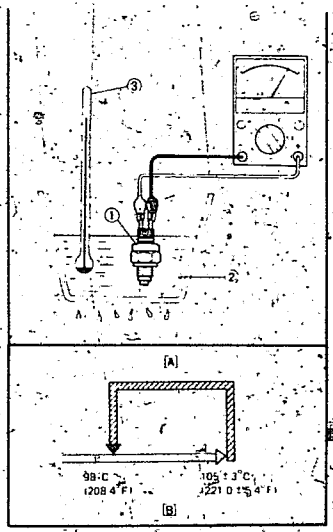
Test step	Water temperature	Good condition
1	0 - 98°C (32 - 208.4°F)	×
2	More than 105 ± 3°C (221.0 ± 5.4°F)	○
3	105 to 98°C (221.0 to 208.4°F)	○
4	Less than 98°C (208.4 F)	×

Test 1 & 2: Heat-up tests
Test 3* & 4*: Cool-down tests
○: Continuity ×: No continuity

⚠ WARNING

Handle the thermo switch with special care. Never subject it to strong shock or allow it to be dropped. Should it be dropped, it must be replaced.

Thermo switch:
8 Nm (0.8 m • kg, 5.8 ft • lb)
Three bond sealock® #10



[A] THERMO SWITCH "ON", FAN "ON"
[B] COOLANT TEMPERATURE

BAD CONDITION

Replace thermo switch

WHEN ENGINE IS HOT, TEMPERATURE GAUGE DOES NOT MOVE

Procedure

Check:

1. Fuse (main and signal)
2. Battery
3. Main switch
4. Thermo unit
5. Voltage
6. Wiring connection (Entire cooling system)

NOTE:

- Remove the following parts before troubleshooting
  1) Seat
  2) Tail cover
  3) Fuel tank
  4) Air filter case
- Use the following special tool(s) in this troubleshooting

Pocket tester: 90890-03112

1 Fuse (main and signal)

- Remove the fuses.
- Connect the pocket tester (Ω × 1) to the fuses.
- Check the fuses for continuity. Refer to "FUSE INSPECTION" in the CHAPTER 3

NOCONTINUITY → Replace fuse(s)

CONTINUITY ↓

2 Battery

- Check the battery condition. Refer to the "BATTERY INSPECTION" section in the CHAPTER 3

INCORRECT →
- Clean battery terminals
- Recharge or replace battery

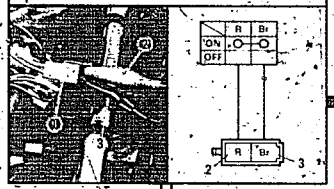
CORRECT ↓

*

*

3 Main switch

- Disconnect the main switch coupler 1 from the wireharness.
- Check the switch component for the continuity between "Red 2" and "Brown 3". Refer to the "CHECKING OF SWITCHES" section



INCORRECT → Replace main switch

CORRECT ↓

4 Thermo unit

- Drain the coolant and remove the thermo unit.

⚠ WARNING

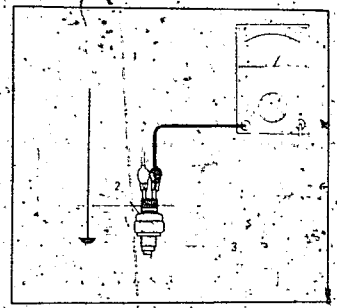
Handle the thermo unit with special care. Never subject it to strong or allow it to be dropped. Should it be dropped, it must be replaced.

- Immerse the thermo unit 2 in coolant 3.
- Measure the resistance at each temperature as tabulated.

1 Thermometer

Coolant temperature	Resistance
50°C (122°F)	154Ω
80°C (176°F)	47 – 57Ω
100°C (212°F)	26 – 29Ω
120°C (248°F)	16Ω

- After measuring the thermo unit, install the unit.



COOLING SYSTEM ELEC

Thermo unit.
14 Nm (1.4 m•kg, 10 ft•lb)

CAUTION:
Avoid overtightening.

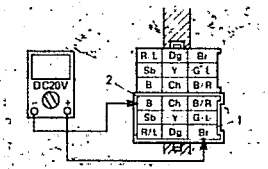
OUT OF SPECIFICATION → Replace thermo unit.

MEET SPECIFICATIONS

5. Voltage

• Connect the pocket tester (DC20V) to the temperature gauge leads

Tester (+) lead--Brown (L) terminal
Tester (−) lead--Black (2) terminal



OUT OF SPECIFICATION → Wiring circuit from main switch to temperature gauge connector; repair

• Turn the main switch to "ON"
• Check for voltage (12V) on the "Brown" lead at the temperature gauge connector

MEETS SPECIFICATION (12V)

POOR CONNECTION → Correct.

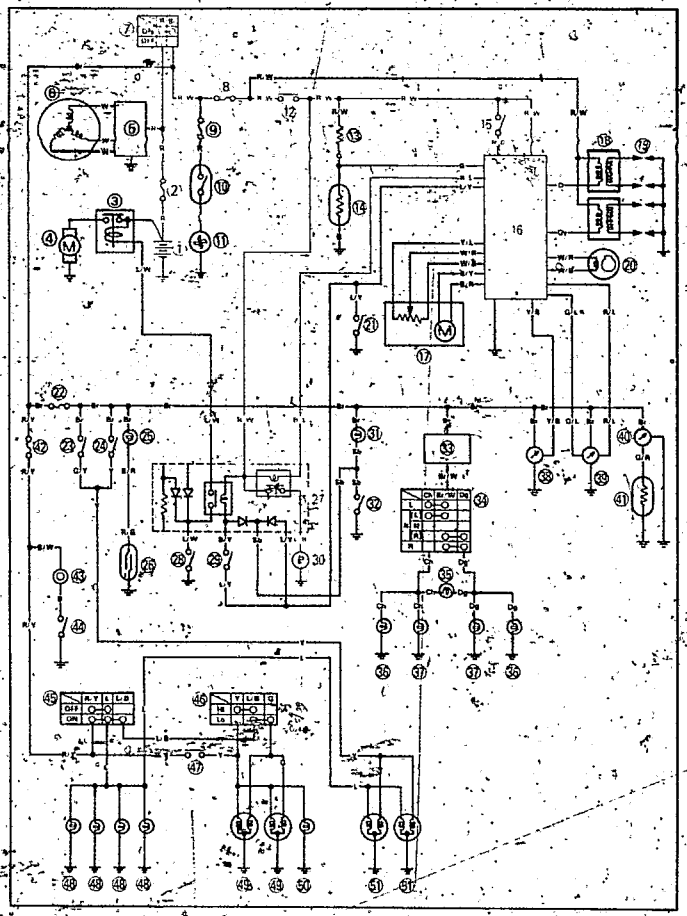
6. Wiring connection

Check the entire cooling system for connections. Refer to the "WIRING DIAGRAM" section

CORRECT

Replace tempmeter gauge

FUEL PUMP SYSTEM
CIRCUIT DIAGRAM

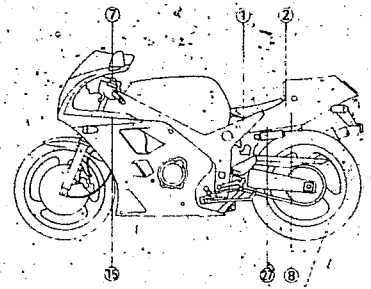


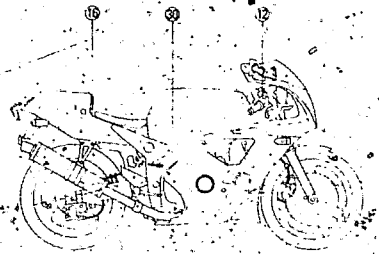
Aforementioned circuit shows fuel pump system circuit in circuit diagram.

NOTE:

For the color codes, see page 8-2.

1 Battery
2 Fuse (main)
7 Main switch
8 Fuse (ignition)
12 "ENGINE STOP" switch
15 Reserve switch
16 Ignitor
27 Relay
30 Fuel pump

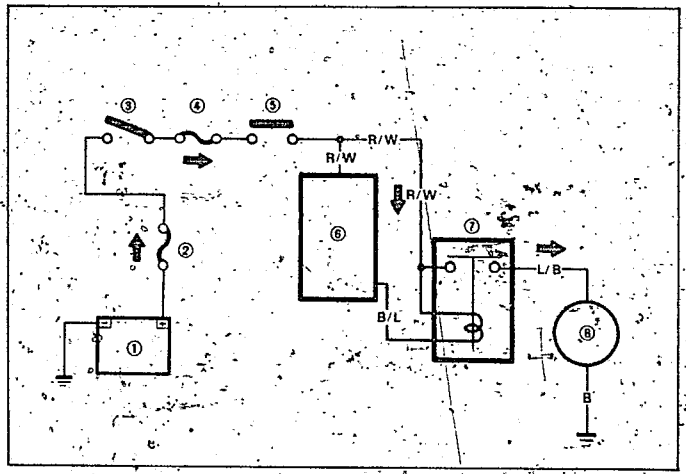




FUEL PUMP CIRCUIT OPERATION

The fuel pump circuit consists of the fuel pump relay, fuel pump, "ENGINE STOP" switch and digital ignition unit.
The digital ignition unit includes the control unit for the fuel pump.
The fuel pump starts and stops as indicated in the chart below.

1 Battery
2 Fuse (main)
3 Main switch
4 Fuse (ignition)
5 "ENGINE STOP" switch
6 Digital ignitor unit
7 Fuel pump relay
8 Fuel pump



FUEL PUMP		
START		STOP
• Main/"ENGINE STOP" switch turned to "ON"	• Engine turned on.	• Engine turned off.
For about 5 seconds when carburetor fuel level is low	After about 0.1 second	After about 5 seconds

TROUBLESHOOTING

FUEL PUMP FAILS TO OPERATE

Procedure

1. Fuse (main and ignition)
2. Battery
3. Main switch
4. "ENGINE STOP" switch
5. Fuel pump relay (relay unit)
6. Fuel pump
7. Wiring connection (Entire fuel system)

NOTE:

- Remove the following befroe troubleshooting
  1) Seat
  2) Tail cover
  3) Fuel tank
  4) Air filter case
- Use the following special tool in this troubleshooting.

Pocket tester: 90890-03112

1 Fuse (main and ignition)
- Remove the fuses.
- Connect the pocket tester (Ω × 1) to the fuses.
- Check the fuses for continuity. Refer to the "FUSE INSPECTION" section in the CHAPTER 3.

NOCONTINUITY → Replace the fuse(s).

CONTINUITY

2 Battery
- Check the battery condition. Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

INCORRECT → • Clean battery terminals. • Recharge or replace battery.

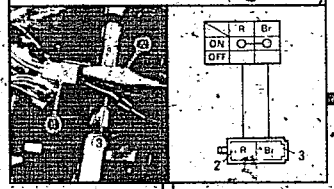
CORRECT

*

FUEL PUMP SYSTEM ELEC

3. Main switch

- Disconnect the main switch coupler 1 and lead from the wireharness.
- Check the switch component for the continuity between "Red 2" and "Brown 3".
  Refer to the "CHECKING OF SWITCHES" section.

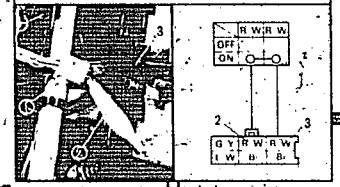


INCORRECT

Replace main switch.

4. "ENGINE STOP" switch

- Disconnect the handlebar switch (right) coupler 1 from the wireharness.
- Check the switch component for the continuity between "Red/White 2" and "Red/White 3".
  Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

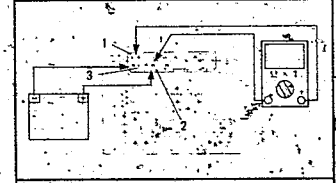
Replace handlebar switch (right)

CORRECT

5. Fuel pump relay (relay unit)

- Disconnect the fuel pump relay unit from the wire harness.
- Connect the pocket tester (Ω × 1) and battery (12V) voltage to the fuel pump relay unit coupler terminals.

Tester (+) lead → Blue/Black 1 terminal
Tester (−) lead → Red/White 2 terminal
Battery (+) lead → Red/White 2 terminal
Battery (−) lead → Black/Blue 3 terminal



- Check the relay for continuity

NOCONTINUITY

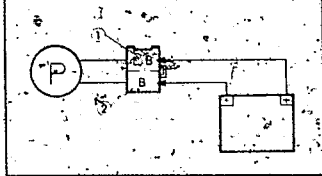
Replace relay unit

CONTINUITY

6. Fuel pump

- Disconnect the fuel pump coupler from the wire harness.
- Connect the battery voltage (12V) as shown.

Battery (+) lead → Blue/Black 1 terminal
Battery (−) lead → Black 2 terminal



- Check the fuel pump operation.

DOES NOT MOVE

Replace fuel pump

MOVES

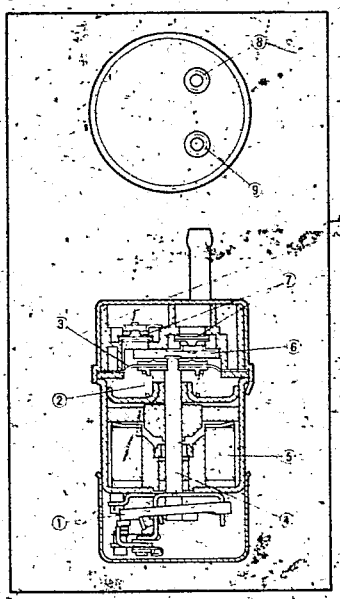
*

7. Wiring connection
- Check the entire fuel pump system for connections
- Refer to the "WIRING DIAGRAM" section

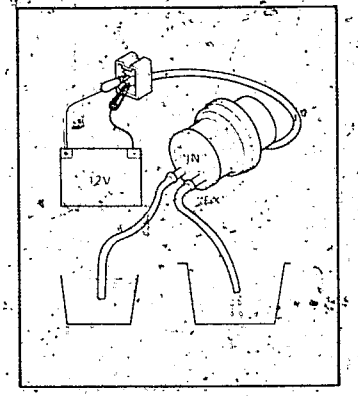
POOR CONNECTION → Correct.

CORRECT ↓

Replace digital ignitor unit.



1. Cut off switch
2. Spring
3. Diaphragm
4. Plunger
5. Solenoid coil
6. Fuel chamber
7. Valve
8. Outlet
9. Inlet



FUEL PUMP TEST

Operation

The diaphragm is pulled in by the plunger allowing fuel to be sucked into the fuel chamber. Fuel is pushed out from the pump until carb float chamber is filled with fuel, and then the cut off switch cuts off the circuit.

When the spring pushes the diaphragm further to the end, the cut-off switch turns on and the solenoid coil pulls the plunger with the diaphragm forcing fuel into the fuel chamber.

NOTE

When the main and "ENGINE STOP" switches are ON, the fuel pump relay is activated for five (5) seconds at which time the fuel pump operates.

Inspection

1 Inspect
- Fuel pump
  Cracks, Damage → Replace.

2 Check
- Fuel pump operation

Checking steps.
- Connect suitable hoses to the fuel pump.
- Put the "IN" side hose into the clean solvent.
- Place an open container under the "EX" side hose end.
- Connect the battery to fuel pump terminal.

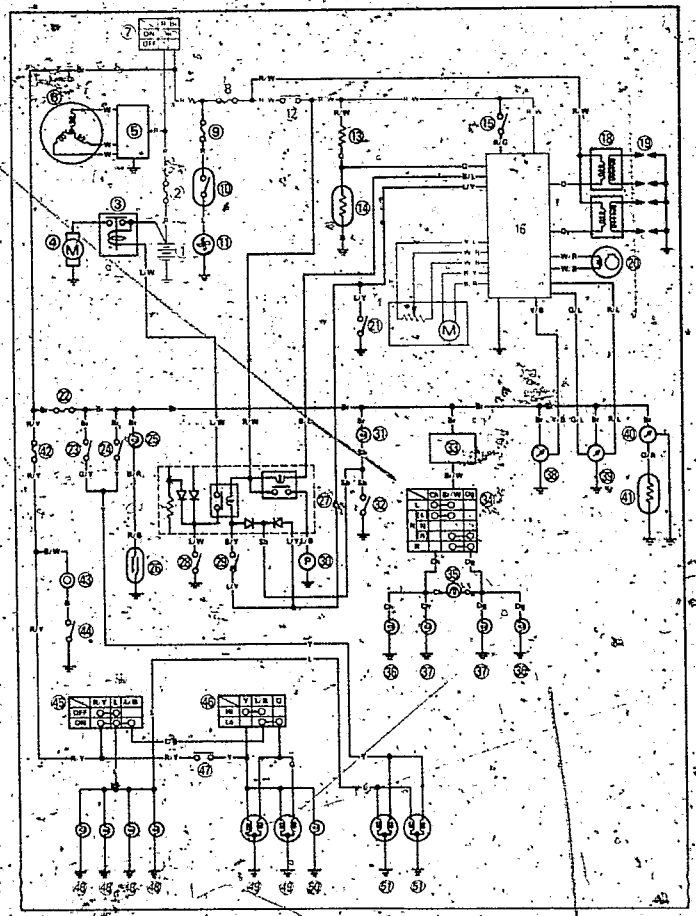
Battery (+) terminal → "Blue/Black" terminal
Battery (−) terminal → "Black" terminal

- If solvent flow out from "EX" side hose, fuel pump is good. If not replace the fuel hose.

NOTE

After checking, pump out the solvent from inside of fuel pump.

EX-UP SYSTEM
CIRCUIT DIAGRAM

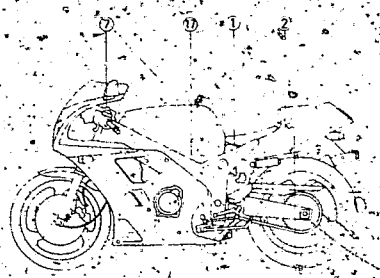


A forementioned circuit diagram shows the EX-UP circuit in the circuit diagram.

NOTE:

For the color codes, see page 8-2.

1. Battery
2. Fuse (main)
7. Main switch
8. Fuse (ignition)
12. "ENGINE STOP" switch
16. Ignitor
17. EX-UP



TROUBLESHOOTING

WHEN MAIN SWITCH IS TURNED TO "ON", EX-UP SERVOMOTOR DOES NOT OPERATE.

Procedure (1)
Check:
1. EX-UP servomotor operation (with EX-UP servomotor coupler connected)
2. Voltage
3. EX-UP servomotor operation (with EX-UP servomotor coupler disconnected)
4. EX-UP servomotor resistance (potentiometer resistance)
5. Wiring connection (entire EX-UP system)

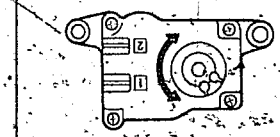
Procedure (2)
Check:
1. Fuse (main and ignition)
2. Battery
3. Main switch
4. "ENGINE STOP" switch
5. Wiring connection (entire EX-UP system)

NOTE:
- Remove the following parts before troubleshooting.
  1) Seat
  2) Tail cover
  3) Fuel tank
  4) Air filter case
- Use the following special tool in this troubleshooting.

Pocket tester: 90890-03112

Procedure (1)

1 EX-UP servomotor operation (with EX-UP servomotor coupler connected)
- Disconnect the EX-UP cables at EX-UP servomotor pully side.
- Start the engine and rev it at to 2,000 r/min

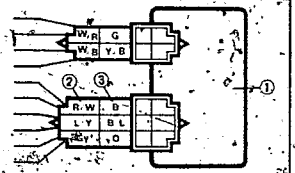


PULLEY TURNS → Check the EX-UP cables connection. If connection is correct, inspect the EX-UP valve and cables. Refer to the "ENGINE OVERHAUL" section in the CHAPTER 4

PULLEY DOES NOT TURN ↓

2 Voltage
- Connect the pocket tester (DC20V) to the digital ignitor unit ① connector.

Tester (+) lead—Red/White ② terminal.
Tester (—) lead—Black ③ terminal



- Turn the main switch to "ON" an check for the voltage between "Red/White and Black".

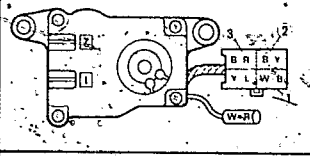
Voltage (Red/White — Black): 10–14V

OUT OF SPECIFICATION → Refer to the "procedure (2)"

MEETS SPECIFICATION ↓

3 EX-UP servomotor operation (with EX-UP servomotor coupler disconnected)
- Disconnect the EX-UP cables from the EX-UP servomotor pulley.
- Disconnect the EX-UP servomotor coupler ① from the wireharness.
- Connect the battery leads to the EX-UP motor coupler.

Battery positive lead—Black/Yellow ② lead
Battery negative lead—Black/Red ③ lead



PULLEY DOES NOT TURN → Replace EX-UP servomotor

• Check the EX-UP servomotor for pulley operation by allowing it to rotate several times.

CAUTION:
This test should be performed within a few seconds to prevent further damage.

PULLEY TURNS

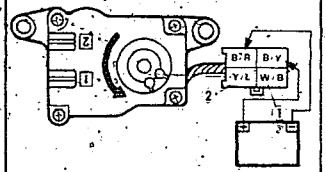
4 EX-UP servomotor resistance (potentiometer resistance)

• Disconnect the EX-UP servomotor coupler from the wireharness.

Step 1:

• Connect the pocket tester (Ω × 1K) to the EX-UP servomotor couplers.

Tester (+) lead—White/Black ① lead
Tester (—) lead—Yellow/Blue ② lead



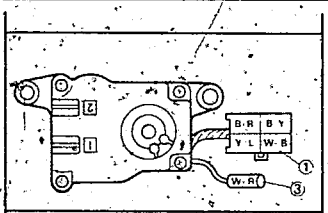
• Measure the EX-UP servomotor resistance.

EX-UP servomotor resistance:
6.7 – 10 kΩ
(White/Black — Yellow/Blue)

Step 2:

• Connect the pocket tester (Ω × 1K) to the EX-UP servomotor coupler.

Tester (+) lead—White/Black ① lead
Tester (—) lead—White/Red ③ lead



• Measure the EX-UP servomotor resistance while turning the pulley slowly.

EX-UP servomotor resistance:
0 – about 10 kΩ
(White/Black — White/Red)
When pully is turned once.

OUT OF SPECIFICATION → EX-UP servomotor is faulty, replace it

BOTH MEET SPECIFICATIONS

5. Wiring connection

• Check the entire EX-UP system for connections.
Refer to the "WIRING DIAGRAM" section

POOR CONNECTION → Correct

CORRECT

Replace digital ignitor unit

Procedure (2)

1. Fuse (main and ignition)
- Remove the fuse.
- Connect the pocket tester (Ω × 1) to the fuses.
- Check the fuses for continuity.

NOCONTINUITY → Replace fuse(s).

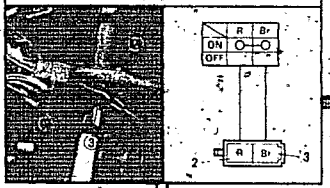
CONTINUITY ↓

2 Battery
- Check the battery condition.
Refer to the "BATTERY INSPECTION" section in the CHAPTER 3

INCORRECT → • Clean battery terminals. • Recharge or replace battery.

CORRECT ↓

3 Main switch
- Disconnect the main switch coupler ① and lead from the wireharness.
- Check the switch component for the continuity between "Red ② and Brown ③" Refer to the "CHECKING OF SWITCHES" section.



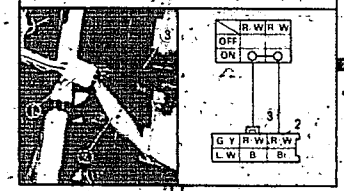
INCORRECT → Replace main switch

CORRECT ↓

*

*

4 "ENGINE STOP" switch
- Disconnect the handlebar switch (right) coupler ① from the wireharness.
- Check the switch component for the continuity between "Red/White ② and Red/White ③"
Refer to the "CHECKING OF SWITCHES" section



INCORRECT → Replace handlebar switch (right)

CORRECT ↓

5 Wiring connection
- Check the entire EXUP system for connections Refer to the "WIRING DIAGRAM" section

POOR CONNECTION → Correct

CORRECT ↓

Refer to "procedure (1)".

?

TRBL
SHTG

9

CHAPTER 9. TROUBLESHOOTING

STARTING FAILURE/HEAD STARTING	A-7
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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 inspection, adjustment, and replacement of parts.

STARTING FAILURE/HARD STARTING

FUEL SYSTEM

	PROBABLE CAUSE
Fuel tank	• Empty • Clogged fuel filter • Clogged fuel strainer • Clogged fuel breather hose • Deteriorated fuel or fuel containing water or foreign material
Fuel cock	• Clogged fuel hose
Carburetor	• Deteriorated fuel, fuel containing water or foreign material • Clogged pilot jet • Clogged pilot air passage • Sucked-in air • Deformed float • Groove worn needle valve • Improperly sealed valve seat • Improperly adjusted fuel level • Improperly set pilot jet • Clogged starter jet • Starter plunger malfunction • Improperly adjusted starter cable
Air filter element	• Clogged
Fuel pump	• Faulty fuel pump • Faulty fuel pump relay

ELECTRICAL SYSTEM

	PROBABLE CAUSE
Spark plug	• Improper plug gap • Worn electrodes • Wire between terminals broken • Improper heat range • Faulty spark plug cap
Ignition coil	• Broken or shorted primary/secondary • Faulty spark plug lead • Broken body
Full-transistor system	• Faulty ignitor unit • Faulty pick-up coil
Switches and wiring	• Faulty main switch • Faulty "ENGINE STOP" switch • Broken or shorted wiring • Faulty neutral switch • Faulty "START" switch • Faulty sidestand switch • Faulty clutch switch
Starter motor	• Faulty starter motor • Faulty starter relay • Faulty circuit cut-off relay (relay unit) • Faulty starter clutch

COMPRESSION SYSTEM

	PROBABLE CAUSE
Cylinder and cylinder head	• Loosen spark plug • Loose cylinder head or cylinder • Broken cylinder head gasket • Worn, damaged or seized cylinder
Piston and piston ring	• Improperly installed piston ring • Worn, fatigued or broken piston ring • Seized piston ring • Seized or damaged piston
Crankcase and crankshaft	• Improperly seated crankcase • Damaged crankshaft oil seal lip • Improperly sealed valve • Improperly contacted valve and valve seat • Improper valve timing • Broken valve spring • Seized crankshaft • Seized camshaft

POOR IDLE SPEED PERFORMANCE

POOR IDLE SPEED PERFORMANCE

	PROBABLE CAUSE
Carburetor	•Improperly returned starter plunger •Loose pilot jet •Clogged pilot air jet •Improperly synchronized carburetors •Improperly adjusted idle speed (Throttle stop screw) •Improper throttle cable play •Flooded carburetor
Electrical system	•Faulty battery •Faulty spark plug •Faulty igniter unit •Faulty pickup coil •Faulty ignition coil
Valve train	•Improperly adjusted valve clearance

POOR MEDIUM AND HIGH SPEED PERFORMANCE

POOR MEDIUM AND HIGH SPEED PERFORMANCE

Refer to "Starting failure/Hard starting" (FUEL SYSTEM, ELECTRICAL SYSTEM, COMPRESSION SYSTEM and valve train)

	PROBABLE CAUSE
Carburetor	•Improper jet needle clip position •Diaphragm malfunction •Improperly adjusted fuel level •Clogged or loose main jet
Air cleaner	•Clogged air filter element
Fuel pump	•Faulty fuel pump

FAULTY GEAR SHIFTING

HARD SHIFTING

Refer to "CLUTCH DRAGGING"

SHIFT PEDAL DOES NOT MOVE

	PROBABLE CAUSE
Shift shaft	•Improperly adjusted shift rod •Bent shift shaft
Shift cam, shift fork	•Groove jammed with impurities •Seized shift fork •Bent shift fork guide bar
Transmission	•Seized transmission gear •Jammed impurities •Incorrectly assembled transmission

JUMP OUT GEAR

	PROBABLE CAUSE
Shift shaft	•Improperly adjusted shift lever position •Improperly returned stopper lever
Shift fork	•Worn shift fork
Shift cam	•Improper thrust play •Worn shift cam grobve
Transmission	•Worn gear dog

CLUTCH SLIPPING/DRAGGING

CLUTCH SLIPPING

	PROBABLE CAUSE
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

OVERHEATING OR OVER-COOLING

TRBL SHTG ?

A-9

CLUTCH DRAGGING

	PROBABLE CAUSE
Clutch	•Warped pressure plate •Unevenly tensioned clutch springs •Match marks not aligned •Bent push rod •Loose push rod/bent clutch boss nut •Burnt primary driven gear bushing •Bent clutch plate •Swollen friction plate •Faulty cylinder kit cup •Broken clutch boss
Transmission oil	•High oil level •Improper quality (High viscosity) •Deterioration

OVERHEATING OR OVER-COOLING

OVERHEATING

	PROBABLE CAUSE
Ignition system	•Improper spark plug gap •Improper spark plug heat range •Faulty ignitor unit
Fuel system	•Improper carburetor main jet *(Improper setting)* •*Improperly adjusted fuel level* •Clogged air filter element
Compression system	•Heavy carbon build up
Engine oil	•Incorrect oil level •Improper oil viscosity •Inferior oil quality
Brake	•Dragging brake
Cooling system	•Faulty water temperature gauge •Faulty thermo unit •Incorrect coolant level •Faulty thermostat •Faulty thermo switch •Clogged or damaged radiator •Faulty radiator cap •Seized impeller shaft •Inoperative fan motor

FAULTY BRAKE/FRONT FORK OIL LEAKAGE AND FRONT FORK MALFUNCTION

TRBL SHTG ?

OVER-COOLING

	PROBABLE CAUSE
Cooling system	•Faulty water temperature gauge •Faulty thermo unit •Faulty thermostat •Faulty thermo switch •Inoperative fan motor

FAULTY BRAKE

POOR BRAKING EFFECT

	PROBABLE CAUSE
Disc brake	•Worn brake pad •Worn brake disc •Air in brake fluid •Leaking brake fluid •Faulty cylinder kit cup •Faulty caliper kit seal •Loose union bolt •Broken brake hose •Oily or greasy brake disc •Oily or greasy brake pad •Improper brake fluid level

FRONT FORK OIL LEAKAGE AND FRONT FORK MALFUNCTION

OIL LEAKAGE

	PROBABLE CAUSE
	•Bent, damaged or rusty inner tube •Damaged or cracked outer tube •Damaged oil seal lip •Improperly installed oil seal •Improper oil level (too much) •Loose damper rod holding bolt •Broken cap bolt O-ring •Loose drain bolt •Damaged drain bolt gasket

MALFUNCTION

	PROBABLE CAUSE
	•Bent, deformed or damaged inner tube •Bent or deformed outer tube •Damaged fork spring •Worn or damaged slide metal •Bent or damaged damper rod •Improper oil viscosity •Improper oil level

INSTABLE HANDLING

INSTABLE HANDLING	PROBABLE CAUSE
Handlebars	•Improperly installed or bent
Steering	•Improperly installed handlebar boss and upper bracket •Bent steering stem •Improperly installed steering stem (Improperly tightened ringnut) •Damaged bearing or bearing race
Front forks	•Uneven oil levels on both sides •Uneven spring tension (Uneven damping adjuster position) •Broken spring •Twisted front forks
Tires	•Uneven tire pressures on both sides •Incorrect tire pressure •Unevenly worn tires
Wheels	•Incorrect wheel balance •Deformed cast wheel •Loose bearing •Bent or loose wheel axle •Excessive wheel run out
Frame	•Twisted •Damaged head pipe •Improperly installed bearing race
Swingarm	•Worn bearing or bush •Bent or damaged
Rear shock absorber	•Fatigued spring •Improperly adjusted spring preload •Oil and gas leakage
Drive chain	•Improperly adjusted chain slack
Fairing	•Damaged or broken •Incorrectly installed

FAULTY SIGNAL AND LIGHTING SYSTEM

HEADLIGHT DARK	PROBABLE CAUSE
	•Improper bulb •Too many electric accessories •Hard charging (Broken stator coil and/or faulty rectifier/regulator) •Incorrect connection •Improperly grounded •Poor contacts (main or "LIGHTS" switch) •Bulb life expired

BULB BURNT OUT	PROBABLE CAUSE
	•Improper bulb •Faulty battery •Faulty rectifier/regulator •Improperly grounded •Faulty main and/or "LIGHTS" switch •Bulb life expired

FLASHER DOES NOT LIGHT	PROBABLE CAUSE
	•Improperly grounded •Discharged battery •Faulty "TURN" switch •Faulty flasher relay •Broken wireharness •Loosely connected coupler •Bulb burnt out

FLASHER KEEPS ON	PROBABLE CAUSE
	•Faulty flasher relay •Insufficient battery capacity (nearly discharged) •Bulb burnt out

FLASHER WINKS SLOWER

PROBABLE CAUSE
- Faulty flasher relay
- Insufficient battery capacity (nearly discharged)
- Improper bulb
- Faulty main and/or "TURN" switch

FLASHER WINKS QUICKER

PROBABLE CAUSE
- Improper bulb
- Faulty flasher relay

HORN IS INOPERATIVE

PROBABLE CAUSE
- Faulty battery
- Faulty main and/or horn switch
- Improperly adjusted horn
- Faulty horn
- Broken wireharness

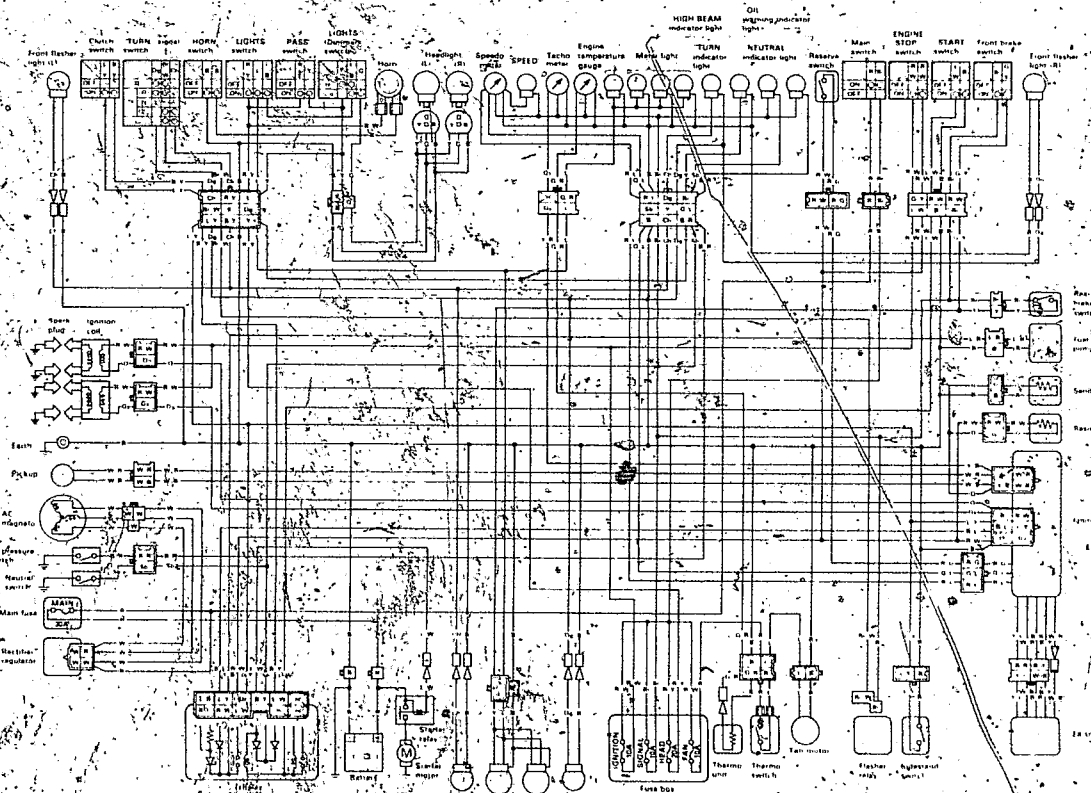
FAULTY EX-UP

FAULTY EX-UP

	PROBABLE CAUSE
Power valve	• Seized or damaged power valve • Carbon build-up
Control cable	• Improperly adjusted cable • Seized or discontinuous cable
Electrical parts	• Insufficient battery capacity (Improperly charged battery) • Faulty main switch • Faulty EX-UP servomotor • Faulty ignitor unit • Faulty relay unit • Broken or shorted wiring

FZR400SP WIRING DIAGRAM

A-12



COLOR CODE	
B	Black
R	Red
L	Blue
G	Green
O	Orange
Y	Yellow
P	Pink
Br	Brown
Ch	Chocolate
Gy	Gray
Sb	Sky blue
Dg	Dark green
W	White
B Y	Black Yellow
R W	Red White
L Y	Blue Yellow
L W	Blue White
G R	Green Red
Br W	Brown White
B W	Black White
B R	Black Red
Y L	Yellow Blue
Y B	Yellow Black
B L	Black Blue
G L	Green Blue
L B	Blue Black
R G	Red Green
R L	Red Blue
R Y	Red Yellow
W B	White Black
W R	White Red

YAMAHA

FZR400RR '92

3TJ-AE1

SUPPLEMENTARY SERVICE MANUAL

FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and data for the FZR400RR ('92). For complete information on service procedures, it is necessary to use this Supplementary Service Manual together with following manual.

FZR400SP Service Manual: 3TJ-ME1

FZR400RR ('92)
SUPPLEMENTARY
SERVICE MANUAL
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1st Edition September 1991
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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 motor cycles 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.

PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.

⚠ 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 motorcycle operator, a bystander, or a person inspecting or repairing the motorcycle.

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

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

HOW TO USE THIS MANUAL

CONSTRACTION OF THIS MANUAL

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

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

2nd title ②: This title appears on the upper of each page on the left of the chapter symbol. (For the chapter "Periodic inspection and adjustment" the 3rd title appears.)

3rd title ③: This is a final title.

MANUAL FORMAT

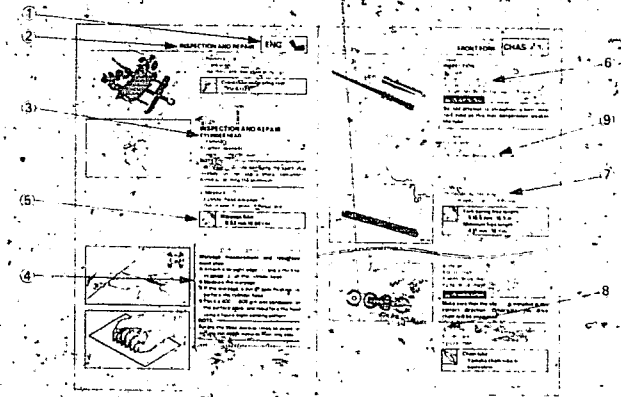
All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspections.
A set of particularly important procedure ④ is placed between a line of asterisks "*" with each procedure preceded by "●".

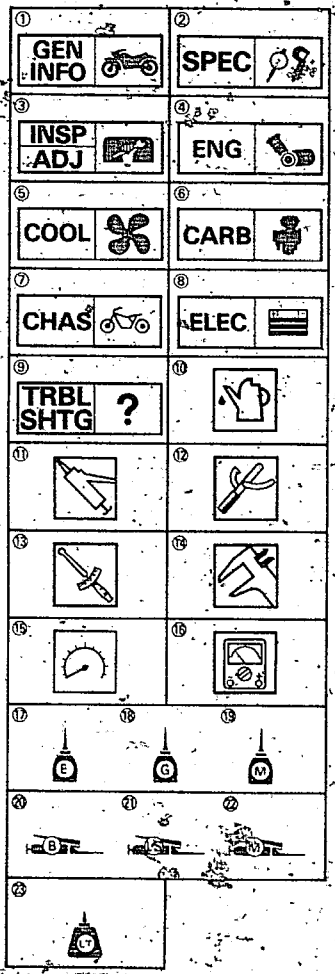
IMPORTANT FEATURES

- Data and a special tool are framed in a box preceded by a relevant symbol ⑤.
- An encircled numeral ⑥ indicates a part name, and an encircled alphabetical letter data or an alignment mark ⑦, the others being indicated by an alphabetical letter in a box ⑧.
- A condition of a faulty component will precede an arrow symbol and the course of action required the symbol ⑨.

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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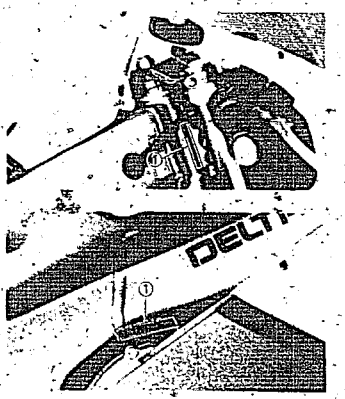
FZR400RR (For GB/F) WIRING DIAGRAM

GENERAL INFORMATION



MOTORCYCLE IDENTIFICATION

FRAME SERIAL NUMBER

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

Starting serial number:
4DX-000101 (GB)
4DX-001101 (F)

ENGINE SERIAL NUMBER

The engine serial number (1) is stamped into the right side of the engine.

Starting serial number:
4DX-000101 (GB)
4DX-001101 (F)

NOTE:

- The first three digits of these numbers are for model identifications, the remaining digits are the unit production number.
- Designs and specifications are subject to change without notice.

SPECIFICATIONS

GENERAL SPECIFICATIONS

Model		FZR400RR
Model code number		4DX1 (GB)/4DX2 (F)
Frame starting number		4DX 000101 (GB) 4DX-001101 (F)
Engine starting number		4DX 000101 (GB) 4DX 001101 (F)
Dimensions		
Overall length		2,015 mm (79.3 in) (GB) 1,975 mm (77.8 in) (F)
Overall width		705 mm (27.8 in)
Overall height		1,090 mm (42.9 in)
Seat height		760 mm (29.9 in)
Wheelbase		1,370 mm (53.9 in)
Minimum ground clearance		125 mm (4.9 in)
Coolant total amount: (Including all routes)		1.9 L (1.7 Imp qt, 2.0 US qt)
Fuel:		
Type		Regular unleaded gasoline
Tank capacity		15 L (3.3 Imp gal, 4.0 US gal)
Reserve amount		2.5 L (0.6 Imp gal, 0.7 US gal)
Transmission		
Primary reduction system		Spur gear
Primary reduction ratio		89/41 (2.170)
Secondary reduction system		Chain drive
Secondary reduction ratio		55/19 (2.895)
Transmission type		Constant mesh 6-speed
Operation		Left foot operation
Gear ratio	1st	43/13 (3.308)
	2nd	40/18 (2.222)
	3rd	36/21 (1.714)
	4th	33/23 (1.435)
	5th	28/22 (1.273)
	6th	27/23 (1.174)

Model		FZR400RR	
Tire:		Front	Rear
Type		Tubeless	Tubeless
Size		120/60R17 55H	160/60R17 69H
Manufacturer (Type)		DUNLOP (D201F) MICHELIN (TX11) BRIDGESTONE (CY17)	DUNLOP (D201) MICHELIN (TX23) BRIDGESTONE (CY16)
Bulb Wattage × Quantity:			
Headlight		12V 55/40W × 2 (GB) 12V 60/55W × 1 (F)	
Tail/brake light		12V 5W/21W × 2	
Flasher light		12V 21W × 4	
Auxiliary light		12V 4W × 1 (F)	
Indicator light:			
Wattage × Quantity	"METER LIGHT"	12V 1.7W × 4	
	"NEUTRAL"	12V 3.4W	
	"HIGH BEAM"	12V 3.4W	
	"TURN"	12V 3.4W	
	"OIL"	12V 3.4W	

MAINTENANCE SPECIFICATIONS

ENGINE

Model		FZR400RR
Clutch:		
Friction plate:		
Thickness		2.9 ~ 3.1 mm (0.114 ~ 0.122 in)
Quantity		8 pcs
Wear limit		2.8 mm (0.11 in)
Clutch plate:		
Thickness		1.8 ~ 2.2 mm (0.072 ~ 0.085 in)
Quantity		7 pcs.
Warp limit		0.1 mm (0.004 in)
Clutch spring:		
Free length		33.5 mm (1.32 in)
Quantity		5 pcs.
Minimum free length		32.5 mm (1.28 in)
Clutch release method		Inner push, screw push
Carburetor:		
I.D. mark		3TJ-01
Main jet	(M.J)	#1.4, #1.00, #2.3, #97.5
Main air jet	(M.A.J.)	#65
Jet needle	(J.N.)	#1.4: 5CEW16-3 #2.3: 5CKP3-3
Needle jet	(N.J.)	X-6
Throttle valve size	(Th.V)	#130
Pilot jet	(P.J.)	#32.5
Pilot air jet	(P.A.J.)	#110
Bypass 1	(B.P.1)	φ0.8
2	(B.P.2)	φ0.8
3	(B.P.3)	φ0.8
Pilot screw	(P.S.)	2 ± 2 turns out
Valve seat	(V.S.)	φ1.0
Starter jet 1	(G.S.1)	#50
2	(G.S.2)	φ0.6
Fuel level		20.9 ~ 21.9 mm (0.82 ~ 0.86 in) Above from the float chamber line
Engine idling speed		1,250 ~ 1,350 r/min
Vacuum pressure at idling speed		19.1 kPa or more (145 mmHg, 5.7 inHg)
Lubrication system:		
Oil filter type		Paper type
Oil pump type		Trochoid pump type
Tip clearance		0.12 mm (0.0047 in)
Side clearance		0.03 ~ 0.08 mm (0.0012 ~ 0.0031 in)

Model	FZR400RR
Cooling system:	
Radiator core size Width	320 mm (12.6 in)
Height	238 mm (9.37 in)
Thickness	24 mm (0.94 in)
Radiator cap opening pressure	105 ~ 125 kPa
	(1.05 ~ 1.25 kg/cm², 14.93 ~ 17.77 psi)
Reservoir tank capacity	0.3 L (0.26 Imp qt, 0.32 US qt)
<From low to full level>	<0.28 L (0.25 Imp qt, 0.30 US qt)>
Water pump	
Type	Single-suction centrifugal pump
Reduction ratio	81/41 × 48/49 (2.126)
Thermostat	
Opening temperature	102 ~ 108°C (216 ~ 226°F)

TIGHTENING TORQUE

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque Nm	m·kg	ft·lb	Remarks
Camshaft cap	Flange bolt	M 6	24	10	1.0	7.2	
Cylinder head	Nut	M 9	12	37	3.7	27	
Spark plug	–	M10	4	12.5	1.25	9.0	
Cylinder head cover	Bolt	M 6	8	10	1.0	7.2	
Cylinder (dram)	Bolt	M 6	2	7	0.7	5.1	
Connecting rod	Nut	M 7	8	23	2.3	17	
Camshaft sprocket	Bolt	M 7	4	24	2.4	17	
Timing chain tensioner	Bolt	M 6	2	10	1.0	7.2	
	Bolt	M11	1	20	2.0	14	
Chain tensioner guide (intake)	Bolt	M 6	2	10	1.0	7.2	
Pipe 2	Bolt	M 6	2	10	1.0	7.2	
Thermo unit cover	Bolt	M 6	2	10	1.0	7.2	
	Flange bolt	M 6	2	7	0.7	5.1	
Radiator	Flange bolt	M 6	4	7	0.7	5.1	
Joint	Bolt	M 6	4	10	1.0	7.2	
Water pump cover	Bolt	M 6	4	10	1.0	7.2	
Pipe 1	Bolt	M 6	2	10	1.0	7.2	
Oil pump cover	Screw	M 6	1	7	0.7	5.1	
Oil pump assembly	Bolt	M 6	3	10	1.0	7.2	
Oil strainer housing	Bolt	M 6	2	10	1.0	7.2	
Oil pan	Bolt	M 6	14	10	1.0	7.2	
Drain bolt	–	M14	1	43	4.3	31	
Oil delivery pipe	Union bolt	M10	1	20	2.0	14	
	Bolt	M 6	1	10	1.0	7.2	
Oil filter	–	M20	1	17	1.7	12	
Oil filter housing	Union bolt	M20	1	50	5.0	36	
Bypass valve assembly	–	M20	1	63	6.3	45	
Carburetor joint	Bolt	M 6	8	10	1.0	7.2	
	Screw	M 5	4	5	0.5	3.6	
Air filter case	Flange bolt	M 6	1	7	0.7	5.1	
Exhaust pipe	Nut	M 6	8	10	1.0	7.2	
(CO)	Bolt	M 6	4	10	1.0	7.2	
Muffler	Bolt	M 8	1	20	2.0	14	
EX-UP	Bolt	M 6	3	10	1.0	7.2	
Pulley	Bolt	M 5	1	5	0.5	3.6	
Exhaust joint	Bolt	M 8	1	20	2.0	14	
Exhaust pipe and muffler	Bolt	M 8	1	20	2.0	14	
EX-UP cover	Bolt	M 6	3	10	1.0	7.2	
Crankcase upper and lower	Bolt	M 8	12	24	2.4	17	
	Bolt	M 6	22	12	1.2	8.7	
Breather plate	Screw	M 6	2	7	0.7	5.1	
2	Screw	M 6	4	7	0.7	5.1	
AC magneto cover	Bolt	M 6	5	10	1.0	7.2	
Crankcase cover 1	Bolt	M 6	5	10	1.0	7.2	
	Screw	M 5	4	4	0.4	2.9	

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque Nm	m·kg	ft·lb	Remarks
Bearing plate	Bolt	M 6	2	10	1.0	7.2	
Crankcase cover 2	Bolt	M 6	7	10	1.0	7.2	
Plug (to crankcase 2)	—	M16	1	8	0.8	5.8	
Crankcase cover 3	Bolt	M 6	10	10	1.0	7.2	
	Screw	M 5	4	4	0.4	2.9	
Cover 1	Screw	M 6	1	7	0.7	5.1	
Plug (to crankcase 2)	—	M16	1	25	2.5	18	
Starter clutch assembly	Flange bolt	M10	1	80	8.0	58	
Starter clutch outer	Bolt	M 8	3	30	3.0	22	
Pressure plate	Bolt	M 5	5	6	0.6	4.3	
Clutch boss	Nut	M18	1	70	7.0	50	
Push lever assembly	Screw	M 5	2	4.5	0.45	3.3	
Push rod	Nut	M 8	1	16	1.6	11	
Drive sprocket	Nut	M18	1	70	7.0	50	
Stopper plate	Flange bolt	M 6	1	10	1.0	7.2	
Shift arm	Flange bolt	M 6	1	10	1.0	7.2	
Shift rod	Nut	M 6	2	10	1.0	7.2	
Stopper lever	Bolt	M 6	1	10	1.0	7.2	
Side plate	Screw	M 5	1	4	0.4	2.9	
AC magneto rotor	Bolt	M10	1	80	8.0	58	
Stator	Bolt	M 6	3	10	1.0	7.2	
Pick-up	Screw	M 5	2	5	0.5	3.6	
Starter motor	Flange bolt	M 6	2	10	1.0	7.2	
Neutral switch	Screw	M 6	2	4	0.4	2.9	
Oil pressure switch	—	—	1	12	1.2	8.7	
Thermo switch assembly	—	M16	1	22.5	2.25	16.3	
Thermo unit	—	—	1	15	1.5	11	
Oil pressure lead	Bolt	M 4	1	1	0.1	0.7	

CHASSIS

Model	FZR400RR
Front suspension:	
Front fork travel	120 mm (4.72 in)
Fork spring free length	346 mm (13.6 in)
<Limit>	< 341 mm (13.4 in) >
Spring rate: K1	6.5 N/mm (0.65 kg/mm, 36.4 lb/in)
Stroke K1	0.0 ~ 120 mm (0.0 ~ 4.72 in)
Optional spring	No
Oil capacity	509 cm³ (17.9 Imp oz, 17.2 US oz)
Oil level	80 mm (3.15 in). From top of inner tube fully compressed without spring.
Oil grade	Fork oil 10W or equivalent
Rear suspension:	
Shock absorber travel	70 mm (2.8 in)
Spring free length	205 mm (8.07 in)
Fitting length	200.5 mm (7.9 in)
Spring Rate K1	59 N/mm (5.9 kg/mm, 330 lb/in)
Stroke K1	0.0 ~ 70 mm (0.0 ~ 2.8 in)
Optional spring	No
Enclosed gas pressure:	
Standard	1,220 kPa (12.2 kg/cm², 174 psi)
Spring preload (Adjuster position):	
Standard	5
Minimum	1
Maximum	9
Drive chain:	
Type/Manufacturer	RK428SMO/TAKASAGO
No. of links	130
Chain free play	35 ~ 45 mm (1.38 ~ 1.77 in)

TIGHTENING TORQUE

Part to be tightened	Thread size	Tightening torque Nm	m•kg	ft•lb	Remarks
Handle crown and inner tube	M 8	22	2.2	17	
Handle crown and steering shaft	M22	110	11.0	80	
Handlebar and inner tube	M 8	22	2.2	17	
Handlebar and handle crown	M 6	13	1.3	9.4	
Steering shaft and ring nut	—	6	0.6	4.3	See "NOTE"
Under bracket and inner tube	M10	38	3.8	27	
Brake hose joint and under bracket	M 6	10	1.0	7.2	
Handle crown and main switch	M 6	10	1.0	7.2	
Front master cylinder	M 6	10	1.0	7.2	
Brake hose and union bolt	M10	26	2.6	19	
Upper cowl and stay	M 6	4	0.4	2.9	
Upper cowl and lower cowl	M 5	3	0.3	2.2	
Front flasher light and stay	M 8	16	1.6	11	
Engine mounting bolt (front)	M10	40	4.0	29	
(rear upper)	M10	55	5.5	40	
(rear lower)	M10	55	5.5	40	
(front pinion bolt)	M 8	23	2.3	17	
Frame and rear frame	M 8	33	3.3	24	
Frame and engine bracket (rear)	M 8	33	3.3	24	
Pivot shaft nut	M18	90	9.0	65	
Relay arm and frame	M10	40	4.0	29	
Relay arm and arm	M10	40	4.0	29	
Rear arm and arm	M10	40	4.0	29	
Rear shock absorber and relay arm	M10	40	4.0	29	
Rear shock absorber and bracket	M10	40	4.0	29	
Frame and rear shock absorber bracket	M16	52	5.2	37	
Chain case	M 6	7	0.7	5.1	
Seal garde	M 6	7	0.7	5.1	
Rear brake hose holder	M 6	7	0.7	5.1	
Fuel tank	M 6	7	0.7	5.1	
Fuel cock	M 6	7	0.7	5.1	
Fuel sender	M 6	7	0.7	5.1	
Reservoir tank	M 6	7	0.7	5.1	
Rear fender	M 6	7	0.7	5.1	
Rear flasher light	M 8	16	1.6	11	
Front fork cap bolt	—	23	2.3	17	
Front fork damper bolt	—	62	6.2	45	
Front wheel axle holder	M 8	20	2.0	14	
Front wheel shaft	M16	75	7.5	54	
Rear wheel shaft and nut	M18	105	10.5	75	
Front caliper and front fork	M10	35	3.5	25	
Rear caliper and bracket	M10	35	3.5	25	
Rear caliper bracket	—	55	5.5	40	

Part to be tightened	Thread size	Tightening torque Nm	m•kg	ft•lb	Remarks
Brake caliper retaining pin	M 8	10	1.0	7.2	
Brake disc and hub	M 8	20	2.0	14	
Rear wheel sprocket and hub	M 8	43	4.3	31	
Bleed screw and caliper	M 8	6	0.6	4.3	
Sidestand bolt	M10	46	4.6	33	
Sidestand locknut	M10	39	3.9	28	
Bracket footrest and frame	M 8	22	2.2	16	
Rear master cylinder and frame	M 8	22	2.2	16	
Rear brake reservoir tank and frame	M 6	4	0.4	2.9	

NOTE:

1. First, tighten the ring nut approximately 38 Nm (3.8 m•kg, 27 ft•lb) by using the torque wrench, then loosen the ring nut one turn.
2. Retighten the ring nut to specification.

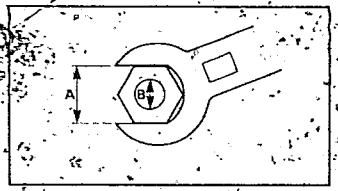
ELECTRICAL

Model	FZR400RR
Ignition coil:	
Model/Manufacturer	CM12-43/HITACHI
Minimum spark gap	6 mm (0.24 in)
Primary winding resistance	1.8 ~ 2.2Ω at 20°C (68°F)
Secondary winding resistance	9.6 ~ 14.4 Ω at 20°C (68°F)
Spark plug cap:	
Type	Resin type
Resistance	10 kΩ at 20°C (68°F)
A.C. Generator:	
Model/Manufacturer	FL-118-17/HITACHI
Nominal output	12V 20.5A at 5,000 r/min
Stator coil resistance	0.31 ~ 0.41Ω at 20°C (68°F) (White – White)
Rectifier/Regulator:	
Model/Manufacturer	SH629A-12/SHINDENGEN
Type	Semi conductor – Short circuit type
Voltage regulator	
No load regulated voltage	14.3 ~ 15.3V
Rectifier	
Capacity	25A
Withstand voltage	240V
Electrical starter system:	
Type	Constant mesh type
Starter motor:	
Model/Manufacturer	3HE/YAMAHA
Output	0.7 kW
Brush – overall length	12.5 mm (0.49 in)
<Limit>	<4 mm (0.16 in)>
Commutator dia.	28.0 mm (1.10 in)
Wear limit	27.0 mm (1.06 in)
Mica undercut (Deep)	0.7 mm (0.028 in)
Starter relay:	
Model/Manufacturer	MS5D-201/HITACHI
Amperage rating	100A
Flasher relay (Relay assembly):	
Type	Semi transistor type
Model/Manufacturer	G8A-101-03/OMRON
Self cancelling device	No
Flasher frequency	60 ~ 120 cyl/min
Wattage	21W × 2 + 3.4W
Thermostat switch:	
Model/Manufacturer	2EL/N, THERMOSTAT
Function temperature	102 ~ 108°C (216 ~ 226°F): ON 98 ~ 101°C (208 ~ 214°F): OFF

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

B-1-1

LUBRICATION POINT AND GRADE OF LUBRICANT

ENGINE

Lubrication point	Lubricant type
Oil seal lips	GR
O-ring	GR
Bearing	E
Piston surface	E
Piston pin	E
Connecting rod (Big and small end)	E
Connecting rod bolt	M
Crankshaft journal	E
Camshaft cam lobe/journal	M
Valve stem (IN. EX.)	M
Valve stem end (IN. EX.)	E
Water pump mechanism seal revolution side	Coolant and water
Water pump impeller shaft	GR
Water pipe or hose	Silicon grease
Oil pump rotor (Inner/outer) shaft	E
Oil level gauge	E
Cylinder head (Bolt thread)	E
Valve lifter outside	E
Camshaft cap (Bolt thread)	E
Cylinder sleeve (O-ring)	Silicon grease
Starter idler gear (Inner gear)	E
Starter idler gear shaft	M
Push lever assembly	GR
Clutch push rod	E
Transmission gear (Wheel/pinion)	M
Axle (Main) drive)	M
Shift cam	E
Shift fork/guide bar	E
Shift shaft assembly	E
Shift boss (Inner)	GR
Matching surface (Cylinder head and cylinder head cover)	Yamaha Bond No. 1215
Crankcase matching surface	Yamaha Bond No. 1215

CHASSIS

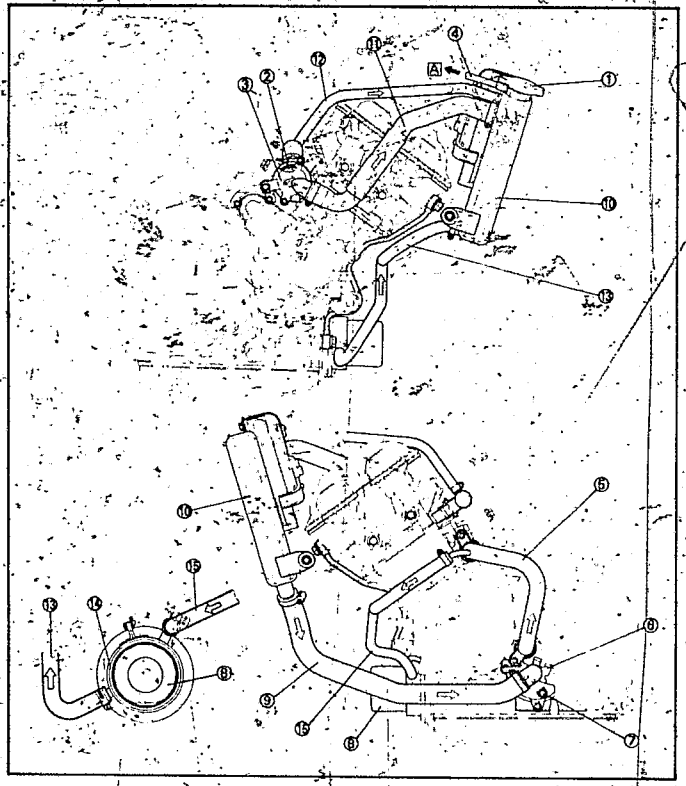
Lubrication point	Lubricant type
Gear unit (Speedometer)	GR
Front wheel oil seal lips	GR
Rear wheel oil seal lips	GR
Bush (Swingarm) and thrust cover	GR
Oil seal lips (Swingarm) and bearing	GR
Pivot shaft (Swingarm)	M
Bearing (Relay arm and rear shock absorber)	M
Bearing (Relay arm and frame)	M
Bearing (Relay arm and connecting rod)	M
Bearing (Connecting rod and swingarm)	M
Shift pedal shaft	GR
Bearing (Steering head)	GR
Tube guide (Throttle grip) inner surface	GR
Brake lever, sliding surface	GR
Clutch lever, sliding surface	GR
Clutch cable end	GR
Sidestand bolt, sliding surface	GR
Swingarm	M
Relay arm	M
Brake pedal and rear master cylinder	GR

B-12

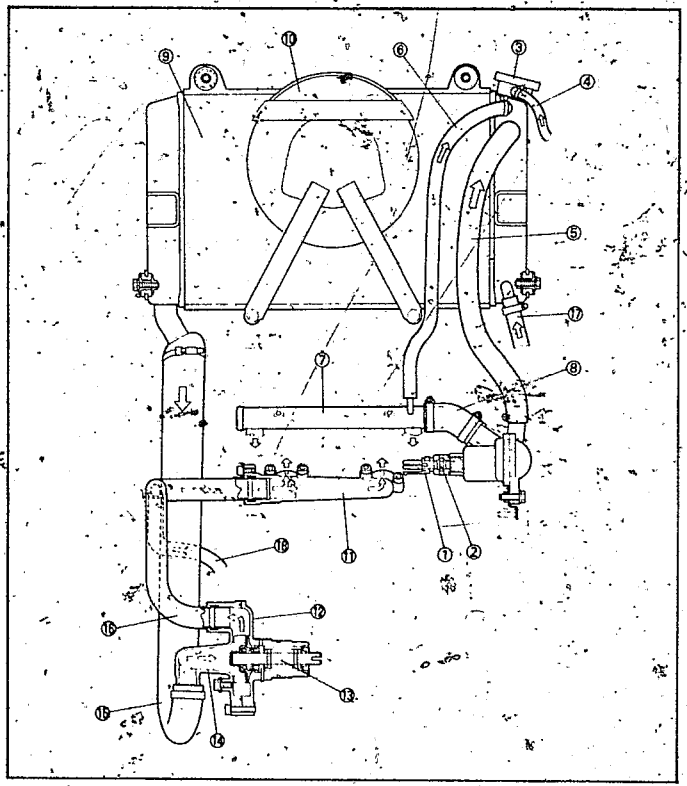
COOLANT DIAGRAM

① Radiator cap
② Thermostatic valve
③ Thermostatic valve housing
④ Reservoir tank hose
⑤ Water pipe
⑥ Water pump
⑦ Drain bolt
⑧ Oil filter
⑨ Radiator hose (outlet)
⑩ Radiator
⑪ Radiator hose #1 (inlet)
⑫ Radiator hose #2 (inlet)
⑬ Oil cooler hose (outlet)
⑭ Oil cooler
⑮ Oil cooler hose (inlet)

[A] To reservoir tank



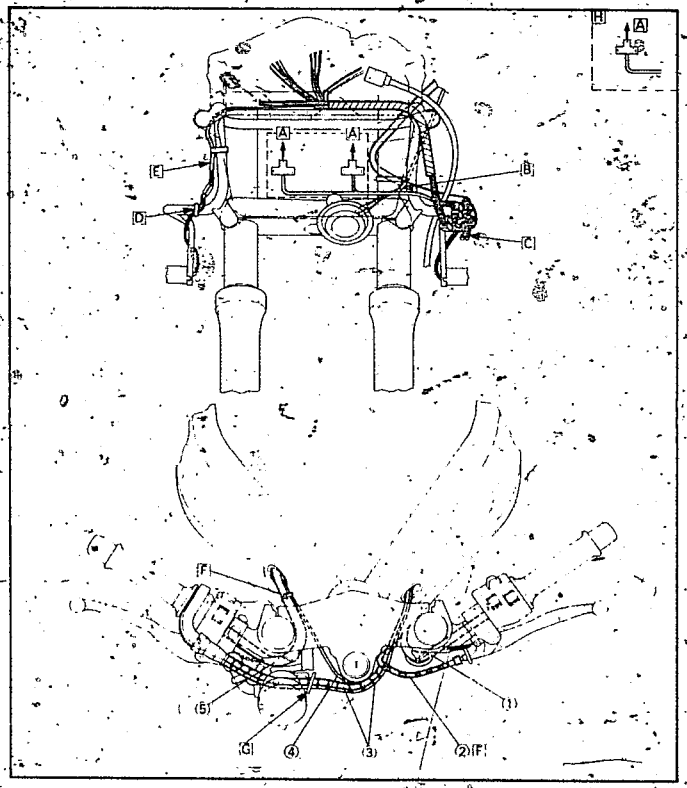
① Thermo switch
② Thermo unit
③ Radiator cap
④ Reservoir tank hose
⑤ Radiator hose #1 (inlet)
⑥ Radiator hose #2 (inlet)
⑦ Radiator pipe 1
⑧ Radiator hose
⑨ Radiator
⑩ Fan motor assembly
⑪ Water jacket joint
⑫ Water pump housing
⑬ Water pump
⑭ Water pump cover
⑮ Radiator hose (outlet)
⑯ Water pipe
⑰ Oil cooler hose (outlet)
⑱ Oil cooler hose (inlet)



CABLE ROUTING

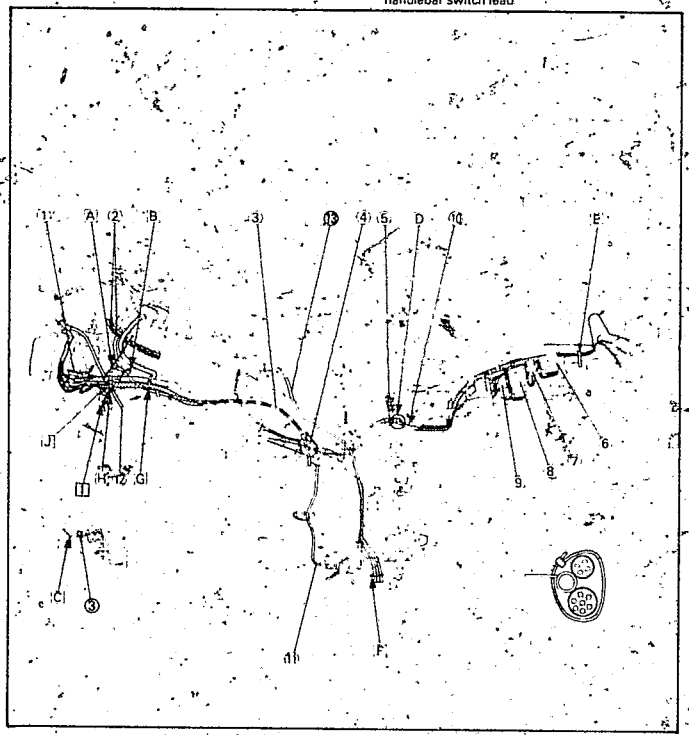
① Handlebar switch lead (left)
② Clutch cable
③ Throttle cable
④ Main switch lead
⑤ Handlebar switch lead (right)

[A] To headlight.
[B] To horn.
[C] To front flasher light (left).
[D] Clamp the flasher light lead.
[E] To front flasher light (right)
[F] Through inside of throttle cable to under the frame.
[G] Through the throttle cables.
[H] For F.



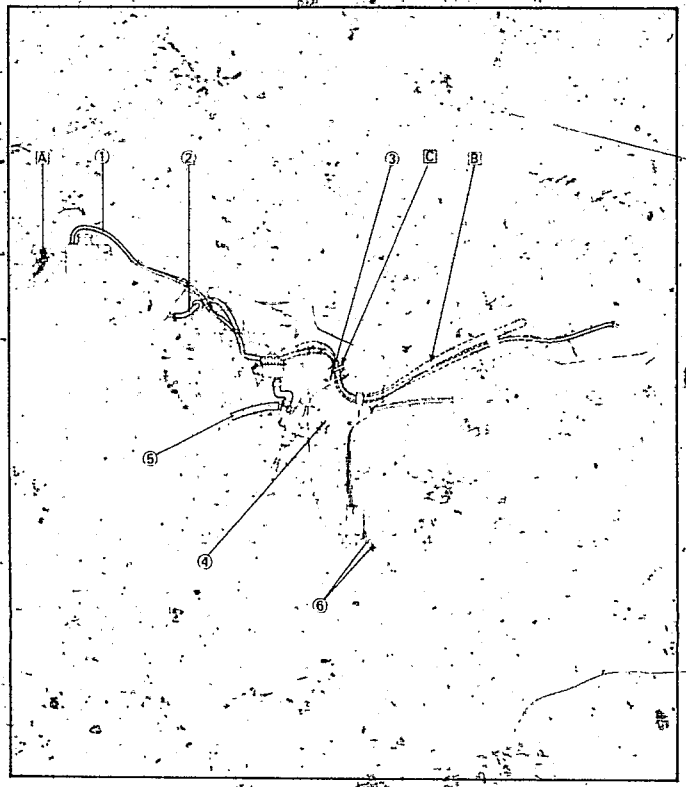
① Headlight lead
② Throttle cable
③ Clutch cable
④ Starter
⑤ Cross tube
⑥ Fuse box
⑦ Main fuse
⑧ Relay
⑨ Flasher relay
⑩ EX-UP lead
⑪ Sidestand switch lead
⑫ Speedometer cable
⑬ Air cleaner drain hose

[A] Clamp the horn lead
[B] Connect the fuel tank reserve switch
[C] Through to clutch cable over the cable guide
[D] Through to the main harness, radiator reservoir hose, over flow hose, ground lead, EX-UP lead, and starter motor (+) lead over the cross tube.
[E] Clamp the flasher light lead and taillight lead.
[F] Clamp the air filter breather hose, fuel tank breather hose, and over flow hose.
[G] Clamp the main harness and handlebar switch lead (left)
[H] Through the guide.
[I] Through the flasher light leads (left and right) under the bracket hole.
[J] Clamp the flasher light lead, main harness and handlebar switch lead

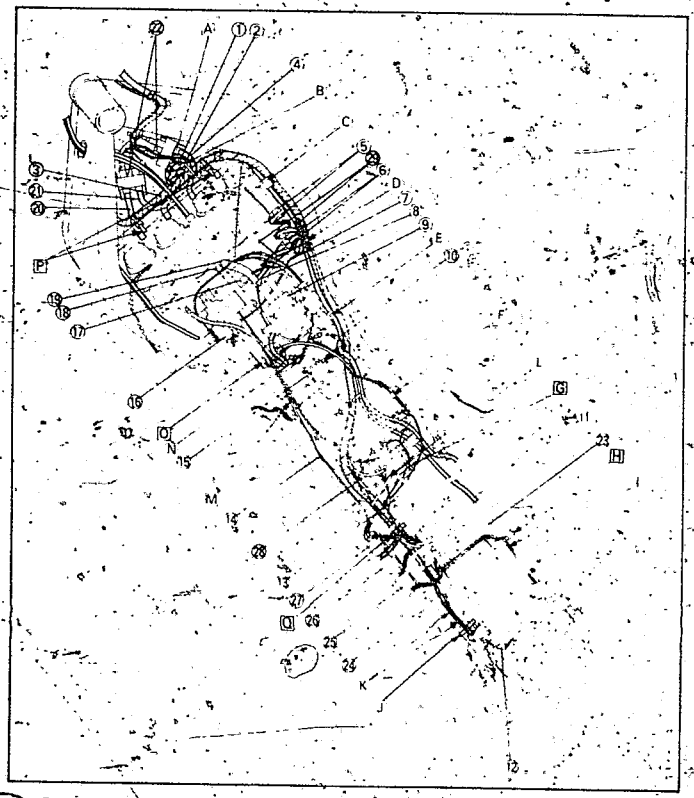


① Reservoir tank over flow hose
② Reservoir hose
③ Brake switch lead
④ Rear brake switch
⑤ Brake hose
⑥ EX-UP cable

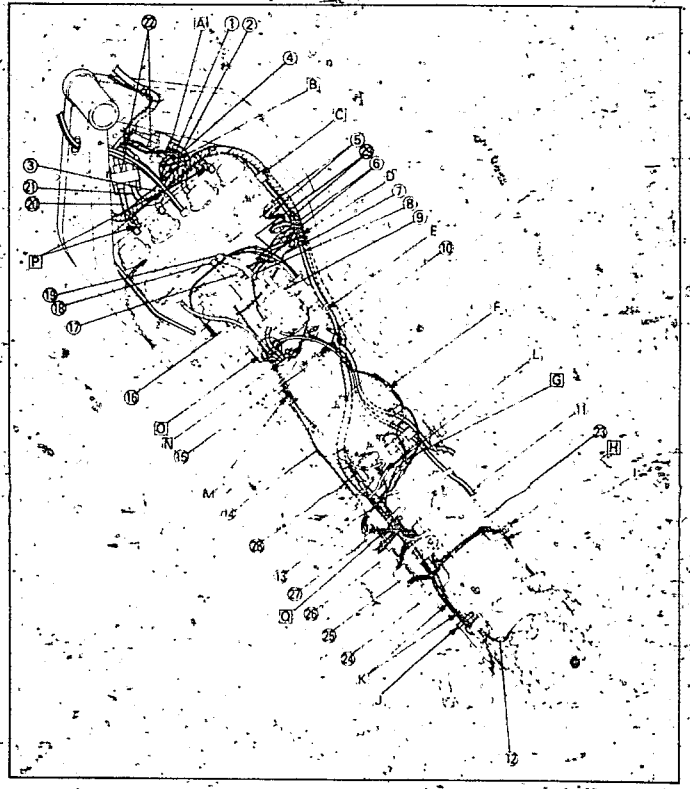
Ⓐ Clamp the flasher light lead (right)
Ⓑ Through the reservoir hose inside of tank rail.
Ⓒ Clamp the brake switch leads and main harness.



① Main switch coupler (red)
② Handlebar switch coupler (white)
③ High tension cord #2
④ High tension cord #3
⑤ Thermo switch/Thermo unit (white)
⑥ AC magneto coupler (white)
⑦ Sidestand lead (blue)
⑧ Fuel pump lead
⑨ Fuel pump
⑩ Rear brake switch coupler
⑪ Over flow hose
⑫ Taillight coupler (white)
⑬ EX-UP test terminal
⑭ EX-UP lead
⑮ Regulator
⑯ EX-UP motor
⑰ Starter motor ⊕ lead
⑱ Air filter breather hose
⑲ Fuel hose (to carburetor)
⑳ High tension cord #1
㉑ High tension cord #4
㉒ Ignition coil
㉓ Ignitor unit
㉔ Fuse box
㉕ Main fuse
㉖ Relay
㉗ Flasher relay
㉘ Starter relay
㉙ Neutral and oil pressure gauge



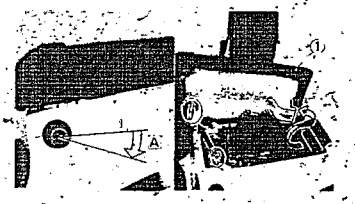
[A] To fan
[B] Clamp the handlebar lead (right), main switch lead, fan lead and main harness
[C] Clamp the main harness and radiator reservoir hose
[D] Clamp the main harness, sidestand lead, AC magneto lead, thermo switch lead, fuel pump lead, neutral lead and oil pressure lead
[E] Clamp the main harness and radiator reservoir hose
[F] Clamp the ground lead ⊖
[G] Clamp the ground lead ⊖ and resistor lead
[H] Clamp the flasher lead
[I] To the rear flasher light (right)
[J] Clamp the flasher light lead and taillight lead
[K] To the rear flasher light (left)
[L] Clamp the main harness, starter relay, EX-UP lead and ⊕ lead
[M] Clamp the EX-UP lead and starter motor lead
[N] Pass through the EX-UP cables
[O] Clamp the air filter hose breather hose over flow hose, EX-UP lead and starter motor lead
[P] Clamp the main harness to the frame
[Q] Clamp the main harness and flasher light lead (F)



PERIODIC INSPECTION AND ADJUSTMENT

COVERS/FUEL TANK REMOVAL AND INSTALLATION

REMOVAL



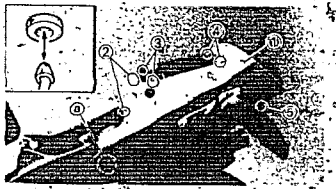
Covers

1 Remove
- Passenger seat 1

NOTE:

Insert the key into the lock and turn it clockwise.
[A] to release the seat lock.

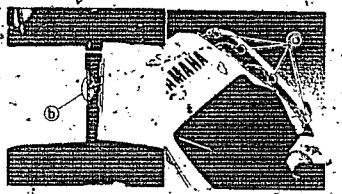
2 Remove
- Bolt 1
- Rider seat 2



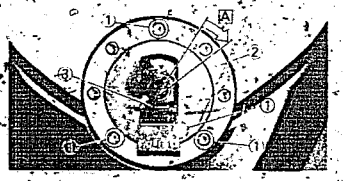
3 Remove:
- Side covers (left and right) 1

Removal steps:

- Remove the screws 2, 3, 4, 5.
- Unhook the projections ⓐ on the side cover from the grommets on the frame.
- Unhook the hooks ⓑ, ⓒ on the side cover from the slots on the tail cover.



4. Remove.
   - Tail cover 1



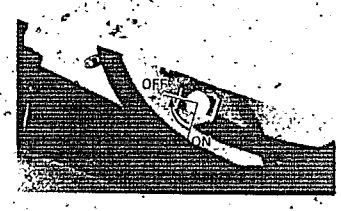
Fuel tank

1. Remove.
   - Socket head bolt 1
   - Fuel tank cap 2

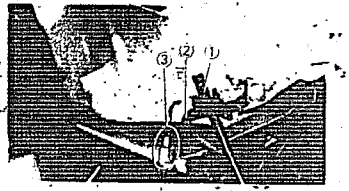
NOTE:

Insert the key 3 into the lock and turn it clockwise 1/4 turn A to release the fuel tank cap 2.

2. Remove
   - Fuel tank installing bolts 1



3. Turn the fuel cock "OFF"



4. Disconnect
   - Breather hose 1
   - Fuel hose 2
   - Fuel sender coupler 3

5. Remove
   - Fuel tank

INSTALLATION

Reverse the "REMOVAL" procedure. Note the following points.

1. Install
   - Rider seat 1
   - Passenger seat 2

NOTE:

When installing the seat, insert the lobe on the rear of the stay 3 in the frame.

CHASSIS

YB533007

DRIVE CHAIN SLACK ADJUSTMENT

NOTE:

Before checking and/or adjusting, rotate the rear wheel several revolutions and check slack at several points to find the tightest point. Check and/or adjust the chain slack with the rear wheel in this "tightest" position.

CAUTION:

Too little of chain slack will overload the engine and other vital parts. Keep the slack within the specified limits.

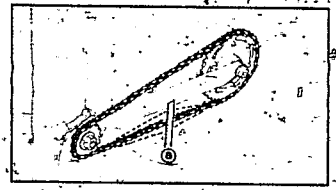
⚠ WARNING

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

1. Place the motorcycle on a level place and hold it in an upright position.

NOTE:

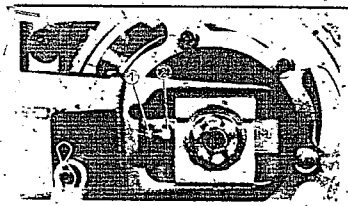
Both wheels should be on the ground without the rider on it.



2. Check
   - Drive chain slack ⓐ
     Out of specification → Adjust.

Drive chain slack:
35 ~ 45 mm (1.38 ~ 1.77 in)
with both wheels on ground without rider

3. Remove
   - Cotter pin 1
4. Loosen
   - Axle nut 2
   - Bolt 3 (brake caliper bracket)



5. Adjust
   - Drive chain slack.

Adjustment steps:
- Loosen the locknut(s) 1.
- Turn the adjuster(s) 2 in or out until the specified slack is obtained.

Turning in → Slack is increased
Turning out → Slack is decreased

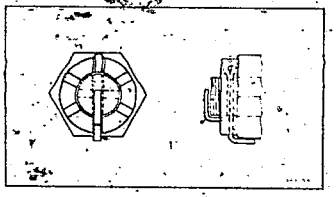
NOTE:

Turn each adjuster exactly the same amount to maintain correct axle alignment. (There are marks on each side of swingarm and on each chain puller. Use them to check for proper alignment.)

- Tighten the axle nut to specification while pushing up or down on the chain to zero slack.

	Axle nut: **105 Nm (10.5 m • kg, 75 ft • lb)**

- Tighten the locknut(s).



6. Install
   - Cotter pin 1

CAUTION:

Do not loosen the axle nut after torque tightening if the axle nut groove is not aligned with the cotter pin hole, align groove with the hole by tightening up on the axle nut.

⚠ WARNING

Always use a new cotter pin.

7. Tighten
   - Bolt (brake caliper bracket)

	Bolt (brake caliper bracket): **35 Nm (3.5 m • kg, 25 ft • lb)**

FRONT FORK ADJUSTMENT

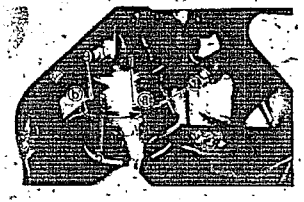
1 Spring preload
This model does not have the above mechanism

5B3J3012

REAR SHOCK ABSORBER ADJUSTMENT

⚠ WARNING

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



Spring preload

1. Adjust.
•Spring preload
Turn the adjuster 1 to direction ⓐ or ⓑ.

Turning toward ⓐ –Spring preload is harder.
Turning toward ⓑ –Spring preload is softer

Adjuster position:
Standard: 5
Minimum: 1
Maximum: 9

CAUTION:

Never turn the adjuster beyond the maximum or minimum setting.

2 Rebound damping/compression damping
This model does not have the above mechanism.

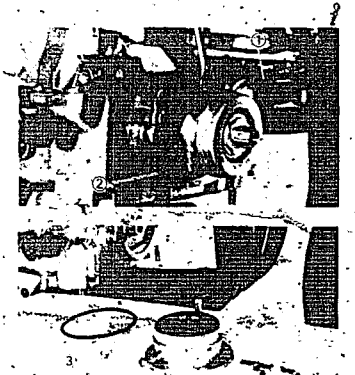
5B4F30

ENGINE OVERHAUL

ENGINE REMOVAL

NOTE:

Please insert this section between oil filter and clutch cable



OIL COOLER

1 Disconnect
•Inlet hose (oil cooler) 1
•Outlet hose (oil cooler) 2

2 Remove
•Bolt 1
(bypass valve included)
•Oil cooler 2
•O-ring 3

INSPECTION AND REPAIR

OIL COOLER

1 *Inspect*
•Oil cooler
Cracks/Damage→Replace

2 Inspect
•Inlet hose (oil cooler)
•Outlet hose (oil cooler)
Cracks/Wear/Damage→Replace

ENGINE ASSEMBLY AND ADJUSTMENT

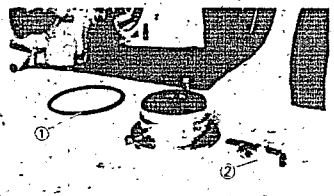
REMOUNTING ENGINE

NOTE:

Please add the following steps after the oil filter installation

OIL COOLER

1 Clean the mating surfaces of the oil cooler and the crankcase with a cloth dampened with thinner

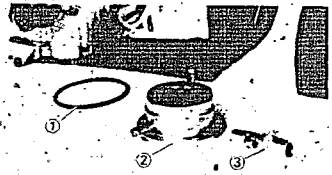


2 Lubricate:
- O-ring (oil cooler) ①
- Bolt ②

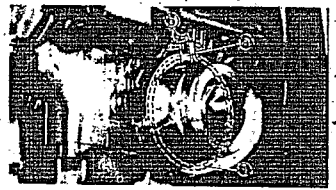
Engine oil

⚠ WARNING

Always use a new O-ring on the oil cooler.

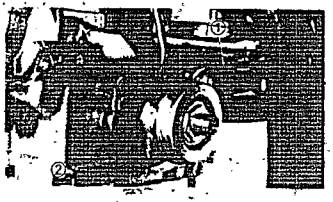


3 Install
- O-ring (oil cooler) ①
- Oil cooler ②
- Bolt ③
(bypass valve included)



NOTE:
- Make sure the O-ring ① is positioned properly.
- Insert the projection ⓐ between the two bosses ⓑ.

Bolt (oil cooler):
63 Nm (6.3 m • kg, 45 ft • lb)

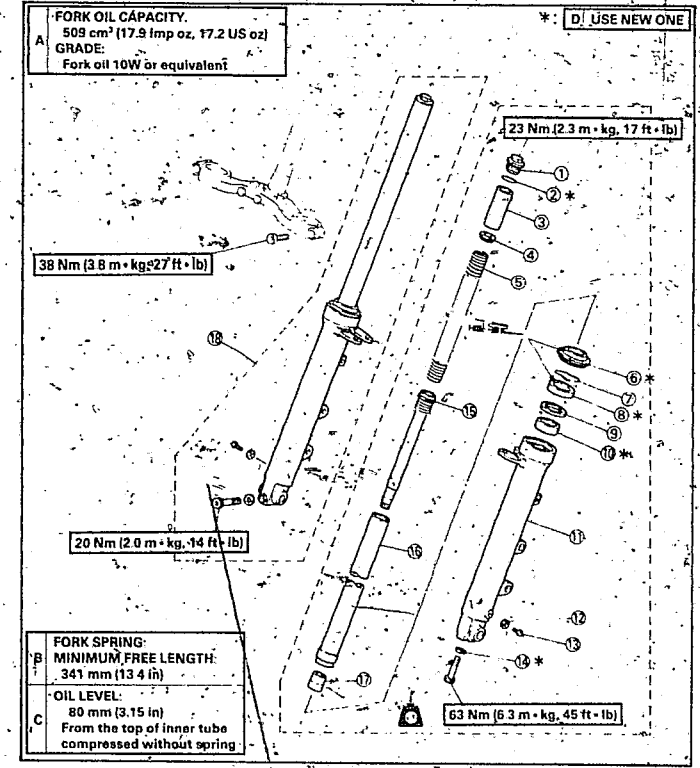


4 Connect:
- Inlet hose (oil cooler) ①
- Outlet hose (oil cooler) ②

CHASSIS

FRONT FORK

1. Cap bolt
2. O-ring
3. Spacer
4. Spring seat
5. Fork spring
6. Dust seal
7. Stopper ring
8. Oil seal
9. Plate washer
10. Slide metal
11. Outer tube
12. Gasket
13. Drain screw
14. Copper washer
15. Damper rod assembly
16. Inner tube
17. Oil lock piece
18. Front fork assembly (right)



YEU74001

REMOVAL

⚠WARNING

Support the motorcycle securely so there is no danger of it falling over.

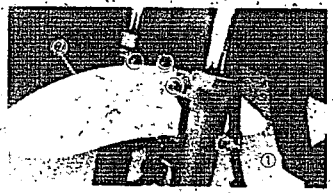
1 Remove
- Lower cowl
- Upper cowl

Refer to the "COWLING" section in the CHAPTER 3

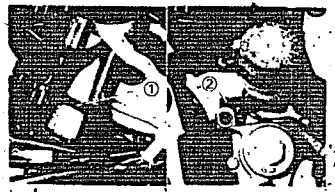
2 Elevate the front wheel by placing a suitable stand under the engine.

3 Remove
- Front wheel

Refer to the "FRONT WHEEL—REMOVAL" section.

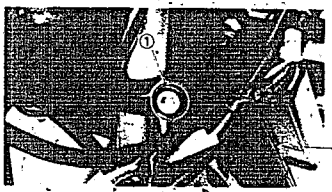


4 Remove
- Holders 1 (brake hose)
- Front fender 2



5 Remove
- Horn lead holder 1
- Reservoir tank stay 2

6 Loosen
- Pinch bolts 1 (handle crown)
- Pinch bolts 2 (handlebar)
- Cap bolts 3



7 Loosen
- Pinch bolts 1 (lower bracket)

⚠WARNING

Support the fork before loosening the pinch bolt.

8 Remove
- Front fork

YEU74001

DISASSEMBLY

1 Remove
- Cap bolt 1
- Spacer 2
- Spring seat 3
- Fork spring 4

2 Drain
- Fork oil

3 Remove
- Dust seal 1

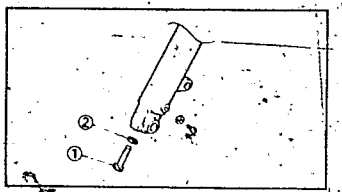
NOTE:

Use a thin screwdriver, and be careful not to scratch the inner fork tube.

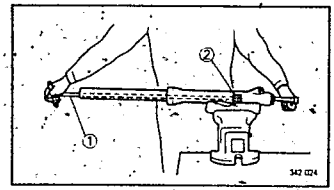
4 Remove
- Stopper ring 1

NOTE:

Use a thin screw driver, and be careful not to scratch the inner fork tube.



5 Remove
- Bolt (damper rod) 1
- Copper washer 2

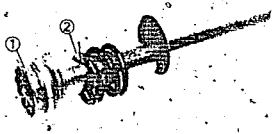


NOTE

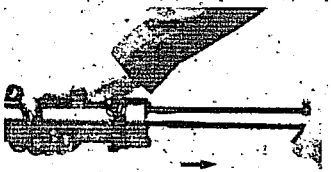
Hold the damper rod loosen the bolt (damper rod) by the T-handle ① and holder ②.

T-handle:
90890-01326
Holder:
90890-01327

6 Remove:
- Damper rod ①
- Spring ②



7 Remove:
- Inner tube



Removal steps:
- Hold the fork leg horizontally.
- Clamp the caliper mounting boss of the outer tube securely in a vise with soft jaws.
- Pull out the inner fork tube from the outer tube by forcefully, but carefully, with drawing the inner tube.

CAUTION:

Excessive force will damage the oil seal and/or the bushes. Damaged oil seal and bushing must be replaced.

Avoid bottoming the inner tube in the outer tube during the above procedure, as the oil lock piece will be damaged.

8 Remove:
- Oil seal ①
- Plate washer ②
- Slide metal ③
- Piston metal ④
- Oil lock piece ⑤

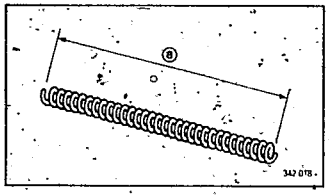
INSPECTION

1 Inspect:
- Inner fork tube ①
- Damper rod ②
- Spring ③

Scratches/Bends/Damages→Replace.

⚠ WARNING

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



2 Measure:
- Fork spring (large) free length ⓐ

Out of specification→Replace.

Fork spring (large) free length:
346 mm (13.6 in)
Minimum free length:
341 mm (13.4 in)

3 Inspect:
- Oil lock piece ①
- O-ring ② (cap bolt)

Damage→Replace.

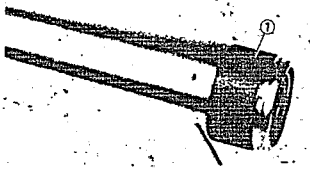
YB574004

ASSEMBLY

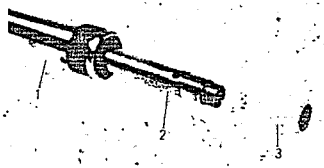
Reverse the "DISASSEMBLY" procedure.
Note the following points.

NOTE:

- In front fork reassembly, by sure to use following new parts:
- Guide bush
- Slide bush
- Oil seal
- Dust seal
- Make sure all components are clean before reassembly



1. Install
   - Piston metal (1)
   to the inner tube

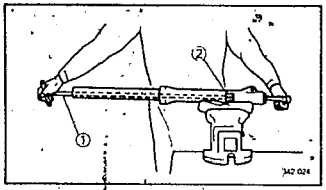


2. Install
   - Inner tube (1)
   - Damper rod assembly (2)
   - Oil lock piece (3)
   to the outer tube

CAUTION:

Allow the damper rod to slide slowly down the inner fork tube until it protrudes from the bottom, being careful not to damage the inner fork tube.

3. Install
   - Copper washer (new)
   - Bolt (damper rod)

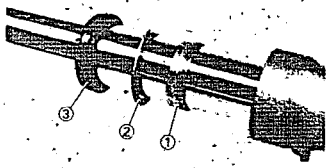


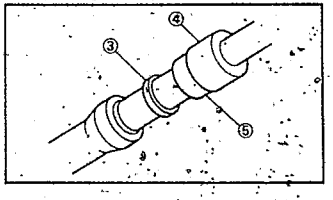
4. Tighten.
   - Bolt (damper rod)

	Bolt (damper rod): **63 Nm (6.3 m•kg, 45 ft•lb)** **LOCTITE®**

NOTE:

Tighten the bolt (damper rod) while holding the damper rod with the T-handle (1) and holder (2).





	T-handle: **90890-01326** **Holder** **90890-01327**

5. Install
   - Slide metal 1
   - Plate washer 2
   - Oil seal 3
   Use the fork seal driver weight 4 and adapter 5.

	Fork seal driver weight: **P/N 90890-01367** **Adapter:** **P/N 90890-01374**

CAUTION:

Be sure that the oil seal numbered side face upward.

NOTE:

Before installing the oil seal, apply the lithium soap base grease onto the oil seal lips.

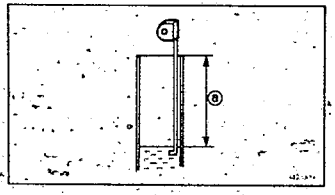
6. Install
   - Stopper ring 1
   - Dust seal

NOTE:

Fit the stopper ring correctly in the groove in the outer tube.

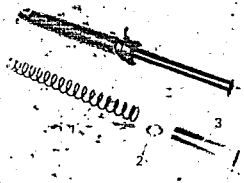
7. Fill
   - Front fork oil
   until top of inner tube end

	Fork oil grade: **Fork oil 10WT or equivalent**



8. Measure
   - Fork oil level

	Oil level (a): **80 mm (3.15 in)** **From the top of inner tube compressed without spring**



9. Install
   - Fork spring 1
   - Spring seat 2
   - Spacer 3

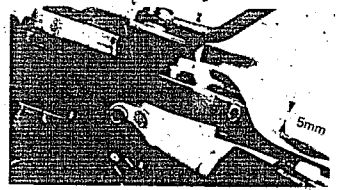
NOTE:
Place the flat surface of spring seat on upright position when installing the spring seat.

10. Install
    - O-ring 1
    - Cap bolt 2

NOTE:
- Before installing the cap bolt, apply the grease to the O-ring.
- Temporarily tighten the cap bolt with your finger.

11. Install
    - Inner tube

NOTE:
Temporarily tighten the inner tube.



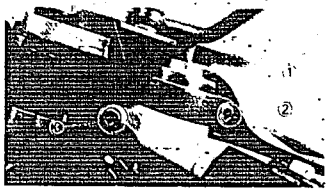
INSTALLATION
Reverse the "REMOVAL" procedure.
Note the following points.

1. Install
   - Front fork
   Temporary tighten the pinch bolts.

NOTE:
Position the inner fork tube end in such a way that it is 5 mm (0.2 in) with the top of the handle crown.

2. Tighten:
   - Pinch bolts 1 (under bracket)

	Pinch bolt (under bracket): **38 Nm (3.8 m • kg, 27 ft • lb)**



3. Tighten
   - Cap bolt 1
   - Pinch bolts 2 (handle crown)
   - Pinch bolt 3 (handlebar)

	Cap bolt **23 Nm (2.3 m • kg, 17 ft • lb)** **Pinch bolt (handle crown)** **22 Nm (2.2 m • kg, 17 ft • lb)** **Pinch bolt (handlebar)** **22 Nm (2.2 m • kg, 17 ft • lb)**

4. Install
   - Brake caliper

	Bolt (brake caliper) **35 Nm (3.5 m • kg, 25 ft • lb)**

5. Install:
   - Front wheel

	Wheel shaft: **75 Nm (7.5 m • kg, 54 ft • lb)** **Pinch bolt (wheel shaft):** **20 Nm (2.0 m • kg, 14 ft • lb)**

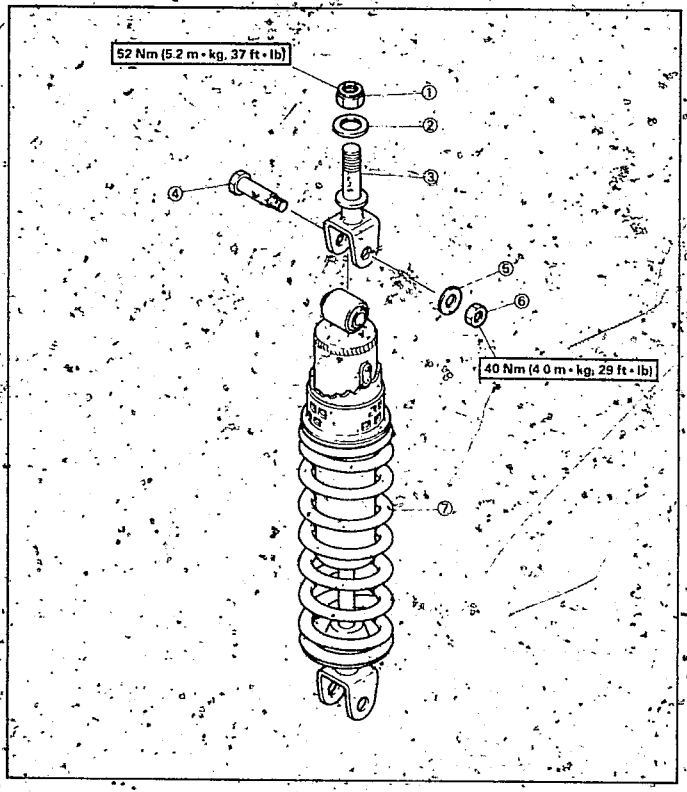
Refer to the "FRONT WHEEL—INSTALLATION" section.

6. Adjust:
   - Front fork setting

   Refer to the "FRONT FORK ADJUSTMENT" section in the CHAPTER 3.

REAR SHOCK ABSORBER AND SWINGARM

1. Nut
2. Spacer
3. Bracket
4. Bolt
5. Plate washer
6. Nut
7. Rear shock absorber assembly



YB576001

HANDLING NOTE

⚠WARNING

This shock absorber contains highly pressurized nitrogen gas. Read and understand the following information before handling the shock absorber. The manufacture can not be held responsible for property damage or personal injury that may result from improper handling.

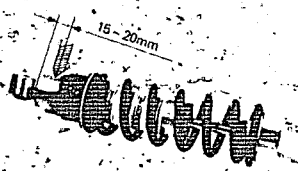
- **Do not tamper with or attempt to open the cylinder assembly.**
- **Do not subject shock absorber to an open flame or other high heat source. this may cause the unit to explode due to excessive gas pressure.**
- **Do not deform or damage the cylinder in any way. Cylinder damage will result in poor damaging performance.**
- **Take care not to scratch the contact surface of the piston rod with the cylinder; or oil could leak out.**
- **When scrapping the shock absorber, refer to the "NOTES ON DISPOSAL" section.**

YB576002

NOTES ON DISPOSAL

Disposal steps:

Gas pressure must be relased before disposing of shock absorber. To do so, drill a 2~3 mm (0.08~0.12 in) hole through the cylinder wall at a point 15~20 mm (0.6~0.8 in) from the end of the gas chamber.

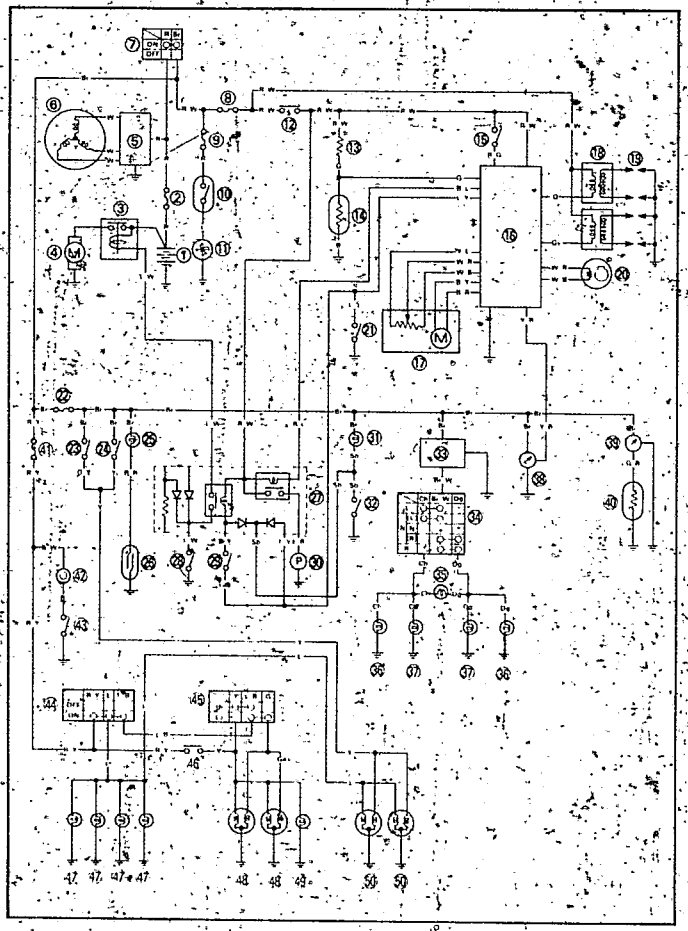


⚠WARNING

Wear eye protection to prevent eye damage from escaping gas and/or metal chips.

ELECTRICAL

FZR400RR CIRCUIT DIAGRAM (For GB)

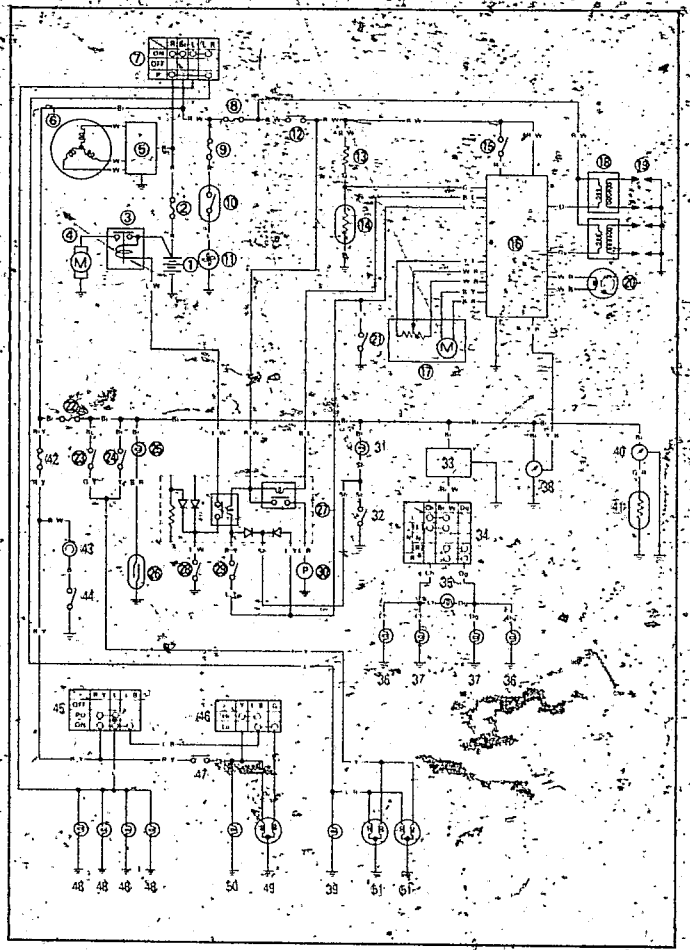


1. Battery
2. Fuse (main)
3. Starter relay
4. Starter motor
5. Rectifier/regulator
6. AC magneto
7. Main switch
8. Fuse (ignition)
9. Fuse (fan)
10. Thermo switch
11. Fan motor
12. "ENGINE STOP" switch
13. Resistor
14. Fuel sender
15. Reserve switch
16. Ignitor
17. EXUP
18. Ignition coil
19. Spark plug
20. Pick up
21. Sidestand switch
22. Fuse (signal)
23. Front brake switch
24. Rear brake switch
25. "OIL" warning indicator light
26. Oil pressure switch
27. Relay
28. "START" switch
29. Clutch switch
30. Fuel pump
31. "NEUTRAL" indicator light
32. Neutral switch
33. Flasher relay
34. "TURN" signal switch
35. "TURN" indicator light
36. Front flasher light
37. Rear flasher light
38. Tachometer
39. Engine temperature gauge
40. Thermo unit
41. Fuse (headlight)
42. Horn
43. "HORN" switch
44. "LIGHTS" switch
45. "LIGHTS" (Dimmer) switch
46. "PASS" switch
47. Meter light
48. Headlight
49. "HIGH BEAM" indicator light
50. Tail/Brake light

COLOR CODE

B	Black	W	White	L/W	Blue/White
Br	Brown	Y	Yellow	L/Y	Blue/Yellow
Ch	Chocolate	B/L	Black/Blue	R/G	Red/Green
Dg	Dark green	B/R	Black/Red	R/Y	Red/Yellow
G	Green	B/W	Black/White	R/W	Red/White
Gy	Gray	B/Y	Black/Yellow	W/B	White/Black
L	Blue	Br/W	Brown/White	W/R	White/Red
O	Orange	G/R	Green/Red	Y/B	Yellow/Black
R	Red	G/Y	Green/Yellow	Y/L	Yellow/Blue
Sb	Sky blue	L/B	Blue/Black		

FZR400RR CIRCUIT DIAGRAM (For F)



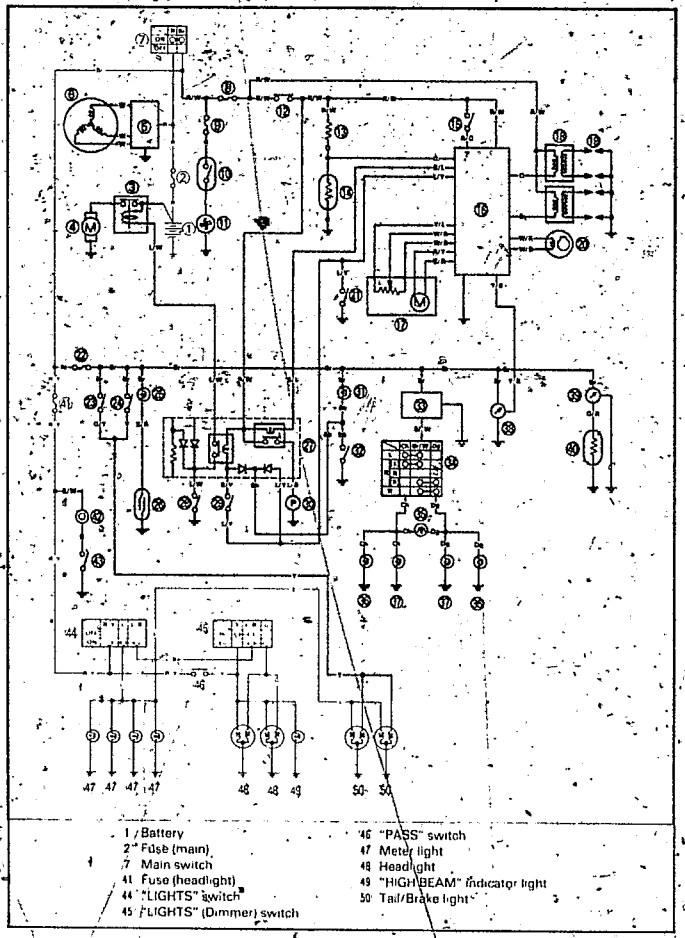
1. Battery
2. Fuse (main)
3. Starter relay
4. Starter motor
5. Rectifier/regulator
6. AC magneto
7. Main switch
8. Fuse (ignition)
9. Fuse (fan)
10. Thermo switch
11. Fan motor
12. "ENGINE STOP" switch
13. Resistor
14. Fuel sender
15. Reserve switch
16. Ignitor
17. EXUP
18. Ignition coil
19. Spark plug
20. Pick up
21. Sidestand switch
22. Fuse (signal)
23. Front brake switch
24. Rear brake switch
25. "OIL" warning indicator light
26. Oil pressure switch
27. Relay
28. "START" switch
29. Clutch switch
30. Fuel pump
31. "NEUTRAL" indicator light
32. Neutral switch
33. Flasher relay
34. "TURN" signal switch
35. "TURN" indicator light
36. Front flasher light
37. Rear flasher light
38. Tachometer
39. Auxiliary light
40. Engine temperature gauge
41. Thermo unit
42. Fuse (headlight)
43. Horn
44. "HORN" switch
45. "LIGHTS" switch
46. "LIGHTS" (Dimmer) switch
47. "PASS" switch
48. Meter light
49. Headlight
50. "HIGH BEAM" indicator light
51. Tail/Brake light

COLOR CODE

B	Black	W	White	L/R	Blue/Red
Br	Brown	Y	Yellow	L/W	Blue/White
Ch	Chocolate	B/L	Black/Blue	L/Y	Blue/Yellow
Dg	Dark green	B/R	Black/Red	R/G	Red/Green
G	Green	B/W	Black/White	R/Y	Red/Yellow
Gy	Grey	B/Y	Black/Yellow	R/W	Red/White
L	Blue	Br/W	Brown/White	W/B	White/Black
O	Orange	G/R	Green/Red	W/R	White/Red
R	Red	G/Y	Green/Yellow	Y/B	Yellow/Black
Sb	Sky blue	L/B	Blue/Black	Y/L	Yellow/Blue

LIGHTING SYSTEM (For GB)

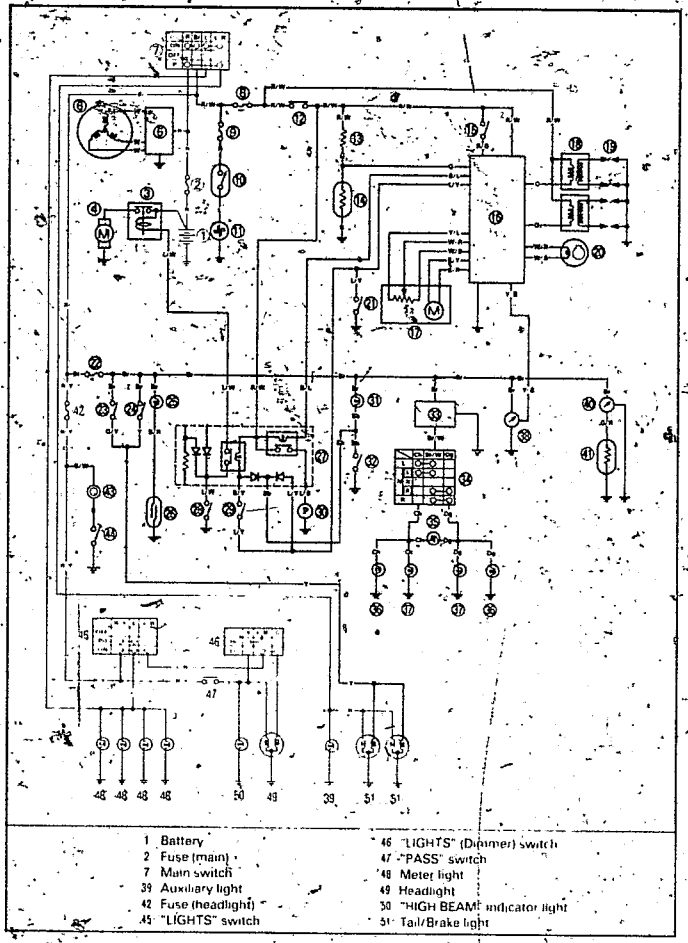
CIRCUIT DIAGRAM



1 Battery
2 Fuse (main)
7 Main switch
41 Fuse (headlight)
44 "LIGHTS" switch
45 "LIGHTS" (Dimmer) switch
46 "PASS" switch
47 Meter light
48 Headlight
49 "HIGH BEAM" indicator light
50 Tail/Brake light

LIGHTING SYSTEM (For F)

CIRCUIT DIAGRAM



1 Battery
2 Fuse (main)
7 Main switch
39 Auxiliary light
42 Fuse (headlight)
45 "LIGHTS" switch
46 "LIGHTS" (Dimmer) switch
47 "PASS" switch
48 Meter light
49 Headlight
50 "HIGH BEAM" indicator light
51 Tail/Brake light

TROUBLESHOOTING

HEADLIGHT "HIGH BEAM" INDICATOR LIGHT, TAILLIGHT, AUXILIARY LIGHT AND/OR METER LIGHT DO NOT COME ON.

Procedure

Check:

1. Fuse (main and head)
2. Battery
3. Main switch
4. "LIGHTS" switch
5. "LIGHTS" (Dimmer) switch
6. "PASS" switch
7. Wiring connection (Entire lighting system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Tail cover
  3) Fuel tank
  4) Air filter case
- Use the following special tool(s) in this troubleshooting.

Pocket tester.
90890-03112

1. Fuse (main and head)

- Remove the fuses.
- Connect the pocket tester (Ω × 1) to the fuses.
- Check the fuses for continuity.
  Refer to the "FUSE INSPECTION" in the CHAPTER 3.

NOCONTINUITY → Replace fuse(s).

CONTINUITY ↓

2. Battery

- Check the battery condition.
  Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

INCORRECT → • Clean battery terminals. • Recharge or replace battery.

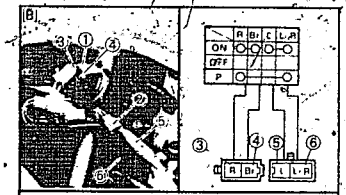
CORRECT ↓

*

*

3. Main switch

- Disconnect the main switch coupler (1, 2) from the wireharness.
- Check the switch component for the continuity between "Red (3) and Brown (4)" and "Blue (5) and Blue/Red (6) (F)" and "Red (3) and Blue/Red (6) (F)".
  Refer to the "CHECKING OF SWITCHES" section.



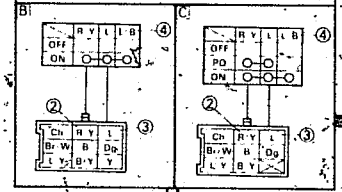
[A] For GB
[B] For F

INCORRECT → Replace main switch.

CORRECT ↓

4. "LIGHTS" switch

- Disconnect the handlebar switch (left) couplet (1) from the wireharness.
- Check the switch component for the continuity between "Red/Yellow (2) and Blue (3)" and "Red/Yellow (2) and Blue/Black (4)".
  Refer to the "CHECKING OF SWITCHES" section.



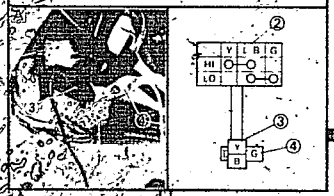
[A] For GB, F
[B] For GB
[C] For F

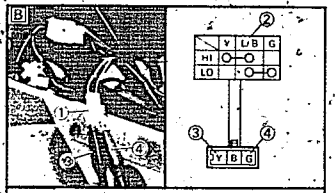
INCORRECT → Replace handlebar switch (left)

*

5. "LIGHTS" (dimmer) switch

- Disconnect the handlebar switch (left) coupler (1) from the wireharness.
- Check the switch component for the continuity between "Blue/Black (2) and Yellow (3)", and "Blue/Black (2) and Green (4)".
  Refer to the "CHECKING OF SWITCHES" section.





A For GB
B For F

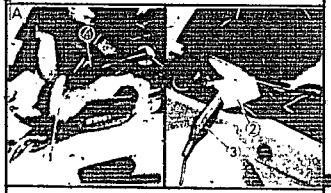
INCORRECT

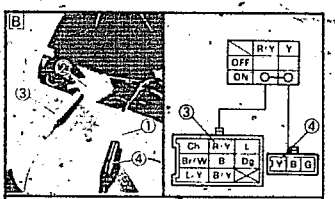
Replace handlebar switch (left).

CORRECT

6. "PASS" switch

- Disconnect the handlebar switch (left) couplers (1), (2) from the wireharness.
- Check the switch component for the continuity between "Red/Yellow (3) and Yellow (4)".
  Refer to the "CHECKING OF SWITCHES" section.





A For GB
B For F

INCORRECT

Replace handlebar switch (left)

7. Wiring connection

- Check the entire lighting system for connections.
  Refer to the "WIRING DIAGRAM" section

POOR CONNECTION

Correct

CORRECT

Check condition of each circuit for lighting system.
Refer to "LIGHTING SYSTEM CHECK" section.

LIGHTING SYSTEM CHECK

1. Headlight and "HIGH BEAM" indicator light do not come on.

1. Bulb and bulb socket

•Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

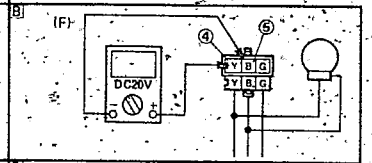
NOCONTINUITY → Replace bulb and/or bulb socket

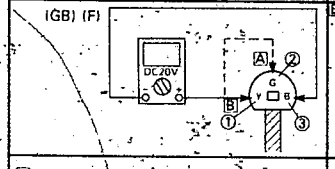
CONTINUITY ↓

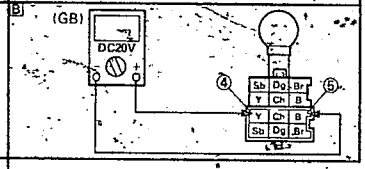
2. Voltage

•Connect the pocket tester (DC20V) to the headlight and "HIGH BEAM" indicator light couplers.

Headlight:
Tester (+) lead→Yellow ① or Green ② lead.
Tester (–) lead→Black ③ lead
"HIGH BEAM" indicator light:
Tester (+) lead→Yellow ④ lead
Tester (–) lead→Black ⑤ lead







[A] When "LIGHTS" (dimmer) switch is "LO" position.
[B] When "LIGHTS" (dimmer) switch is "HI" position.

•Turn the main switch to "ON".
•Turn the "LIGHTS" switch to "ON".
•Turn the "LIGHTS" (dimmer) switch to "LO" or "HI" position.
(•Push the "PASS" switch.)
•Check voltage (12V) on the "Green" and "Yellow" lead at bulb socket connectors.

MEETS SPECIFICATION (12V) ↓

This circuit is good.

Wiring circuit from main switch to bulb socket connector is faulty, repair.

2. Meter light does not come on.

1. Bulb and bulb socket

•Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

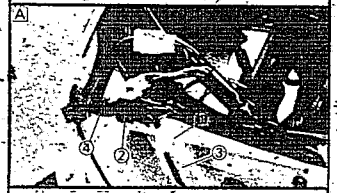
NOCONTINUITY → Replace bulb and/or bulb socket

CONTINUITY ↓

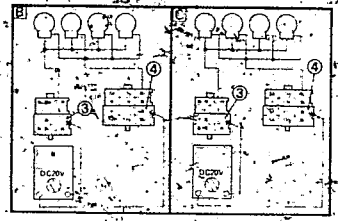
2. Voltage

•Connect the pocket tester (DC20V) to the bulb socket coupler ①, ②.

Tester (+) lead→Blue ③ terminal
Tester (–) lead→Black ④ terminal



[A] For GB, F
[B] For GB
[C] For F



•Turn the main switch to "ON".
•Turn the "LIGHTS" switch to "PO" or "ON".
•Check for voltage (12V) on the "Blue" lead at the bulb socket connector.

OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socket connector is faulty, repair.

MEETS SPECIFICATION (12V) ↓

This circuit is good.

3. Auxiliary light does not come on. (For F)

1. Bulb and bulb socket

•Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NOCONTINUITY → Bulb and/or bulb socket are faulty, replace.

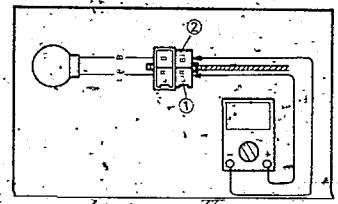
CONTINUITY

2. Voltage

•Connect the pocket tester (DC20V) to the bulb socket connector.

Tester (+) lead → Blue/Red ① lead
Tester (−) lead → Black ② lead

•Turn the main switch to "ON".
•Turn the "LIGHTS" switch to "PO".
•Check for voltage (12V) on the Blue/Red lead at the bulb socket connector.



OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socket connector is faulty, repair.

MEETS SPECIFICATION (12V)

This circuit is good.

4. Tailight does not come on.

1. Bulb and bulb socket

•Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NOCONTINUITY → Replace bulb and/or bulb socket.

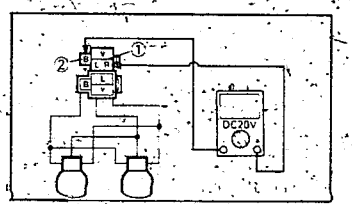
CONTINUITY

2. Voltage

•Connect the pocket tester (DC20V) to the bulb socket connector.

Tester (+) lead → Blue/Red ① terminal
Tester (−) lead → Black ② terminal

•Turn the main switch to "ON".
•Check for voltage (12V) on the Blue/Red lead at the bulb socket connector.



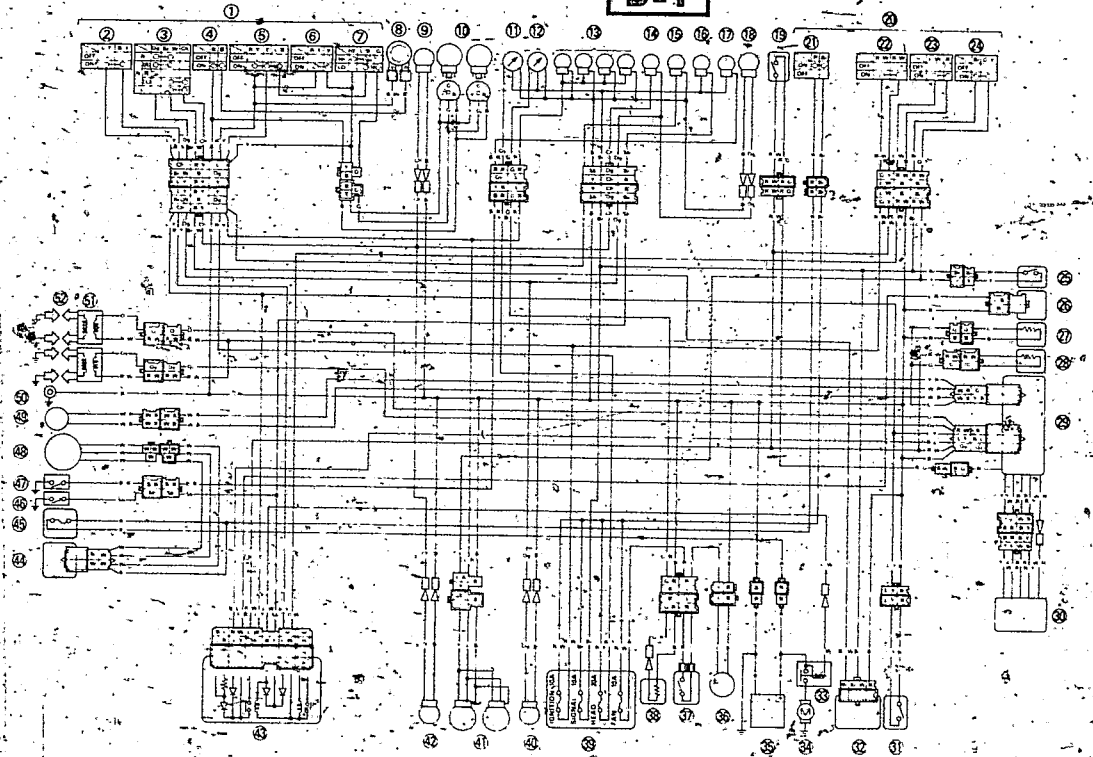
OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socket connector is faulty, repair.

MEETS SPECIFICATION (12V)

This circuit is good.

FZR400RR WIRING DIAGRAM (For GB)

D-1



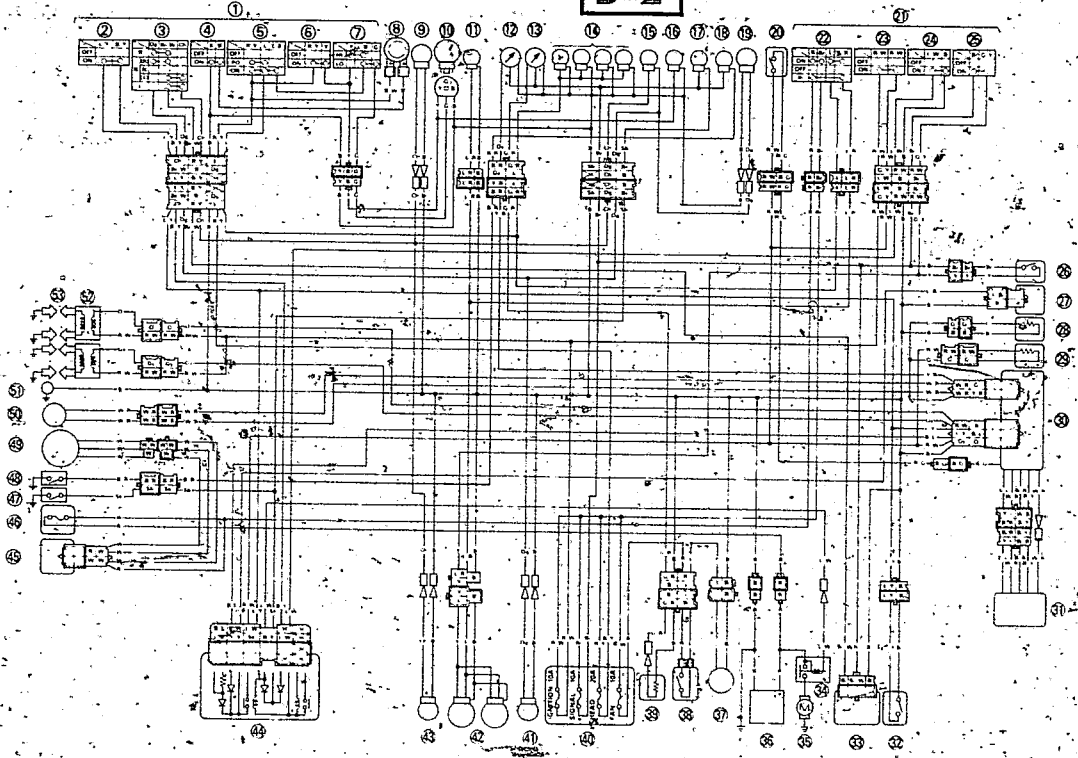
1. Handlebar switch (left)
2. Clutch switch
3. "TURN" signal switch
4. "HORN" switch
5. "LIGHTS" switch
6. "PASS" switch
7. "LIGHTS" (Dimmer) switch
8. Horn
9. Front flasher light (left)
10. Headlight
11. Tachometer
12. Engine temperature gauge
13. Meter light
14. "TURN" indicator light
15. "HIGH BEAM" indicator light
16. "NEUTRAL" indicator light
17. "OIL" warning indicator light
18. Front flasher light (right)
19. Reserve switch
20. Handlebar switch (right)
21. Main switch
22. "ENGINE STOP" switch
23. "START" switch
24. Front brake switch
25. Rear brake switch
26. Fuel pump
27. Fuel sender
28. Resistor
29. Ignitor unit
30. Ex-up
31. Sidestand switch
32. Flasher relay
33. Starter relay
34. Starter motor
35. Battery
36. Fan motor
37. Thermo switch
38. Thermo unit
39. Fuse box
40. Rear flasher light (right)
41. Tail/brake light
42. Rear flasher light (left)
43. Relay
44. Rectifier/Regulator
45. Main fuse
46. Neutral switch
47. Oil pressure switch
48. A.C. magneto
49. Pickup coil
50. Frame earth
51. Ignition coil
52. Spark plug

COLOR CODE

B	Black	B/Y	Black/Yellow
Br	Brown	Br/W	Brown/White
Ch	Chocolate	G/R	Green/Red
Dg	Dark green	G/Y	Green/Yellow
G	Green	L/B	Blue/Black
Gy	Gray	L/W	Blue/White
L	Blue	L/Y	Blue/Yellow
O	Orange	R/G	Red/Green
R	Red	R/W	Red/White
Sb	Sky blue	R/Y	Red/Yellow
W	White	W/B	White/Black
Y	Yellow	W/R	White/Red
B/L	Black/Blue	Y/B	Yellow/Black
B/R	Black/Red	Y/L	Yellow/Blue
B/W	Black/White		

FZR400RR WIRING DIAGRAM (For F)

D-2



1. Handlebar switch (left)
2. Clutch switch
3. "TURN" signal switch
4. "HORN" switch
5. "LIGHTS" switch
6. "PASS" switch
7. "LIGHTS" (Dimmer) switch
8. Horn
9. Front flasher light (left)
10. Headlight
11. Auxiliary light
12. Tachometer
13. Engine temperature gauge
14. Meter light
15. "TURN" indicator light
16. "HIGH BEAM" indicator light
17. "NEUTRAL" indicator light
18. "OIL" warning indicator light
19. Front flasher light (right)
20. Reserve switch
21. Handlebar switch (right)
22. Main switch
23. "ENGINE STOP" switch
24. "START" switch
25. Front brake switch
26. Rear brake switch
27. Fuel pump
28. Fuel sender
29. Resistor
30. Ignitor unit
31. Ex-up
32. Sidestand switch
33. Flasher relay
34. Starter relay
35. Starter motor
36. Battery
37. Fan motor
38. Thermo switch
39. Thermo unit
40. Fuse box
41. Rear flasher light (right)
42. Tail brake light
43. Rear flasher light (left)
44. Relay
45. Rectifier/Regulator
46. Main fuse
47. Neutral switch
48. Oil pressure switch
49. A.C. magneto
50. Pickup coil
51. Frame earth
52. Ignition coil
53. Spark plug

COLOR CODE

B	Black	B/Y	Black/Yellow
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Gy	Gray	L/W	Blue/White
L	Blue	L/Y	Blue/Yellow
O	Orange	L/R	Blue/Red
R	Red	R/G	Red/Green
Sb	Sky blue	R/W	Red/White
W	White	R/Y	Red/Yellow
Y	Yellow	W/B	White/Black
B/L	Black/Blue	W/R	White/Red
B/R	Black/Red	Y/B	Yellow/Black
B/W	Black/White	Y/L	Yellow/Blue