TABLE OF CONTENTS

VIEW OF SUZUKI SP370

Left Side

Right Side

GENERAL INFORMATION

CONTENTS

1

SPECIFICATIONS

DIMENSIONS AND WEIGHT	
Overall length	2 200 mm (86.6 in.)
Overall width	850 mm (33.5 in.)
Overall height	1 180 mm (46.5 in.)
Wheelbase	1 420 mm (55.9 in.)
Ground clearance	240 mm (9.4 in.)
Dry weight	123 kg (271 lbs)
ENGINE	
Type	Four-stroke cycle, air-cooled, OHC
Number of cylinder	1
Bore	85.0 mm (3.346 in.)
Stroke	65.2 mm (2.567 in.)
Piston displacement	369 cm^3 (22.5 cu.in.)
Compression ratio	8.9 : 1
Carburetor	MIKUNI VM32SS, single
Air cleaner	Polyurethane foam element
Starter system	Primary kick
Lubrication system	Wet sump
TRANSMISSION	
Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Primary reduction	3.045 (67/22)
Final reduction	2.800 (42/15)
Gear ratios, Low	2.636 (29/11)
2nd	1.750 (28/16)
3rd	1.294 (22/17)
4th	1.000 (20/20)
Top	0.818 (18/22)
Drive chain	DAIDO #520DS, 100 links
CHASSIS	
Front suspension	Telescopic, oil dampened
Rear suspension	Swinging arm, gas/oil dampened, spring 5-way adjustable
Steering angle	43° (right and left)
Caster	58°
Trail	146 mm (5.75 in.)
Turning radius	2.3 m (7.5 ft)
Front brake	Internal expanding
Rear brake	Internal expanding
Front tire size	3.00-21-4PR
Rear tire size	4.00-18-4PR
Front tire pressure	See page 10-13
Rear tire pressure	See page 10-13
ELECTRICAL	
Ignition type	Magneto
Ignition timing	10° B.T.D.C. below 1 500 rpm and 35° B.T.D.C. above 3 500 rpm
Spark plug	NGK D8EA or NIPPON DENSO X24ES-U for other market than Canada, NGK DR8ES-L for Canada
Battery	6V 4AH/10 Hours
Generator	Flywheel magneto
Fuse	15A
CAPACITIES	
Fuel tank including reserve	8.5 lit (2.2/1.9 US/Imp gal.)
reserve	1.8 lit (1.9/1.6 US/Imp. qt.)
Engine oil	1.6 lit (1.7/1.4 US/Imp. qt.)
Front fork oil	252 ml (8.52/8.87 US/Imp oz) in each leg
FUEL TYPE	Unleaded or lowlead gasoline
OIL TYPE	SAE 10W/40
FRONT FORK OIL	SAE 10W/20

* Specifications are subject to change without notice.

GENERAL INFORMATION

IDENTIFICATION TABLE

SERIAL NUMBER LOCATION

The frame serial number ① is stamped on the steering head pipe. The engine serial number ② is located on the left side of the crankcase. These numbers are required especially for registering the machine and ordering spare parts.

Fig. 1-1.

Fig. 1-2.

FUEL, OILS AND BREAKING-IN PROCEDURE

FUEL

Gasoline used should be graded 85 ~ 95 octane or higher. An unleaded or low-lead gasoline type is recommended.

ENGINE OIL

Be sure that the engine oil you use comes under API classification of SE or SD and that its viscosity rating is **SAE 10W-40**. If **SAE 10W-40** motor oil is not available, select the oil viscosity according to the following chart:

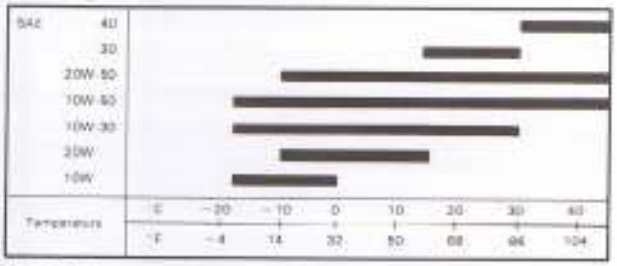


Fig. 1-3.

FRONT FORK OIL

SAE 10W/20

BREAKING-IN PROCEDURE

During manufacture only the best possible materials are used and all machined parts are finished to a very high standard but it is still necessary to allow the moving parts to "**BREAK-IN**" before subjecting the engine to maximum stresses. The future performance and reliability of the engine depends on the care and restraint exercised during its early life. The general rules are as follows:

1. Keep to these break-in engine speed limits:

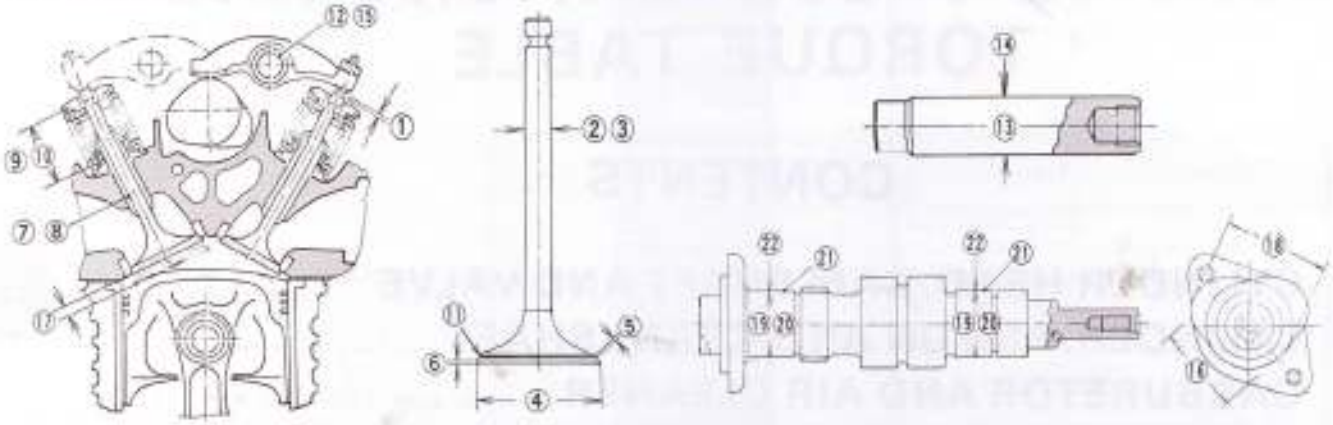
Initial	500 miles (800 km)	Below 4 500 rpm
Up to	1 000 miles (1 600 km)	Below 5 500 rpm
Over	1 000 miles (1 600 km)	Below 8 000 rpm

2. Upon reaching an odometer reading of 1 000 miles (1 600 km), you can subject to motorcycle to full throttle operation. However, do not exceed 8 000 rpm at any time.

SERVICE SPECIFICATIONS AND TORQUE TABLE

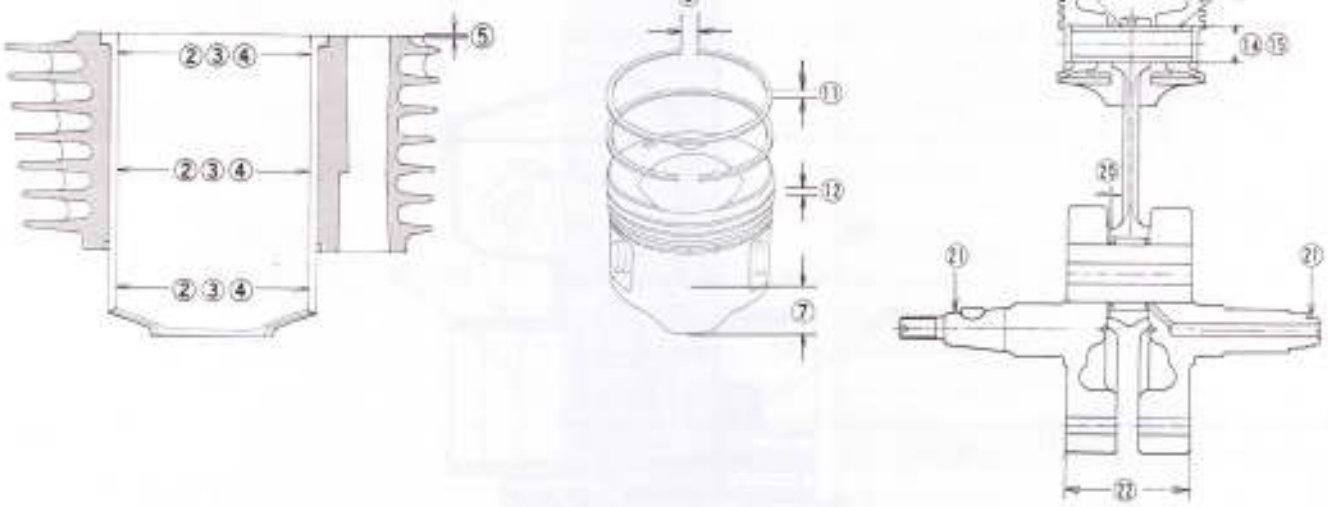
CONTENTS

CYLINDER HEAD, CAM SHAFT AND VALVE



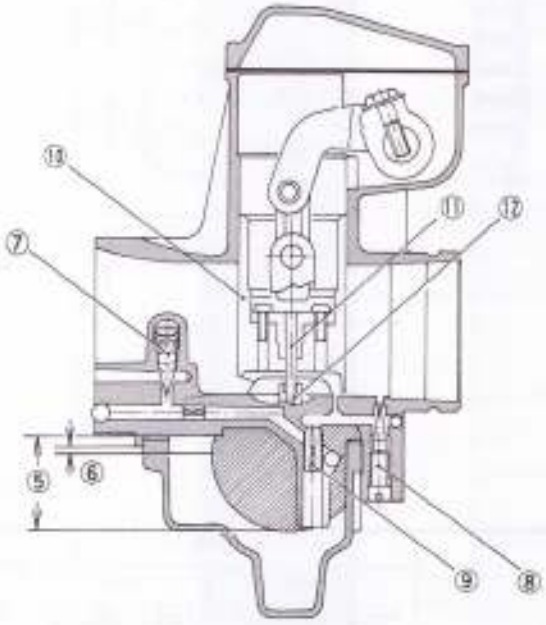
NO.	ITEM		STD		SERVICE LIMIT	
			(mm)	(in.)	(mm)	(in.)
1	Valve Clearance - (Cold Engine)		1/8 turn-back (0.08)	1/8 turn-back (0.0031)	—	—
2	Valve Stem Dia O.D.	IN	6.690~6.975	0.2634~0.2746	6.90	0.2717
		EX	6.695~6.960	0.2636~0.2740	6.80	0.2677
3	Valve Stem Axial Runout	IN	0.01	0.0004	0.05	0.0019
		EX	0.01	0.0004	0.05	0.0019
4	Valve Head Dia.	IN	42.0	1.650	—	—
		EX	36.0	1.420	—	—
5	Valve Seat Width		1.0~1.2	0.040~0.047	1.5	0.006
6	Valve Margin	IN	1.0~1.4	0.040~0.055	0.5	0.020
		EX	1.0~1.4	0.040~0.055	0.5	0.020
7	Valve Guide I.D.	IN	6.995~7.015	0.2754~0.2761	7.1	0.2795
		EX	6.995~7.015	0.2754~0.2761	7.1	0.2795
8	Valve Stem/Guide Clearance	IN	0.020~0.050	0.0008~0.0019	0.19	0.0074
		EX	0.035~0.070	0.0014~0.0027	0.30	0.0118
9	Valve Spring Free Length	IN	36.95	1.455	35.5	1.3976
		OUT	43.0	1.693	41.5	1.6388
10	Valve Spring Tension	IN	24.2~27.8 kg/ 23 mm	53~61 lbs/ 0.9 in.	—	—
		OUT	50.4~58.3 kg/ 27 mm	111~129 lbs/ 1.06 in.	—	—
11	Valve seat runout	IN	0.03	0.0012	0.1	0.0039
		EX	0.03	0.0012	0.1	0.0039
12	Valve Rocker Arm I.D.		12.000~12.018	0.4725~0.4731	12.050	0.4744
13	Rocker Arm Shaft O.D.		11.992~11.995	0.4722	11.963	0.4699
14	Rocker Arm Shaft Runout		0.005	0.0002	0.06	0.0024
15	Valve Rocker Arm/Shaft Clearance		0.005~0.026	0.0002~0.0010	0.10	0.0040
16	Cam Base Circle Dia.		33.0	1.299	—	—
17	Valve Lift		9.0	0.354	—	—
18	Cam Lobe Height		39.880~39.920	1.5701~1.5716	39.78	1.5661
19	Camshaft Bearing Surface O.D.		25.000~25.021	0.9843~0.9850	24.970	0.9831
20	Camshaft Journal I.D.		24.959~24.980	0.9826~0.9834	—	—
21	Camshaft Journal Clearance		0.020~0.062	0.008~0.0024	0.15	0.0059
22	Camshaft Deflection		0.03	0.0012	0.1	0.0039
23	Camshaft Chain Size		DID219FTS	—	—	—
24	Number of Chain Links			—	—	—

CYLINDER, PISTON AND CRANKSHAFT



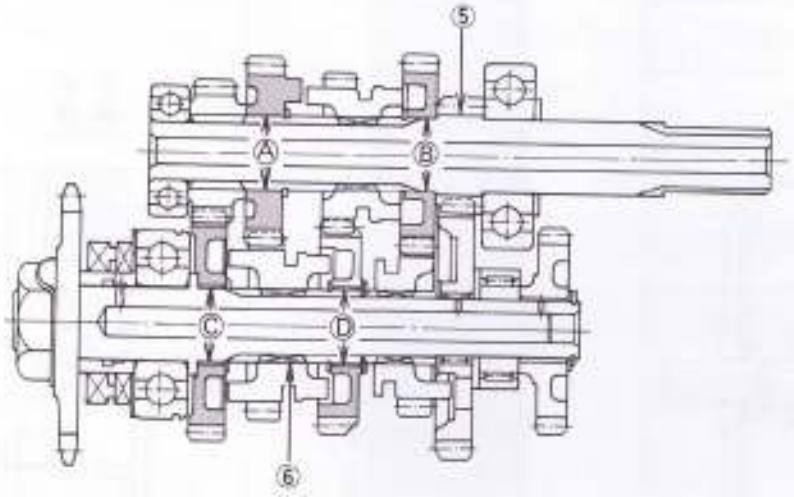
NO	ITEM		STD (mm)	STD (in.)	SERVICE LIMIT (mm)	SERVICE LIMIT (in.)
1	Compression Pressure		10～13 kg/cm²	142～184 psi	7.0 kg/cm²	100 psi
2	Cylinder Bore Dia.		85.000～85.015	3.3465～3.3470	85.10	3.3504
3	Cylinder Bore Taper		0.005	0.0002	——	——
4	Cylinder Bore Out-of-Roundness		0.005	0.0002	——	——
5	Cylinder Warpage		0.03	0.0012	0.1	0.0039
6	Cylinder Head Warpage		0.03	0.0012	0.2	0.0078
7	Piston Dia/Measured at 15 mm (0.59 in.) above Skirt End		84.935～84.950	3.3439～3.3444	84.90	3.343
8	Piston/Cylinder Clearance		0.060～0.070	0.0024～0.0027	0.120	0.0047
9	Piston Ring Free End Gap	1st	7.0	0.276	5.0	0.197
		2nd	7.5	0.295	6.5	0.256
10	Piston Ring End Gap	1st	0.4～0.7	0.0157～0.0275	0.8	0.0315
		2nd	0.4～0.7	0.0157～0.0275	0.8	0.0315
11	Piston Ring Thickness	1st	1.17～1.19	0.0461～0.0468	1.10	0.043
		2nd	1.47～1.49	0.0579～0.0586	1.40	0.055
12	Piston Ring Groove Width	1st	1.22～1.24	0.0480～0.0488	1.30	0.051
		2nd	1.51～1.53	0.0594～0.0602	1.60	0.063
		Oil	2.81～2.83	0.1106～0.1114	2.90	0.114
13	Piston Ring/Ring Groove Clearance	1st	0.03～0.07	0.0012～0.0027	0.17	0.00669
		2nd	0.02～0.06	0.0008～0.0023	0.16	0.00629
14	Piston Pin O.D.		19.995～20.000	0.7872～0.7874	19.960	0.7858
15	Piston Pin Bore I.D.		20.002～20.008	0.7875～0.7877	20.060	0.7898
16	Piston Pin/Bore Clearance		0.0002～0.0013	0.0001～0.0005	0.1	0.0039
17	Con Rod Small End Bore		20.012～20.020	0.7879～0.7881	20.060	0.7898
18	Piston Pin/Rod Bore Clearance		0.012～0.025	0.0005～0.0009	0.05	0.0019
19	Con Rod Deflection Std/Limit		——	——	0.16	0.0063
20	Con Rod Side Clearance		0.1～0.55	0.0039～0.0216	1.0	0.0394
21	Crankshaft Runout		0.05	0.0019	0.05	0.0020
22	Crankshaft Width/Wheel to Wheel		70.9～71.1	2.7913～2.7992	——	——

CARBURETOR AND AIR CLEANER



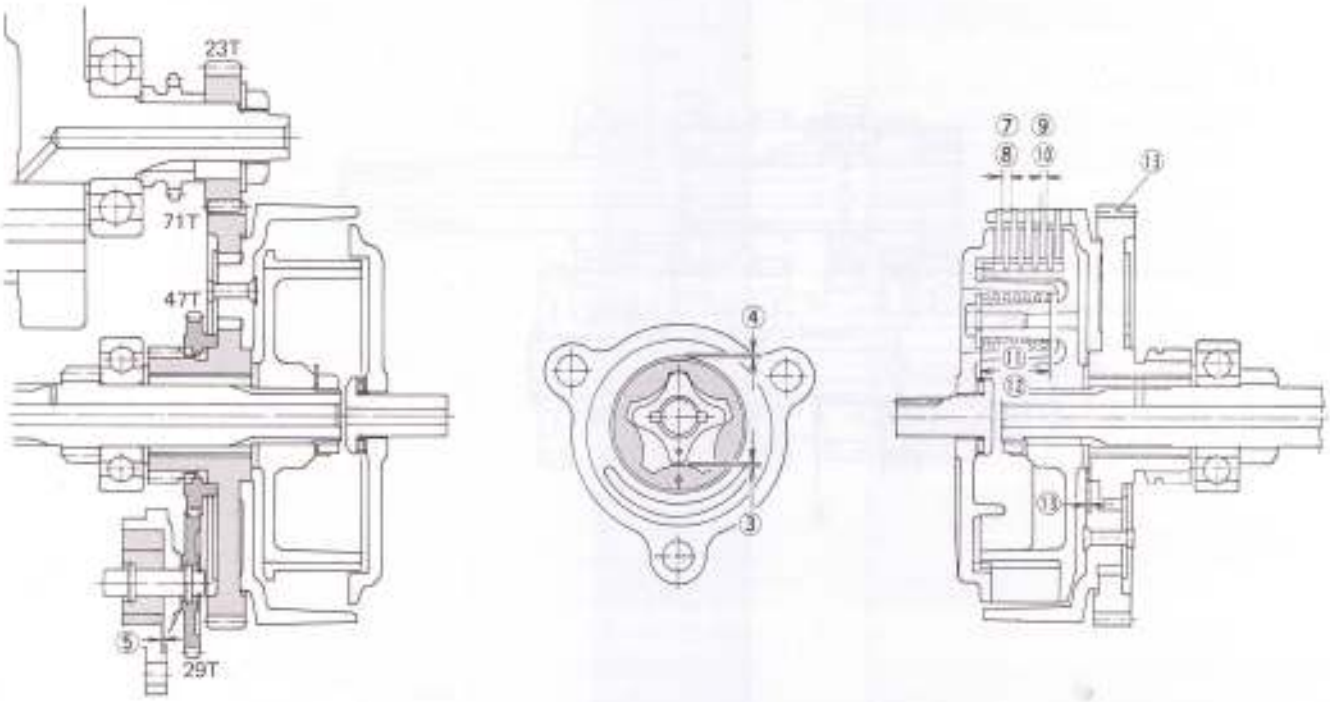
NO.	ITEM	SPECIFICATIONS
1	Idle RPM	1,300 r.p.m.
2	Carb. Type	MIKUNI VM32SS
3	Carb. I.D. Number	32410
4	Bore Size	32 mm (1.260 in.)
5	Float Level Dry Measure	22.5 mm (0.886 in.)
6	Float Level Wet Measure	5 mm (0.197 in.)
7	Air Screw	2.0
8	Pilot Screw	1.0
9	Pilot Air Jet	1.0
10	Pilot Fuel Jet	#25
11	Cut-a-Way	□2.5
12	Jet Needle	6CH2-4
13	Needle Jet	P-7
14	Main Jet	#125
15	Throttle Cable Free Play	1.0~1.5 mm (0.04~0.06 in.)
16	Air Filter-Type	Polyurethane fam element filter
17	Recommended Filter Oil Amount	18.0~22.0g (0.64~0.77 oz.) 20~25 cc (0.68~0.84 US oz.)

TRANSMISSION AND GEAR SHIFTING



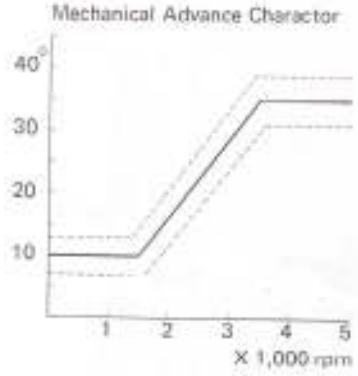
NO.	ITEM		STD (mm)	STD (in.)	SERVICE LIMIT (mm)	SERVICE LIMIT (in.)
1	Shift Pawl Return Spring Free Length		10.5	0.4133	—	—
2	Cam Stopper Spring Free Length		47.0	1.8503	—	—
3	Gear I.D.	A	19.985~22.006	0.7868~0.8663	—	—
		B	19.985~22.006	0.7868~0.8663	—	—
		C	19.985~22.006	0.7868~0.8663	—	—
		D	19.985~22.006	0.7868~0.8663	—	—
4	Shaft O.D.	A	19.939~19.960	0.7868~0.8663	—	—
		B	19.939~19.960	0.7868~0.8663	—	—
		C	19.939~19.960	0.7868~0.8663	—	—
		D	19.939~19.960	0.7868~0.8663	—	—
5	Countershaft Deflection		0.03	0.0011	—	—
6	Driveshaft Deflection		0.03	0.0011	—	—
7	Shift Fork Shaft Deflection		0.03	0.0011	—	—
8	Shift Fork Shaft O.D.		9.957~9.984	0.3920~0.3930	—	—
9	Shift Fork Bore I.D.		10.000~10.022	0.3937~0.3945	—	—
10	Shift Fork/Shift Shaft Clearance		0.038~0.065	0.0015~0.0025	—	—
11	Shift Fork Thickness		3.95~4.05	0.1555~0.1594	3.85	0.152
12	Shift Fork to Gear Groove Clearance		0.20~0.40	0.0079~0.0157	0.60	0.024
13	Drivechain - Max. Stretch @20 pins		317.5	12.5	323.0	12.716
14	Drivechain Size and Length		#520 X 100ℓ			

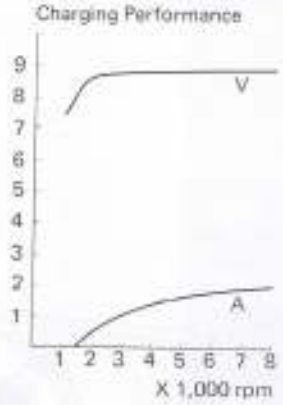
OIL PUMP AND CLUTCH

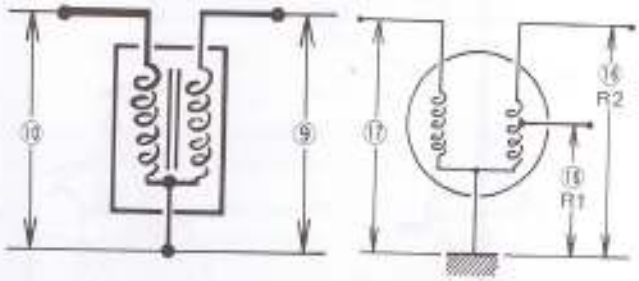


NO.	ITEM	STD		SERVICE LIMIT	
		(mm)	(in.)	(mm)	(in.)
1	Oil Pump Output Pressure/ 60°C (140°F))	0.20~0.45 kg/ cm²	2.8~6.4 psi	0.20~0.45 kg/ cm²	2.8~6.4 psi
2	Operational Speed (Reduction Ratio)	500 r.p.m. (5.0:1)	——	——	——
3	Tip Clearance	0.03~0.06	0.0012~0.0023	0.2	0.0078
4	Pump Body Clearance	0.055~0.136	0.0022~0.0053	0.25	0.0098
5	Pump End Clearance	0.035~0.085	0.0014~0.0033	0.15	0.0059
6	Clutch Drive Plate Thickness	3.4~3.6	0.134~0.141	3.2	0.126
7	Clutch Drive Plate Warpage	0.1	0.0039	0.1	0.004
8	Clutch Driven Plate Thickness	1.94~2.06	0.076~0.081	——	——
9	Clutch Driven Plate Warpage	——	——	0.2	0.0078
10	Spring Length/Free Length	40.5	1.594	39.1	1.539
11	Spring Pressure				
12	Primary Drive/Driven Gear Backlash	0.02	0.00078	0.1	0.004
13	Primary Driven Gear Lateral Movement	0.2~0.3	0.0079~0.0118	——	——

ELECTRICAL EQUIPMENTS AND FUNCTIONS



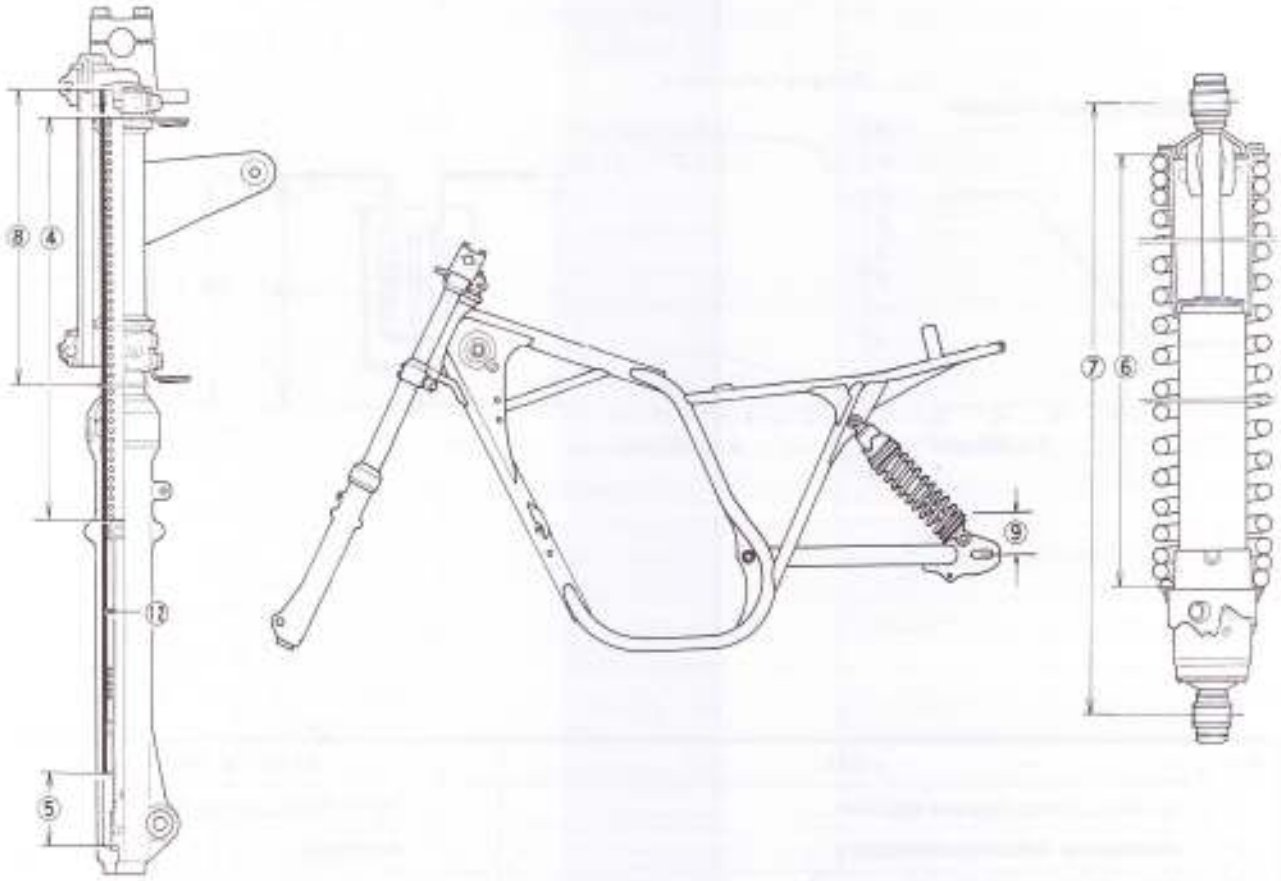




NO.	ITEM	SERVICE DATA
1	Ignition Timing Degrees and mm	10°/1500 r.p.m. (0.754)
2	Mechanical Advance Character	As shown
3	Spark Plug Heat Range/Size/Type	See table below
4	Spark Plug Gap	0.6~0.7 mm (0.024~0.028 in.)
5	Contact Point Gap	0.3~0.4 mm (0.012~0.016 in.)
6	Contact Point Dwell	295° @ Camshaft
7	Spark Performance	Over 12 kV @ 1 atm
8	Condenser Capacity Mfd.	0.20~0.24 μF
9	Ignition Coil Resistance (Primary)	0.75Ω
10	Ignition Coil Resistance (Secondary)	5.7 kΩ
11	Spark Plug Cap Resistance	10 kΩ
12	Charging Performance	As shown
13	Battery Capacity/Code Number Specific Gravity	6N4B-2A, 6V4AH 1.26 @20°C
14	Fuse Size	15A
15	Magneto (Primary Coil Resistance)	2.3Ω
16	Magneto (Lighting Coil Resistance)	0.24Ω
17	Magneto (Charging Coil Resistance)	0.16Ω
18	Rectifier - Type	Half-wave Rectification
19	Headlight Max Voltage	9V/8,000 r.p.m.
20	Turn Signal Relay - Number of Clicks/Minute	85 C/M

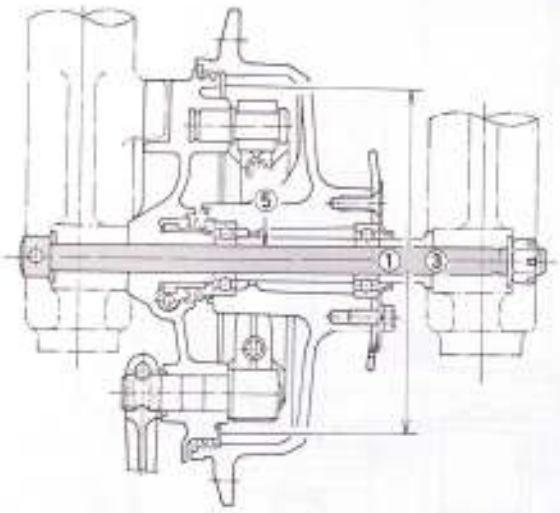
	HOT TYPE	STANDARD	COLD TYPE
NGK	D7EA (DR7ES-L for Canada)	D8EA (DR8ES-L for Canada)	D9EA (DR8ES for Canada)
ND	X22ES-U	X24ES-U	X27ES-U

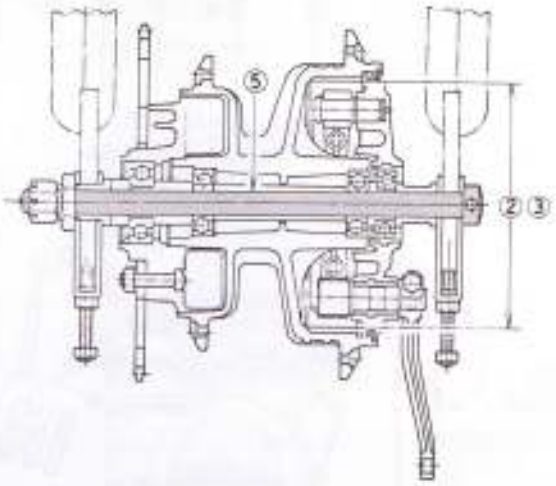
SUSPENSION

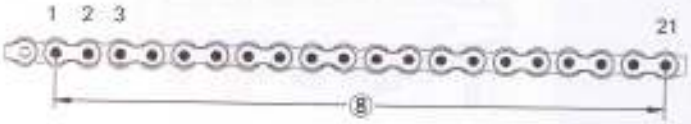


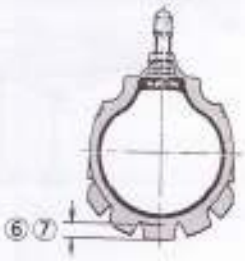
NO.	ITEM	STD		SERVICE LIMIT	
		(mm)	(in.)	(mm)	(in.)
1	Swing arm deflection on frame (axle shaft)	0.5	0.02	1.0	0.04
2	Fork Fluid Viscosity	SAE10W/20	——	——	——
3	Fork Fluid Capacity Drain/Overhaul (one leg)	252 cc	8.52/8.87 US/Imp.oz	——	——
4	Fork Spring Free Length	578.5	22.78	——	——
5	Front Fork Travel	195.0	7.68	——	——
6	Rear Shock Spring Free Length	——	——	——	——
7	Rear Shock Length	340	13.39	——	——
8	Fork Oil Level (max. compression)	181	7.13	——	——
9	Rear Wheel Stroke	131	5.16	——	——
10	Front Fork Inner Tube Runout	——	——	——	——
11	Front Fork Inner Tube Piston Dia.	28.0	1.10	——	——
12	Front Fork Outer Tube Inner Dia.	36.0	1.42	——	——
13	Swing Arm Pivot Bushing Inner Dia.	14.000~14.040	0.5512~0.5527	——	——
14	Swing Arm Spacer Outer Dia.	14.2	0.559	——	——

BRAKES AND WHEELS



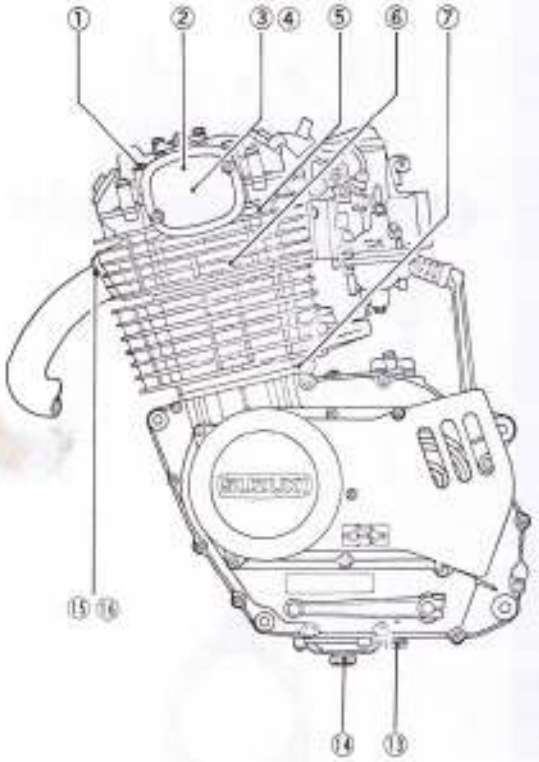


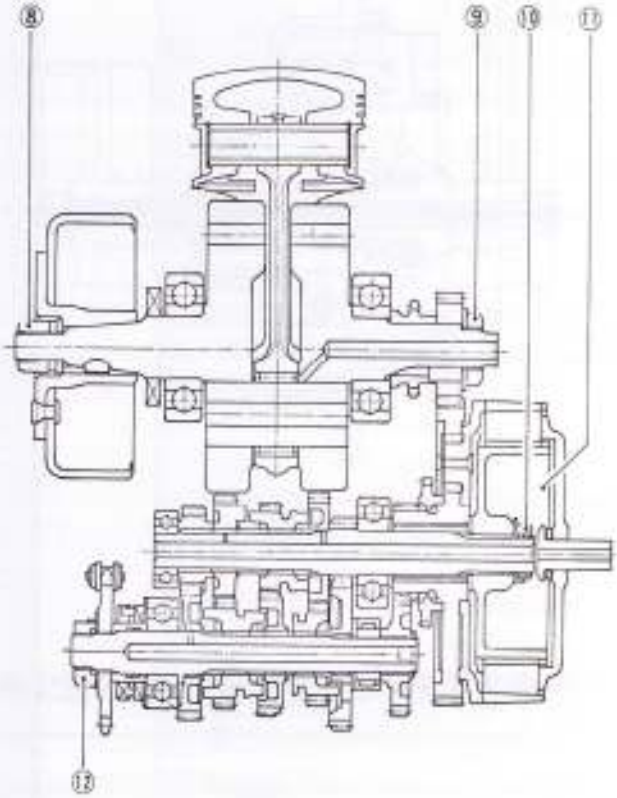




NO.	ITEM	STD		SERVICE LIMIT	
		(mm)	(in.)	(mm)	(in.)
1	Front Brake Drum Dia	150	5.906	150.7	5.933
2	Rear Brake Drum Dia	150	5.906	150.7	5.933
3	Brake Lining	149.7	5.894	146.0	5.748
4	Wheel Rim Runout Axial, Lateral	1.50	0.0590	2.0	0.08
5	Axle Runout	0.15	0.0059	0.25	0.098
6	Front Wheel Tread Depth	8.0	0.315	1.6	0.06
7	Rear Wheel Tread Depth	11.0	0.433	2.0	0.08
8	Drive Chain Length (20 Pitches)	317.5	12.5	323.0	12.7
9	Drive Chain	TYPE ..... DID 520DS SIZE ..... #520 NUMBER OF LINK 100			
10	Tire Size	FRONT ..... 3.00-21-4PR REAR 4.00-18-4PR			
11	Tire Pressure	See page 10-13			

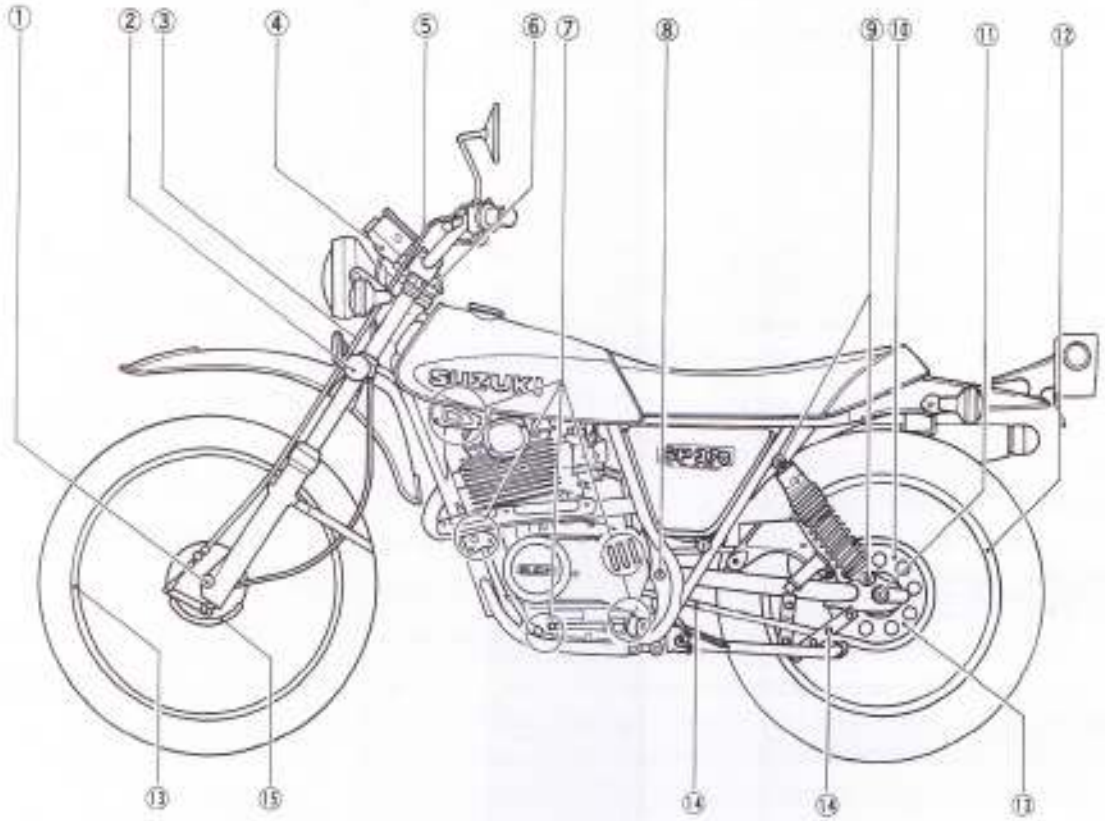
TIGHTENING TORQUE





NO.	ITEM	N.m	kg-m	lb-ft
1	Cylinder Head Cover Bolt	9~10	0.9~1.0	7.0
2	Tappet Adjusting Nut	12~15	1.2~1.5	9.0~10.5
3	Advance Governor Bolt	6~9	0.6~0.9	4.5~6.5
4	Cam Shaft Sprocket Bolt	8~11	0.8~1.1	6.0~7.5
5	Cylinder Head Nut (10 mm)	35~40	3.5~4.0	25.5~28.5
6	Spark Plug	15~20	1.5~2.0	11.0~14.0
7	Cylinder Nut	7~11	0.7~1.1	5.5~7.5
8	Flywheel Magneto Nut	55~65	5.5~6.5	40.0~47.0
9	Primary Drive Gear Nut	80~100	8.0~10.0	58.0~72.0
10	Clutch Sleeve Hub Nut	40~60	4.0~6.0	29.0~43.0
11	Clutch Spring Bolt	11~13	1.1~1.3	8.0~9.0
12	Engine Sprocket Nut	40~60	4.0~6.0	29.0~43.0
13	Neutral Cam Stopper Plug	18~28	1.8~2.8	13.5~20.0
14	Oil Drain Plug	18~20	1.8~2.0	13.5~14.0
15	Exhaust Pipe Bolt	9~12	0.9~1.2	6.5~8.5
16	1st, 2nd Muffler Bolt	9~12	0.9~1.2	6.5~8.5

TIGHTENING TORQUE



NO.	ITEM		N.m	kg-m	lb-ft
1	Front Axle Nut		36~52	3.6~5.2	26.0~37.5
2	Steering Stem Lower Bolt (A)		15~25	1.5~2.5	11.0~18.0
3	Steering Stem Lower Bolt (B)		20~30	2.0~3.0	14.5~21.5
4	Steering Stem Head Bolt (A) (8 mm)		15~25	1.5~2.5	11.0~18.0
5	Handlebar Holder Bolt		12~20	1.2~2.0	9.0~14.5
6	Steering Stem Head Bolt		35~50	3.5~5.0	25.5~36.0
7	Engine Mounting Bolt	10 mm	45~55	4.5~5.5	33.0~39.5
		8 mm	25~32	2.5~3.2	18.5~23.0
		6 mm	6~9	0.6~0.9	4.5~6.5
8	Rear Swinging Arm Shaft		50~60	5.0~6.0	36.5~43.0
9	Rear Shock Absorber Nut		20~30	2.0~3.0	14.5~21.5
10	Rear Sprocket Bolt		15~25	1.5~2.5	11.0~18.0
11	Rear Axle Nut		50~80	5.0~8.0	36.5~57.5
12	Spoke		4~5	0.4~0.5	3.0~3.5
13	Rear Brake Cam Lever Bolt		5~8	0.5~0.8	4.0~5.5
14	Rear Torque Link Bolt		2~3	2.0~3.0	14.5~21.5
15	Front Brake Cam Lever Bolt		5~8	0.5~0.8	4.0~5.5

PERIODIC MAINTENANCE

CONTENTS

PERIODIC MAINTENANCE SCHEDULE

MAINTENANCE CHART

The maintenance schedule, which follows, is based on philosophy. It is timed by odometer indication, and is calculated to achieve the ultimate goal of motorcyle maintenance in the most economical manner.

Item \ Interval	Initial 1 000 km (600 miles)	Every 3 000 km (2000 miles)	Every 6 000 km (4000 miles)
Battery (Specific gravity of electrolyte)	—	Inspect	—
Cylinder head nuts, exhaust pipe bolts and muffler connectors	Retighten	Retighten	—
Air cleaner	—	Clean	—
Cam drive chain	Adjust	Adjust	—
Valve clearance	Adjust	Adjust	—
Spark plug	—	Clean and adjust gap	Replace
Fuel line	Replace every two years		
Contact breaker point	Inspect	Inspect	—
Ignition timing	Inspect	Inspect	—
Engine oil	Change	Change	—
Engine oil filter	Clean	Clean	Replace
Carburetor idle rpm	Adjust	Adjust	—
Clutch	Inspect	Inspect	—
Drive chain	—	Inspect and lubricate	—
Brakes	—	Inspect	—
Tire	Inspect	Inspect	—
Steering	Inspect	Inspect	—
Chassis nuts and bolts	Retighten	Retighten	—

LUBRICATION CHART

Item \ Interval	Every 3 000 km (2 000 miles)	Every 6 000 km (4 000 miles)
Brake cam shaft	—	Grease
Brake cable	Motor oil	—
Clutch cable	Motor oil	—
Drive chain	Motor oil	—
Throttle cable	Motor oil	—
Throttle grip	—	Grease

PERIODIC MAINTENANCE PROCEDURES

This section describes the service procedures for each section of Periodic Maintenance.

BATTERY

Inspect every 3 000 km

1. Remove left side frame cover to check battery.
2. Confirm that the breather pipe is secured tight, free of damage, and routed as shown below.
3. Check level and specific gravity of electrolyte. Add distilled water, if necessary, to keep the surface of the electrolyte above the LOWER level line and below the UPPER level line.

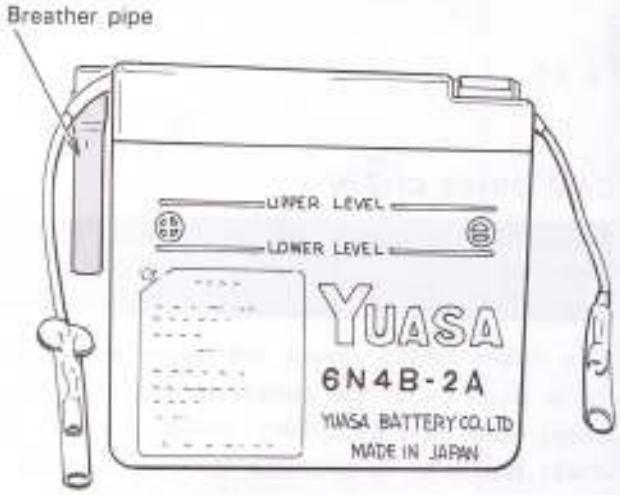


Fig. 3-1.

Fig. 3-2.

To determine state of charge, check specific gravity with a hydrometer.

Standard specific gravity	1.260 at 20°C

A specific gravity reading of 1.220 (at 20°C) or under means that the battery needs recharging. Take it down and connect it to a charger. Charging the battery in the place will cause rusting and may even rupture the rectifier.

CYLINDER HEAD NUTS, EXHAUST PIPE BOLTS AND MUFFLER CONNECTORS

Retighten at initial 1 000 km and every 5 000 km

Cylinder head

Remove the fuel tank and seat.

Tighten the three 10-mm nuts to the specified torque with a torque wrench, when engine is cold.

Cylinder head tightening torque:

35 ~ 40 N.m (3.5 ~ 4.0 kg-m, 25.5 ~ 28.5 lb-ft)

Fig. 3-3.

After tightening the three nuts, tighten the two 6-mm nuts (indicated as ①) to the torque value below:

Cylinder tightening torque:

7 ~ 11 N.m (0.7 ~ 1.1 kg-m, 5.5 ~ 7.5 lb-ft)

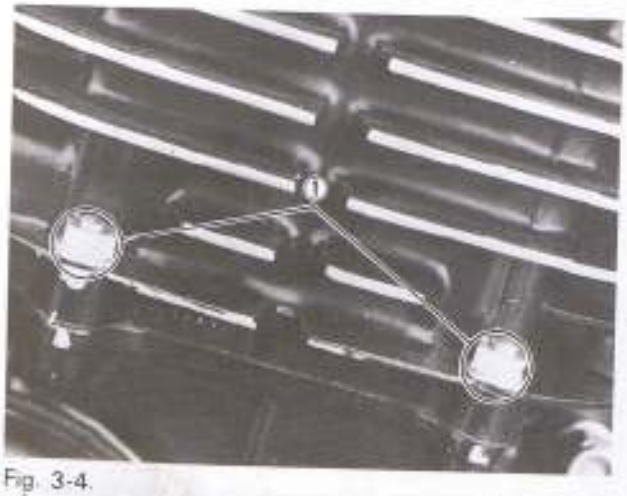


Fig. 3-4.

Exhaust pipe bolts and muffler connectors

Tighten the exhaust pipe bolts and muffler connections to the specified torque with a torque wrench.

Exhaust pipe bolt and muffler connectors tightening torque:

9 ~ 12 N.m (0.9 ~ 1.2 kg-m, 6.5 ~ 8.5 lb-ft)

AIR CLEANER

Clean every 3 000 km

Wash the element as follows:

1. Fill a suitable sized washing pan with non-flammable cleaning solvent.
   Immerse the element in the solvent and wash it clean.
2. Squeeze the solvent off the washed element by pressing it between the palms of both hands. Do not twist and wring the element or it will develop fissures.
3. Immerse the element in a pan of motor oil, and squeeze excess oil out of the element so that it is slightly oily.

CAUTION:

Before and during the cleaning operation, examine the element to see if it has any ruptures or fissures. A ruptured or fissured element must be replaced.

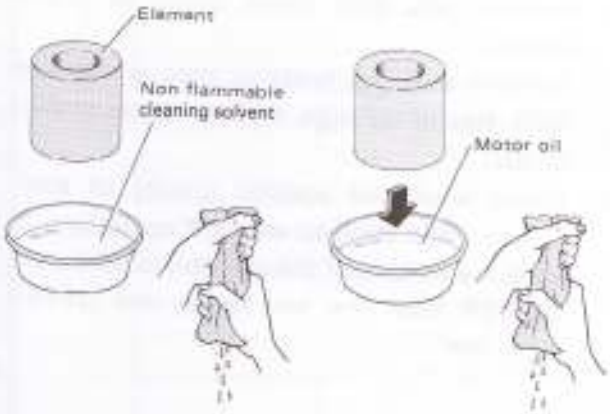


Fig. 3-5.

CAM DRIVE CHAIN

Adjust at initial 1 000 km and every 3 000 km

The chain which drives the valve actuating cams must be at the correct tension to avoid chain noise and disturbing ignition timing. A chain tensioner is provided for this purpose. The steps for chain adjustment are as follows:

1. Remove generator cover and spark plug, and turn over generator rotor anti-clockwise one turn by hand (in the direction of engine rotation).
2. Loosen lock nut ① on chain adjuster, and run back adjusting screw ②. This will cause the tensioner push rod to press further on the chain, i.e., tense the chain.
3. Tighten adjusting screw ② (to hold adjuster push rod in the pressed position), and secure the screw by tightening lock nut ①.

NOTE:
If the chain is still noisy after the tensioner has been re-set as above, the cause is very likely a stickly push rod. To remedy, take out the tensioner and service it to smoothen push rod movement.

Fig. 3-6


Fig. 3-7

VALVE CLEARANCE

Adjust at initial 1 000 km and every 3 000 km

Too much valve clearance results in valve chatter and excessively, small valve clearance causes damage to the valve or reduces power output. Check the clearance periodically and make sure it is adjusted to the specified value.

NOTE:
The valve clearance is specified for a cold engine. Check it when the engine is cold.

Valve clearance adjustment

Valve clearance specification (inlet and exhaust valves)	Turn adjusting screw back by 1/8 rotation or 45 degrees from lock	0.08 mm (0.0031 in.)

Check and adjust both valves when the piston is at top dead center (T.D.C.) of compression stroke. It is not necessary to use a thickness gauge: merely turn in adjusting screw all the way to lock and turn it back by 1/8 rotation or 45°. This will produce the specified clearance.

To set the piston at T.D.C. of compression stroke, proceed as follows:

1. Remove generator cover, timing inspection cap and spark plug.
2. Turn over flywheel by hand to bring "T" mark ① (on flywheel) to the index mark ② (on crankcase).
   If the contact points are apart, it means that the piston is on the compression stroke; if the points are closed, it means that the piston is on the exhaust stroke. In the latter case, turn over flywheel one complete rotation (360°) to bring the piston to T.D.C. on the compression stroke.

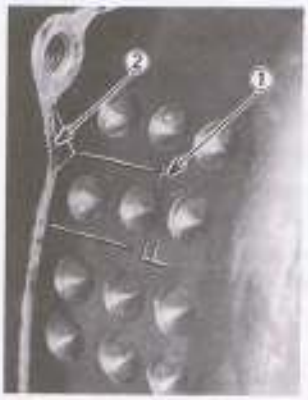


Fig. 3-8.


Fig. 3-9.

To adjust clearance, proceed as follows:

1. Remove valve adjusting hole caps of both inlet and exhaust valves.
2. At each valve, loosen lock nut ③ and tighten adjusting screw ④ all the way.
3. From that position of the screw, turn is back 1/8 of a turn (45°), hold the screw there, and tighten the nut.
4. You may use a feeler gauge to check the clearance but this is not necessary: just apply a fingertip and confirm the presence of a gap.

Fig. 3-10

Fig. 3-11.

SPARK PLUG

Clean and adjust gap every 3 000 km, replace every 6 000 km

After first 6 000 km, remove the carbon deposits with a wire or pin and adjust the spark plug gap to 0.6 ~ 0.7 mm (0.024 ~ 0.028 in.), measuring with a thickness gauge.
Replace the plug every 12 000 km, and remove the carbon deposits and adjust the gap every 6 000 km after replacing the plug.
When removing carbon deposits, be sure to observe the appearance of the plug, noting the color of the carbon deposits. The color observed indicates whether the standard plug is suitable or not. If the standard plug is apt to get wet, a hotter plug should be used. If the standard plug is apt to overheat (porcelain is whitish in appearance), replace with a colder one.

	HOT TYPE	STANDARD	COLD TYPE
NGK	D7EA (DR7ES-L for Canada)	D8EA (DR8ES-L for Canada)	D9EA (DR8ES for Canada)
ND	X22ES-U	X24ES-U	X27ES-U

Fig. 3-12.

Fig. 3-13.

FUEL LINE

Replace the fuel hose every two years.

Fig. 3-14.

CONTACT BREAKER POINT

Inspect at initial 1 000 km and every 3 000 km

Inspect the contact surfaces for dirt, buring and wear. If the faces are dirty, clean; if roughened, smoothen by grinding with a file or oil stone. Points worn beyond repair must be replaced.

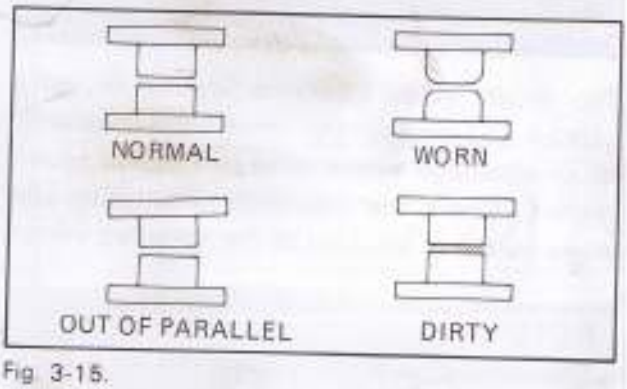


Fig. 3-15.

IGNITION TIMING

Inspect at initial 1 000 km and every 3 000 km

Point gap (standard)	0.3 ~ 0.4 mm (0.012 ~ 0.016 in.)
Spark plug gap	0.6 ~ 0.7 mm (0.024 ~ 0.028 in.)
Ignition timing	10° BTDC: 1 500 rpm and below 35° BTDC: 3 500 rpm and above

Timing adjustment

First, adjust the contact point gap to the value specified, and then adjust the ignition timing; correct timing will not obtained if this order is reversed.

Adjust contact point gap as follows:

1. Remove generator cover and timing inspection cap.
2. Remove the spark plug.
3. Turn over generator rotor anti-clockwise to obtain widest point gap.
4. Measure the gap with a feeler gauge; the gap should be between 0.3 ~ 0.4 mm (0.012 ~ 0.016 in.); if not, loosen screws ① securing the base ②, and displace base ② to increase or decrease the gap so that it is within range.
5. Tighten screws ①, and recheck the gap.

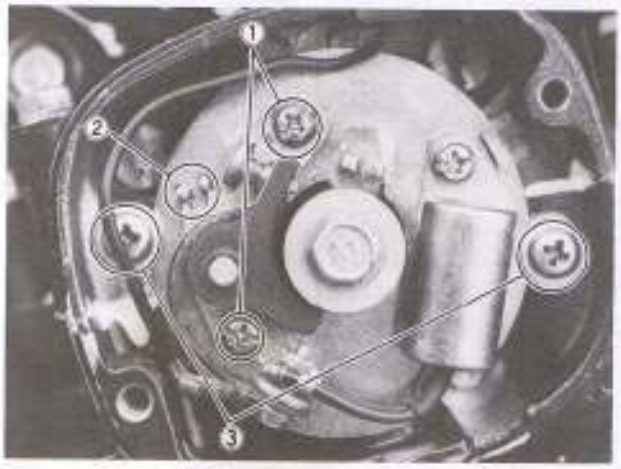


Fig. 3-16

Procedure for adjusting ignition timing

1. Turn on ignition switch, and confirm engine stop switch is in "RUN" position.
2. Hook up the timing tester (09900-27003), with ⊕ probe placed on the ⊕ point of the breaker and ⊖ probe grounded.
3. Turn over generator rotor anti-clockwise to check if the tester buzzer starts sounding just when "F" mark ① (on generator rotor) comes to the index mark ② (on crankcase); if so, the ignition timing is correct.

Fig. 3-17

Fig. 3-18

NOTE:
The buzzer starts sounding just when the contact points separate, and this moment of separation must occur when "F" mark moves through the index mark. Thus, obviously, steps 2 and 3 above are meaningful only when the piston is at or near T.D.C. on the compression stroke. To determine whether the piston is on compression or exhaust stroke has already been explained.

4. If buzzer starts sounding too early or too late, loosen the two screws ③ securing the breaker base and angularly displace the base to obtain the correct.
   Displace the base anti-clockwise to advance or clockwise to retard the timing, by an amount necessary to obtain concurrence of the meeting of the two marks and the start of buzzer sounding.
5. After tightening the two base securing screws, recheck the timing because tightening may have disturbed it.
6. Turn off ignition switch.

Checking the ignition timing with the timing light

After setting the contact points by adjusting in the above manner, check the performance of the timing mechanism using the electro tester (09900-28106). Illuminate the generator rotor with the timing light of this tester and vary the engine speed to see if the ignition is correctly timed or not. The procedure is as follows.

1. Run the engine within a speed range not exceeding 1,500 rpm. Under this condition, "F" mark ① and timing mark ② should be in perfect alignment.
   If not, readjust the breaker for correct timing.

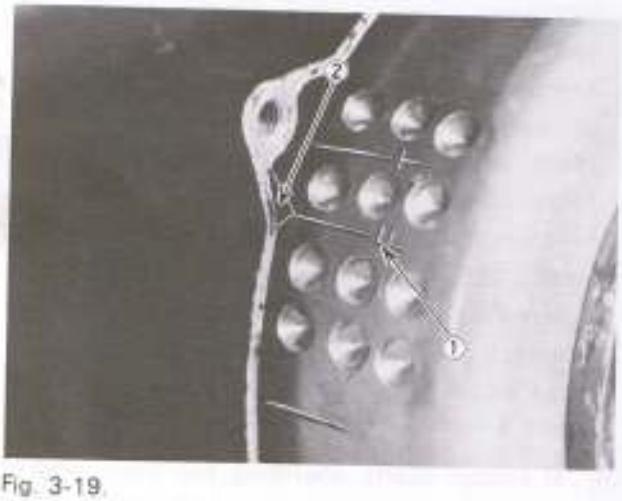


Fig. 3-19

2. Run the engine in a speed range above 3,500 rpm; and similarly observe the position of mark ③ relative to mark ②. If the two marks are in alignment, it means that the ignition is properly advanced.

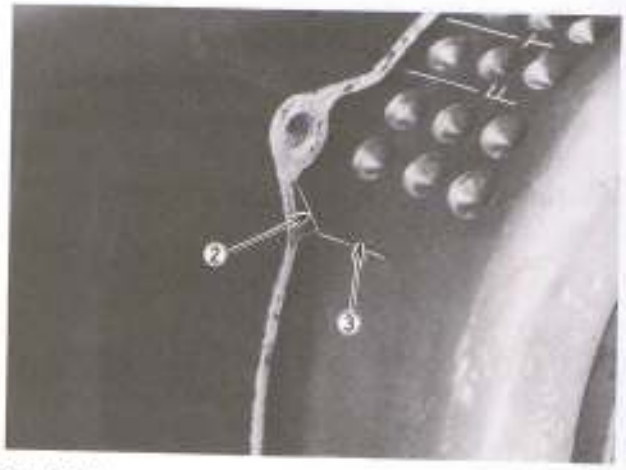


Fig. 3-20

ENGINE OIL

Change at initial 1 000 km and every 3 000 km

The oil should be changed when the engine is hot. The procedure is as follows:

1. Support the motorcycle upright by placing a jack or block under the engine.
2. Drain the oil by removing the drain plug ① and filler cap ②.

Fig. 3-21

Fig. 3-22

3. Insert drain plug ① securely and add fresh oil through the filler. The capacity of oil pan is about 1 600 cc (3.4 pt).
   Use API SE or SD oil with SAE 10W-40 viscosity.
4. Start the engine and allow it to run for several seconds at idling speed.
5. Shut down the engine and wait about one minute, then check the oil level in the level gauge ③. If the level is below the "F" mark, add oil.

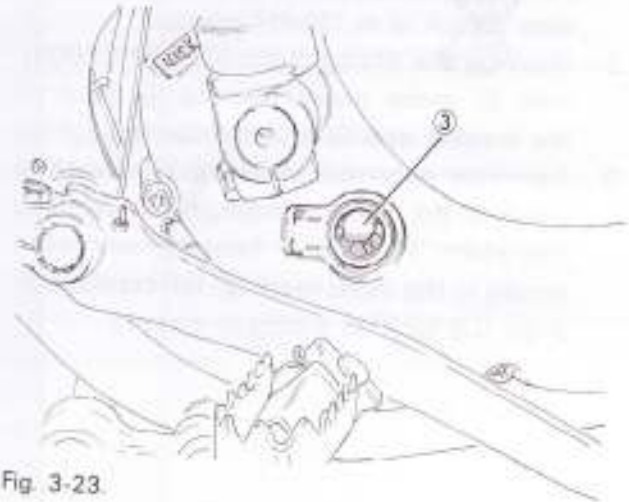


Fig. 3-23

ENGINE OIL FILTER

Clean at initial 1 000 km and every 3 000 km. Replace every 6 000 km.

Clean or replace the oil filter in the following manner:

1. Drain engine oil by removing the drain plug ①.
2. Remove the three screws ② holding down the filter cap ③.
3. Take off the cap ③, and pull out the filter ④.
4. Wash the filter ④ in cleaning solvent, and dry out the filter with compressed air. Or replace the filter with a new one.
5. After inserting the filter, replace cap ③ and secure it tightly.

Fig. 3-24.

Fig. 3-25.

CARBURETOR IDLE RPM

Adjust at initial 1 000 km and every 3 000 km

1. Start the engine and warm it up by running it at 1 500 rpm for 10 minutes in summer (when ambient temperature is about 30°C (86°F)) or for 20 minutes in winter (when ambient temperature is about −5°C (23°F)).
2. When the engine has warmed up, turn the throttle stop screw ① in or out so that engine runs at 1 300 rpm.

CAUTION:
No adjustment other than the procedure above is necessary because calibration is performed by the carburetor manufacturer.

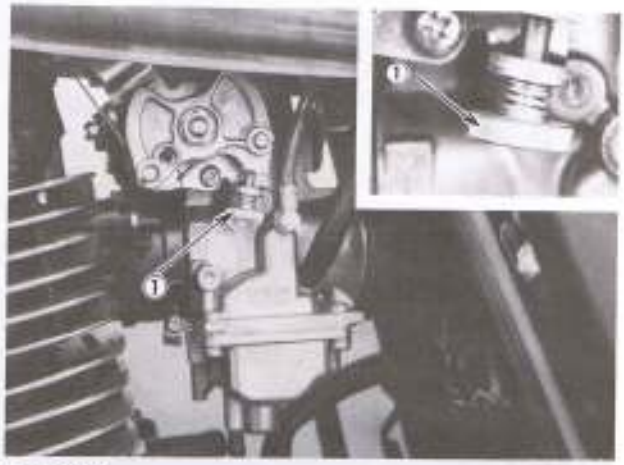


Fig. 3-26.

Throttle cable

Check the throttle cable play on both the pull side and return side cables. The prescribed play is 1.0 ~ 1.5 mm (0.04 ~ 0.06 in.) for both cables.

The amount of play should be measured when the throttle grip rests at its home position for the pull side cable and when the grip is twisted all the way in the case of return side cable.

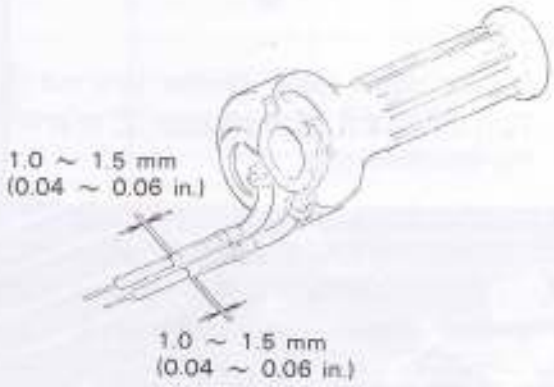


Fig. 3-27.

To adjust the play, turn the cable adjuster ①. After completing the check or adjusting as above, make sure that the lock nut ② is secured and that the grip turns smoothly.

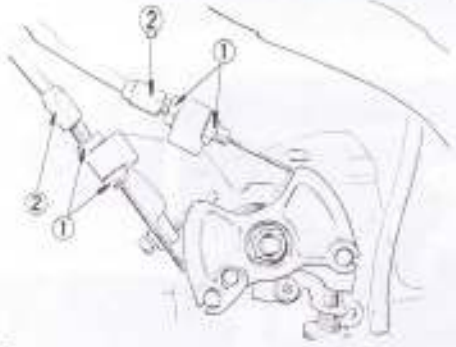


Fig. 3-28

CLUTCH

Inspect every 3 000 km

Clutch play should be 2 ~ 3 mm (0.08 ~ 0.12 in.) as measured at the clutch lever holder before the clutch begins to disengage. If the play in the clutch is incorrect, adjust it in the following way:

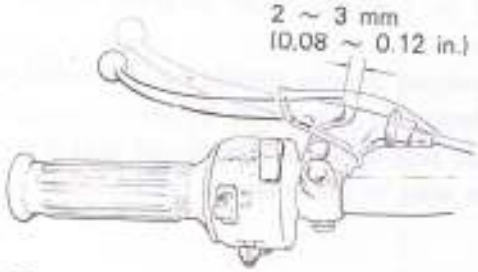


Fig. 3-29

1. Loosen clutch cable adjuster lock nut ①.
2. Turn the clutch cable adjuster ② to provide the specified play.

Fig. 3-30

3. Tighten lock nut ①.

At the same time, lubricate the clutch cable with motor oil.

DRIVE CHAIN

Inspect and lubricate every 3 000 km

Visually inspect the drive chain for the below-listed possible malconditions. (Lift the rear wheel and place a jack or block under the engine, and turn the rear wheel slowly by hand, with the transmission in NEUTRAL.)

1. Loose pins
2. Damaged rollers
3. Rusted links
4. Twisted or seized links
5. Excessive wear

If any defects are found, the drive chain must be replaced.

At intervals of 1 000 km (600 miles), clean and lubricate the chain as follows:

1. Wash the chain in cleaning solvent. If the chain tends to rust faster, the interval must be shortened.
2. After washing and drying the chain, lubricate it with chain lube or motor oil.

Check the drive chain for wear and adjust the chain tension as follows:

1. Loosen axle and sleeve nuts ① after pulling out cotter pin ②.
2. Tense the drive chain fully by tightening the adjusters ③ after loosening lock nuts ④.

Fig. 3-31

3. Remove the chain case. Using a caliper rule, measure the center-to-center distance between two pins 20 pitches apart (19 pins in between the two). If the distance exceeds 323.0 mm (12.7 in.), replace the chain with a new one. The standard distance is 317.5 mm (12.5 in.).

Fig. 3-32.

4. Loosen the adjuster ③ until the chain has 15 ~ 20 mm (0.6 ~ 0.8 in.) of sag at the middle between engine and rear sprockets. The mark ⑤ on both chain adjusters must be at the same position on the scale to ensure that the front and rear wheels are correctly aligned.

Fig. 3-33.

5. After adjusting the drive chain, tighten the sleeve and axle nuts ① securely and lock with cotter pin ②. Always use a new cotter pin.

BRAKES

Inspect every 3 000 km

Front brake

Measure the distance between the front brake lever and throttle grip. The distance ① should be 20 ~ 30 mm (0.8 ~ 1.2 in.). If adjustment is necessary, turn the front brake adjuster ② in or out after loosening lock nut ③.

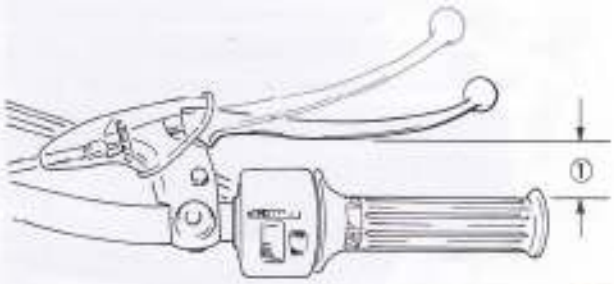


Fig. 3-34.

Fig. 3-35.

Rear brake

To adjust brake pedal travel, first set the pedal at a position for comfortable riding by turning the brake pedal stopper, and then adjust the free travel ① to 20 ~ 30 mm (0.8 ~ 1.2 in.) If adjustment is necessary, turn the rear brake adjuster ② in or out after loosening lock nut ③.

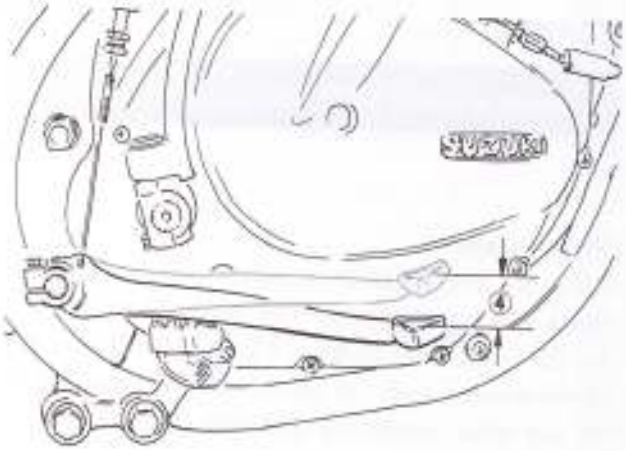


Fig. 3-36

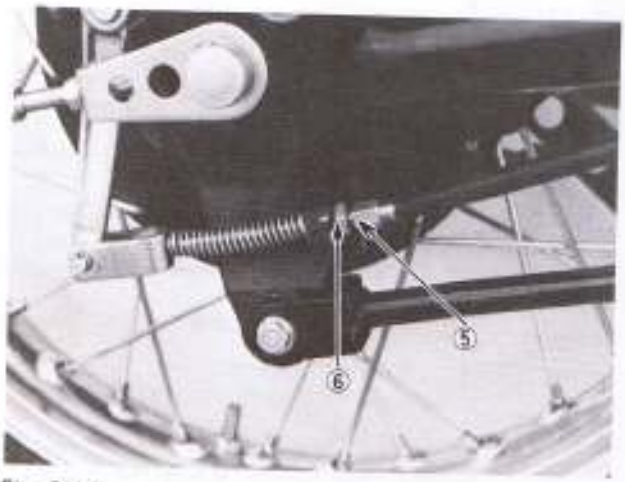


Fig. 3-37

Brake lining wear limit

This motorcycle is equipped with brake lining wear limit indicators on both front and rear brakes. As shown in Fig. 3-38, at the condition of normal lining wear, an extended line from the index mark on the brake camshaft should be within the range embossed on the brake panel with brake on. To check wear of the brake lining, follow the steps below.

1. First check if the brake system is properly adjusted.
2. While operating the brake, check to see that the extention line from the index mark is within the range on the brake panel.
3. If the index mark is outside the range as shown in the Fig. 3-39, the brake shoe assembly should be replaced to ensure safe operation.

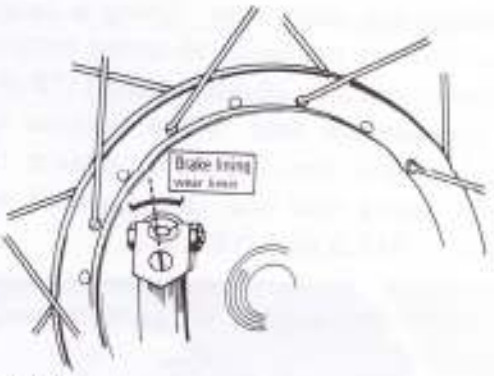


Fig. 3-38

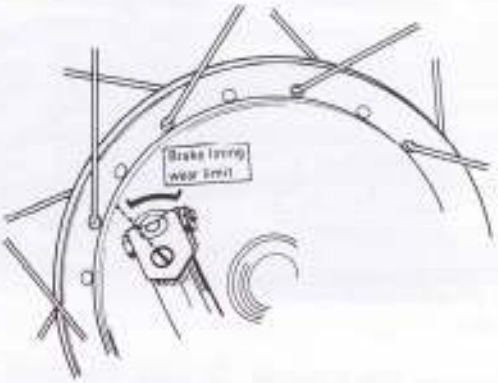


Fig. 3-39

TIRES

Inspect at initial 1 000 km and every 3 000 km

Inspect the tires for wear and damage; and check the tire tread depth as shown. Replace a badly worn or damaged tire. A tire with its tread worn down to the limit (in terms of tread depth) must be replaced.

Tread depth service limit

Front	1.6 mm (0.06 in.)
Rear	2.0 mm (0.08 in.)

Fig. 3-40

Check the tire pressure, and examine the valve for evidence of air leakage.

TIRE INFLATION PRESSURE (To be measured when tire is cold condition)

COLD INFLATION TIRE PRESSURE	FRONT		REAR	
	SOLO RIDING	DUAL RIDING	SOLO RIDING	DUAL RIDING
Normal riding	150 kPa (1.5 kg/cm², 21 psi)	150 kPa (1.5 kg/cm², 21 psi)	150 kPa (1.5 kg/cm², 21 psi)	200 kPa (2.0 kg/cm², 28 psi)
Continuous high speed riding	175 kPa (1.75 kg/cm², 25 psi)	175 kPa (1.75 kg/cm², 25 psi)	200 kPa (2.0 kg/cm², 28 psi)	250 kPa (2.5 kg/cm², 36 psi)

STEERING

Inspect at initial 1 000 km and every 3 000 km

Check the steering system by shaking the handlebar sideways, and up and down. If rattling is heard, the following bolts should be checked to determine whether they are properly tightened or not.

1. Steering stem head bolt ①.
2. Handlebar clamp bolts ②.
3. Upper and lower bracket bolts ③, ④.
4. Upper and lower bracket rear bolts ⑤, ⑥.

Tightening torque:

Steering stem head bolt:
35 ~ 50 N.m
(3.5 ~ 5.0 kg-m, 25.5 ~ 36.0 lb-ft)
Handlebar clamp bolt:
12 ~ 20 N.m
(1.2 ~ 2.0 kg-m, 9.0 ~ 14.0 lb-ft)
Front fork upper bracket bolt:
15 ~ 25 N.m
(1.5 ~ 2.5 kg-m, 11.0 ~ 18.0 lb-ft)
Front fork lower bracket bolt:
15 ~ 25 N.m
(1.5 ~ 2.5 kg-m, 11.0 ~ 18.0 lb-ft)
Front fork upper bracket rear bolt:
15 ~ 25 N.m
(1.5 ~ 2.5 kg-m, 11.0 ~ 18.0 lb-ft)
Front fork lower bracket rear bolt:
20 ~ 30 N.m
(2.0 ~ 3.0 kg-m, 14.5 ~ 21.5 lb-ft)

If a rattle is still heard with these bolts properly tightened, disassemble the steering stem and inspect the following items and replace the defective parts.

1. Wear of the inner and outer races ⑦, ⑧.
2. Wear or damage of steel balls ⑨.
3. Number of steel balls.
4. Distortion of steering stem ⑩.

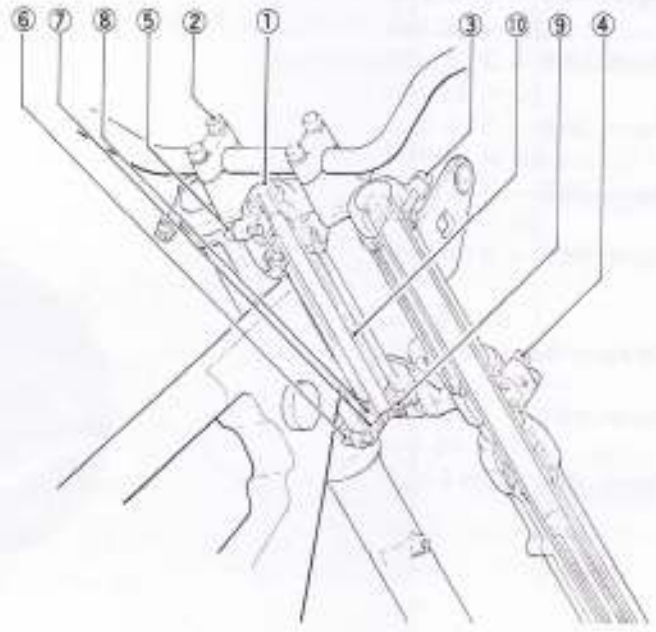


Fig. 3-41.

CHASSIS NUTS AND BOLTS

1,000; 6,000; 12,000; 18,000; 24,000 km
600; 4,000; 7,500; 11,000; 15,000 miles

The nuts and bolts listed below are important parts, and they must be in good condition for safety. They must be retightened, as necessary, to the specified torque with a torque wrench.

1. Handlebar clamp bolt ..... 12 ~ 20 N.m
   (1.2 ~ 2.0 kg-m, 9.0 ~ 14.0 lb-ft)
2. Steering head bolt ..... 35 ~ 50 N.m
   (3.5 ~ 5.0 kg-m, 25.5 ~ 36.0 lb-ft)
3. Front fork upper bracket bolt
   (R and L) ..... 15 ~ 25 N.m
   (1.5 ~ 2.5 kg-m, 11.0 ~ 18.0 lb-ft)
4. Front fork upper bracket
   rear bolt ..... 15 ~ 25 N.m
   (1.5 ~ 2.5 kg-m, 11.0 ~ 18.0 lb-ft)
5. Brake lever holder bolt ..... 5 ~ 8 N.m
   (0.5 ~ 0.8 kg-m, 4.0 ~ 5.5 lb-ft)
6. Brake cam lever bolt
   (Front and Rear) ..... 5 ~ 8 N.m
   (0.5 ~ 0.8 kg-m, 4.0 ~ 5.5 lb-ft)
7. Front fork lower bracket bolt
   (R and L) ..... 15 ~ 25 N.m
   (1.5 ~ 2.5 kg-m, 11.0 ~ 18.0 lb-ft)
8. Front fork lower bracket
   rear bot ..... 20 ~ 30 N.m
   (2.0 ~ 3.0 kg-m, 14.5 ~ 21.5 lb-ft)
9. Rear torque link nut ..... 20 ~ 30 N.m
   (2.0 ~ 3.0 kg-m, 14.5 ~ 21.5 lb-ft)
10. Rear shock absorber nut ..... 20 ~ 30 N.m
    (2.0 ~ 3.0 kg-m, 14.5 ~ 21.5 lb-ft)
11. Rear axle nut ..... 50 ~ 80 N.m
    (5.0 ~ 8.0 kg-m, 36.5 ~ 57.5 lb-ft)
12. Swinging arm pivot nut ..... 50 ~ 60 N.m
    (5.0 ~ 6.0 kg-m, 36.5 ~ 43.0 lb-ft)
13. Front axle nut ..... 36 ~ 52 N.m
    (3.6 ~ 5.2 kg-m, 26.5 ~ 37.5 lb-ft)
14. Engine mount nut
    (6 mm) ..... 6 ~ 9 N.m
    (0.6 ~ 0.9 kg-m, 4.5 ~ 6.5 lb-ft)
    (8 mm) ..... 25 ~ 32 N.m
    (2.5 ~ 3.2 kg-m, 18.5 ~ 23.0 lb-ft)
    (10 mm) ..... 45 ~ 55 N.m
    (4.5 ~ 5.5 kg-m, 33.0 ~ 39.5 lb-ft)

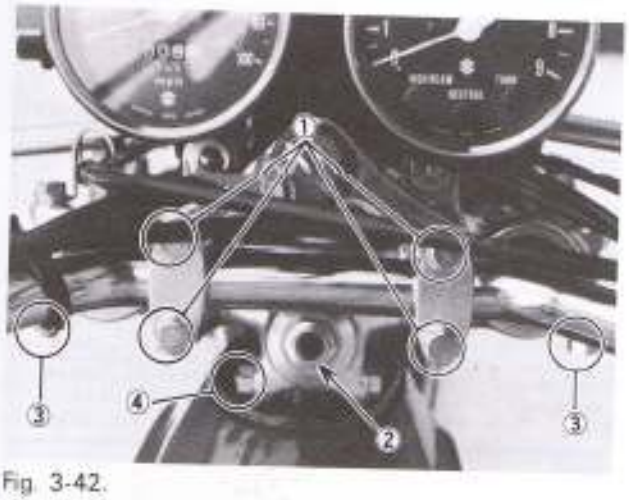


Fig. 3-42.

Fig. 3-43.

Fig. 3-44.

Fig. 3-45.

Fig. 3-48.

Fig. 3-46.

Fig. 3-49.

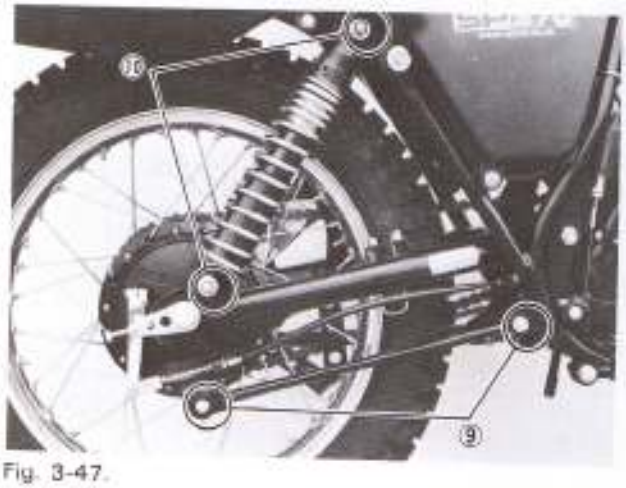


Fig. 3-47.

Fig. 3-50.

SPECIAL MATERIALS

The materials listed below are needed for maintenance work on the SP370, and should be kept on hand for use. Additions to standard materials are cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them are described in the text of this manual.

No.	Part Number	Description or Name
1	99000-25010	SUZUKI SUPER GREASE A
2	99000-25030	SUZUKI SUPER GREASE C
3	99000-25140	SUZUKI MOLYPASTE
4	99000-31070	SUZUKI BOND NO. 1211
5	99000-32040	THREAD LOCK CEMENT

①

②

③

④

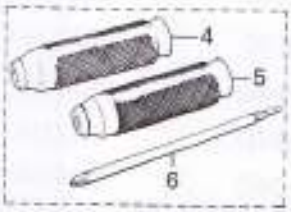
⑤

SPECIAL TOOLS

The tools listed hereunder are special ones, designed to facilitate maintenance work — disassembly, reassembly, servicing, checking, etc. — on the SP370, and protect the parts and components of the motorcycle against damage. Each shop is advised to have these special tools as standard shop equipment.

1


2


3


7


8


9


11


12


13


14

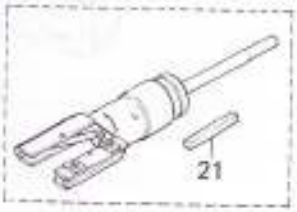

15

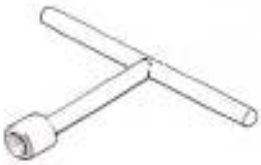

16


17


18


19

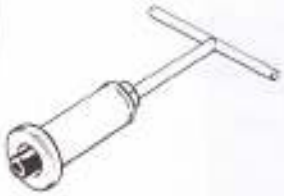

20


22


No.	Part Number	Part Name	Remarks
1	09900-06107	Snap ring pliers	Opening type
2	09900-06108	Snap ring pliers	Closing type
3	09900-09002	Shock driver set	
4	09900-09101	• Shock driver untightening tool	
5	09900-09102	• Shock driver tightening tool	
6	09900-09202	• Shock driver bite	
7	09900-20101	Vernier caliper	
8-1	09900-20201	Micrometer	
8-2	09900-20202	Micrometer	
8-3	09900-20204	Micrometer	
9	09900-20508	Cylinder gauge set	
10-1	09900-20507	• Cylinder gauge rod	82 mm
10-2	09900-20509	• Cylinder gauge rod	75 mm
10-3	09900-20510	• Cylinder gauge rod	65 mm
11	09900-20602	Dial gauge	
12	09900-20701	Magnetic stand	
13	09900-20803	Thickness gauge	
14	09900-20804	Thickness gauge	
15-1	09900-21102	Torque wrench	0 ~ 12 N.m (0 ~ 1.2 kg-m)
15-2	09900-21103	Torque wrench	0 ~ 90 N.m (0 ~ 9.0 kg-m)
16-1	09900-21301	Steel "V" block set	75 mm
16-2	09900-21302	Steel "V" block set	100 mm
17	09900-25002	Pocket tester	
18	09900-27003	Timing tester	
19	09900-28106	Electro tester	
20	09900-35002	Honing hone	
21	09900-35103	• Hone	
22-1	09910-10110	Stud bolt installer	6 mm
22-2	09910-11510	Stud bolt installer	10 mm

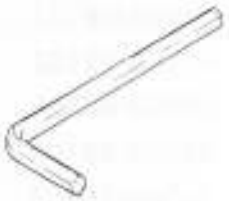
23

24

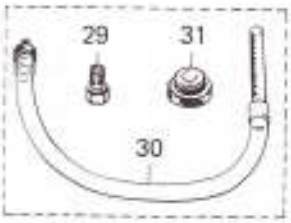


25

27



28



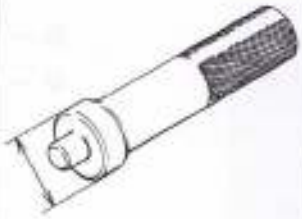
32

33

34

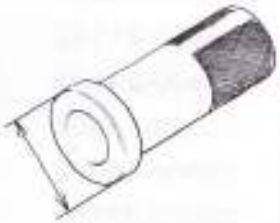
35

36



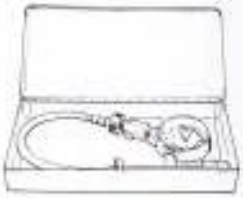
37

38

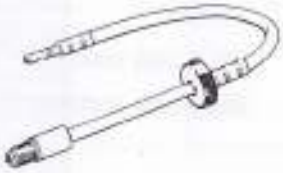


39

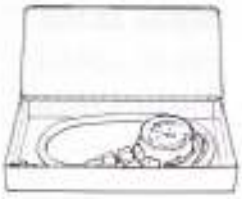
40



41

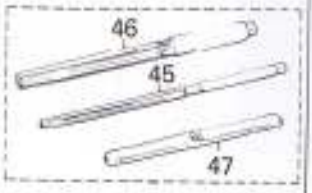


42



43

44



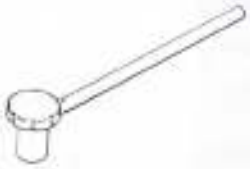
48

49

No.	Part Number	Part Name	Remarks
23	09910-20115	Conrod stopper	
24	09910-32812	Crankshaft installer	
25	09910-34510	Piston puller	
26	09910-33210	Piston pin puller attachment	
27-1	09911-70110	"L" type hexagon wrench	5 mm
27-2	09911-71510	"L" type hexagon wrench	8 mm
28	09913-14540	Fuel level gauge set	
29	09913-14410	• Attachment	
30	09913-14511	• Gauge body	
31	09913-14530	• Attachment	
32	09913-50110	Oil seal remover	
33	09913-60910	Bearing and gear puller	
34	09913-70122	Bearing installer	26.5 mm (1.04 in.)
35	09913-75510	Bearing installer	70.5 mm (2.78 in.)
36	09913-75820	Bearing installer	32.0 mm (1.26 in.)
37	09913-80111	Bearing installer	34.0 mm (1.34 in.)
38	09913-85210	Bearing installer	62.0 mm (2.44 in.)
39	09914-79610	Bearing installer	40.0 mm (1.57 in.)
40	09915-64510	Compression gauge	
41	09915-63210	Compression gauge adapter	
42	09915-74510	Oil pressure gauge	
43	09916-14510	Valve lifter	
44	09916-34510	Valve guide reamer set	
45	09916-34520	• Reamer	7 mm
46	09916-34530	• Reamer	12.2 mm
47	09916-34540	• Handle	
48	09916-44510	Valve guide remover	
49	09916-57320	Valve stem seal and valve guide installer handle	
50	09911-94530	Valve stem seal installer attachment	
51	09916-54530	Valve guide installer attachment	

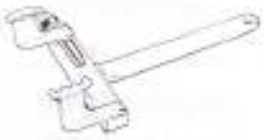
52

53



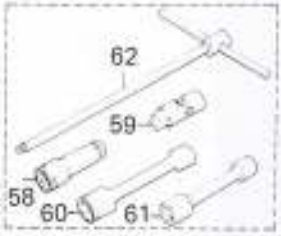
54

55



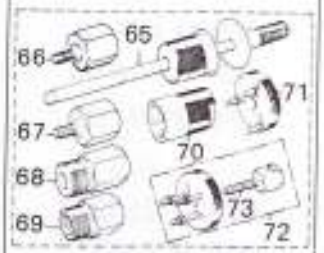
56

57



63

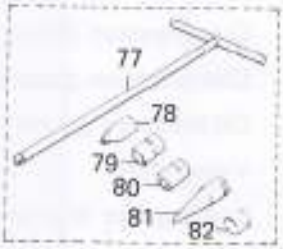
64



74

75

76



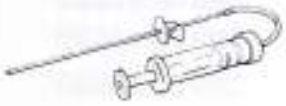
83

84

85

86

87



88

No.	Part Number	Part Name	Remarks
52	09916-84510	Forceps	
53	09917-13210	Tappet adjust wrench	
54	09920-13111	Crankshaft remover	
55	09920-53710	Clutch sleeve hub holder	
56	09923-73210	Bearing puller	
57	09930-14511	Cylinder head nut and spark plug wrench set	
58	09930-14520	• Spark plug wrench socket	
59	09930-14530	• Universal joint	
60	09911-74510	• Long socket	14 mm
61	09911-74520	• Long socket	12 mm
62	09914-24510	• "T" handle	
63	09930-13210	Spark plug wrench socket	
64	09930-30133	Rotor remover set	
65	09930-30102	• Rotor remover slide shaft	
66	09930-30141	• Attachment A	10 mm screw
67	09930-30150	• Attachment B	8 mm screw
68	09930-30161	• Attachment C	27 mm screw
69	09930-30170	• Attachment D	24 mm screw
70	09930-30180	• Attachment E	30 mm screw
71	09930-30190	• Attachment F	3 × 6 mm screw
72	09930-30211	• Attachment G	3 × 5 mm screw
73	09930-30220	• Bolt for attachment F	
74	09930-40113	Rotor and engine sprocket holder	
75	09940-10122	Steering stem nut wrench	
76	09940-34511	Front fork assembling tool	
77	09940-34520	• "T" handle	
78	09940-34530	• Attachment A	
79	09940-34540	• Attachment B	
80	09940-34550	• Attachment C	
81	09940-34561	• Attachment D	
82	09940-34570	• Attachment E	
83	09940-53111	Front fork oil seal installer	
84	09940-60112	Sporke nipple wrench	
85	09940-81611	Stand	
86	09941-34511	Steering race and swinging arm bearing installer	
87	09943-74111	Front fork oil level gauge	
88	09916-24900	Valve seat cutter set	

TROUBLE SHOOTING

CONTENTS

TROUBLE SHOOTING

When trouble occurs with a motorcycle, it is important to find the source of the trouble as rapidly as possible. It is also necessary to perform only the work required to repair the machine and not bother with parts which are functioning correctly. The list of possible trouble and their causes given below should help the serviceman to repair motorcycles quickly without loss of time.

ENGINE

IF ENGINE IS HARD TO START

Check fuel in the fuel tank first. When a proper amount of fuel is in the tank, check the following points.

No.	Description	Check Points	Action
1.	Check that fuel flows into carburetor.	* If fuel does not enter into carburetor.	
		1. Fuel strainer clogged.	Remove and clean.
		2. Fuel pipe clogged or damaged.	Clean or replace.
		3. Fuel cock clogged.	Clean.
2.	Check that spark jumps in spark plug (turn engine with kick starter).	* If blue or hot spark jumps in the spark plug, check the following points.	
		1. Ignition timing.	Adjust.
		2. Fuel.	
		3. Carburetor float.	Adjust or replace.
		4. Engine compression.	See specifications and adjust.
	* If the spark is weak.	1. Damage in spark plug.	Repalce.
		2. Incorrect spark plug gap.	Adjust.
		3. Damage in spark plug cap.	Replace.
		4. Dirty contact breaker point.	Clean and adjust.
		5. Bad insulation in condenser.	Replace.
		6. Damage in ignition coil or primary coil.	Replace.
	* If there is no spark	1. Damage in spark plug.	Replace.
		2. Dirty or wet spark plug.	Clean.
		3. Incorrect spark plug gap.	Adjust.
		4. Dirty or incorrect contact breaker gap.	Clean and adjust.
		5. Bad insulation in condenser.	Replace.
		6. Damage in ignition coil.	Replace.
		7. Damage in ignition switch	Replace.
		8. Damage in wiring harnesses.	Repair or replace.
3.	Check that engine compression is proper. (Turn engine with kick starter.)	* If engine compression is improper.	
		1. Improperly adjusted valve clearance.	Adjust.
		2. Worn valve guides or valves seating poorly.	Repair or replace.
		3. Improper valve timing.	Adjust.
		4. Worn cylinder and piston rings.	Repair or replace.

No.	Description	Check Points	Action
		5. Stiff piston ring on piston.	Repair or replace.
		6. Damaged cylinder head gasket.	Replace.
		7. Damaged piston.	Replace.
		8. Improperly tightened spark plug.	Tighten securely.
		9. Improperly tightened cylinder head.	Tighten securely.
		10. Damaged cylinder or cylinder head.	Replace.

These three things — fuel, spark and compression — are basic points for engine operation. To find engine trouble, first check these points.

IF ENGINE DOES NOT RUN SMOOTHLY

No.	Description	Check Points	Action
1.	Turning throttle grip, check that engine rpm increase.	* Engine rpm increase, but motorcycle speed does not increase.	
		1. Clutch slippage.	Adjust or replace.
		* If engine rpm does not increase.	
		1. Improperly adjusted carburetor.	Adjust.
		2. Dirty air cleaner.	Clean.
		3. Clogged fuel line.	Clean.
		4. Improperly adjusted ignition timing.	Adjust.
		5. Clogged exhaust pipe and muffler.	Clean.
		6. Improperly adjusted valve clearance.	Adjust.
		7. Improperly adjusted valve timing.	Adjust.
2.	Turning throttle grip, check that engine runs smoothly.	When rapidly accelerated, engine does not run smoothly.	
		1. Improper ignition timing.	Adjust.
		2. Improperly working contact breaker.	Adjust.
		3. Improperly adjusted carburetor.	Adjust.
		4. Dirty spark plug.	Clean and adjust.
		* Engine does not run smoothly at low rpm.	
		1. Too early ignition.	Adjust.
		2. Dirty contact breaker.	Clean and adjust.
		3. Dirty or improperly adjusted spark plug.	Clean and adjust.
		4. Clogged or damaged fuel line.	Clean or replace.
		5. Improperly working contact breaker.	Adjust.
		6. Improperly adjusted valve clearance.	Adjust.
		7. Improper valve timing.	Adjust.
		* Engine does not run smoothly at high rpm.	
		1. Clogged or damaged fuel line.	Clean or replace.
		2. Dirty or improperly adjusted spark plug.	Clean and adjust.
		3. Improperly working contact breaker.	Adjust.
		4. Too late ignition timing.	Adjust.
		5. Improperly adjusted carburetor.	Adjust.
		6. Dirty air cleaner.	Clean.

No.	Description	Check Points	Action
		7. Improperly adjusted valve clearance.	Adjust.
		8. Improper valve timing.	Adjust.
3.	Check that engine compression is correct.	See "If engine is hard to start" section.	
4.	If engine overheats.	1. Not enough oil in the engine.	Add oil.
		2. Defective oil pump or clogged oil circuit.	Repair or clean.
		3. Improper ignition timing.	Adjust.
		4. Carbon deposit in combustion chamber.	Clean.
		5. Carbon deposit in exhaust pipe and muffler.	Clean.
		6. Improperly adjusted spark plug.	Adjust.
		7. Clutch slippage.	Adjust.
		8. Brake dragging.	Adjust.
		9. Improperly adjusted carburetor.	Adjust.

IF ABNORMAL NOISE IS HEARD IN ENGINE

No.	Description	Check Points	Action
Intermittent noises:			
1.	If noise is heard during rapid acceleration:	1. Valve clearance too large.	Ajust.
		2. Weakened or broken valve springs.	Replace.
		3. Stretched chain.	Replace.
		4. Worn sprockets.	Replace.
		5. Tension adjustor not working.	Repair or replace.
		6. Too much play in piston ring side clearance.	Repair or replace.
		7. Piston rings stiff with carbon deposits.	Clean.
		8. Worn connecting rod big end.	Replace.
		9. Too early ignition timing.	Adjust.
2.	If noise is heard at low engine rpm.	1. Valve clearance too large.	Adjust.
		2. Weakened or broken valve springs.	Replace.
		3. Stretched chain.	Replace.
		4. Worn sprocket.	Replace.
		5. Tension adjustor not working.	Repair or replace.
		6. Too big clearance between piston and cylinder.	Repair or replace.
		7. Worn connecting rod big end.	Replace crankshaft.
		8. Too mutch lateral movement of spacer on primary driven gear shaft.	Repair spacer.

No.	Description	Check Points	Action
	Occasional noises:		
1.	If noise is heard when starting the engine.	1. Valve clearance too large.	Adjust.
		2. Weakened or broken valve springs.	Replace.
		3. Streched chain.	Replace.
		4. Worn sprocket.	Replace.
		5. Tension adjustor not working.	Repair or replace.
		6. Too big clearance between piston and cylinder.	Repair or replace.
		7. Worn connecting rod big end.	Replace crankshaft.
		8. Too much laterial movement of spacer on primary driven gear shaft.	Repair spacer.
2.	If noise is heard at high rpm.	1. Valve clearance too large.	Adjust.
		2. Streched chain.	Replace.
		3. Worn sprocket.	Replace.
		4. Tension adjustor not working.	Repair or replace.
		5. Too big clearance between piston and cylinder.	Repair or replace.
		6. Worn connecting rod big end.	Replace crankshaft.
		7. Too much lateral movement of spacer on primary driven gear shaft.	Repair spacer.
		8. Bent connecting rod.	Repair or replace.
	Continual noise:		
		1. Worn or damaged main bearings.	Replace.
		2. Damaged piston rings.	Replace.
		3. Defective transmission gears.	Repair or replace.
		4. Defective primary pinion and primary gear.	Repair or replace.

IF ENGINE OVERHEATS

If engine overheats at high speed running after it is run in, check to see if a brake is dragging, or cylinder cooling fins are dirty. Inspect the following points.

No.	Description	Check Points	Action
1.	Check to see if engine oil lower than "L" level.		Add oil.
2.	Check condition of engine oil.		Replace.
3.	Check if engine oil compression is lower than service limit.	* Too low compression.	
		1. Defective oil pump.	Replace.
		2. Defective oil strainer.	Clean or replace.
		3. Defective oil gallery cap.	Repair or replace.

No.	Description	Check Points	Action
4.	Check if engine compression is higher than service limit.	* Too high compression. 1. Carbon deposits in combustion chamber. 2. Too thin cylinder head gasket.	Remove the carbon deposits. Replace.
5.	Check carbon deposits.	* Check for carbon deposits in muffler, exhaust pipe, exhaust port and combustion chamber.	Disassemble and remove the carbon deposits.
6.	Check that piston rings move smoothly in grooves.	* Piston rings stiff because of carbon deposit.	Remove carbon deposits.
7.	Too lean gas mixture.		Adjust carburetor.
8.	Check that the clutch works properly.	Clutch slippage causes overheating of engine.	Adjust.
9.	Check that the ignition timing is correct.		Adjust.

ELECTRICAL

IGNITION SYSTEM

No.	Description	Check Points	Action
1.	No sparking or poor sparking.	1. Defective ignition coil. 2. Defective spark plugs.	Replace. Replace.
2.	Contact points burn or pit prematurely.	Defective condenser.	Replace.
3.	Spark plug soon becomes fouled with carbon.	1. Mixture too rich. 2. Idling speed set too low. 3. Improper gasoline. 4. Dirty element in air cleaner. 5. Spark plugs too cold.	Adjust carburetor. Adjust carburetor. Change. Clean. Replace by hot type plug.
4.	Spark plug becomes fouled too soon.	1. Worn piston rings. 2. Pistons or cylinders worn. 3. Too much clearance of valve stems in valve guides.	Replace. Replace. Replace.
5.	Spark plug electrodes overheat or burn.	1. Spark plug is too hot. 2. The engine overheats. 3. Improper ignition timing. 4. Spark plug loose. 5. Mixture too lean.	Replace by cold type plug. Tune up. Adjust. Retighten. Adjust carburetors.

CHARGE SYSTEM

No.	Description	Check Points	Action
1.	Magneto does not charge.	1. Open or short in lead wires, or loose lead connections. 2. Shorted, grounded or open generator coils. 3. Silicon diodes punctured. 4. Shorted regulator lead wire.	Repair or replace or retighten. Replace. Replace. Repair or repalce.
2.	Magneto does charge, but charging rate is below the specification.	1. Lead wires shorting intermittently or open-circuited or loosely connected at terminals. 2. Grounded or open-circuited stator coils of generator.	Repair, or retighten. Replace.

No.	Description	Check Points	Action
		3. Defective silicon diode.	Replace.
		4. Defective regulator.	Replace.
		5. Not enough electrolyte in battery.	Add distilled water to raise level.
		6. Defective cell plates in battery.	Replace the battery.
3.	Battery overcharges.	1. Internal short-circuit in battery.	Replace the battery.
		2. Regulator damaged or defective.	Replace the regulator.
		3. The regulator poorly grounded.	Clean and tighten ground connection.
4.	Unstable charging.	1. Lead wire insulation frayed due to vibration, presenting condition of intermittent short.	Repair or replace.
		2. Magneto layer short.	Replace.
		3. Defective regulator.	Replace.
5.	Battery "sulfation".	1. Charging rate too low or too high. (A battery out of use should be recharged at least once a month to avoid sulfation.)	Replace the battery.
		2. Battery electrolyte too much or too little, or its specific gravity too high or too low.	Keep the electrolyte up to the prescribed level, or adjust the S.G. by consulting the battery maker's directions.
		3. The battery left out of use too long in cold climinate.	Replace the battery. if badly sulfated.
6.	Battery discharges itself rapidly.	1. Dirty container top and sides.	Clean.
		2. Impurities in the electrolyte or electrolyte specific gravity is too high.	Change the electrolyte by consulting the battery maker's directions.

CHASSIS

No.	Description	Check Points	Action
1.	If handle feels too heavy.	1. Steering stem overtightened. 2. Broken steel balls on steering stem. 3. Distorted steering stem. 4. Not enough pressure in wheel tires. 5. Overtightened steering ball races.	Adjust. Replace. Replace. Adjust. Adjust.
2.	If wobble in handle.	1. Loose steering stem nut. 2. Loss of balance between right and left cushions. 3. Distorted front fork. 4. Distorted front axle or cocked tire.	Adjust. Replace. Repair or replace. Replace.
3.	If wobble in front and rear wheels.	1. Frame nuts, and bolts are loosened. 2. Distorted wheel rim. 3. Worn-down front wheel bearings. 4. Loose wheel spokes. 5. Defective or improper tire. 6. Loose nut on axle.	Retighten. Replace. Replace. Retighten. Replace. Retighten.
4.	If front cushions too soft.	1. Weakened springs. 2. Not enough damper oil. 3. Defective fork oil.	Replace. Refill. Replace.
5.	If front cushions too stiff.	1. Damper oil too viscous. 2. Too much damper oil. 3. Defective fork oil.	Replace. Remove excess oil. Replace.
6.	If noisy front cushions.	1. Not enough damper oil. 2. Loose nuts on cushions.	Refill. Retighten.
7.	If wobble in rear wheel.	1. Distorted wheel rim. 2. Worn-down rear wheel bearings. 3. Loose wheel spokes. 4. Defective or improper tire. 5. Loose axle nut.	Replace. Replace. Retighten. Replace. Retighten.
8.	If rear cushions too soft.	1. Weakened springs. 2. Rear cushion adjustors set improperly.	Replace. Adjust.
9.	If rear cushions too stiff.	1. Rear cushion adjustors set improperly.	Adjust.

Defective brakes

First check the play in the front brake lever and the rear brake pedal. Inspect the following points.

No.	Description	Check Points	Action
1.	Insufficient braking.	1. Worn brake linings.	Replace.
		2. Dirty brake linings.	Clean.
		3. Brake drum muddy or wet.	Clean.
		4. Worn brake cam.	Replace.
		5. Improperly working front brake wire.	Adjust or replace.
2.	Brake drags.	1. Rust in moving parts.	Repair.
		2. Moving parts dirty with oil or insufficient lubricant.	Clean and apply a proper amount of lubricant.
		3. Friction in moving parts.	Repair.
3.	Abnormal noise is heard.	1. Worn brake linings.	Replace.
		2. Foreign particles on brake linings.	Clean.
		3. Dirty brake drum.	Clean.

ENGINE

CONTENTS

COMPRESSION CHECK

The compression pressure of a cylinder is a good indicator of its internal conditions. The decision to overhaul the cylinders is often based on the results of a compression pressure test, and many a cautious rider conducts this test himself at regular intervals and logs his readings to form a case history to which he may refer later to tell when to overhaul his engine.

Compressiomn pressure

Standerd	Limit
1 000～1 300 kPa (10～13 kg/cm², 142～185 psi)	700 kPa (7 kg/cm², 100 psi)

A low compression pressure means any of the following malconditions:

- Excessively worn cylinder wall
- Worn-down piston or piston rings
- Piston rings stuck in the grooves
- Poor seating contact of valves
- Ruptured or otherwise defective cylinder head gasket

When the compression pressure noted is down to or below the value indicated above, the remedy is to overhaul the engine, with these five malconditions in mind.

Compression pressure test procedure:

NOTES:

1) **Before testing the engine for compression pressure, make sure that the cylinder head nuts and bolts are tightened to specified torque values.**
2) **Have the engine warmed up by idling before testing it.**

1. Remove spark plug.
2. Fit the compression gauge (special tool: 09915-64510) ① to the plug holes, taking care to make the connection absolutely tight.
3. Twist the throttle grip into wide-open position.
4. Crank the engine several times with the kick starter, and read the highest gauge indication as the compression of the cylinder.

Fig. 7-1

DISMOUNTING

1. Wash dirt off the engine.

Fig. 7-2.

2. Drain engine oil.

Fig. 7-3.

3. Remove frame cover at the right and left sides.

NOTE:
If muffler ① is hot, take care not to get burnt.

Fig. 7-4.

4. Remove seat lower cover at the right and left sides.

NOTE:
Seat lower cover is fitted as shown in Fig. 7-5. If it is removed roughly, it will break. Remove it carefully following the procedure below.

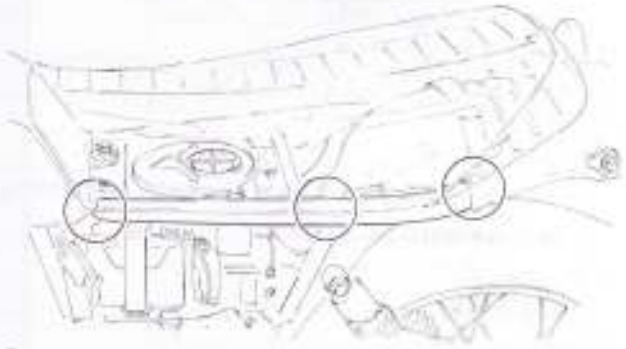


Fig. 7-5.

a. Place fingers into the upper part of rear shock absorber and unhook ① by drawing lightly toward you as shown in Fig. 7-6.

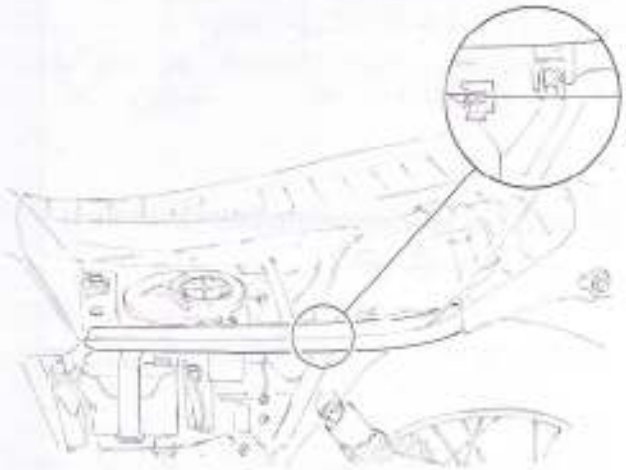


Fig. 7-6.

b. Pull the rear fender of seat lower cover gently toward you and remove the insert ②.

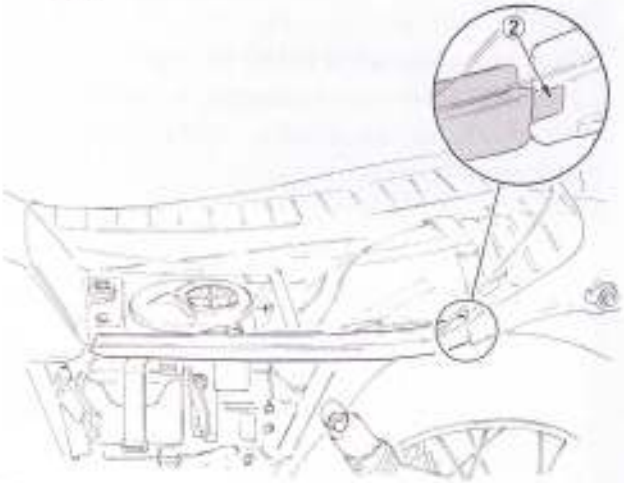


Fig. 7-7.

c. Finally, remove the seat cover by extracting it backward at a slant.

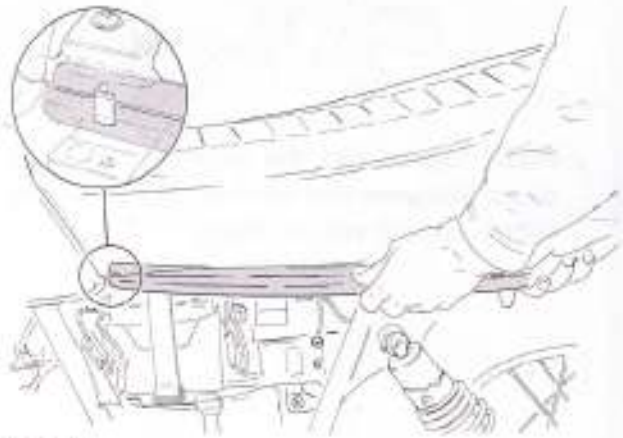


Fig. 7-8.

5. Remove seat mounting bolt ① and nut ②, and take off seat.

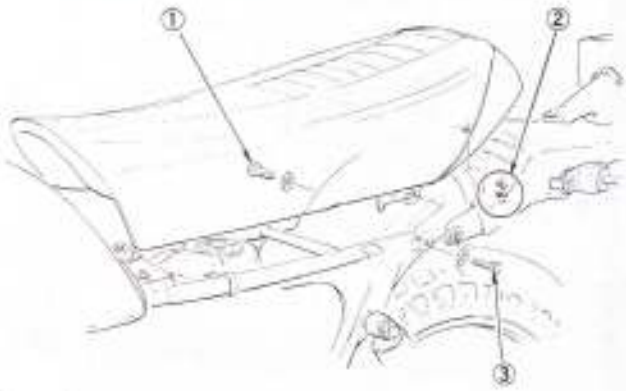


Fig. 7-9.

6. Turn fuel cock lever to "OFF" position and disconnect fuel hose from carburetor and then, remove fuel tank.

Fig. 7-10.

7. Disconnect tachometer cable.

Fig. 7-11.

8. Disconnect clutch cable.

Fig. 7-12.

9. Remove brake pedal ①, right front footrest ② and rear stop lamp switch assembly ③.

Fig. 7-13.

10. Remove carburetor and blow-by gas breather hose ①.

Fig. 7-14.

11. Disconnect exhaust pipe.

Fig. 7-15.

12. Remove magneto cover ① and gear shifting lever ②.

Fig. 7-16.

13. Disconnect drive chain.

Fig. 7-17.

14. Disconnect contact-point lead wire ① and magneto lead wire ②.

Fig. 7-18.

15. Remove engine mount bolts.

Fig. 7-19.

16. The engine is now ready for removal. Use both hands, and carry it off the chassis, taking it out from the right-hand side.

Fig. 7-20.

REMOUNTING

Engine is mounted in the reverse order to removal. Pay attention to the following items.

1. Mount the engine to the frame.

NOTE:
When the clearance between the frame and engine exceeds the specified limit, adjust the clearance with shims.

Part No.	Remarks
09169-08022	9 × 1.0 mm (0.35 × 0.039 in.)
09169-08023	9 × 0.6 mm (0.35 × 0.024 in.)
09169-10011	11 × 1.0 mm (0.43 × 0.039 in.)
09169-10012	11 × 0.6 mm (0.43 × 0.024 in.)

Clearance limit:

Within 0.6 mm (0.023 in.)

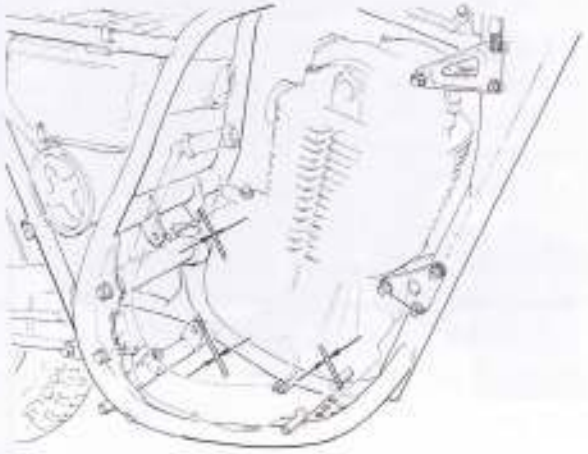


Fig. 7-21.

2. Prior to tightening the engine mounting nuts and bolts, fit the drive chain. The chain joint clip ① must be fitted correctly as shown in Fig. 7-22.

Fig. 7-22.

3. The engine mounting nuts are self-lock nuts. Once the nut has been removed, it is no longer of any use. Be sure to use new nuts and tighten them to the specified torque.

Tightening torque:

6 mm	6~9 N.m (0.6~0.9 kg-m, 4.5~6.5 lb-ft)
8 mm	25~32 N.m (2.5~3.2 kg-m, 18.5~23.0 lb-ft)
10 mm	45~55 N.m (4.5~5.5 kg-m, 33.0~39.5 lb-ft)

Fig. 7-23.

4. Install magneto leads as shown in Fig. 7-24, and fit clamp ①.

NOTE:
The leads must not touch the muffler ②.

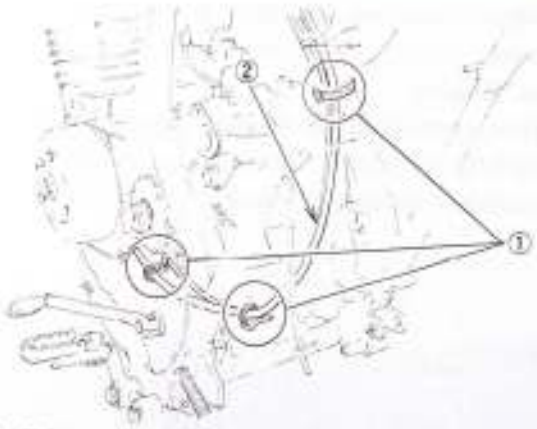


Fig. 7-24.

5. Fit clutch release arm ① and then, clutch cable adjuster ② and clutch cover.

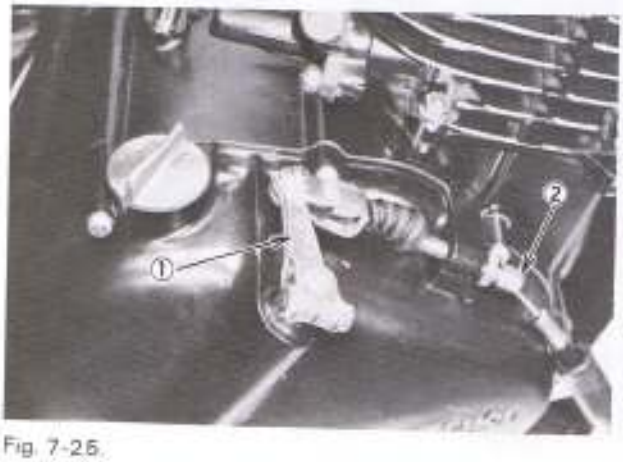


Fig. 7-25.

6. Before mounting carburetor, connect blow-by gas breather hose ①. Check the blow-by gas breather hose for damage and then, fit clip ② correctly.

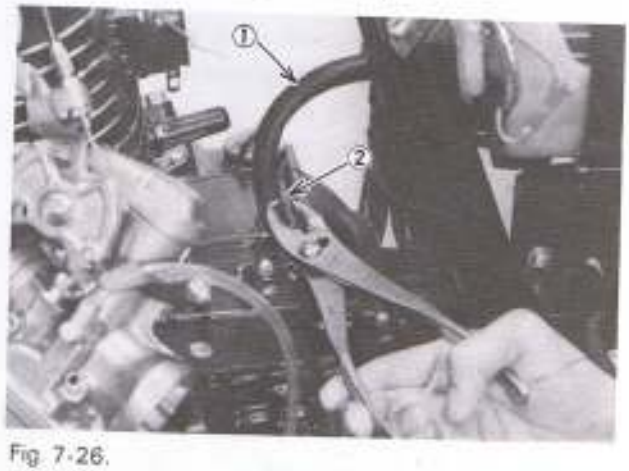


Fig. 7-26.

7. Disconnect air inlet hose. After carburetor has been fitted, confirm that throttle valve ② opens fully using a hand mirror ①. If the adjustment is defective, readjust with a full throttle stopper ③.

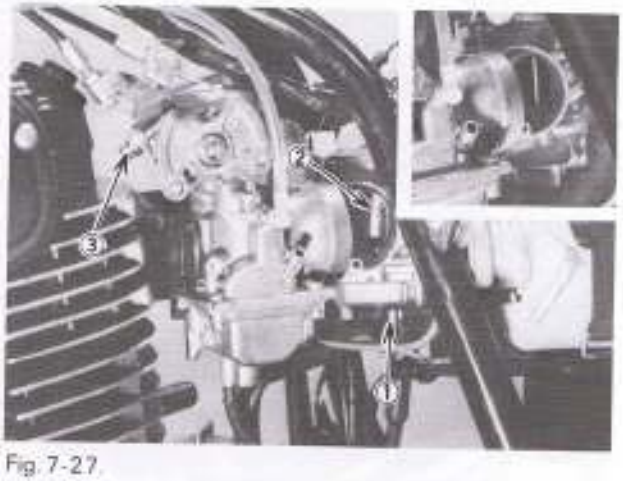


Fig. 7-27.

8. Check play in throttle cable ① when throttle grip is fully closed, and play in throttle cable ② when throttle grip is fully opened.

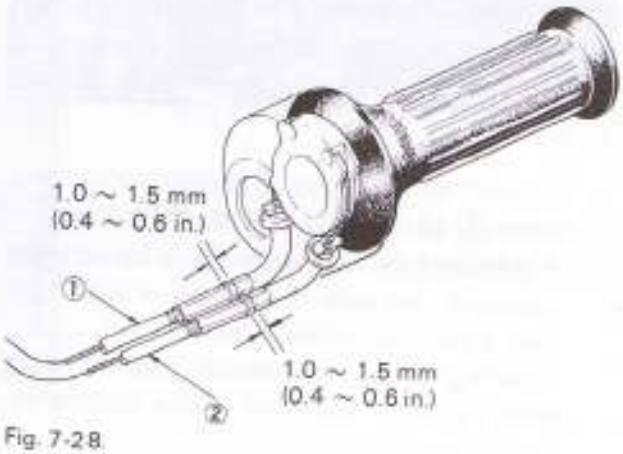


Fig. 7-28.

If the cables have too much play in them, adjust in the following manner.

a. Loosen lock nuts ①.
b. To adjust play in cable, turn adjuster ② in or out to obtain the correct play: 1.0 ~ 1.5 mm (0.04 ~ 0.06 in.).
c. After adjusting the play, tighten the lock nuts ①.

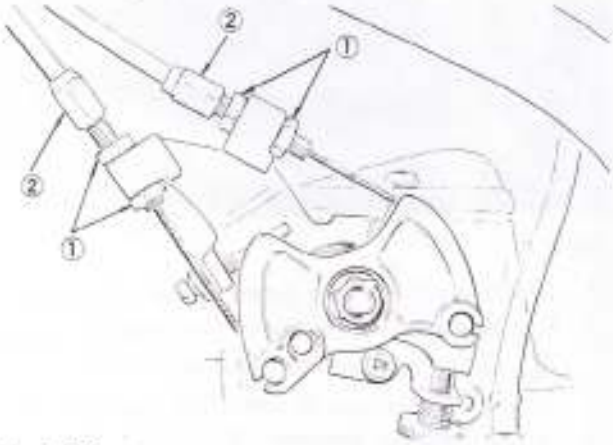


Fig. 7-29

NOTE:
Insert air vent pipe ① of carburetor into the frame correctly as shown in Fig. 7-30. Confirm that the air vent pipe is not bent at any place.

Fig. 7-30

9. Connect exhaust pipe ②, keeping mounting bolts ① of 1st and 2nd mufflers loose.
If exhaust pipe connector ③ is found to be damaged, be sure to replace it with new one, otherwise exhaust leakage will occur.
After tightening the exhaust pipe clamping bolts ④ to the specified torque, tighten exhaust pipe clamping bolt ⑤.
Finally, tighten bolts ① of 1st and 2nd mufflers securely.

Exhaust pipe and muffler tightening torque:

12 N.m (0.9 ~ 1.2 kg-m, 6.5 ~ 8.5 lb-ft)

Fig. 7-31

10. After mounting fuel tank and seat, fit seat lower cover. The installation procedure is as follows:
First, place part ① on rear fender and then, part ② on frame, and finally, install part ③ correctly holding it gently.

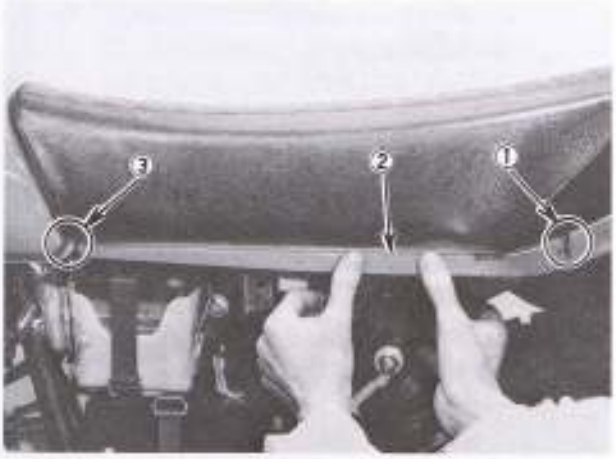


Fig. 7-32

11. Attach clutch cable end to clutch lever and then, adjust the play following the preocedure below.
The play in the clutch should be 2 ~ 3 mm (0.08 ~ 0.12 in.) as measured at the clutch lever holder before the clutch begins to disengage.

a. Loosen clutch cable adjuster lock nut ①.
b. Turn the clutch cable adjuster ② to provide the specified play.
c. Tighten the lock nut ①.

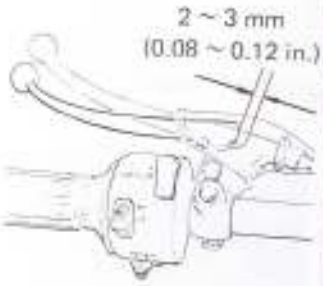


Fig. 7-33.

Fig. 7-34.

12. Supplying engine oil.
"Oil filling" is an operation consisting of the following steps:
a. Remove the filler cap ①.
b. Reset drain plug securely and add fresh oil through the filler. About 1600 cc (3.4 pt) of oil will be enough to fill the oil pan.

Fig. 7-35.

c. Start the engine and allow it to run for several seconds at idling speed.
d. Shut down the engine and wait about one minute, then check the oil level in the level gauge ②. Should the level be found to be below "F" mark, add oil to bring the level up to the mark.

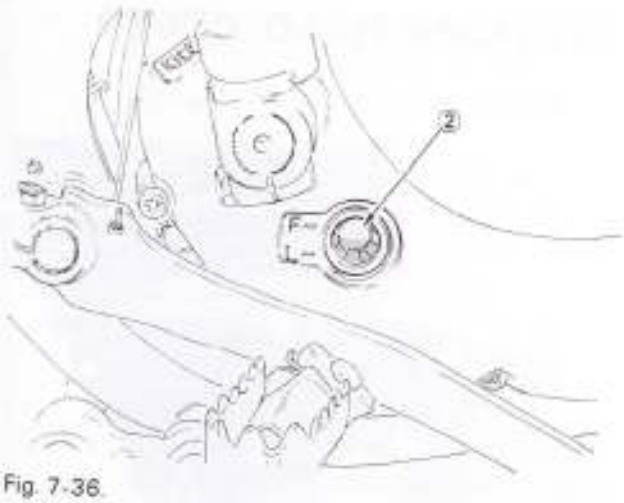


Fig. 7-36.

13. Adjust carburetor idling in the following manner.
a. Start the engine and warm it by running it at 1 500 rpm for 10 minutes in summer (when ambient temperature is 30°C (86°F) or thereabouts) or for 20 minutes in winter (when ambient temperature is down to −5°C (23°F) or thereabouts.)
b. After engine warms up, turn the throttle stop screw ① in or out so that engine runs at 1,300 rpm.

CAUTION:
No adjustment except the procedure mentioned above is necessary because calibration is performed by carburetor manufacturer.

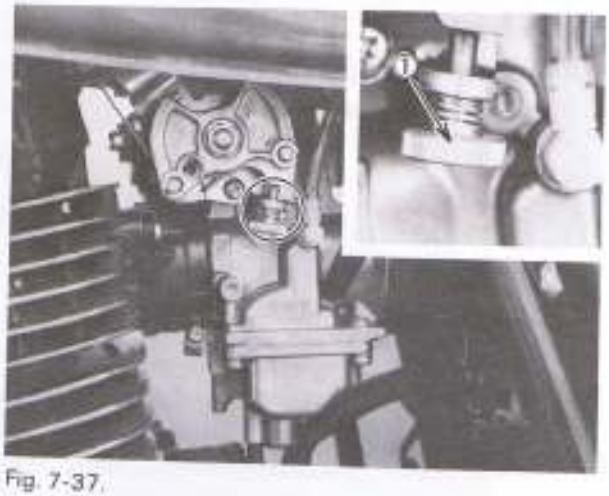


Fig. 7-37.

CYLINDER HEAD COVER

1. Remove chain tensioner assembly ①.

Fig. 7-38.

2. Remove spark plug ① and contact breaker cover ②.

Fig. 7-39.

3. Remove contact breaker ① and advance governor assembly ②.

Fig. 7-40.

4. Bring the piston to top dead center. Rotate the flywheel magneto rotor and align the crankcase match mark with the "T" mark on the flywheel magneto rotor, with the knock pin ① on the camshaft upper most.

NOTE:
When removing cylinder head cover, piston must be at top dead center.

Fig. 7-41.

Fig. 7-42.

5. Loosen the cylinder head cover bolts in the order indicated in Fig. 7-43 and detach the cylinder head cover.

Fig. 7-43.

CAMSHAFT DRIVE SPROCKET AND CAMSHAFT

To remove camshaft from cylinder head, remove camshaft driven sprocket bolts using an L-type hexagon wrench (09911-70110). The camshaft can then be removed easily.

Fig. 7-44.

NOTE:
Do not drop camshaft drive chain and sprocket into cylinder head.

CAMSHAFT

Camshaft works to open and close intake and exhaust valves through valve rocker arm. Fig. 7-45 below shows the valve timing.

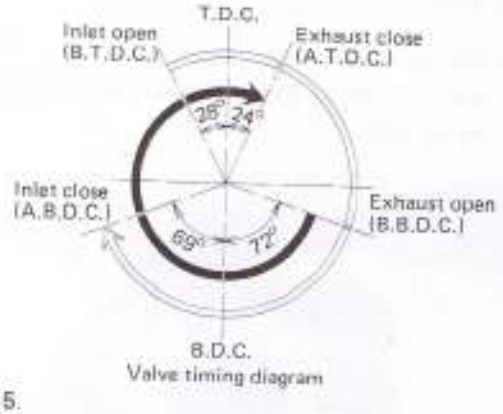


Fig. 7-45.

CYLINDER HEAD

1. Cylinder head can be lifted off after removing the 4 nuts. Loosen these nuts diagonally.

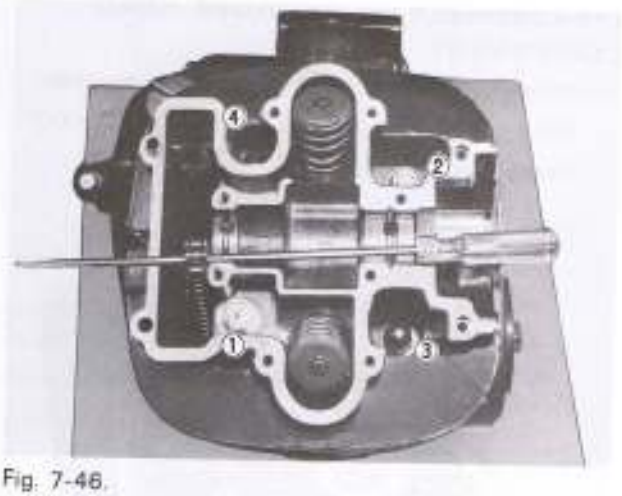


Fig. 7-46.

NOTE:
If it is difficult to remove the cylinder head, gently prize it off while tapping the fin side of the cylinder head with a plastic hammer. Be careful not to break the fins.

Fig. 7-47.

2. After removing the rocker arm shaft cap setscrew, extract rocker arm shaft.
   Next, screw a 6 mm bolt into the rocker arm shaft and extract by pulling the bolt with pliers. The valve rocker arm can then be taken out.

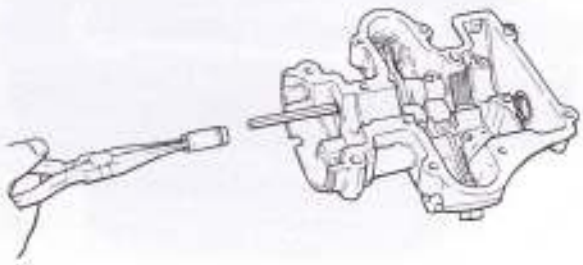


Fig. 7-48.

DISASSEMBLY OF CYLINDER HEAD COMPONENT

Remove each valve in the following manner:

1. Using the valve lifter (09916-14510), compress the spring.

Fig. 7-49

2. Take off the valve cotter from valve stem, using forceps.

Fig. 7-50

3. Take out valve seat, inner spring and outer spring.

Fig. 7-51

4. Pull out the valve from the other side.

Fig. 7-52

5. Remove each valve guide as follows:
   a. Remove oil seal, using long-nose pliers. Pick out valve lower seat.

Fig. 7-53

   b. Using the valve guide remover (09916-44510), drive the guide out toward cylinder head side.

Fig. 7-54

VALVE GUIDE, STEM SEAL AND VALVE

The reassembling procedure is as follows:

NOTE:
When reassembling valve mechanism, previously used parts must be restored to their original positions.

1. Re-finish the valve guide holes on cylinder head with a 12.2-mm reamer (09916-34530).

Fig. 7-55.

2. Fit a ring to each valve guide. Be sure to use new rings and valve guides. Use of rings and valve guides removed in disassembly must be avoided. Bear in mind that the intake valve guide differs in shape from that of the exhaust valve.

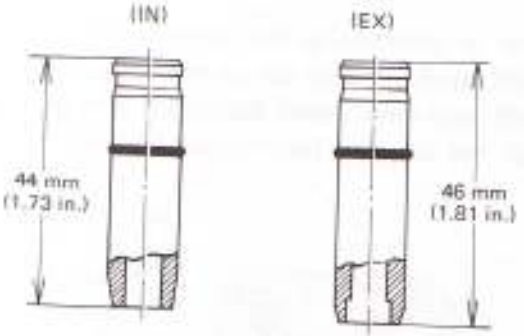


Fig. 7-56.

3. Oil the stem hole of each valve guide and drive it into the guide hole with the valve guide installer (09916-57320, 09916-54530). Carry out this job at normal temperature.

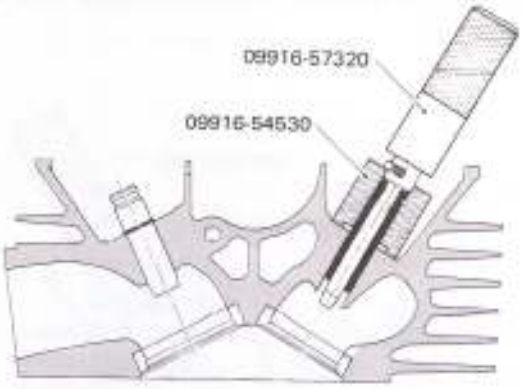


Fig. 7-57.

4. After fitting all valve guides, re-finish their bores with a 7-mm reamer (09916-34520). Be sure to clean and oil the guides after reaming.

Fig. 7-58.

5. Install valve spring lower seats. Be careful not to confuse the lower seats with the upper ones.

Fig. 7-59. 1. Lower 2. Upper

6. Oil each stem seal, and install it by using the stem seal installer (09911-94530, 09916-57320).

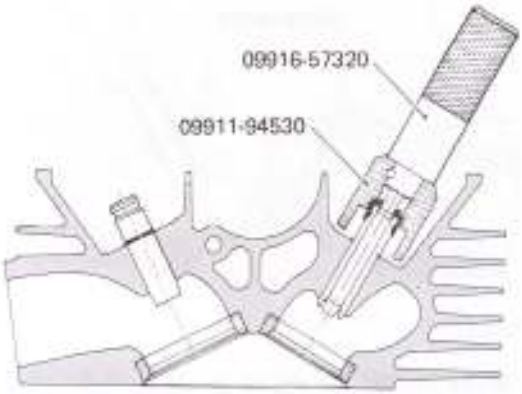


Fig. 7-60

7. Insert the valves, with their stems coated with a high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) all around and along the full stem length without any gaps. Lubricate the lip (of stem seal) similarly.

CAUTION:
When inserting each valve, take care not to damage the lip of the stem seal.

Fig. 7-61

8. Install valve springs, making sure that the close-pitch end ① of each spring goes in foremost to rest on the head. The coil pitch of both the inner and outer springs vary: the pitch decreases from top to bottom, as shown below.

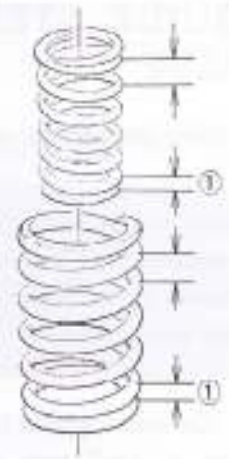


Fig. 7-62

9. Fit upper spring seat, compress spring with a valve lifter (special tool) and insert cotter with forceps.

Fig. 7-63

VALVE ROCKER ARM AND SHAFT

Prior to assembling the valve rocker arm and shaft, apply engine oil to the rocker arm and shaft, and then, insert the rocker arm and shaft with the stepped part turned inward.

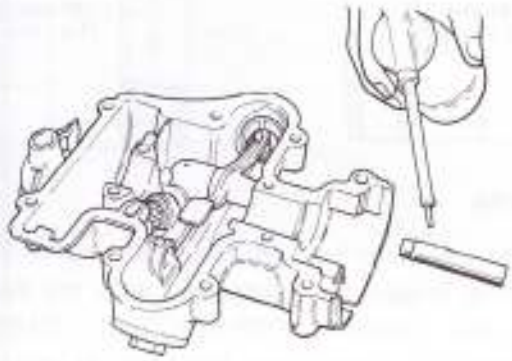


Fig. 7-64

Next, insert the rocker arm shaft cap and tighten the screw.

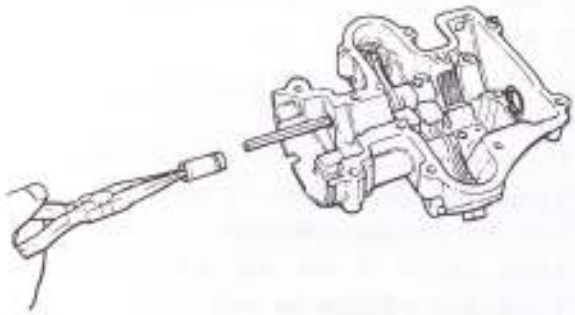


Fig. 7-65.

NOTE:
Use a new O-ring on the rocker arm shaft cap to prevent oil leakage and be careful not to break O-ring when inserting it.
Apply screw lock to the threaded part of the screw to prevent loosening.

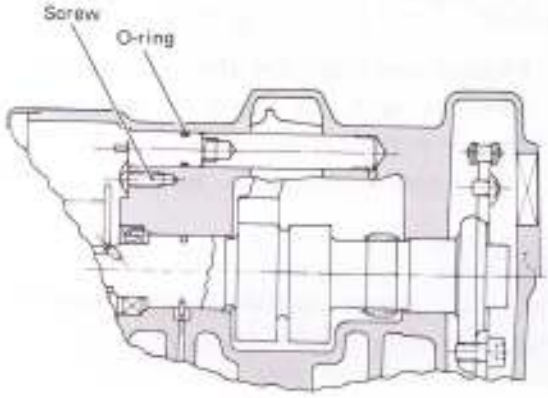


Fig. 7-66.

CYLINDER HEAD

1. Fit dowel pins ① to cylinder head and then, attach new gasket to cylinder head.

NOTE:
Use a new cylinder head gasket to prevent oil leakage. Do not use the old gasket.

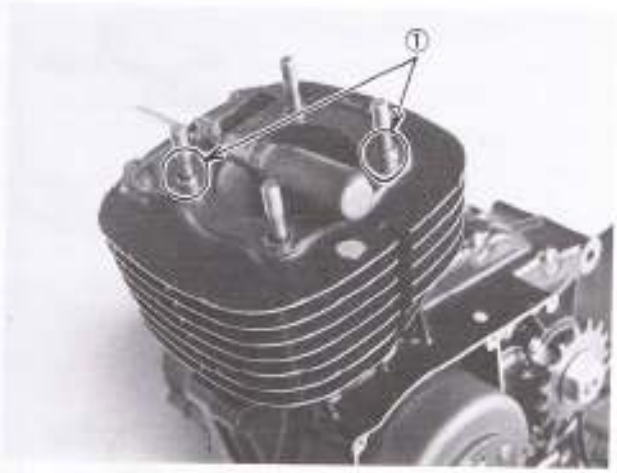


Fig. 7-67.

2. Copper washers and crown nuts are used to secure the cylinder head. These parts must be fitted in the correct position.

NOTE:
Use new O-ring for cylinder head nut ① to prevent oil leakage.

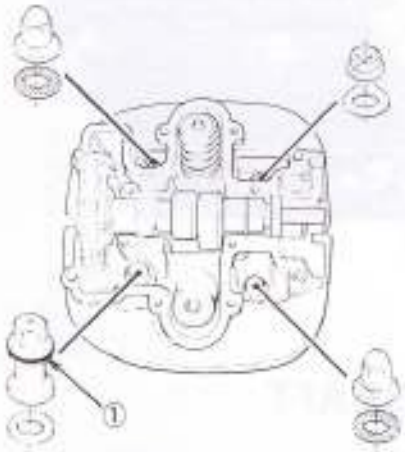


Fig. 7-68.

3. With the head snugly seated on the cylinder, secure it by tightening the 4 nuts diagonally. Tighten each nut to the torque value specified below.

Cylinder head nut tightening torque:

35 ~ 40 N.m (3.5 ~ 4.0 kg-m, 25.5 ~ 28.5 lb-ft)

Fig. 7-69.

4. Tighten the cylinder head nuts to the specified torque and then, tighten cylinder nuts ①.

Fig. 7-70.

CAMSHAFT

1. Completely remove gasket material from cylinder head and cylinder head cover and thoroughly wipe off oil stains from the fitting surfaces.

Fig. 7-71.

2. Align "T" mark on flywheel magneto rotor with the convex mark on the crankcase keeping the camshaft drive chain pulled upward.

NOTE:
If work is done without drawing the camshaft drive chain upward, the chain will be caught between crankcase and cam chain drive sprocket and the crankshaft cannot be rotated.

Fig. 7-72.

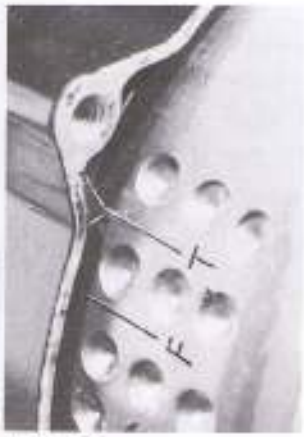


Fig. 7-73.

3. Engage the chain on the camshaft driven sprocket, with the screw ① positioned as shown in the figure. When the sprocket is not positioned correctly, turn the sprocket.

NOTE:
Do not rotate camshaft and flywheel magneto rotor while doing this.

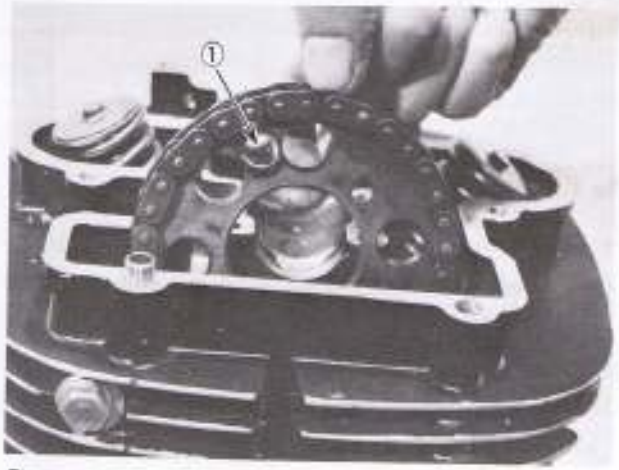


Fig. 7-74.

4. Apply THREAD LOCK CEMENT to the Allen bolt and tighten the sprocket with an L-type hexagon wrench.

Tightening torque:

8 ~ 11 N.m (0.8 ~ 1.1 kg-m, 6.0 ~ 7.5 lb-ft)

Fig. 7-75.

5. Apply high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) to the camshaft journal and place camshaft on cylinder head.

Fig. 7-76.

NOTE:
When fitting the camshaft, pay attention to the direction i.e., turn the sprocket mounting part to the right side, and the notched part ① of camshaft to the intake side as shown in the Fig. 7-77 so that the camshaft is parallel to the fitting face of the cylinder head.

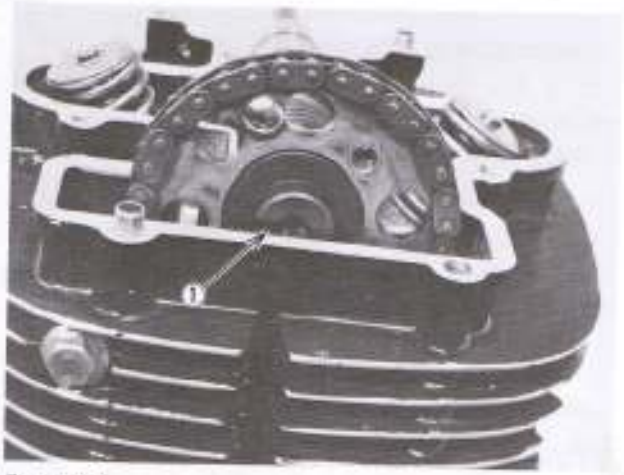


Fig. 7-77.

CYLINDER HEAD COVER

1. Remove tachometer driven gear from cylinder head cover.

NOTE:
If the cylinder head cover is tightened with the tachometer driven gear fitted, the cylinder head cover will break.

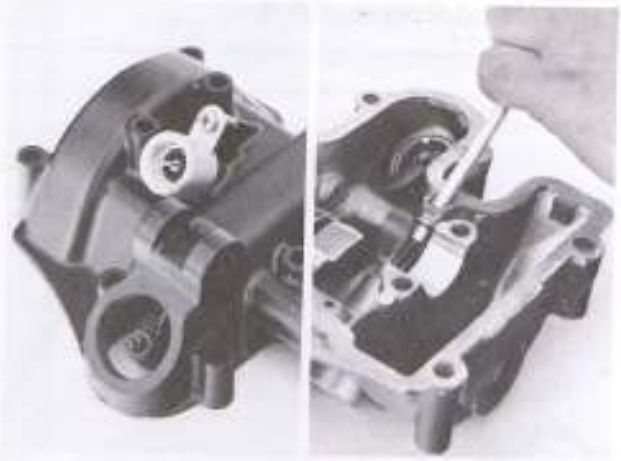


Fig. 7-78.

2. Thoroughly wipe off oil from the fitting surfaces of cylinder head and cover and fit dowel pin to the cylinder head side. Uniformly apply "SUZUKI BOND No. 1211" to the portion shown in Fig. 7-79.

NOTE:
SUZUKI BOND No. 1211 maintains its excellent sealing properties at high

temperatures. When the engine is running, the cylinder head becomes very hot. Therefore, under no circumstances is "SUZUKI BOND No. 4" to be used. This is for the crankcase fitting surface and if used on the cylinder cover oil leakage will occur.

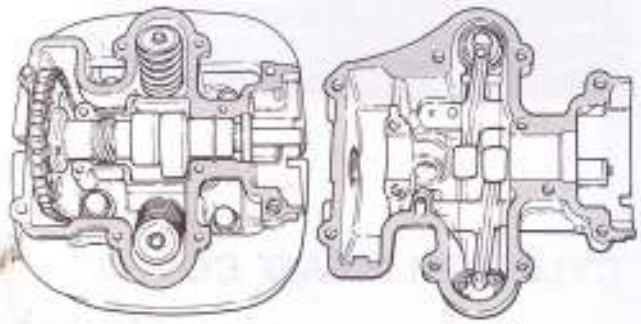


Fig. 7-79.

3. Lightly tighten the cylinder head cover bolts diagonally and then, if everything is satisfactory, tighten securely with a torque wrench to the specified torque.

Tightening torque:

9 ~ 10 N.m (0.9 ~ 1.0 kg-m, 7.0 lb-ft)

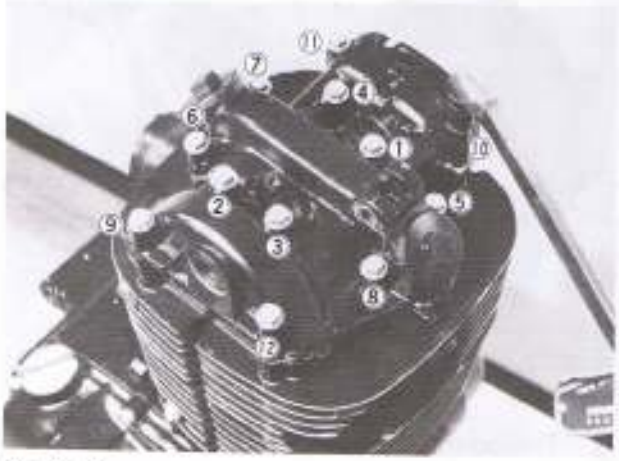


Fig. 7-80.

4. Apply engine oil to tachometer driven gear shaft and then, insert together with sleeve and fix with gear sleeve plate.

Fig. 7-81.

CAM DRIVE CHAIN TENSIONER

Install cam shaft tensioner following the procedure below.

1. After loosening lock nut ①, loosen screw ② one turn and fully insert push rod ③ into the chain tensioner. Lock the push rod ③ by tightening adjusting screw ②.

Fig. 7-82.

2. Mount the chain tensioner on the cylinder.
3. Loosen adjusting screw ②.
   This will cause the tensioner push rod to press further on the chain, i.e., increase chain tension.
4. Tighten adjusting screw ② (to hold adjuster push rod in the pressed position), and secure the screw by tightening the lock nut ①.

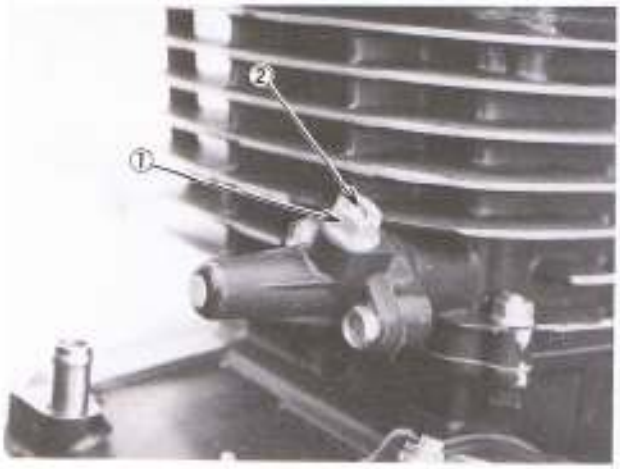


Fig. 7-83.

5. Turn over flywheel magneto rotor ① counterclockwise one turn by hand (in the direction of engine rotation).

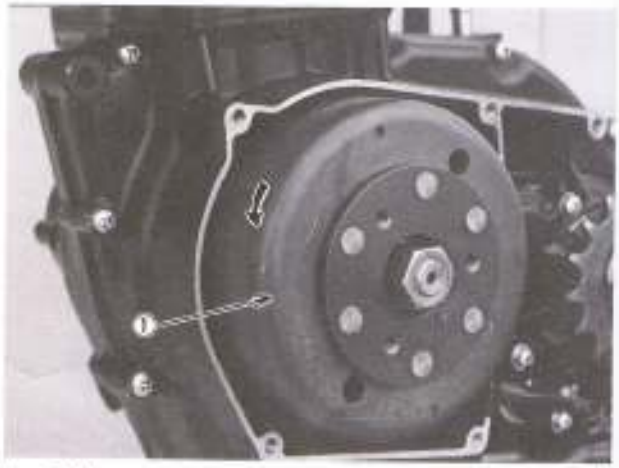


Fig. 7-84.

NOTE:
If the chain happens to be noisy even after the tensioner has been re-set as above, the cause is very likely a sticky push rod. The remedy for this is to take off the tensioner and service it to obtain a smooth push rod movement.

ADVANCE GOVERNOR AND CONTACT BREAKER

Fit advance governor and contact breaker in the following manner.

1. Align pin ① fitted to camshaft with slot ② in the advance governor and fit correctly.

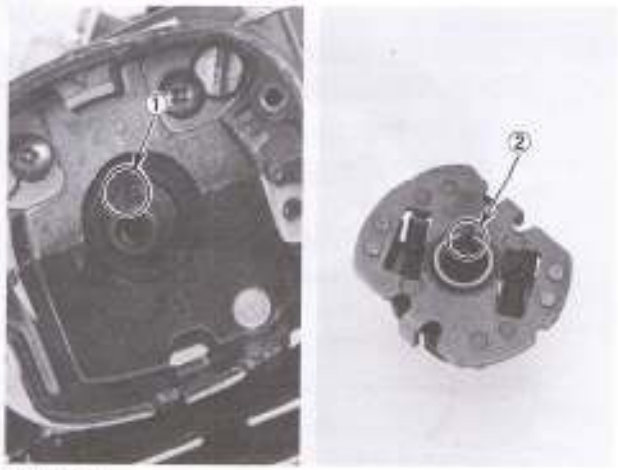


Fig. 7-85.

2. Align mark on contact breaker with the arrow mark on the cylinder head cover and fit the contact breaker in position.

Fig. 7-86.

3. Tighten the advance governor to the specified torque.

NOTE:
Over-tightening of the bolt will adversely influence characteristic of the advance governor.

Tightening torque:

6 ~ 9 N.m (0.6 ~ 0.9 kg-m, 4.5 ~ 6.5 lb-ft)

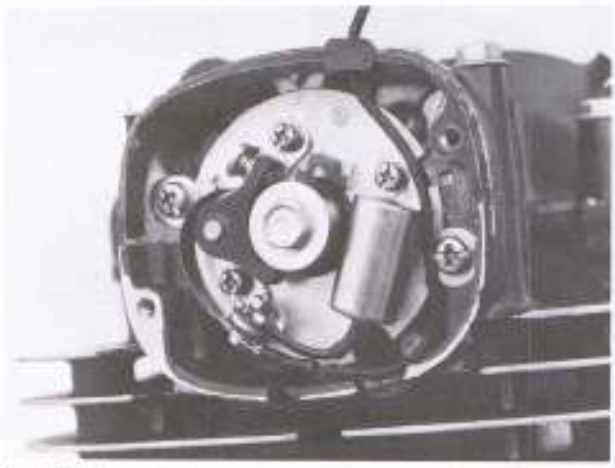


Fig. 7-87.

CHECKING AND ADJUSTING VALVE CLEARANCE

With the cylinder head cover detached, clearance ① of inlet and exhaust valves must be adjusted, referring to page 3-5.

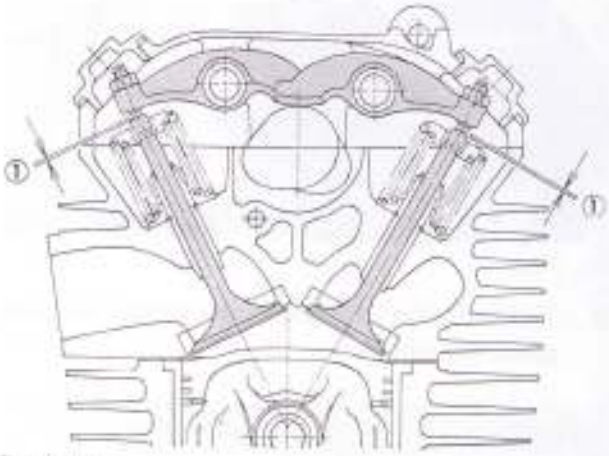


Fig. 7-88.

CHECKING AND ADJUSTING IGNITION TIMING

To check and adjust advance characteristic of advance governor and ignition timing, refer to page 3-8.

CYLINDER HEAD COVER

After removing gasket from the fitting surface of the cylinder head cover, place the cylinder head cover on a surface plate and check for distortion with a feeler gauge. Check points are shown in Fig. 7-89.

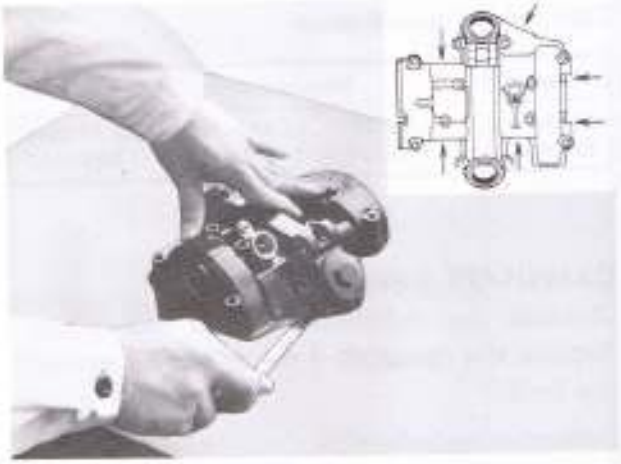


Fig. 7-89.

If the distortion exceeds the limit, replace the cylinder head set.

Cylinder head cover distortion specification.

Standard	Service limit
0.03 mm (0.0012 in.)	0.2 mm (0.0079 in.)

For clearance between camshaft and journal, refer to the camshaft item (page 7-26).

ROCKER ARM SHAFT

ROCKER ARM SHAFT RUNOUT

Support the rocker arm shaft on "V" blocks, as shown, and check runout with a dial gauge. The rocker arm shaft must be replaced if it exhibits a deflection exceeding the limit.

Valve stem runout specification

Standard	Service limit
0.005 mm (0.0002 in.)	0.06 mm (0.0024 in.)

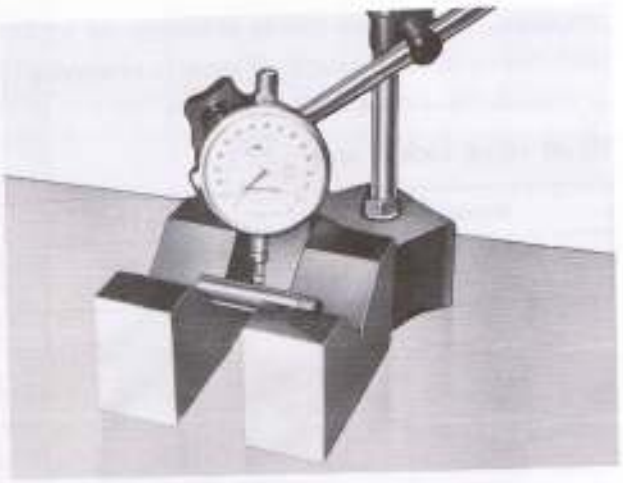


Fig. 7-90.

WEAR OF ROCKER ARM SHAFT

Measure diameter of rocker arm shaft with a micrometer. If wear is in excess of the limit, fit a new rocker arm shaft.

Rocker arm shaft diameter

Standard	Service limit
11.992 ~ 11.995 mm (0.4722 in.)	11.936 mm (0.4699 in.)

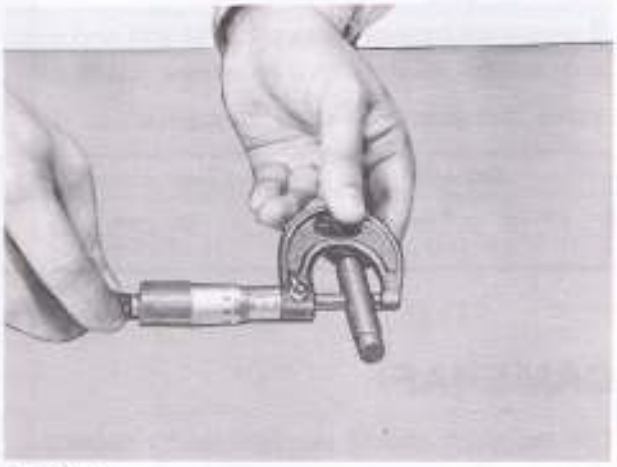


Fig. 7-91.

VALVE ROCKER ARM

The valve rocker arm is made of chromium-molybdenum steel and the point where it comes in contact with the camshaft is plated to improve wear resistance.

When checking the valve rocker arm, the inside diameter of the valve rocker arm and wear of the camshaft contacting surface should be

checked. Check the inside diameter of rocker arm with a caliper gauge. If wear is in excess of the limit, fit a new rocker arm.

ID of valve rocker arm

Standard	Service limit
12.000 ~ 12.018 mm (0.4725 ~ 0.4731 in.)	12.050 mm (0.4744 in.)

Fig. 7-92.

VALVE ROCKER ARM-TO-SHAFT CLEARANCE

If clearance between valve rocker arm and shaft is in excess of the limit, fit a new spare part.

Valve rocker arm-to-shaft clearance

Standard	Service limit
0.016 ~ 0.052 mm (0.0006 ~ 0.020 in.)	0.1 mm (0.0040 in.)

CAMSHAFT

The camshaft should be checked for deflection and also for wear of cams and journals if the engine has been noted to give abnormal noise or vibration or to lack output power. Any of these malconditions could be caused by camshaft worn down or distorted to the service limit.

CAM WEAR

Worn-down cams are often the cause of mis-timed valve operation resulting in reduced output power. The limit of cam wear is specified for both intake and exhaust cams in terms of cam height Ⓗ which is to be measured with a micrometer. Replace camshafts if found worn down to the limit.

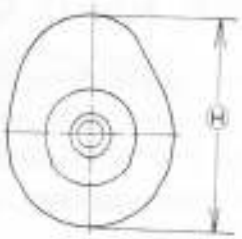


Fig. 7-93.

Cam height specification

Height Ⓗ	Standard	Service limit
Intake and Exhaust cam	39.88 ~ 39.92 mm (1.5701 ~ 1.5716 in.)	39.78 mm (1.5661 in.)

CAMSHAFT DEFLECTION

Measure the deflection with a dial gauge. Replace the camshaft if the deflection exceeds the limit.

Deflection specification

Standard	Service limit
0.03 mm (0.0011 in.)	0.1 mm (0.0039 in.)

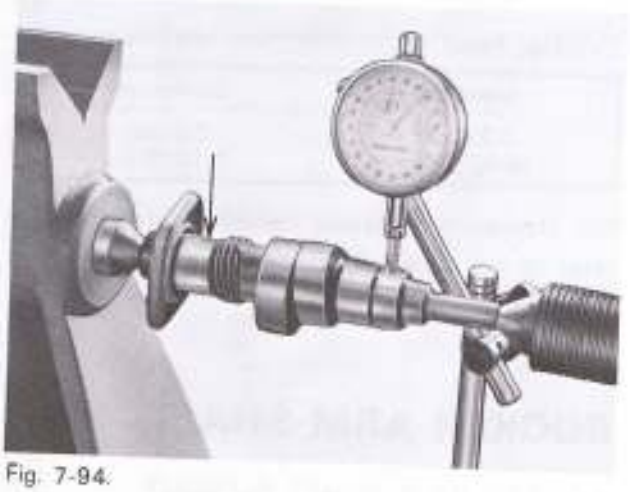


Fig. 7-94.

JOURNAL WEAR

Determine whether each journal is worn down to the limit or not by measuring camshaft journal clearance with the camshaft installed. Use plastigage to read the clearance, which is specified as follows:

Clearance specification

Standard	Service limit
0.020 ~ 0.062 mm (0.0008 ~ 0.0024 in.)	0.15 mm (0.0059 in.)

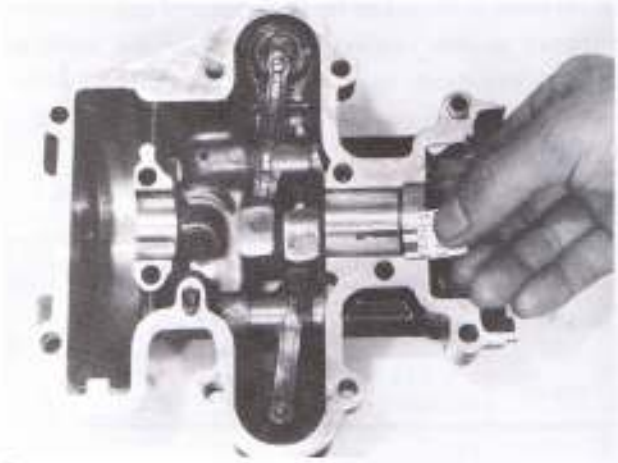


Fig. 7-95.

NOTE:
At the stage when gaskets have been removed from fitting surfaces of cylinder head and cover, and before SUZUKI BOND No. 1211 has been applied, fit the cylinder head cover and tighten to the torque specified below.

Tightening torque:

9 ~ 10 N.m (0.9 ~ 1.0 kg-m, 7.0 lb-ft)

CYLINDER HEAD

1. Decarbon combustion chamber.
2. Check the gasketed surface of the cylinder head for flatness with a straightedge and feeler gauge, taking a clearance reading at several places as indicated. If the largest reading at any position of the straightedge exceeds the limit, replace the cylinder head.

Cylinder head flatness specification

Standard	Service limit
0.03 mm (0.0011 in.)	0.20 mm (0.0078 in.)

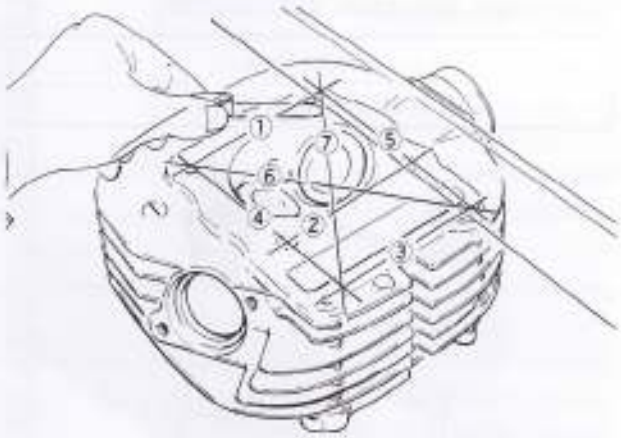


Fig. 7-96.

VALVE

VALVE FACE WEAR

Visually inspect each valve for seating face wear. Replace valve if found to have an abnormally worn face.

Vlave margin Ⓣ decreases as the wear of the face advances. Measure valve margine and, if it is found to have decreased to the limit, replace it.

Valve margin specification

	Standard	Service limit
IN. EX valve	1.0 ~ 1.4 mm (0.040 ~ 0.055 in.)	0.5 mm (0.020 in.)

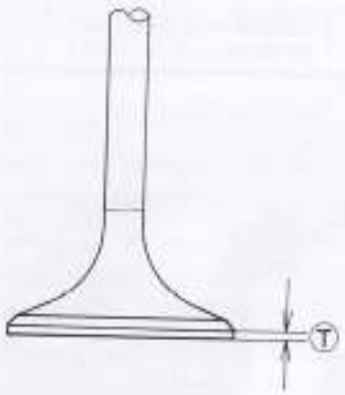


Fig. 7-97.

VALVE STEM DEFLECTION

Support the valve with "V" blocks, as shown, and check deflection with a dial gauge. The valve must be replaced if it exhibits a deflection exceeding the limit.

Valve stem deflection specification

Service limit
0.05 mm (0.0019 in.)

Fig. 7-98.

VALVE-TO-GUIDE CLEARANCE

Measure the clearance in two directions, "X" and "Y", perpendicular to each other, by rigging up the dial gauge as shown. If the clearance measured exceeds the limit specified below, then determine whether the valve or the guide should be replaced to reduce the clearance to within the standard range:

Valve-to-guide clearance

Valve	Standard	Service limit
Intake	0.020 ~ 0.050 mm (0.0008 ~ 0.0019 in.)	0.19 mm (0.0075 in.)
Exhaust	0.035 ~ 0.070 mm (0.0014 ~ 0.0027 in.)	0.30 mm (0.0118 in.)

Fig. 7-99.

If the valve stem is worn down to the limit, when measured with a micrometer, and the clearance is found to be in excess of the limit indicated above, replace the valve; if the stem is within the limit, then replace the guide. After replacing valve or guide, be sure to recheck the clearance.

Valve stem diameter specification

Valve	Standard	Service limit
Intake	6.960 ~ 6.975 mm (0.2634 ~ 0.2746 in.)	6.9 mm (0.2717 in.)
Exhaust	6.945 ~ 6.960 mm (0.2636 ~ 0.2746 in.)	6.8 mm (0.2677 in.)

Fig. 7-100.

VALVE SEATS

IMPORTANT:
Before checking the seat widths and, as necessary, refacing seats, make sure that the valves and valve guides are in good condition.

SEAT WIDTH MEASUREMENT

Uniformly coat the valve seat with red lead paste. Fit the valve and tap it in a rotating manner, in order to get a clear impression of the seating contact between coated seat and valve face. Use the valve lapper to hold the valve head.

Fig. 7-101.

The ring-like red lead impression left on the valve face must be continuous — without any gaps and, in addition to this requirement, the width of the red-lead ring, which is the seat "width", must be within the limit:
If either requirement is not met, correct the seat by servicing it as follows:

Valve seat width specification

Seat width	Standard	Service limit
Ⓦ	1.0 ~ 1.2 mm (0.040 ~ 0.047 in.)	1.5 mm (0.059 in.)

Fig. 7-102.

VALVE SEAT SERVICING

The valve seats for both intake and exhaust valves are angled to present three bevels, 15° (inner), 45° (middle) and 75° (outer). To reface the seat, proceed as follows:

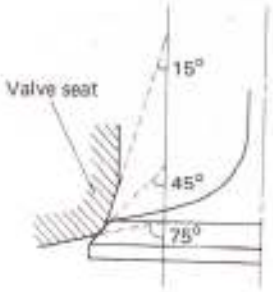


Fig. 7-103.

1. First make cuts at 15° and 75°, removing a minimum of stock.
2. Make a cut at 45°, to obtain a width of 1.0 ~1.2 mm (0.040 ~0.047 in.). The amount of stock removed in this cutting directly affects the valve position and valve clearance.

NOTE:
This is a delicate machining operation, and must be carried out cautiously, bearing in mind the possibility of raising the valve too much toward the rocker arm.

Fig. 7-104.

3. Lap the seat with two or three sizes of lapping compound. Use the coarse compound to produce contacting width by operating the valve lapper in the usual manner. Finish the seat width with the fine compound.

Fig. 7-105.

4. Clean the seat after lapping. Check the seat width with the valve in the manner outlined above, with the red-lead paste applied uniformly to the seat.

NOTE:
After servicing the valve seats, be sure to adjust the valve clearance when the cylinder head has been installed in reassembly.

VALVE SPRINGS

The strength of the two coil springs dictates tightness of valve seating. Weakened springs result in reduced engine power output, and often causes the valve mechanism to make a chattering noise.
Check the strength of the springs by measuring their free lengths and also the force required to compress them. If the limit indicated below is exceeded by the free length reading or if the measured force is not within the range specified, replace the spring with one supplied by SUZUKI.

NOTE:
Replace two springs at a time, outer and inner, if either one of these is found to be beyond the limit.

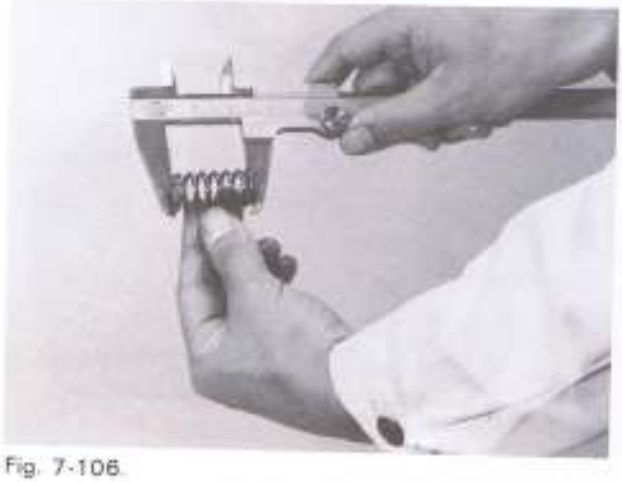


Fig. 7-106

Spring rate specification

Spring	Standard
INNER	24.2 ~ 27.8 kg/23 mm (53 ~ 61 lbs/0.91 in.)
OUTER	50.4 ~ 57.8 kg/27 mm (111 ~ 127 lbs/1.06 in.)

Free length specification

Spring	Standard	Service limit
INNER	36.95 mm (1.455 in.)	35.50 mm (1.397 in.)
OUTER	43.00 mm (1.693 in.)	41.50 mm (1.634 in.)

DISASSEMBLY

The cylinder can be removed by raising it with both hands, and at the same time trying to shake it. When the cylinder cannot be removed by this means, tap the side of the fins and then lift it in the same manner as above.

NOTE:
If tapping is necessary, do not break the fins.

Fig. 7-107.

REASSEMBLY

1. Before mounting the cylinder block, oil the big and small end of the connecting rod and also the sliding surface of the piston. confirm that the "O" ring ① is accurately positioned in the groove.

Fig. 7-108.

2. Fit dowel pins ① to crankcase and then fit gasket.

NOTE:
To prevent oil leakage, do not use the old gaskets and O-rings again; always use new ones.

Fig. 7-109.

3. Hold each piston ring with the piston ring sections positioned as shown in Fig. 7-110 and put them onto the cylinder. Confirm that the piston rings are caught by the cylinder skirt.

Fig. 7-110.

NOTE:
When mounting the cylinder, after attaching camshaft drive chain ①, keep the camshaft drive chain taut. The camshaft drive chain must not be caught between cam drive chain sprocket and crankcase when crankshaft is rotated.

Fig. 7-111.

4. Tighten the cylinder head nuts then tighten the cylinder base nut.

Fig. 7-112.

INSPECTION

To check the cylinder for wear, take I.D. readings and determine whether the cylinder needs reworking to the next oversize. For this purpose, use the cylinder gauge (09900-20508) and take a total of 6 readings at three elevations in longitudinal and transverse directions, two readings at each elevation.

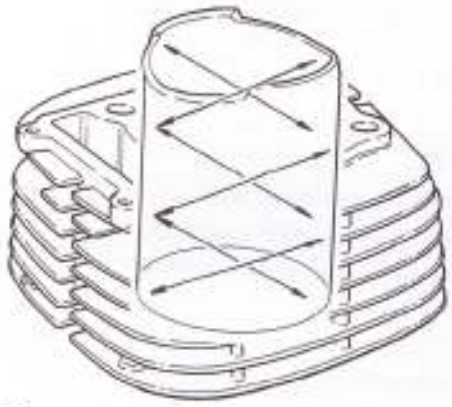


Fig. 7-113.

If any of the readings exceeds the I.D. limit or if the difference between the maximum and the minimum reading exceeds the difference limit, or if the bore surface is found to be badly burned or scored, rebore the cylinder to the size for the oversize piston available.

Limit on difference between maximum and minimum readings (max. allowable difference)	0.1 mm (0.0039 in.)

Fig. 7-114.

Cylinder I.D. specification

Standard I.D.	I.D. limit
85.000 ~ 85.015 mm (3.34646 ~ 3.34705 in.)	85.10 mm (3.35039 in.)

Oversize piston	0.5 mm, 1.0 mm

Piston-to-cylinder clearance	0.060 ~ 0.070 mm (0.0023 ~ 0.028 in.)

DISASSEMBLY

Place a clean rag over the cylinder base to prevent piston pin circlip from dropping into crankcase and then, remove the piston pin circlip with long-nose pliers.

Fig. 7-115.

Fit piston pin puller attachment ① as shown in Fig. 7-116 and remove the piston pin.

Fig. 7-116.

REASSEMBLY

INSTALLING OIL RING

The first member to go into the ring groove is spacer ①. After placing the spacer, fit the two side rails ②. The spacer and side rails can be positioned either way.

Fig. 7-117.

Fig. 7-118.

INSTALLING TOP AND 2ND RINGS

The shape of the ring face of top ring and middle (2nd) ring differ. The face of the top ring is chrome-plated whereas that of the 2nd ring is not. The color of the 2nd ring appears darker than that of the top one.

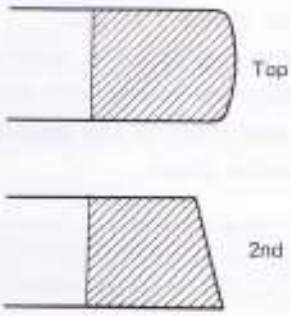


Fig. 7-119.

Top and 2nd (middle) rings have the letter "T" marked on the side. Be sure to bring the marked side to the top when fitting them to the piston.

Fig. 7-120

Distribute the gaps of the three rings as shown. Before inserting each piston into the cylinder, confirm that the gaps are located as shown.

Fig. 7-121

FITTING PISTON

The following are reminders for piston installation:

1. Rub a small quantity of SUZUKI MOLY PASTE onto the piston pin.
2. Place a clean rag over the cylinder base to prevent piston pin circlip from dropping into crankcase and then, fit the piston pin circlip with long-nose pliers.

NOTE:
Use a new piston pin circlip to prevent drop-off which will occur with a bent one.

3. When fitting the piston, turn arrow mark ① on the piston head to exhaust side.

Fig. 7-122

INSPECTION

DECARBONING

Using a soft-metal scraper, decarbon the crown of the piston. Clean the ring grooves similarly.

PISTON WEAR DETERMINATION

Measure the piston at the places and in the directions indicated. If the service limit is reached, replace the piston.

Piston diameter specification

Standard	Service limit
84.935 ~ 84.950 mm (3.34390 ~ 3.34449 in.)	84.90 mm (3.34252 in.)

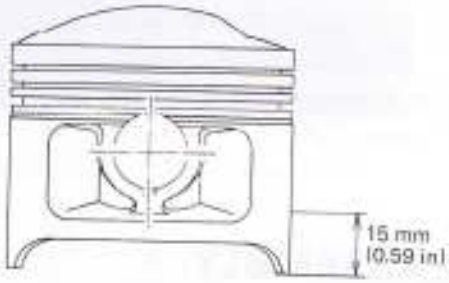


Fig. 7-123

PISTON RING CLEARANCE IN THE GROOVE

Check each ring with a thickness gauge. If the clearance limit is exceeded by any of the three rings, determine whether the ring or the piston should be replaced by measuring the ring thickness and the groove width. Limits are specified for the width and thickness below.

Fig. 7-124.

Ring-to-groove clearance specification

Ring	Standard	Service limit
TOP	0.03 ~ 0.07 mm (0.0012 ~ 0.0027 in.)	0.17 mm (0.0066 in.)
MIDDLE	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in.)	0.16 mm (0.0062 in.)
OIL	—	0.15 mm (0.0059 in.)

Ring thickness specification

Piston ring	Standard	Service limit
TOP	1.17 ~ 1.19 mm (0.0461 ~ 0.0468 in.)	1.10 mm (0.043 in.)
MIDDLE	1.47 ~ 1.49 mm (0.0579 ~ 0.0586 in.)	1.40 mm (0.0055 in.)

Ring groove width specification

Ring groove	Standard	Service limit
TOP	1.22 ~ 1.24 mm (0.0480 ~ 0.0488 in.)	1.30 mm (0.051 in.)
MIDDLE	1.51 ~ 1.53 mm (0.0594 ~ 0.0602 in.)	1.60 mm (0.063 in.)
BOTTOM	2.81 ~ 2.83 mm (0.1106 ~ 0.1114 in.)	2.90 mm (0.114 in.)

PISTON RING GAP

Each piston ring, with the exception of oil rings, is required to have a ring gap within the specified range and must be replaced if the limit is exceeded. To measure the gap, fit the ring to the cylinder at its skirt portion near the end and measure the gap. The specification values indicated here refer to the gap measured in this manner.

Ring gap specification

Piston ring	Standard	Limit
TOP and MIDDLE	0.4 ~ 0.7 mm (0.0157 ~ 0.0275 in.)	0.8 mm (0.0315 in.)

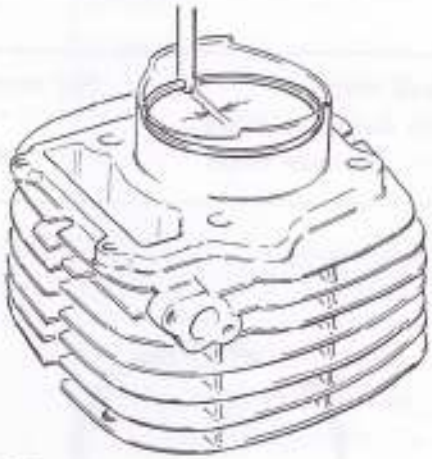


Fig. 7-125.

When the elastic strength of a piston ring is reduced to the critical value it must be replaced. The limit is specified as the free-state ring gap, as follows.

Free-state ring gap specification

Piston ring	Standard	Service limit
TOP	7.0 mm (0.276 in.)	5.0 mm (0.197 in.)
MIDDLE	8.5 mm (0.335 in.)	6.5 mm (0.256 in.)

Fig. 7-126.

OVERSIZE PISTON RINGS

The following information serves to distinguish standard piston rings from oversize ones.

Top and 2nd rings:

Top and 2nd rings have a number on the ring end indicated by the arrow, if they are oversize rings.

Standard rings	No number
0.5 mm oversize rings	"50"
1.0 mm oversize rings	"100"

Fig. 7-127.

OIL RING SPACER

Oversize oil ring spacers have their end portions, to a length of 10 to 15 mm, painted red or yellow.

Standard spacers	No paint
0.5 mm oversize spacers	Painted RED
1.0 mm oversize spacers	Painted YELLOW

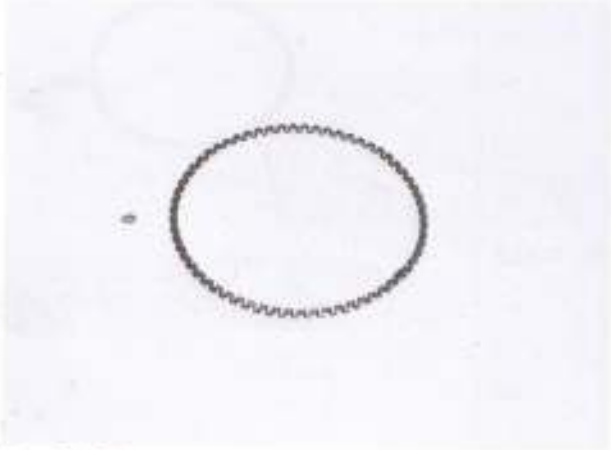


Fig. 7-128.

OIL RING SIDE RAIL

The only way to tell an oversize side rail of an oil ring from a standard-size one is to measure its outside diameter.

Standard side rails	85.0 mm in O.D.
0.5 mm oversize side rails	85.5 mm in O.D.
1.0 mm oversize side rails	86.0 mm in O.D.

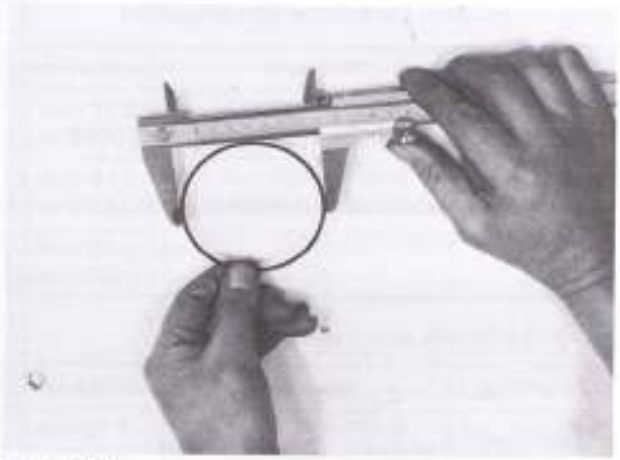


Fig. 7-129.

FLYWHEEL MAGNETO

1. To remove flywheel magneto rotor, hold the rotor with special tool ① and loosen nut ②.

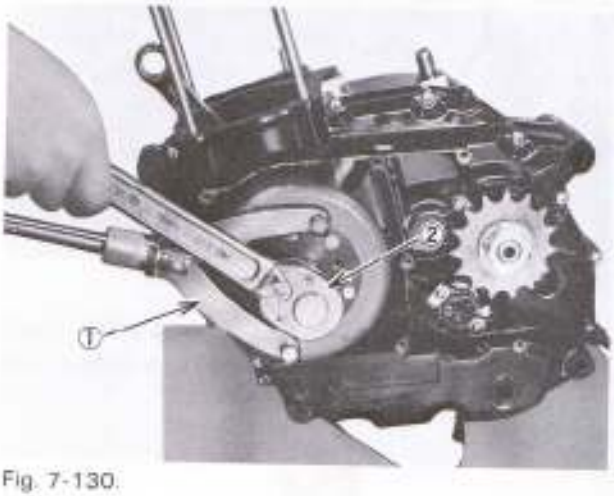


Fig. 7-130.

2. Using the rotor remover (special tool: 09930-30101) ① and attachment (special tool: 09930-33710) ②, remove rotor ③.

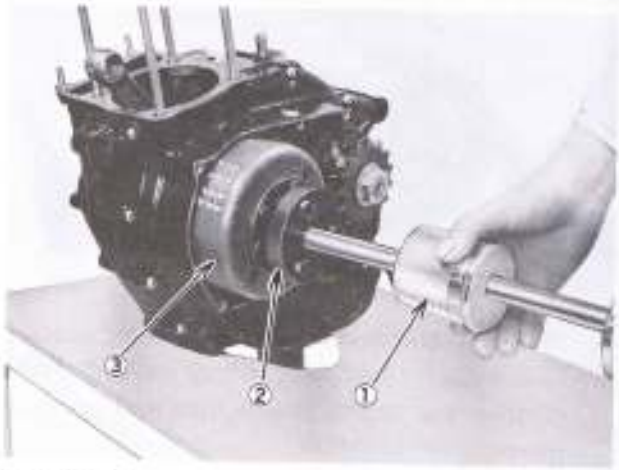


Fig. 7-131.

3. Remove gear shifting switch body, contact and spring.

NOTE:
Don't loss neutral contact ① and spring ②.

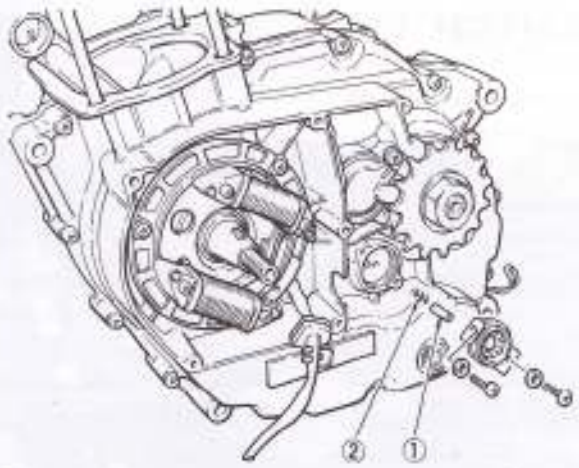


Fig. 7-132.

4. Remove flywheel magneto stator.

Fig. 7-133.

ENGINE SPROCKET

To remove the engine sprocket, straighten washer with a chisel and then, holding the sprocket with special tool 1 , loosen nut with a 30 mm wrench.

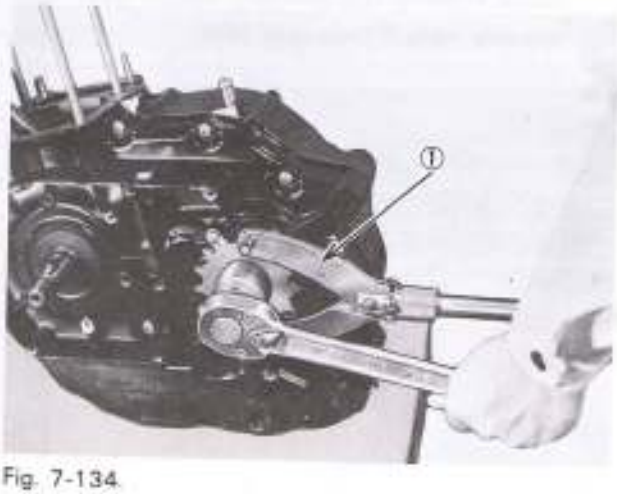


Fig. 7-134.

CLUTCH

1. Drain engine oil.

Fig. 7-135. 1. Drain plug

2. After kick starter lever assembly has been removed, remove the 12 clutch cover screws and detach clutch cover by tapping with a plastic hammer.

Fig. 7-136.

3. Loosen the 6 clamping bolts diagonally while holding the primary driven gear, and remove clutch pressure disk.

NOTE:
Do not allow camshaft drive chain to be caught between crankcase and camshaft drive sprocket.

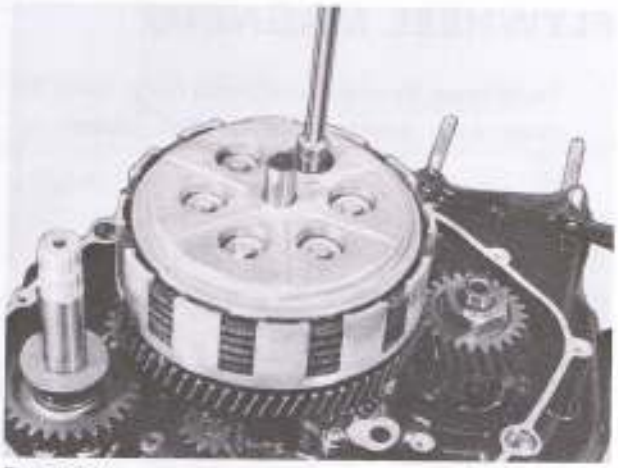


Fig. 7-137.

4. After clutch drive and driven plate have been removed, straighten clutch sleeve hub nut washer with a chisel.

Fig. 7-138.

5. With clutch sleeve hub held with special tool, loosen clutch sleeve hub nut and then, remove the clutch sleeve hub and primary driven gear together.

Fig. 7-139.

PRIMARY DRIVE GEAR

After removing the primary drive gear, fit special tool to the underside of connecting rod and remove primary drive gear nut. Then, the primary drive gear and drive chain sprocket can be removed.

NOTE:
Fit special tool onto a gasket to prevent the cylinder base face from being damaged by contact with the special tool. The primary driven gear nut must have a left-hand thread.

Fig. 7-140.

CAMSHAFT DRIVE CHAIN SPROCKET AND CHAIN

Camshaft drive sprocket can be removed from the side shown, by removing primary gear and key.
Camshaft drive chain can be removed similarly when cam driven sprocket has been taken off.

Fig. 7-141.

ENGINE OIL FILTER

Engine oil filter is fitted to the bottom of the crankcase. To remove the filter, drain engine oil and remove oil filter, drain engine oil and remove oil filter cap.

1. Engine oil strainer
2. Spring
3. O-ring
4. Cap
5. Bolt
6. Gasket
7. Drain plug

Fig. 7-142.

OIL PUMP

After removing primary driven gear, take off the oil pump assembly.

Fig. 7-143.

KICK STARTER DRIVE GEAR AND IDLE GEAR

Kick starter drive gear and idle gear can be removed easily after primary driven gear has been removed.

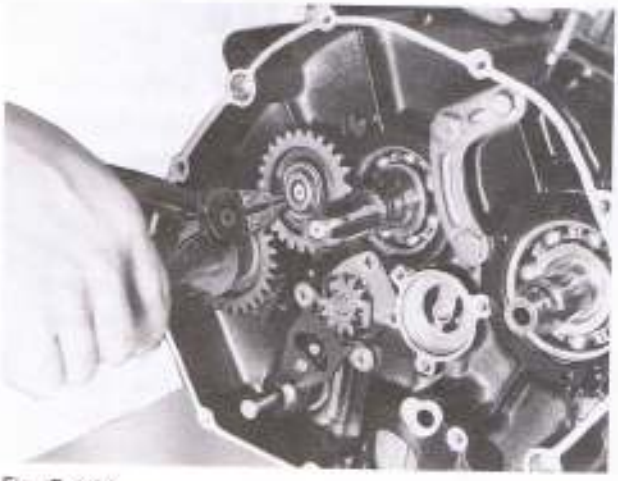


Fig. 7-144.

GEAR SHIFTING MECHANISM

CAM DRIVEN GEAR

To remove cam driven gear, first remove gear shifting shaft and loosen pawl lifter and cam guide screw ① with a shock screwdriver.

NOTE:
When removing cam driven gear do not lose gear shifting pawl ②, pin ③ and spring ④.

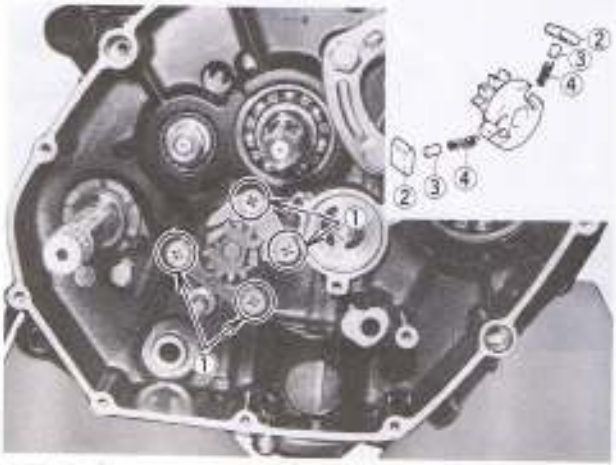


Fig. 7-145.

CRANKCASE

When replacing such internal parts of crankcase as crank shaft, transmission, etc., separate the crankcase halves in the following manner.

1. Remove neutral cam stopper.

1. Neutral cam stopper
2. Spring
3. Washer
4. Stopper plug
5. Gear shifting cam

Fig. 7-146.

2. After removing the 12 crankcase setscrews, fit special tool as shown in Fig. 7-147 and separate the crankcase into 2 parts, right and left by tapping the crankcase with a plastic hammer.

Fig. 7-147.

NOTE:
Screw adapter thread more than 5 mm into the crankcase and make the special tool plate and end face of crankcase parallel with each other.

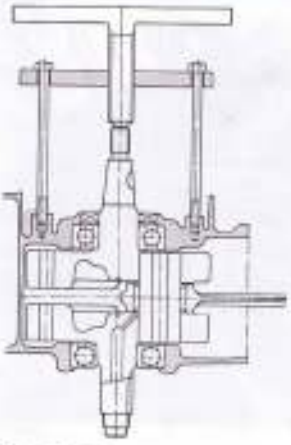


Fig. 7-148.

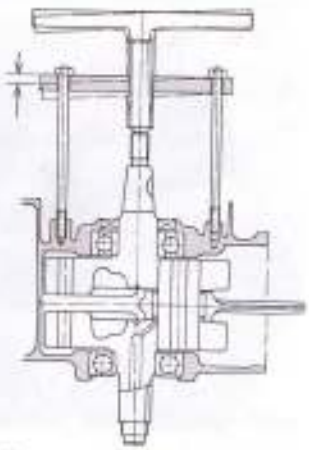


Fig. 7-149.

NOTE:
When tapping the crankcase with a plastic hammer, never tap the hatched part ①. This is the passage for the camshaft drive chain. If it is tapped with a plastic hammer, it will break or be deformed.

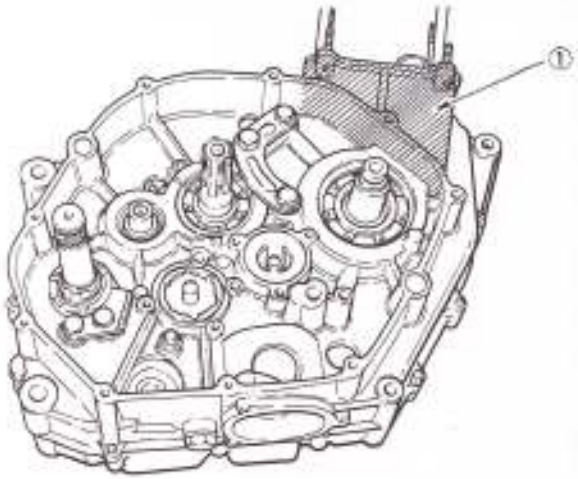


Fig. 7-150.

GEAR SHIFTING CAM AND FORK

Remove the gearshifting cam and fork in the following manner.

1. First, remove gear shifting cam stopper spring ① from crankcase and then, extract shifting fork shaft ②. Gear shifting fork ③ and gear shifting cam stopper ④ can then be taken out.

Fig. 7-151.

2. When the gear shifting fork shaft is moved in the direction of the arrow and it is kept drawn out about 10 mm, the shifting fork shaft and gear shifting fork can be removed in one piece.

Fig. 7-152.

3. Remove gear shifting cam.

TRANSMISSION

After the transmission has been removed from the crankcase, bind it with rubber bands, for convenience in reassembly.

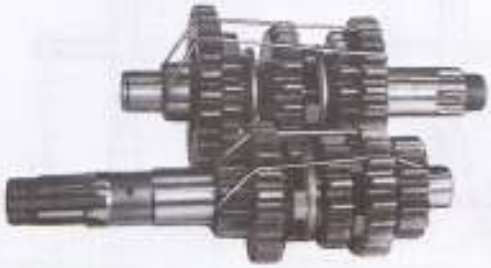


Fig. 7-153.

KICK STARTER SHAFT

To remove the kick starter shaft, first remove circlip and spring guide, and then the spring. Then, extract kick starter shaft to the right side.

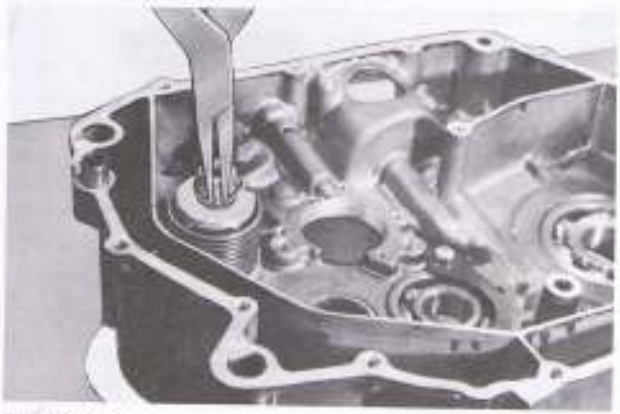


Fig. 7-154.

When removing crankshaft assembly be sure to use the special tool.

Fig. 7-155.

NOTE:
Screw the special tool bolt more than 5 mm into the crankcase, and fit the special tool so that the special tool plate is parallel with the end face of the crankcase.

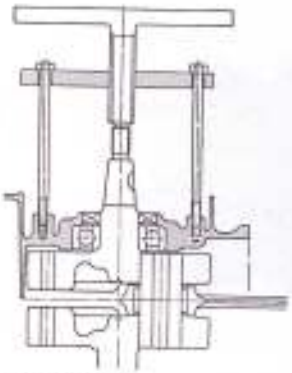


Fig. 7-156.

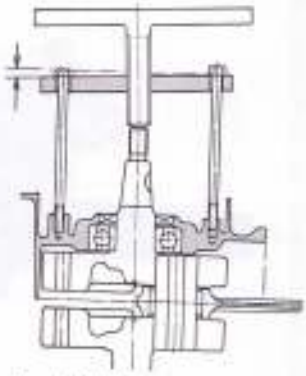
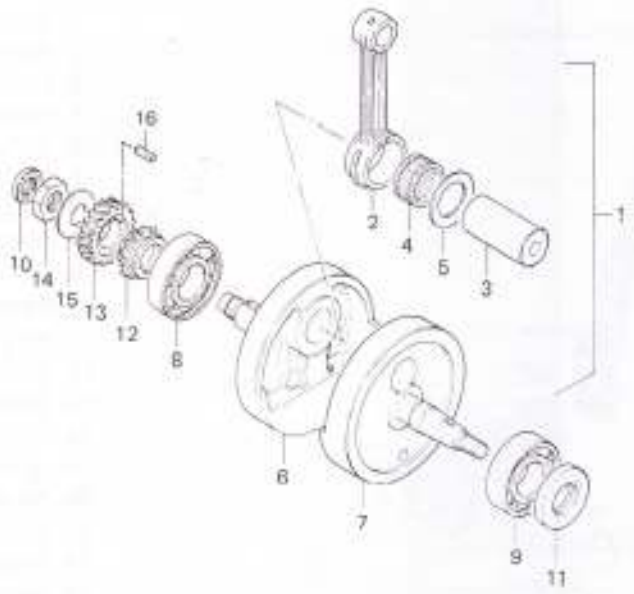


Fig. 7-157.

NOTE:
Absolutely avoid removing crankshaft by striking with a plastic hammer. Always use the special tool, otherwise crankshaft alignment accuracy will be affected.

Fig. 7-158.

CRANKSHAFT



1. Crankshaft ass'y
2. Connecting rod
3. Pin
4. Bearing
5. Washer
6. Crankshaft, RH
7. Crankshaft, LH
8. Bearing, RH
9. Bearing, LH
10. Oil seal, RH
11. Oil seal, LH
12. Chain drive sprocket
13. Primary drive gear
14. Nut
15. Lock washer
16. Key

Fig. 7-159.

CRANKSHAFT

1. Grease lip ① of crankshaft oil seal.

NOTE:
Replace the crankshaft oil seal with a new one every disassembly to prevent oil leakage.

Fig. 7-160.

2. Fit the crankshaft on the left crankcase side using the special tool as shown in Fig. 7-161.

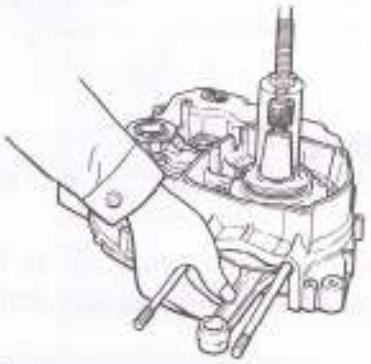
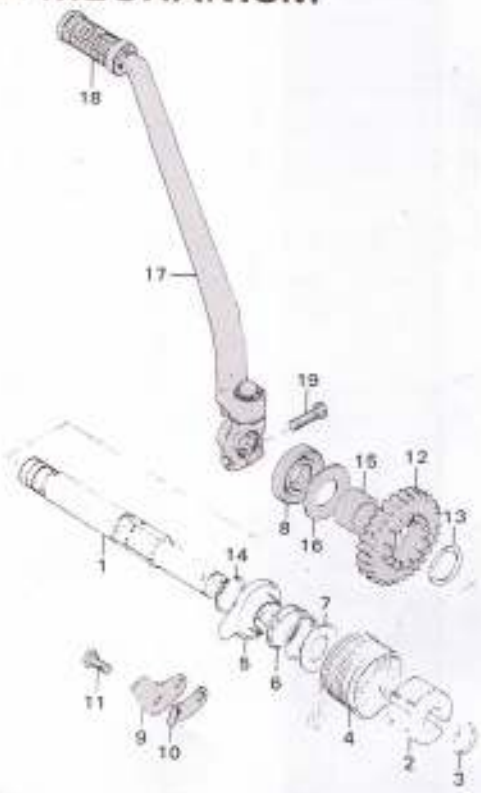


Fig. 7-161.

NOTE:
Never fit the crankshaft into the crankcase by striking it with a plastic hammer. Always use the special tool, otherwise crankshaft alignment accuracy will be affected.

Fig. 7-162.

KICK STARTER MECHANISM



1. Kick starter shaft
2. Spring guide
3. Circlip
4. Spring
5. Kick starter
6. Spring
7. Plate
8. Oil seal
9. Guide
10. Stopper
11. Bolt
12. Drive gear
13. Washer
14. Circlip
15. Spacer
16. Oil reservoir plate
17. Kick starter lever ass'y
18. Cover
19. Bolt

Fig. 7-163.

KICK STARTER SHAFT

Fit the kick starter shaft in the following manner.

1. Fit washer ① and circlip ② to the kick starter shaft before fitting kick starter ③.

NOTE:
When fitting the kick starter, be sure to align the punched marks ④.

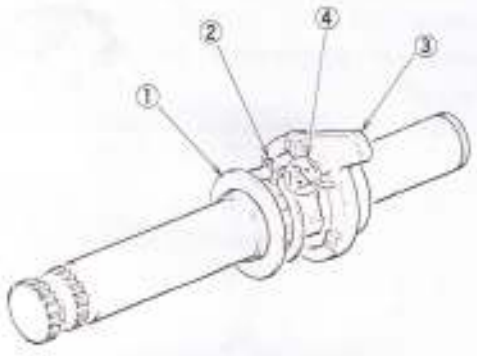


Fig. 7-164.

2. Fit spring ① and washer ② and insert the kick starter shaft into crankcase. Engage pawl ③ of kick starter on starter guide ④.

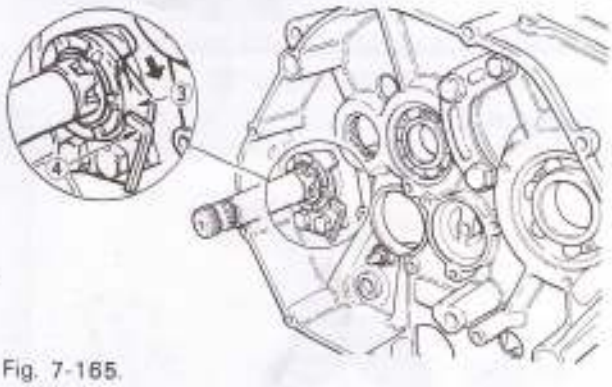
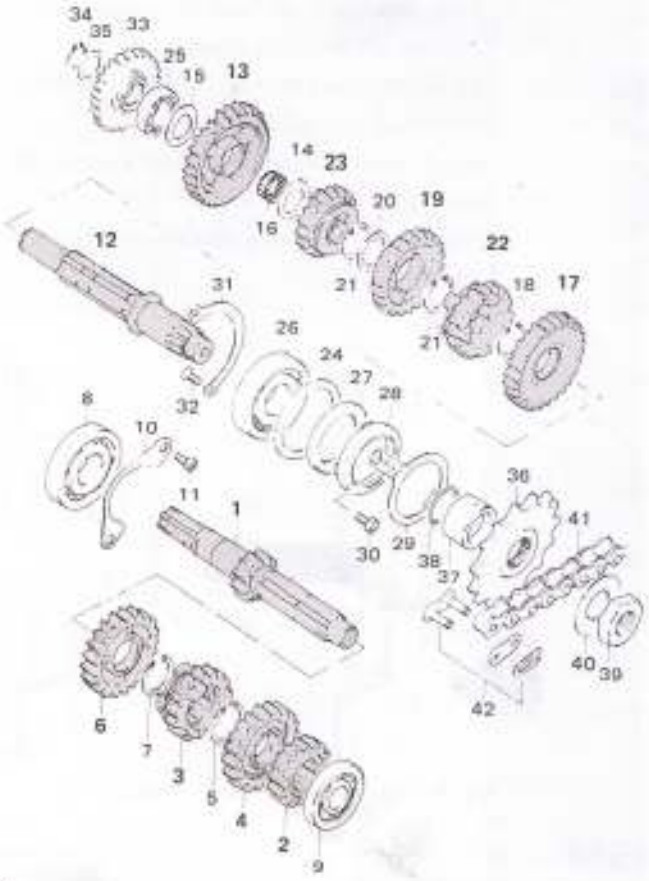


Fig. 7-165.

3. When fitting kick return spring ①, hook part ② of return spring onto crankcase, turn it 1/2 a turn clockwise with pliers and fit part ③ of return spring into hole of kick shaft. Then, fit spring guide and circlip.

Fig. 7-166.

TRANSMISSION



1. Countershaft
2. 2nd drive gear
3. 3rd drive gear
4. 4th drive gear
5. Circlip
6. 5th drive gear
7. Circlip
8. Bearing, RH
9. Bearing, LH
10. Bearing holder
11. Screw
12. Driveshaft
13. 1st driven gear
14. Washer
15. Washer
16. Bearing
17. 2nd driven gear
18. Circlip
19. 3rd driven gear
20. Washer
21. Circlip
22. 4th driven gear
23. 5th driven gear
24. Washer
25. Bearing, RH
26. Bearing, LH
27. Oil seal
28. Oil seal
29. Oil seal holder
30. Screw
31. Bearing holder
32. Screw
33. Kick starter idle gear
34. Circlip
35. Washer
36. Sprocket
37. Spacer
38. O'ring
39. Nut
40. Washer
41. Drive chain ass'y
42. Joint

Fig. 7-167.

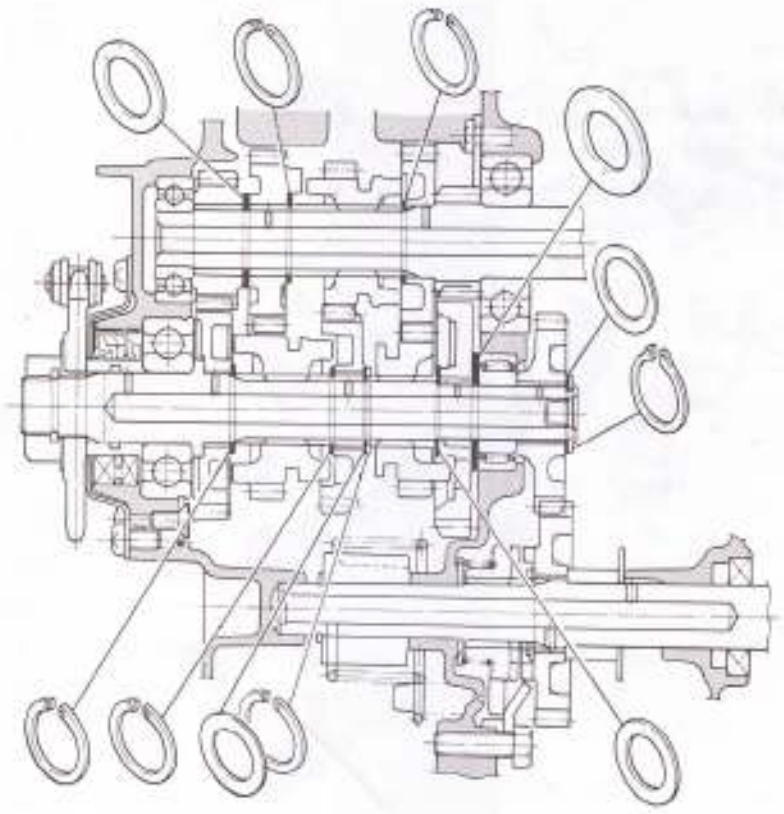


Fig. 7-168.

TRANSMISSION

For assembly of transmission, refer to Fig. 7-167.

NOTE:
Replace oil seals ① and ② of drive shaft with new ones every disassembly to prevent oil leakage. Also grease the oil seal lips. On installation, refer to Fig. 7-169 for correct position and direction.

NOTE:
The section of the oil seal spacer also serves as an oil passage to the drive shaft as illustrated in Fig. 7-170. If the spacer is inverted, no oil will be supplied to the drive shaft side. Assemble the spacer as shown in Fig. 7-170.
Replace "O" ring with new one every disassembly.

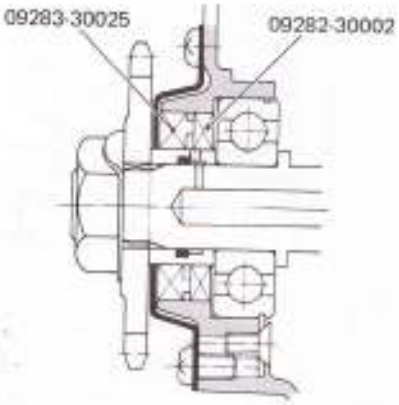


Fig. 7-169.

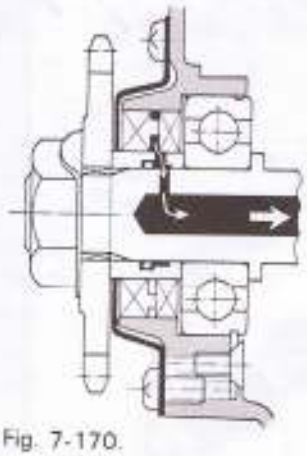


Fig. 7-170.

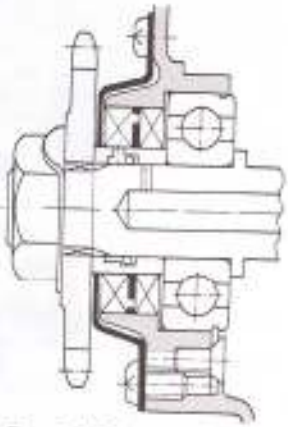


Fig. 7-171.

GEAR SHIFTING MECHANISM

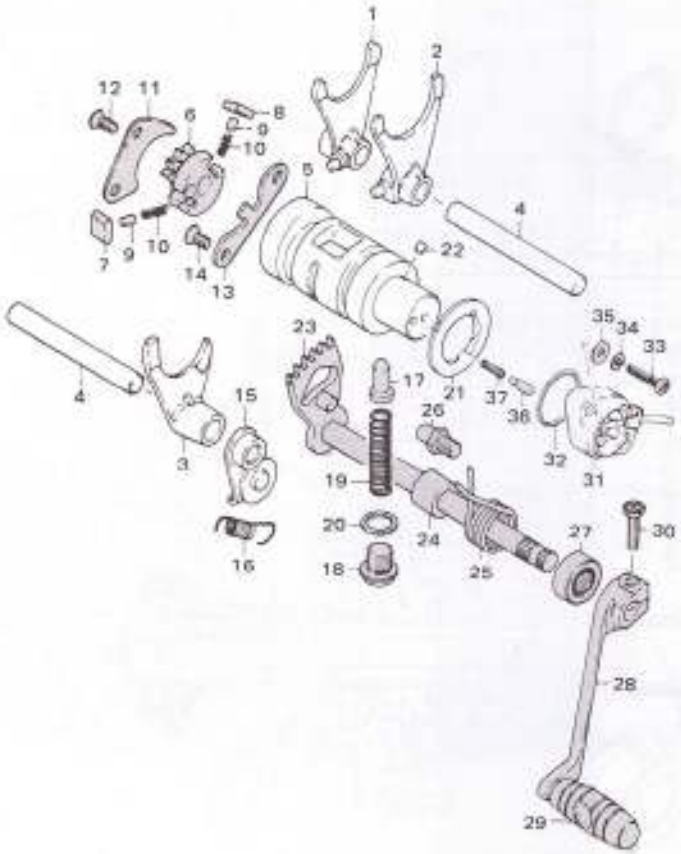


Fig. 7-172.

1. Gear shifting fork (1)
2. Gear shifting fork (2)
3. Gear shifting fork (3)
4. Fork shaft
5. Gear shifting cam
6. Cam driven gear
7. Pawl (1)
8. Pawl (2)
9. Pin
10. Spring
11. Pawl lifter
12. Screw
13. Cam guide
14. Screw
15. Stopper
16. Spring
17. Cam neutral stopper
18. Stopper plug
19. Spring
20. Washer
21. Stopper plate
22. Pin
23. Gear shifting shaft
24. Spacer
25. Spring
26. Arm stopper
27. Oil seal
28. Gear shifting lever ass'y
29. Cover
30. Bolt
31. Gear shifting switch body
32. O-ring
33. Screw
34. Lock washer
35. Washer
36. Contact
37. Spring

GEAR SHIFTING CAM AND FORK

Fit the gear shifting cam on crankcase.
Position the cam as shown in Fig. 7-173 so that the gear shifting fork can be installed easily.

Fig. 7-173.

After cam stopper and gear shifting fork have been fitted, hook cam stopper spring onto crankcase.

Fig. 7-174.

NOTE:
Three gear shifting forks are used. They resemble each other very closely in external appearance and configuration. Carefully examine Fig. 7-175 for correct individual installing positions and directions.

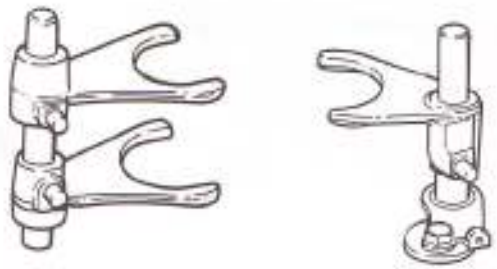


Fig. 7-175.

CRANKCASE

When reassembling the crankcase pay attention to the following.

1. Remove gasket on the fitting surfaces of right and left halves of crankcase and thoroughly remove oil stains.
2. Fit dowel pin ① on the left half.
3. Apply engine oil to the big end of the crankshaft connecting rod and all parts of the transmission gears.

Fig. 7-176.

4. Apply SUZUKI BOND No. 1211 (99000-31070) uniformly to the fitting surface of the right half of the crankcase, and after waiting a few minutes, fit the right half on the left half.

NOTE:
Never use SUZUKI BOND No. 4 (99000-31030).

Fig. 7-177.

5. After the crankcase screws have been tightened, check if drive shaft ① and countershaft ② rotate smoothly.

Fig. 7-178.

If a large resistance is felt to rotation, adjust by tapping the drive shaft or countershaft with a plastic hammer as shown in Fig. 7-179.

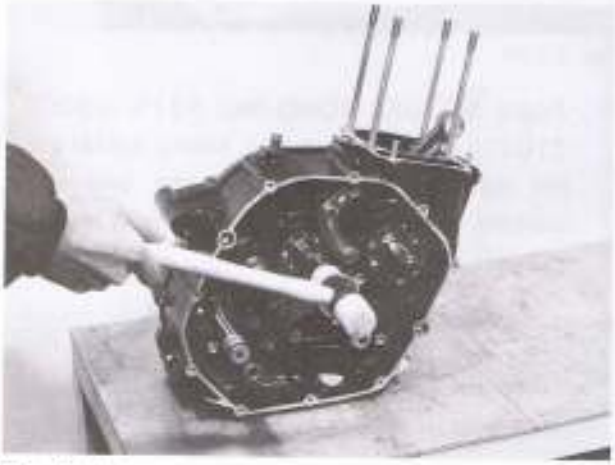


Fig. 7-179.

GEAR SHIFTING CAM DRIVEN GEAR

Two types of gear shifting pawl are available and they greatly resemble each other. Take care to use the correct one. When fitting the pawls to the cam driven gear, set the side where dimension Ⓐ is large to the outside as shown in Fig. 7-180.

Fig. 7-180.

Next, install cam guide and pawl lifter. Apply a small quantity of THREAD LOCK CEMENT to the threaded parts of the clamping screws.

THREAD LOCK CEMENT	99000-32040

GEAR SHIFTING SHAFT

Install the gearshift shafts, with the center of the gear on the shaft side matched to the center of the gearshift cam driven gear.

Fig. 7-181.

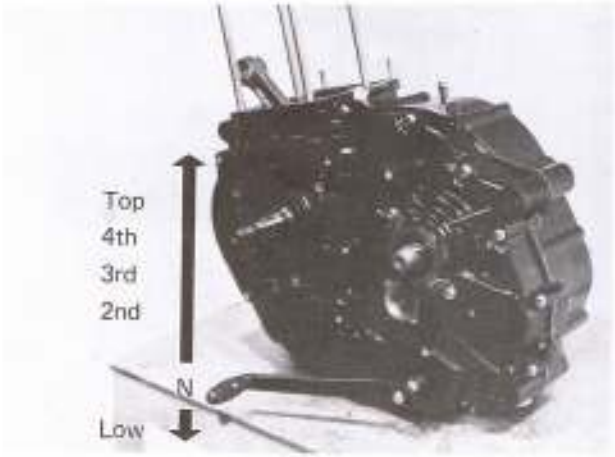


Fig. 7-182.

NOTE:
After the cam driven gear, cam guide and gear shifting shaft have been fitted, confirm that gear change is normal.
If gear change is not obtained, it means that assembly of gears or installation of gear shifting fork is incorrect. If this is the case, disassemble and trace the mistake.

OIL PUMP AND OIL FILTER

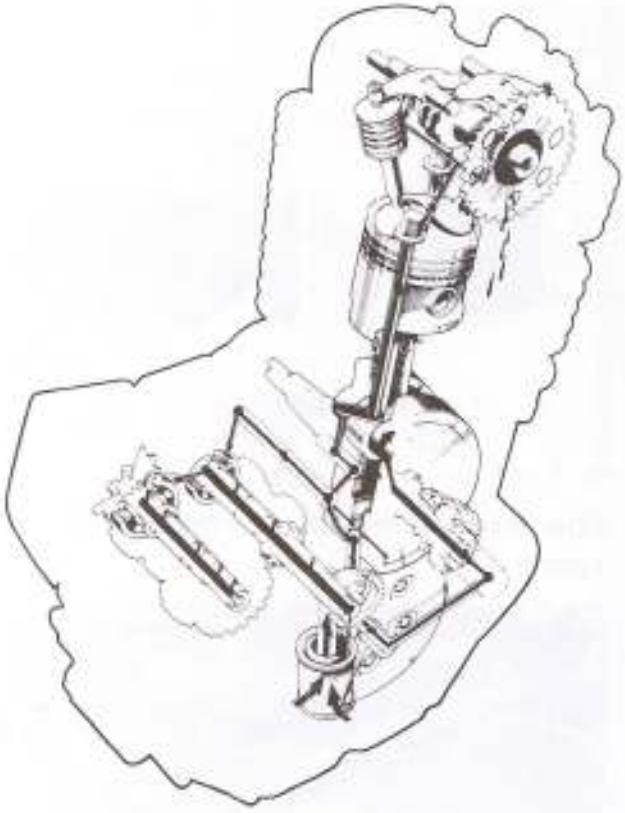
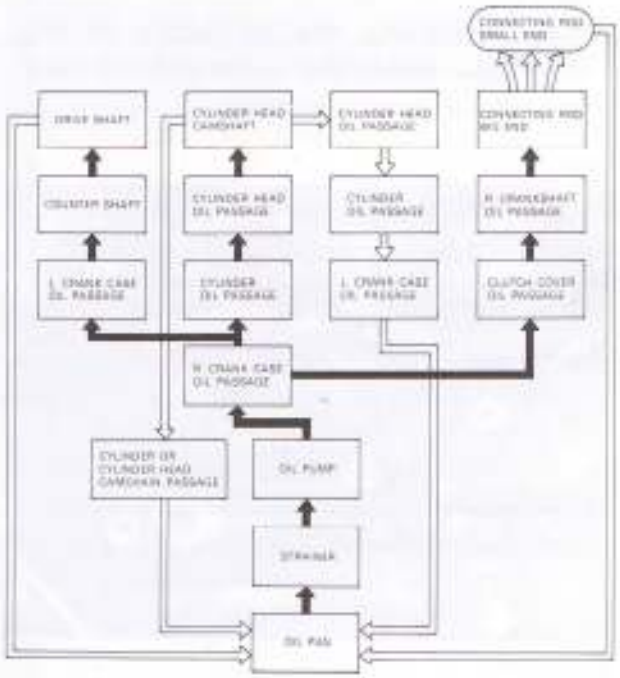


Fig. 7-183.

SP370 LUBRICATION



OIL PUMP

Before assembling the oil pump, apply engine oil to the sliding surfaces of the case, outer rotor, inner rotor and shaft.

Fig. 7-184.

NOTE:
After installing the oil pump in the crankcase, rotate the pump gear by hand to see if it turns smoothly.

Fig. 7-185.

OIL PUMP DRIVE GEAR

The oil drive gear is sub-assembled on the primary driven gear. Usually, there is no need to remove the drive gear. However, if the gear is removed, reassemble it so that boss ① is brought to the primary driven gear side as illustrated in Fig. 7-186.

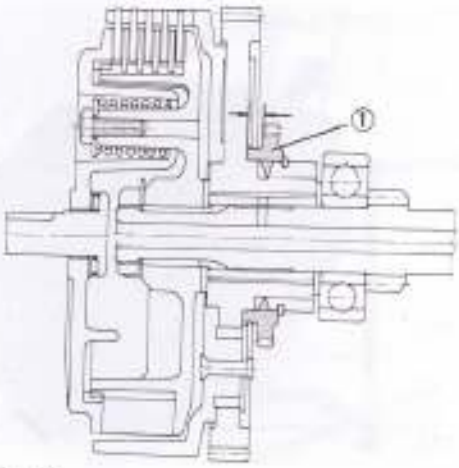


Fig. 7-186.

ENGINE OIL FILTER

Wash the filter ① with cleaning solvent, and then blow compressed air through it to dry off solvent.

Fig. 7-187.

Fig. 7-188.

After inserting the filter, fit the cap ② and tighten it.

Fig. 7-189.

NOTE:
Refer to page 3-9 for the frequency of engine oil filter periodic inspection and replacement.

CAMSHAFT DRIVE CHAIN SPROCKET

Install the sprocket with the key slot turned to the outside.

Fig. 7-190.

PRIMARY DRIVE GEAR

Install the primary drive gear in the reverse order to removal, and tighten it with a torque wrench to the specified torque.

Tightening torque:

80 ~ 100 N.m (8.0 ~ 10.0 kg-m, 58.0 ~ 72.0 lb-ft)

Fig. 7-191.

KICK STARTER DRIVE GEAR AND IDLE GEAR

Install kick idle gear and kick starter drive gear referring to Fig. 7-192 for the correct installing direction. Do not forget the washers.

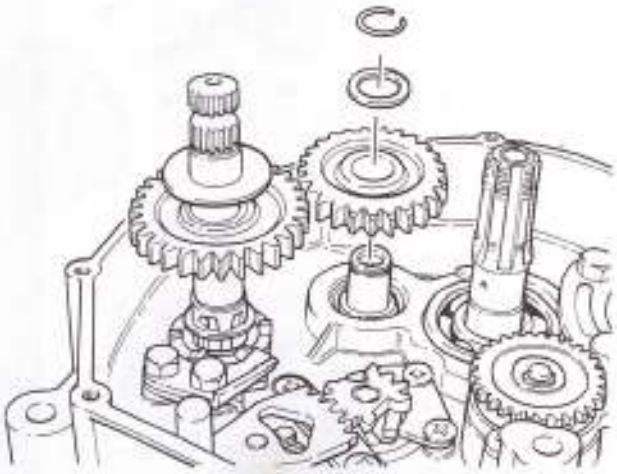
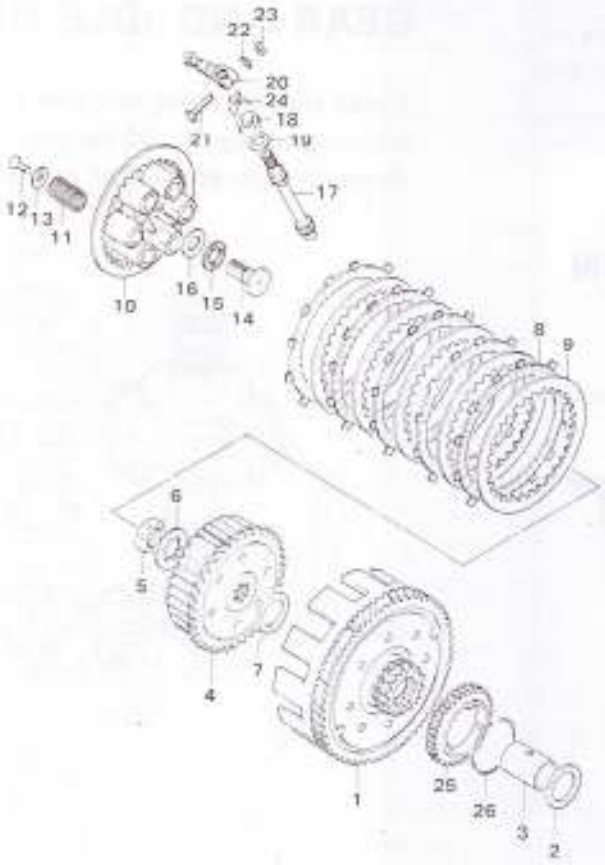


Fig. 7-192.

CLUTCH



1. Primary driven gear ass'y
2. Washer
3. Spacer
4. Sleeve hub
5. Nut
6. Lock wahser
7. Washer
8. Drive plate
9. Driven plate
10. Pressure disk
11. Spring
12. Bolt
13. Washer
14. Release rack
15. Bearing
16. Washer
17. Release pinion
18. Oil seal
19. Washer
20. Release arm
21. Bolt
22. Washer
23. Nut
24. Spring
25. Oil pump drive gear
26. Circlip

Fig. 7-193.

CLUTCH

Assemble the clutch, in the reverse order to disassembly. Pay attention to the following points.

1. Washers on each side of the primary driven gear are of different sizes. Don't make a mistake over which washer goes on which side.

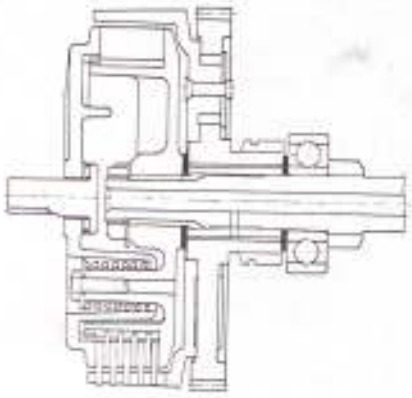


Fig. 7-194.

2. When inserting spacer on countershaft, apply a small quantity of engine oil to both inside and the outside of the spacer.

Fig. 7-195.

3. Tighten clutch sleeve hub nut using the special tool to the specified torque.

Tightening torque:

40 ~ 60 N.m (4.0 ~ 6.0 kg-m, 29.0 ~ 43.0 lb-ft)

Fig. 7-196

4. Bend washer to prevent the clutch sleeve hub nut from loosening.

Fig. 7-197

5. Fit the clutch release bearing washer ① as indicated in Fig. 7-198.

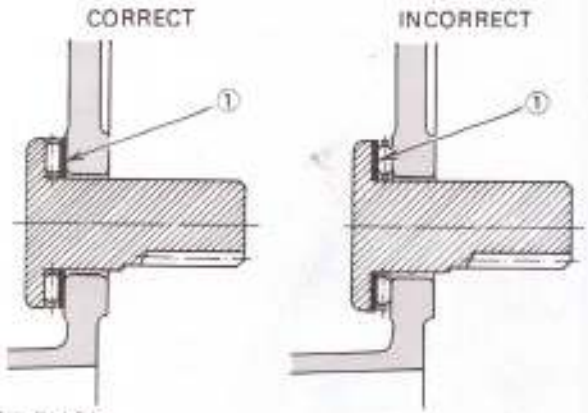


Fig. 7-198

6. Tighten clutch spring bolts diagonally, to the specified torque.

Tightening torque:

11 ~ 13 N.m (1.1 ~ 1.3 kg-m, 8.0 ~ 9.0 lb-ft)

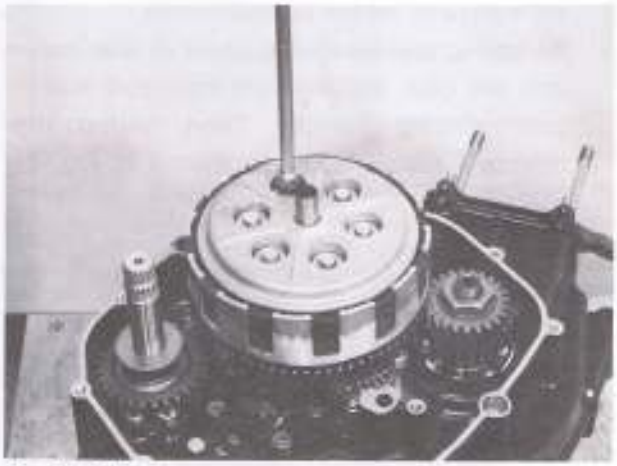


Fig. 7-199

7. When installing the clutch cover, first, fit the clutch release rack notch as shown in Fig. 7-200.
   The clutch release will then engage the pinion, so that the cover can be fitted.

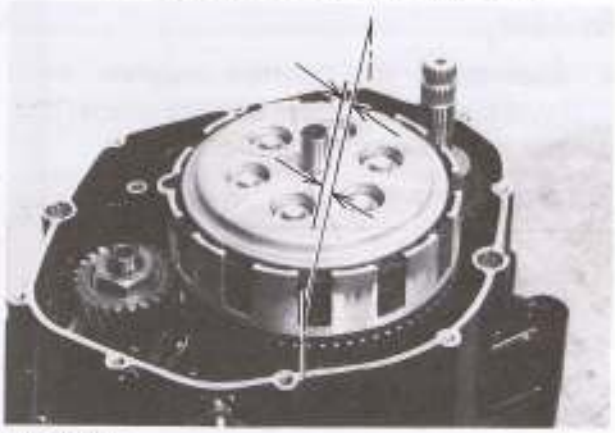


Fig. 7-200

FLYWHEEL MAGNETO

Install the flywheel magneto in the following manner.

1. Fit key ① in the key slot on the crankshaft.

Fig. 7-201

2. Fit magneto stator on crankcase.
3. Fit spring and neutral contact in that order into the gear shifting cam hole and mount gear shifting switch. Then, clamp the magneto stator leads as shown in Fig. 7-202.

Fig. 7-202.

4. After fitting the flywheel magneto, hold flywheel magneto rotor with the special tool and tighten to the specified torque.

Tightening torque:

55 ~ 65 N.m (5.5 ~ 6.5 kg-m, 40.0 ~ 47.0 lb-ft)

NOTE:
Thoroughly wipe off oil from the tapered parts ① of crankshaft and rotor with rags.

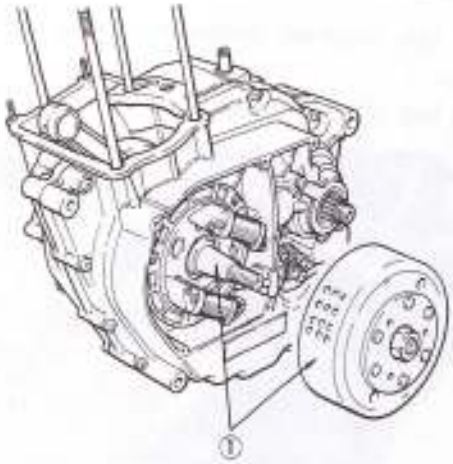


Fig. 7-203.

ENGINE SPROCKET

To fit the engine sprocket, turn the stepped part in the sprocket to the outside, tighten the nut to the specified torque and bend the washer.

Tightening torque:

40 ~ 60 N.m (4.0 ~ 6.0 kg-m, 28.5 ~ 43.0 lb-ft)

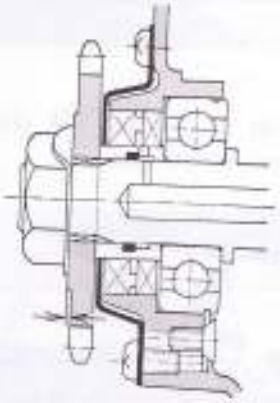


Fig. 7-204.

CRANKSHAFT

Check the following items.

CRANKPIN WEAR AND BIG END SIDE CLEARANCE

Check the wear of crankpin in terms of connecting rod movement using a square as shown.

Deflection service limit	3.0 mm (0.118 in.)

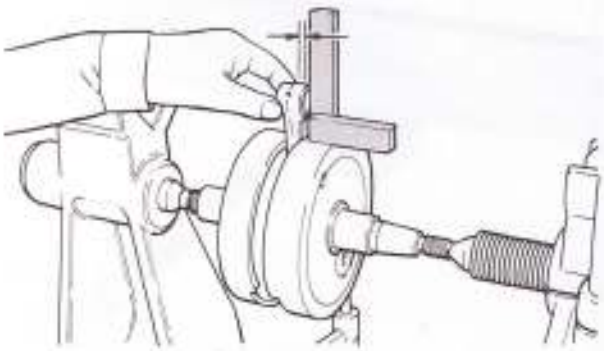


Fig. 7-205.

Push the big end of the connecting rod to one side and measure its side clearance with a thickness gauge.

Big end side clearance specification

Standard	Limit
0.1 ~ 0.55 mm (0.0039 ~ 0.021 in.)	1.0 mm (0.0393 in.)

Fig. 7-206.

Where the limit is exceeded, replace crankshaft assembly or reduce the deflection and the side clearance to within the limit by replacing the worn parts — connecting rod, big end bearing, crankpin and thrust washer, etc.

CRANKSHAFT RUNOUT

Support the crankshaft on surface plate with center as shown. Rig up the dial gauge, as shown, and rotate the crankshaft slowly and read the runout.

Repair the crankshaft if the runout is greater than the limit.

Crankshaft runout specification

Standard	Service limit
0 ~ 0.05 mm (0 ~ 0.0020 in.)	0.05 mm (0 ~ 0.0020 in.)

Fig. 7-207.

ENGINE OIL FILTER

Wash the filter ① with cleaning solvent, and then blow compressed air through it to dry off solvent.

Fig. 7-208.

NOTE:
Refer to page 3-9 for the frequency of engine oil filter periodic inspection and replacement.

OIL PUMP

There are three clearances to be checked in order to determine whether the oil pump should be replaced or not.

TIP CLEARANCE

This is the clearance between inner rotor and outer rotor. Use a thickness gauge.

Tip clearance limit	0.2 mm (0.008 in.)

Fig. 7-209.

OUTER ROTOR CLEARANCE IN THE BODY

Use a thickness gauge.

Outer rotor clearance limit	0.25 mm (0.0098 in.)

Fig. 7-210.

SIDE CLEARANCE

Put a straightedge on the pump and measure the clearance under the steel straight edge, as shown.

The oil pump must be replaced if any of these limits are exceeded.

Side clearance limit	0.15 mm (0.0059 in.)

Fig. 7-211.

NOTE:
If the inner and outer rotors have been removed, on reassembly align punched marks ① correctly as shown in Fig. 7-212.

Fig. 7-212.

ENGINE OIL PRESSURE TEST

When the oil pump is replaced or disassembled for service, be sure to check the oil pressure in the following procedure.

1. Adjust the oil level to between "F" ① and "L" ② marks in the inspection window, and

confirm that there is no sign of oil leakage at any part of the lubrication oil circuit. Make sure, also, that oil strainer is clean.

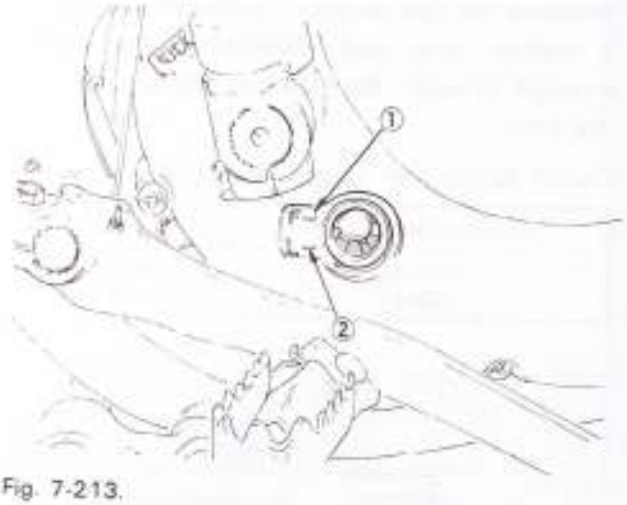


Fig. 7-213.

2. Start the engine and warm it up by running it at 2 000 rpm for 10 minutes (in summer when ambient temperature is 30°C (86°F) or thereabouts) or for 20 minutes (in winter when ambient temperature is down to −5°C (23°F) or thereabouts).
3. Stop the engine, and install the oil pressure gauge (special tool: 09915-74510) ① at the place indicated.

Fig. 7-214.

4. Restart the engine and run it at 2 500 rpm. Under this condition, take a pressure reading with the gauge. This reading should be within the range below.

Oil pump pressure	20 ~ 45 kPa 0.20 ~ 0.45 kg/cm² 2.8 ~ 6.4 psi

If pressure is too low, it means that the oil pump is worn internally or otherwise defective and needs to be overhauled. If inner parts are found to be worn beyond the limit, replace the whole oil pump as an assembly.

DRIVE AND COUNTER-SHAFT

When the drive shaft or countershaft has been replaced with a new one, inspect the lubricating oil ports ① let into the shaft before fitting gears.
If burrs are present remove with an oil stone.

Fig. 7-215.

Gear shifting fork clearance in the groove
Check each gear with a thickness gauge. If the clearance limit is exceeded by any of the three gears, determine whether the gear or the gear shifting fork should be replaced by measuring the thickness and the groove width. Limits are specified for the width and thickness.

Fig. 7-216.

	Standard	Limit
3rd drive, 4th driven and Top driven gear	0.20 ~ 0.40 mm (0.0079 ~ 0.0157 in.)	0.60 mm (0.024 in.)

SHIFT FORKS

"Gear misses" are often due to excessively worn shift forks. Measure each shift fork thickness and, if the limit has been reached, replace.

Fork thickness specification

Standard	Limit
3.95 ~ 4.05 mm (0.1555 ~ 0.1594 in.)	3.75 mm (0.148 in.)

Fig. 7-217.

GEAR SHIFTING PAWL

With spring, pin and pawl fitted to the cam driven gear, hold the pawl ① by hand and confirm that the pin moves smoothly.

If it does not move smoothly, smooth gear changes will not be obtained. Check for burrs in the cam driven gear hole.

Fig. 7-218.

CLUTCH

FREE LENGTH OF CLUTCH SPRINGS

Measure the free length of each coil spring with a caliper rule, and determine the elastic strength of each. Replace any spring not within the limit.

Clutch spring free length specification

Standard (when new)	Limit
40.5 mm (1.5944 in.)	39.1 mm (1.5393 in.)

Fig. 7-219.

CLUTCH DRIVE PLATE WEAR

Measure the thickness of each drive plate with a caliper rule. Replace drive plates found to have worn down to the limit.

Drive plate thickness specification

Standard (when new)	Limit
3.4 ~ 3.6 mm (0.1339 ~ 0.1417 in.)	3.1 mm (0.1220 in.)

Fig. 7-220.

CLUTCH PLATE WARP

Check each plate for warp by placing it on a surface plate and inserting a thickness gauge under the clutch plate at several places. The warp limit in terms of clearance is the same for drive plates and driven plates, and is specified as follows:

Replace plates exceeding this limit.

Clutch plate warp limit	0.1 mm (0.004 in.)

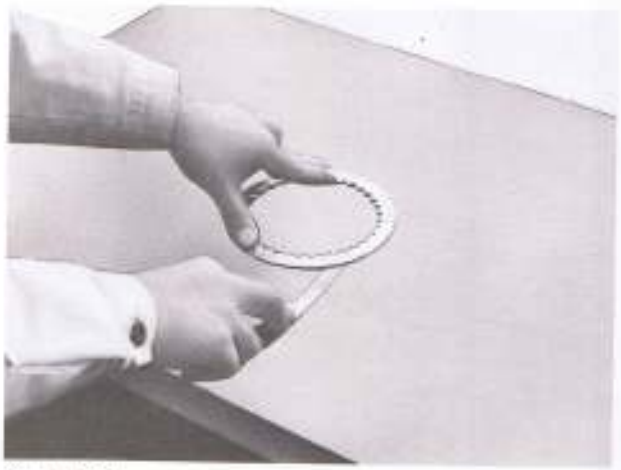


Fig. 7-221.

STEPPED WEAR IN CLUTCH SLEEVE HUB SPLINE

Stepped wear in clutch sleeve hub spline due to contact with clutch driven plate occurs after long operation, and results in poor clutch disengagement. If the clutch sleeve hub spline is found to be badly worn, replace it with a new one.

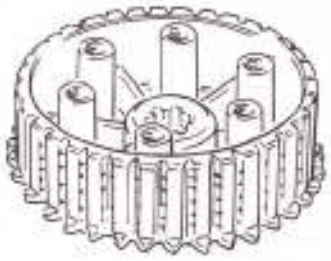


Fig. 7-222.

PLAY IN PRIMARY DRIVEN GEAR

Primary driven gear is composed as shown in Fig. 7-223.

1. Primary driven gear
2. Damper
3. Plate
4. Rivet
5. Clutch housing

Fig. 7-223.

If the internal damper ② wears, play is generated between gear and housing, causing abnormal noise. If the play is extreme, replace the damper with a new one.

Fig. 7-224.

PRIMARY DRIVEN GEAR LATERAL MOVEMENT

Measure primary driven gear lateral movement with a dial gauge placing the gear and spacer on a surface plate.

Fig. 7-225.

If the lateral movement is too large, correct with an oil stone.
On the other hand, if the lateral movement is too small, clutch disengagement is poor. If this is the case, replace the spacer with a new one.

Gear lateral movement specification

Gear lateral movement	0.2 ~ 0.3 mm (0.0079 ~ 0.0118 in.)

Fig. 7-226

GEAR BACKLASH

After confirming that axial runout of primary driven gear is correct, fit the primary driven gear and clutch sleeve.

Drive gear and driven gear must be replaced if backlash exceeds the limit.

Gear backlash specification

Standard	Limit
0.02 mm (0.0008 in.)	0.1 mm (0.004 in.)

Fig. 7-227

FUEL SYSTEM

CONTENTS

FUEL COCK AND FUEL TANK

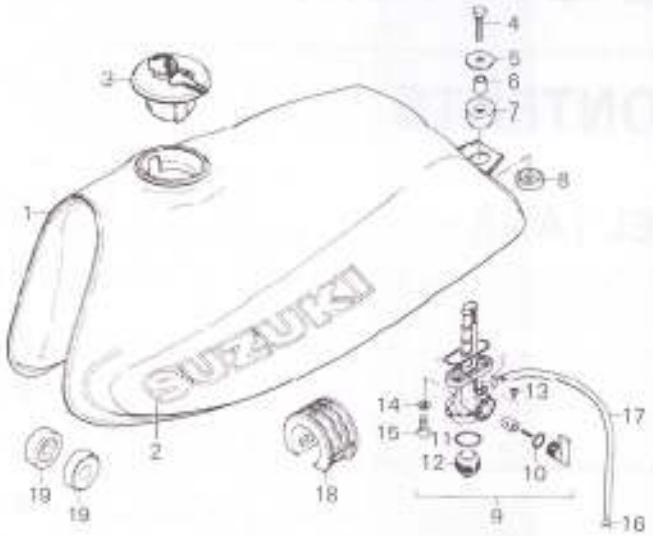


Fig. 8-1

1. Fuel tank
2. Emblem
3. Fuel tank cap ass'y
4. Bolt
5. Washer
6. Spacer
7. Rear cushion (2)
8. Rear cushion (1)
9. Fuel cock ass'y
10. Lever gasket
11. "O" ring
12. Cap
13. Screw
14. Gasket
15. Bolt
16. Clip
17. Fuel hose
18. Center cushion
19. Front cushion

DISASSEMBLY

1. Shut off the fuel cock, and take the fuel hose off the carburetor inlet.

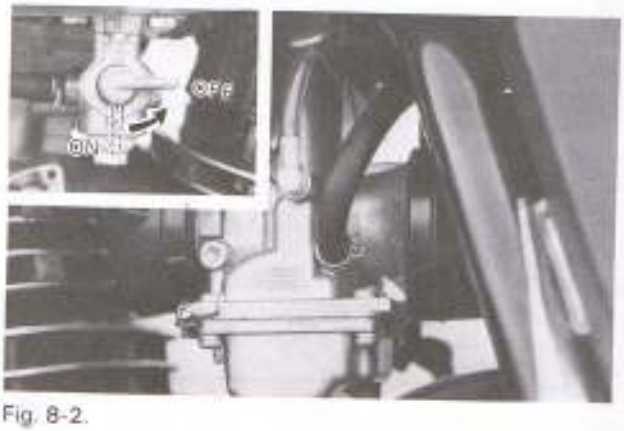


Fig. 8-2

2. Place a clean oil pan under the fuel cock assembly ②, unscrew the fuel cock clamping bolts ①, and take off the fuel cock assembly.

Fig. 8-3

CLEANING

Rust from the fuel tank tends to build up in the filter, which, when the filter has been neglected for a long period, inhibits the flow of fuel. Remove the rust from the filter ① using compressed air.

Fig. 8-4

REASSEMBLY

1. Place filter gasket ② on fuel cock ①, and fix the fuel cock on the fuel tank.

NOTE:
Gasket ③ must be replaced with a new one to prevent leakage.

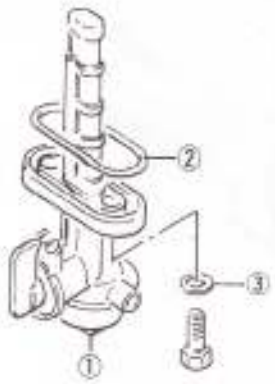


Fig. 8-5.

2. Attach fuel hose ① on the carburetor inlet, fix with clip ②, and then fill the tank with fuel.

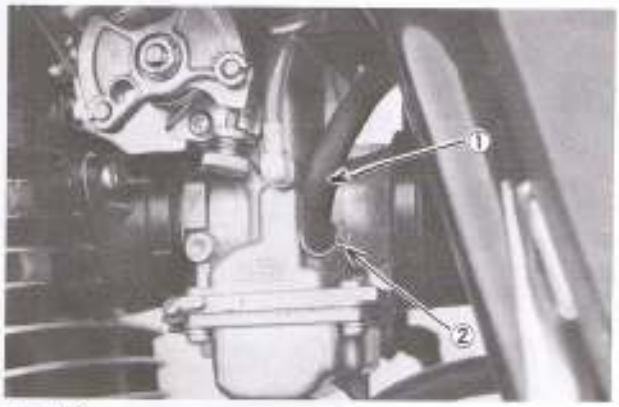


Fig. 8-6.

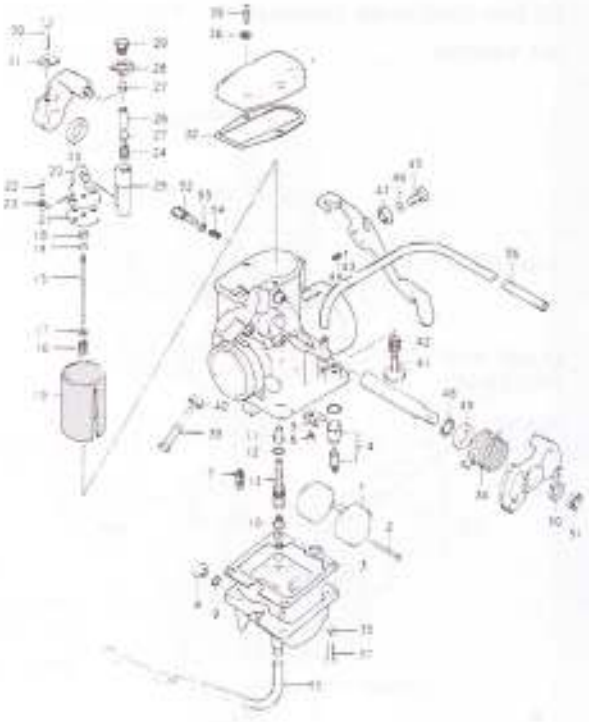
FUEL TANK

1. See page 7-5 for fuel tank removal.

CARBURETOR

DESCRIPTION

The model SP370 employs the VM32SS type carburetor. This carburetor, with an oval main-bore, has an excellent throttle response, and also supplies the appropriate mixture for all ranges of engine speed. The throttle valve is controlled forcibly by means of two control cables, which gives firmer control compared to the conventional automatic shut-off type which uses a throttle valve spring.



1. Float
2. Float pin
3. Gasket
4. Needle valve ass'y
5. Plate
6. Screw
7. **Pilot jet**
8. Drain plug
9. O-ring
10. **Main jet**
11. Breather pipe
12. O-ring
13. **Needle jet**
14. Clip
15. **Jet needle**
16. Spring
17. Washer
18. Ring
19. **Throttle valve**
20. Bracket
21. Plate
22. Screw
23. Lock washer
24. Spring
25. Connector
26. Pin
27. Pin
28. Plate
29. Screw
30. Bolt
31. Plate
32. Gasket
33. Ring
34. Spring
35. Screw
36. Lock washer
37. Screw
38. Lock washer
39. Throttle adjuster
40. Nut
41. Throttle stop screw
42. Spring
43. Ball
44. Spring
45. Screw
46. Lock washer
47. Ring
48. Seal
49. Ring
50. Washer
51. Nut
52. **Air pilot screw**
53. O-ring
54. Spring
55. Hose
56. Hose

Fig. 8-7.

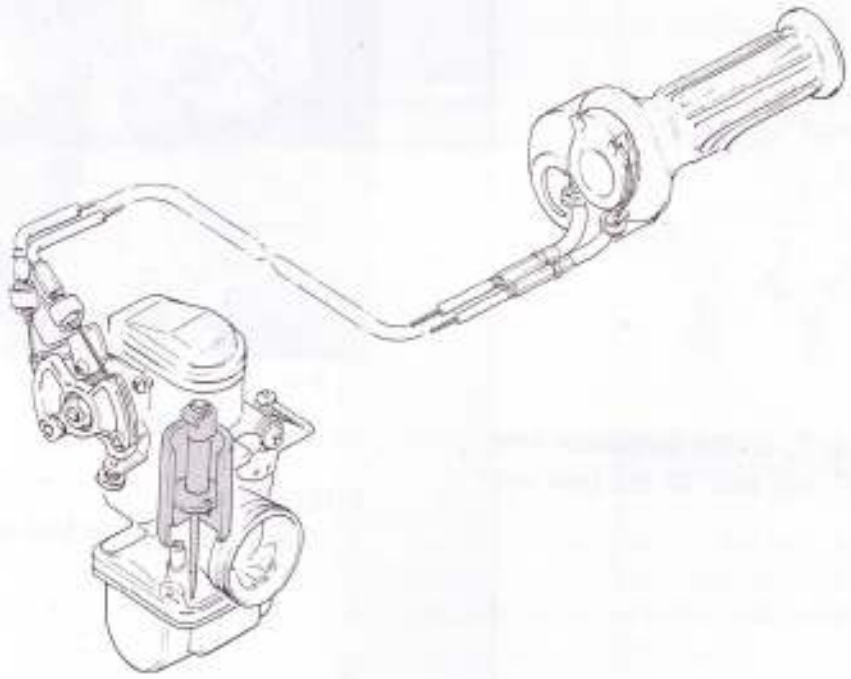


Fig. 8-8.

OPERATION

Starter system (See Fig. 8-9)

When the starter plunger is pulled up, the fuel metered by the starter jet is mixed with air and separated into tiny particles in the emulsion tube and the mixture then flows into the plunger area, mixes again with air coming from the starter air hole and jets into the throat.

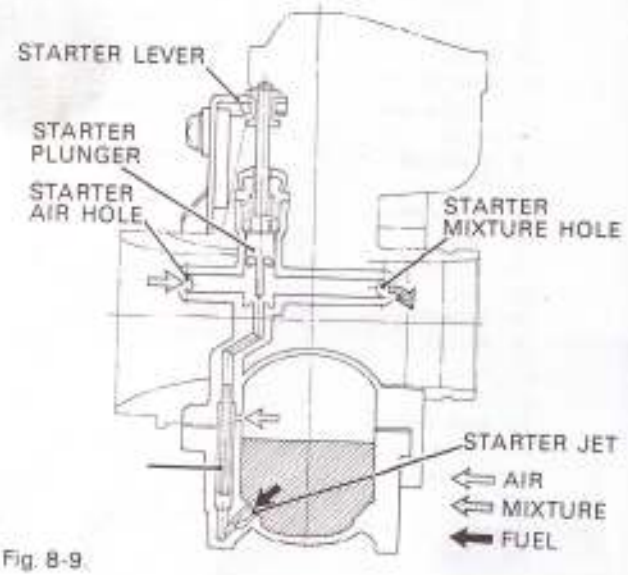


Fig. 8-9.

Main metering system (See Fig. 8-10)

The fuel passes through the main jet and mixes with air metered by the air jet. The mixture then jets into the main bore after being metered by the clearance between the needle jet and the jet needle.

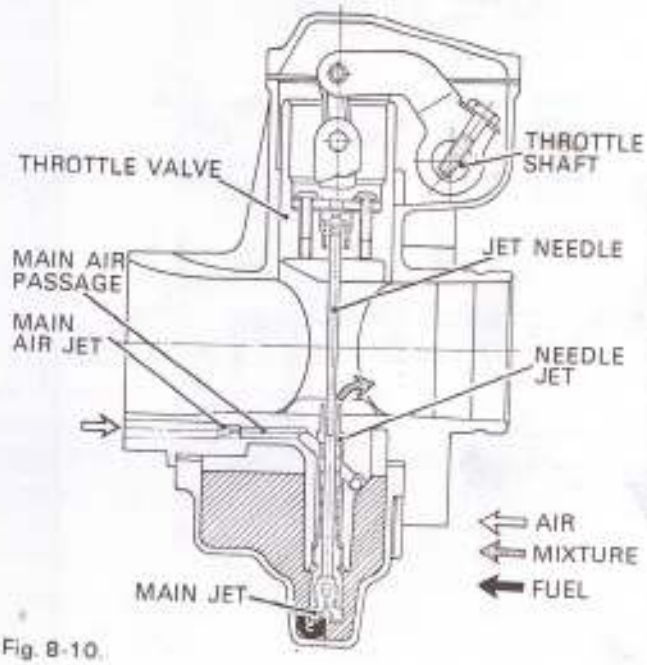


Fig. 8-10.

Idle system (See Fig. 8-11)

The fuel metered by the pilot jet is mixed with the proper amount of air metered by the air screw and is separated into fine particles. The mixture then jets into the throat through the pilot outlet. The pilot screw controls the amount of mixture. When the throttle valve opens a little, the mixture jets through the by-pass and the pilot outlet.

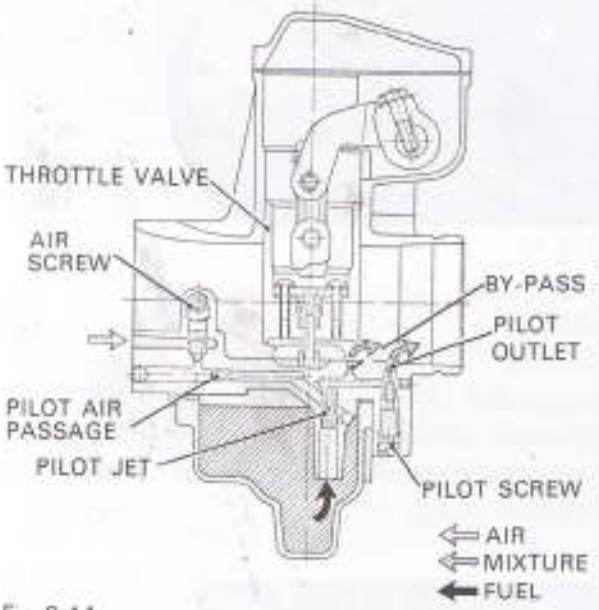


Fig. 8-11

Float system

A float and needle valve assembly which keep the level of fuel constant while the engine is firing are installed in the float chamber. Fuel flows into the float chamber through the gap between the tapered end of the needle valve ① and the valve seat ② from the fuel tank via the fuel cock and fuel line.

When the fuel in the float chamber reaches a given level, the float ③ rises and the float tongue ④ pushes the needle valve upward, making its tapered end fit in the needle valve seat so that the fuel stops flowing into the float chamber.

As the fuel in the float chamber is consumed by the engine, the float and needle valve lower, permitting fuel to enter the float chamber again. Thus the fuel consumed is replenished. While the engine is firing, this up and down movement of the float and needle valve is repeated to keep the fuel level correct.

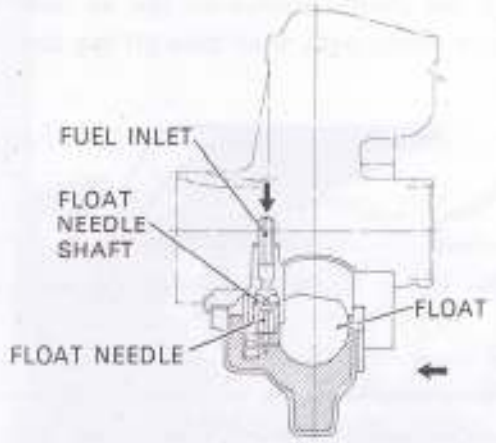


Fig. 8-12

The standard fuel level is 36.5 mm (1.437 in.) from the center line of the main bore, or 5 mm (0.197 in.) from the brim of the float chamber body.

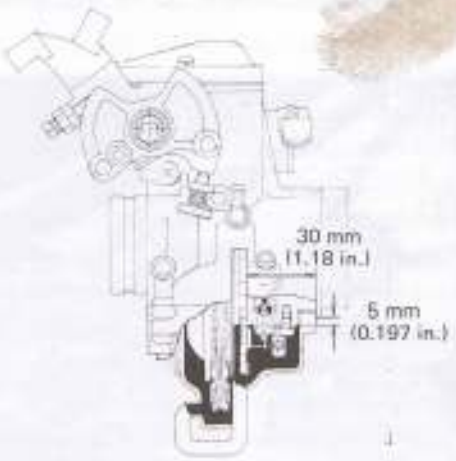


Fig. 8-13

REMOVAL

1. Shut off the fuel cock, and take the fuel hose off the carburetor inlet.

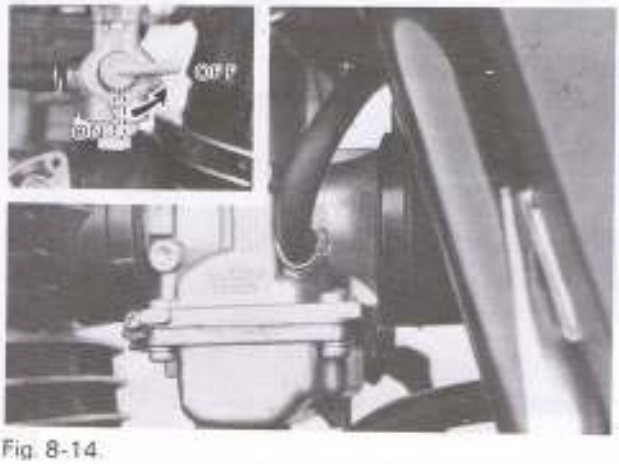


Fig. 8-14

2. Loosen the clamp screws on the air inlet hose and intake pipe, then take off the carburetor.

Fig. 8-15.

3. Loosen lock nuts ①, and screw them along the cable adjusters ② to the ends of the threads.

Fig. 8-16.

4. Remove throttle cables ① from throttle lever ②.

Fig. 8-17.

5. Remove lock nuts ① from cable adjuster ②, then take throttle cables ③ off the carburetor ④.

Fig. 8-18.

NOTE:
With equipment of coercive open-and-close carburetor, there are two throttle cables, opening and closing. Place an identification label on each cable as shown in Fig. 8-19.

Fig. 8-19.

OVERHAUL

1. Unscrew and remove the carburetor top cover.

Fig. 8-20.

2. Remove throttle valve arm bolt ①, then take out throttle lever ② and throttle valve arm ③ together.

Fig. 8-21.

Fig. 8-22.

3. Take out the throttle valve upward as shown in Fig. 8-23.

Fig. 8-23.

4. Remove four fitting screws with a cross head screw driver and separate the float chamber body from the mixing chamber body.

Fig. 8-24.

5. The float can be removed from the mixing chamber body by removing the float pin. Be careful not to bend or raise the float tongue which contacts the needle valve and controls closing and opening of the fuel passage, as change in the float tongue angle causes an incorrect fuel level, resulting in maladjusted carburation. Remove the needle valve together with float.

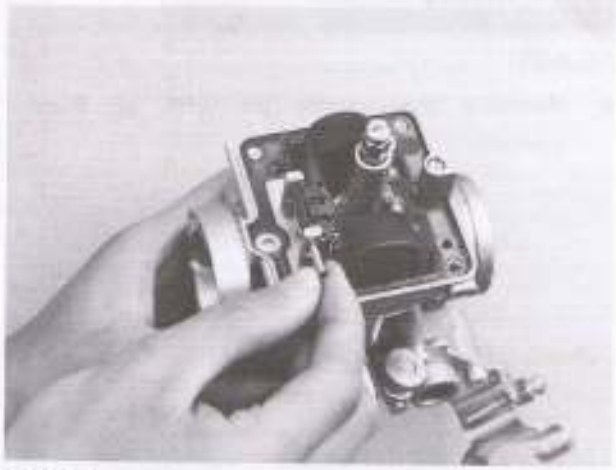


Fig. 8-25.

6. Remove the needle valve seat plate with a cross head screw driver, and remove needle valve seat.

Fig. 8-26.

7. Remove the main jet with a screw driver.

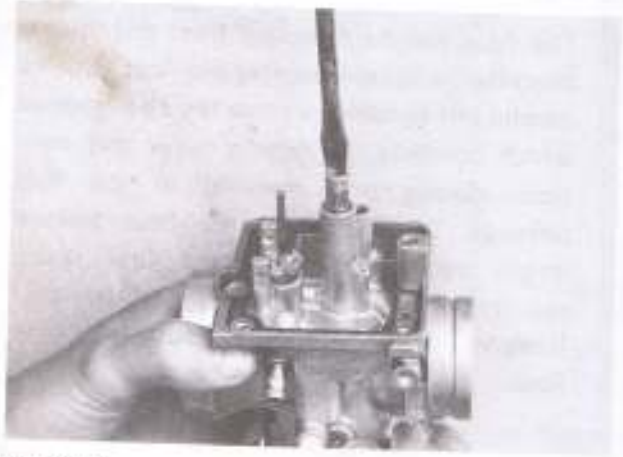


Fig. 8-27.

8. Remove the needle jet with an 8-mm wrench.

Fig. 8-28.

9. Remove the pilot jet with a small screw driver.

INSPECTION AND SERVICING

1. Wash all parts with cleaning solvent and dry.
2. Blow compressed air through all jets and passages to make sure they are not clogged. Do not use wire, etc. to clean them, as this can damage the parts.

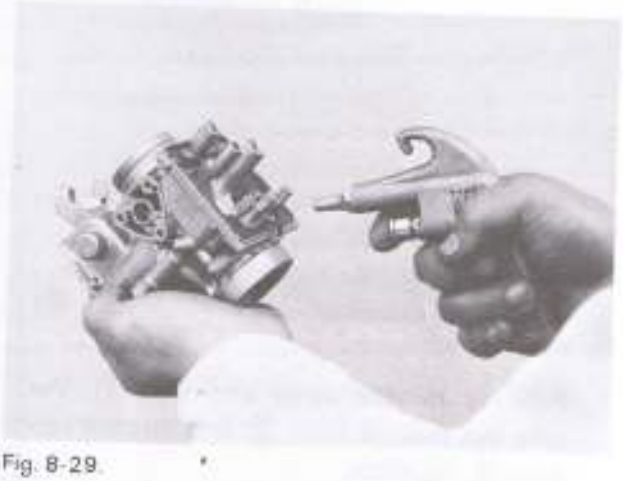


Fig. 8-29.

3. Check the float chamber gasket for damage and wear, and replace if needed.
4. Insert the throttle valve in the mixing chamber and check for play to see if the throttle valve is worn. Replace a worn, scored or scratched throttle valve.
5. Check the needle valve tapered end for wear. As the needle valve repeatedly contacts the valve seat to keep the fuel level correct, the tapered end of the needle valve is apt to wear. If the needle valve is worn, there will be a gap between the valve seat and needle valve even when the float tongue pushes the needle valve. Fuel will flow into the carburetor continuously and overflow. Check to see if the needle valve contacts the valve seat properly when disassembling the carburetor. Replace the needle valve if needed. To check, refit the valve seat, needle valve and float to the mixing chamber body, and then connect the fuel line to the fuel cock. Push the float with a finger until the tongue pushes the needle valve. Turn on the fuel cock. If fuel flows into the carburetor, the needle valve is worn. In most cases, however, fuel overflow is caused by foreign material caught between the valve seat and needle valve. The filter net of the fuel cock must always be kept in good condition.

Fig. 8-30.

6. A damaged float also causes fuel overflow. Shake the float to see if there is fuel inside. If there is, the float leaks and must be replaced.

Fig. 8-31.

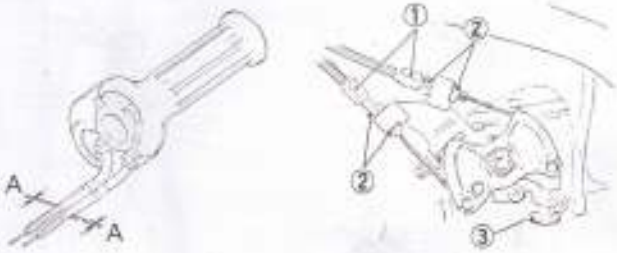
REASSEMBLY

The procedure for assembling is the reverse of disassembling.

Refer to page 7-9 for the procedure and notes on assembly.

CABLES AND ADJUSTMENT

Refer to page 3-9 for throttle cable adjustment and idling adjustment.



A: 1.0 ~ 1.5 mm (0.04 ~ 0.06 mm)

1. Adjuster
2. Lock nut
3. Throttle stop screw

Fig. 8-32.

AIR CLEANER

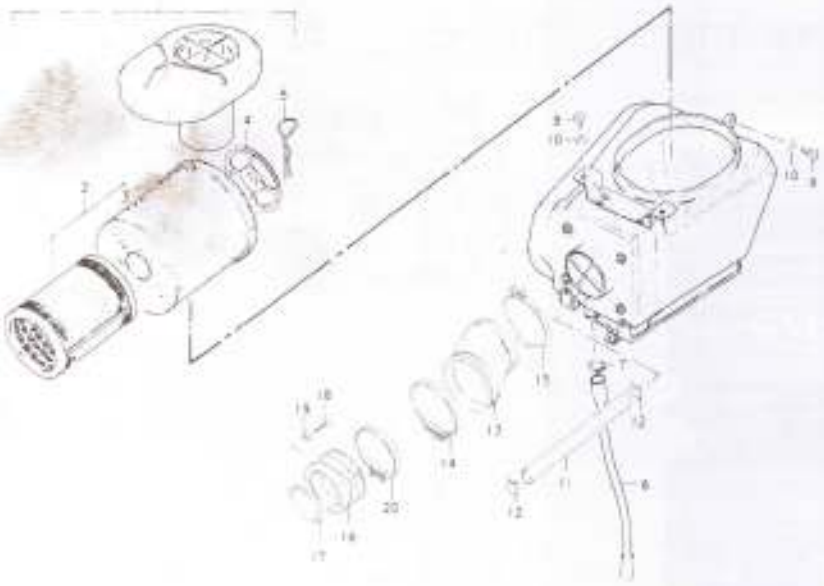


Fig. 8-33.

1. Air cleaner ass'y
2. **Filter ass'y**
3. **Filter**
4. **Holder**
5. **Snap pin**
6. **Drain tube**
7. **Clip**
8. Screw
9. Screw
10. Washer
11. Breather hose
12. Clip
13. Air inlet hose
14. Clamp
15. Clamp
16. Intake pipe
17. O-ring
18. Screw
19. Lock washer
20. Clamp

DESCRIPTION

The air cleaner filters impurities out of the air before it is inhaled into the carburetor. The resin processed air cleaner element covered with air cleaner case is mounted the center of the frame with cross screws.
The air cleaner filters air to prevent dust entering the carburetor.
The air cleaner element made of polyurethane foam is inserted in an air cleaner case, and accommodated within the frame.
The air cleaner outlet is connected to the carburetor by a rubber tube.
Blowby gas is led through the air cleaner, mixed with fresh mixture, then recycled to the combustion chamber as illustrated in Fig. 8-34.

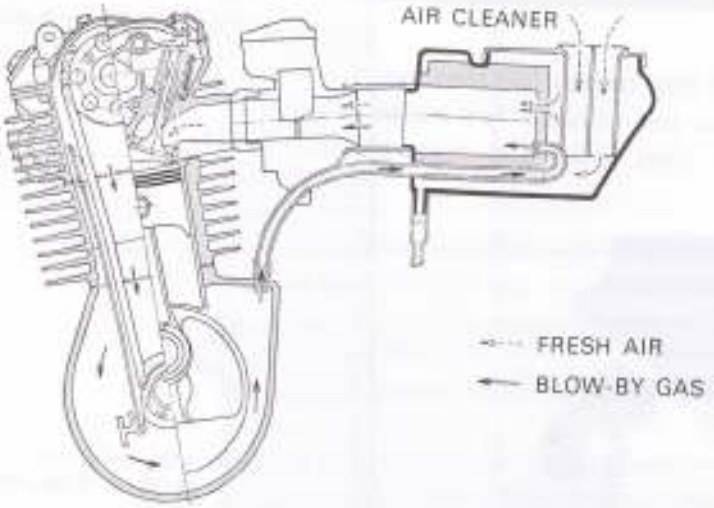


Fig. 8-34.

DISASSEMBLY

The procedure for removing the air cleaner assembly is as follows:

1. Remove right and left frame covers.

NOTE:
Protect the hands when the muffler ① is hot.

Fig. 8-35.

2. Remove right and left seat covers, referring to page 7-5.

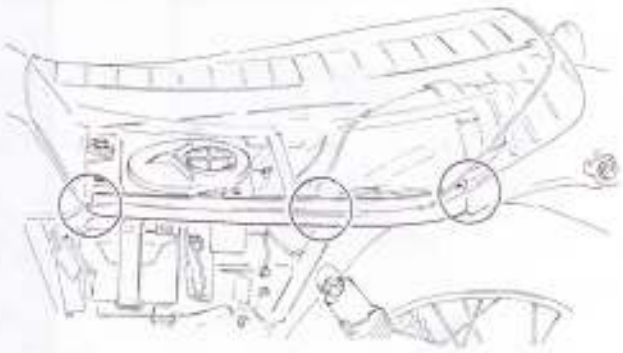


Fig. 8-36.

3. Unscrew seat fixing bolts ①, and remove the seat.

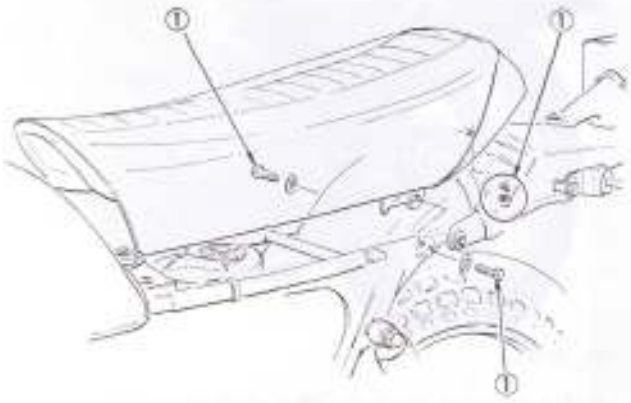


Fig. 8-37.

4. Loosen exhaust pipe clamping bolts and second muffler fixing bolts.

Fig. 8-38.

Fig. 8-39.

5. Loosen clamp ①, unscrew first muffler clamping bolt ②, then the first muffler can be taken off to the right and rear.

Fig. 8-40.

6. Remove air inlet hose clamping screws ① and air cleaner clamping screws ②, then the air cleaner assembly can be taken off to the right.

Fig. 8-41.

7. Loosen air inlet hose clamping screw ①, and remove air inlet hose.

Fig. 8-42.

REASSEMBLY

The procedure for reassembling is the reverse of disassembling.

Special notes are as follows:

1. Attach drain tube ① to the air cleaner as shown in Fig. 8-43.

Fig. 8-43

2. When mounting the first muffler, check connector ①, and replace it with a new one if it is damaged.

Fig. 8-44

3. When mounting first ① and second ② mufflers, be sure to use washer ③, cushion ④, and spacer ⑤.
   Tighten each clamping bolt by hand, then tighten them in the order of exhaust pipe ⑥, second muffler, and first muffler, to the specified clamping torque.

Fig. 8-45

Exhaust pipe and muffler tightening torque:

9 ~ 12 N.m (0.9 ~ 1.2 kg-m, 7.0 ~ 8.5 lb-ft)

NOTE:
Heated mufflers could cause a short circuit if they touch wiring.
Confirm that wiring is not touching mufflers when mounting them.

Fig. 8-46

AIR CLEANER FILTER

DISASSEMBLY

1. Remove the seat, referring to page 7-5.
2. Pull off the air cleaner cover ①.

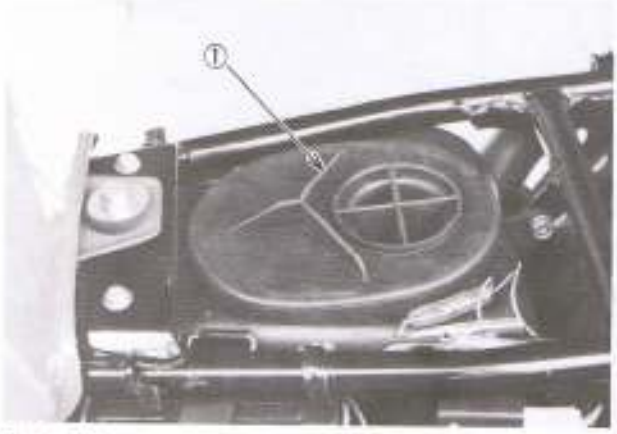


Fig. 8-47.

3. Disconnect the air cleaner breather pipe ①.
4. Pull out the snap pin ②.

Fig. 8-48.

5. Take out the filter assembly ① and remove three screws ②.
6. Take off the polyurethane filter ③.

Fig. 8-49.

CLEANING OF AIR CLEANER FILTER

Refer to page 3-4 for air filter cleaning.

REASSEMBLY

The procedure for assembling is the reverse of disassembling.
The following should be noted:

1. Be sure to assemble the upper section of the filter as shown in Fig. 8-50.

Fig. 8-50.

If the filter is assembled as shown in Fig. 8-51, air is taken into the engine without first being filtered by ①, which will shorten the life of the engine.

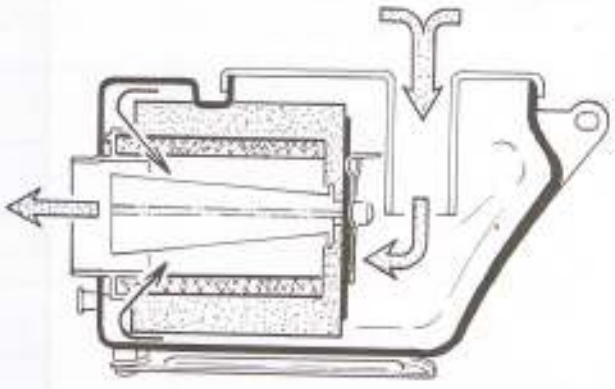


Fig. 8-51.

ELECTRICAL SYSTEM

CONTENTS

IGNITION SYSTEM

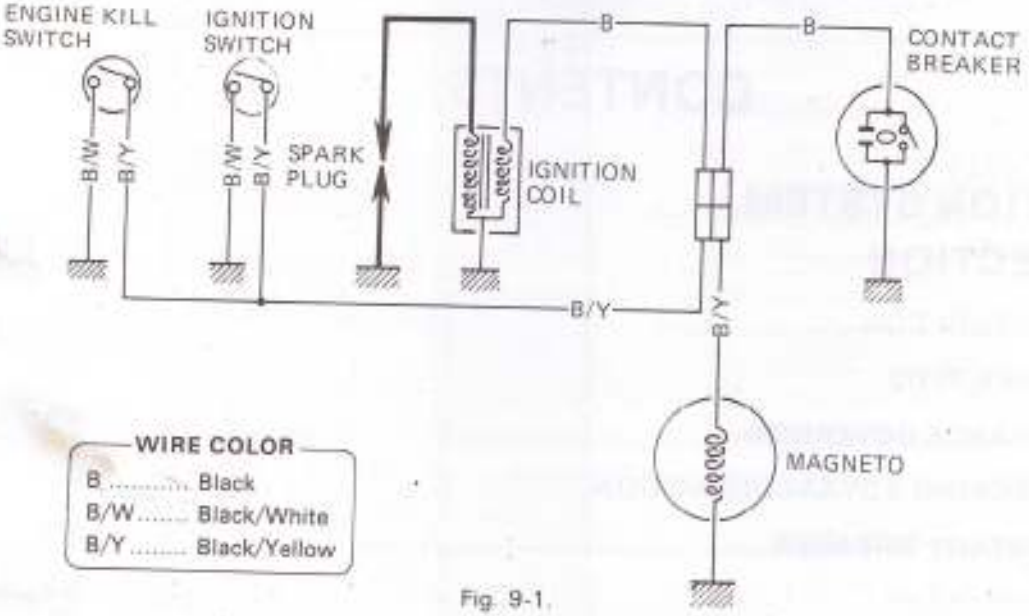


Fig. 9-1

The ignition system is the usual magneto ignition system, consisting of a magneto, a contact breaker, an ignition coil, an ignition switch, an advance governor and spark plug. The contact breaker is operated by the camshaft above the cylinder head. The camshaft makes one revolution for two of the crankshaft. The ignition system circuit diagram is shown in Fig. 9-1.

IGNITION SYSTEM DATA

Spark plugs	Type	NGK ..... D8EA DR8ES-L (for Canada) DENSO ... X24ES-U
	Gap	0.6 ~ 0.7 mm (0.024 ~ 0.028 in.)
Three-needle sparking distance of ignition coil		7 mm (0.28 in.) minimum
Contact point gap		0.3 ~ 0.4 mm (0.012 ~ 0.016 in.)
Condenser capacitance: (NIPPON DENSO)		0.20 ~ 0.24μF
Spark advancer:		
Advance angle		25°
Beginning of advance		1 500 rpm
End of advance		3 500 rpm

INSPECTION

IGNITION COIL

Using the electro tester, test ignition coil for sparking performance. Test connection is as indicated. Make sure that the three-needle sparking distance is at least 7 mm (0.28 in.).

Electro tester	09900-28104

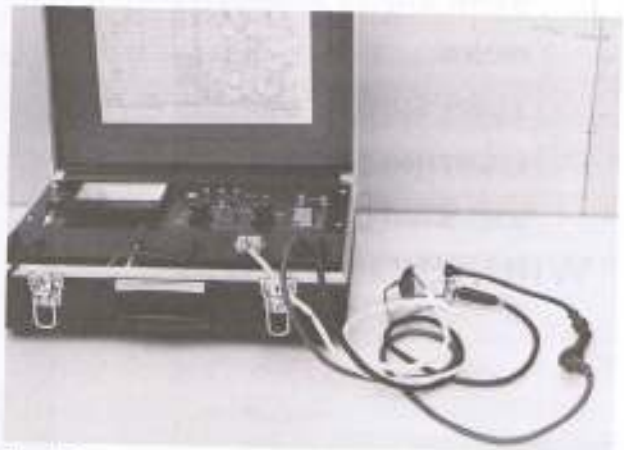


Fig. 9-2

SPARK PLUG

Clean the plug in a plug cleaner or with a wire brush and pin. Use the pin to prick out carbon, taking care not to damage the porcelain.

Fig. 9-3.

Check the gap with a thickness gauge, and adjust it, as necessary, to this value:
Spark plug gap specifications:

0.6 ~ 0.7 mm (0.024 ~ 0.028 in.)

The standard plug is made by either NGK or NIPPON DENSO.

Fig. 9-4.

ADVANCE GOVERNOR

Clean the sliding surfaces, removing dust and stains, and confirm that moving parts move smoothly. Inspect the advancer pin for wear.

Fig. 9-5.

CHECKING ADVANCING ACTION

Upon starting up the engine, check the engine speeds at which the ignition begins to advance and stops advancing. To do this, use the electro tester (09900-28104).

Fig. 9-6.

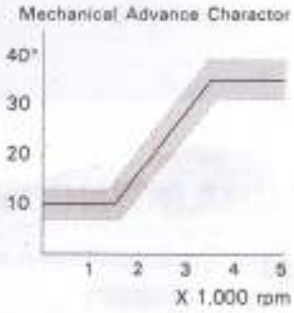


Fig. 9-7.

CONTACT BREAKER

Check and adjust the contact points as outlined in page 3-6. Inspect the contact points for wear and burning. If the point faces are dirty, wipe them off with a clean, dry cloth.

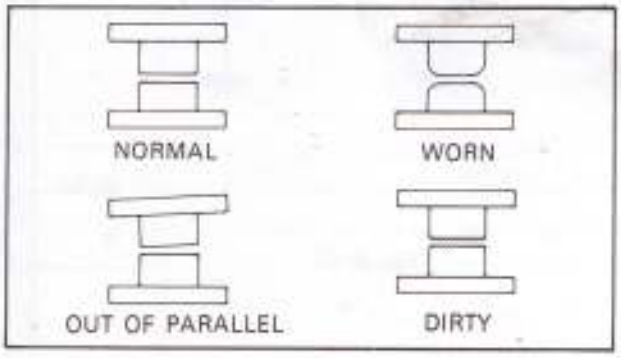


Fig. 9-8.

CONDENSER

Using the tester, check the performance of the capacitor.

Electro static capacity	0.20 ~ 0.24μF

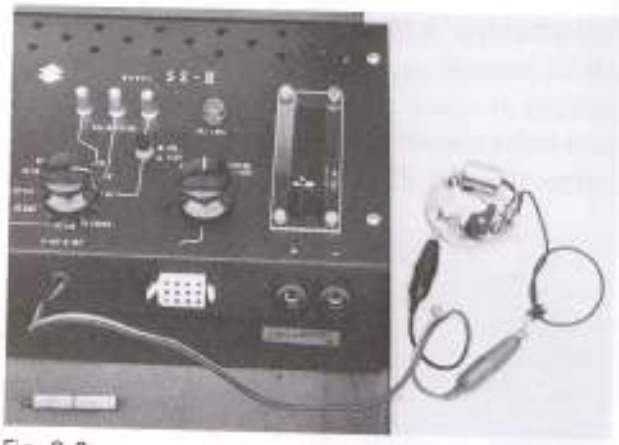


Fig. 9-9.

IGNITION TIMING INSPECTION AND ADJUSTMENT

For ignition timing inspection and adjustment, see page 3-7.

CHARGING SYSTEM

The charging system is the conventional half-wave rectification system consisting of a magneto, a rectifier and a battery.

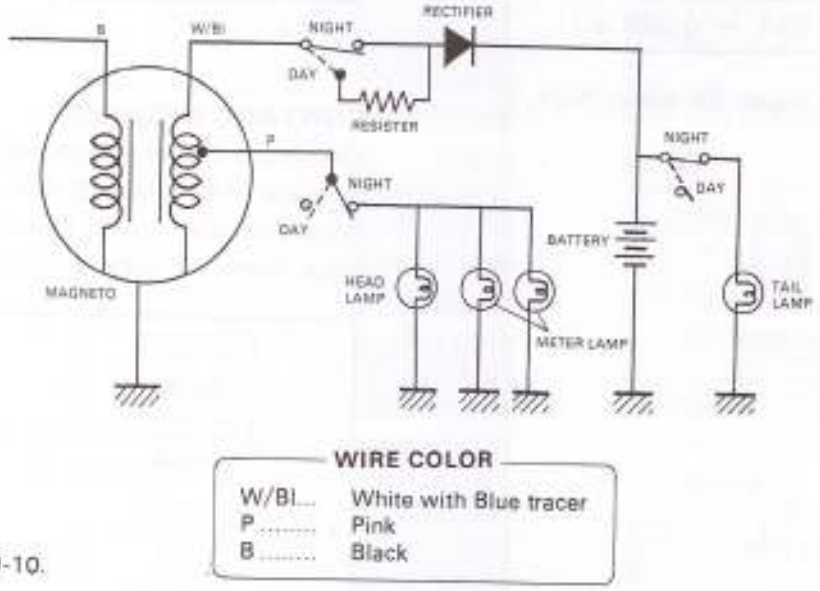


Fig. 9-10.

CHARGING RATE SPECIFICATION

	CHARGING RATE
DAY	More than 0.4A/2 000 rpm, less than 3.5A/8 000 rpm
NIGHT	More than 0.5A/2 000 rpm, less than 3.5A/8 000 rpm

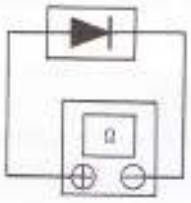
NOTE:

1. **Charging current measurement in reference to the above listed value is valid when (1) the battery is in fully charged state, (2) neutral lamp is off (meaning that the gear has been shifted), and (3) the engine is carrying rated load.**
2. **In canadian and Norway specifications, the charging rate slightly differ from those for standard specification listed above due to difference of head lamp and tail lamp, etc.**

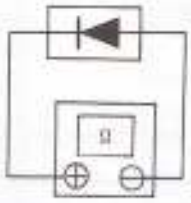
INSPECTION

When the charging rate is low, check the rectifier, magneto and battery, and connections for contacting condition.

Measure rectifier resistance with the ER resistance meter. If the measured values are as shown in the following table, the rectifier is OK.



Resistance: ∞



Resistance: Approx. 8Ω

MAGNETO

Check the stator coil for continuity (between White/Blue and Ground: Pink and Ground). If the meter indicates approx. 0Ω, the coil is OK.

BATTERY

Check electrolyte level, and be sure the battery is in fully charged state.

BATTERY

Battery specifications

Type	6N4B-2A
Capacity	6V, 4Ah
Voltage	6V
Electrolyte S.G.	1.260 at 20°C

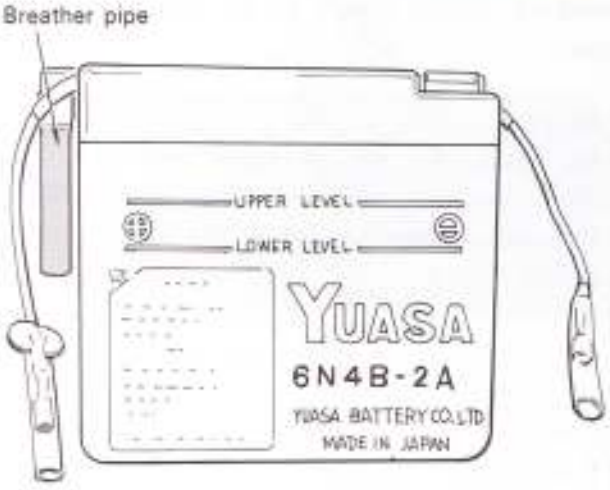


Fig. 9-11.

1. Confirm that the vent pipe is secured tight, free of damage, and routed as shown.
2. Add distilled water, as necessary, to keep the surface of the electrolyte above the LOW level mark. Do not exceed the HIGH level mark.
3. If the electrolyte surface falls rapidly, requiring frequent addition of distilled water, check the charging system and determine the reason for the low charging rate.
4. Periodically, check the specific gravity of the electrolyte using a hydrometer to find the state of charge. After adding distilled water, run the machine to recharge the battery.

Fig. 9-12.

ELECTRICAL EQUIPMENT AND DATA

IGNITION SWITCH

Circuit continuity should be obtained in accordance with the chart below, when the ignition switch is checked with a tester.

Ignition circuit test chart

For Belgium, England, Finland and Sweden

Switch position	B/W	B/Y	O	R	Br	Br
OFF	○——	——○				
ON			○——	——○	○——	——○
P	○——	——○		○——	——○	

B/W ..... Black with White tracer
B/Y ..... Black with Yellow tracer
O ..... Orange
R ..... Red
Br ..... Brown

For others

Switch position	BLACK/ WHITE	BLACK/ YELLOW	RED	ORANGE
OFF	○——	——○		
ON			○——	——○

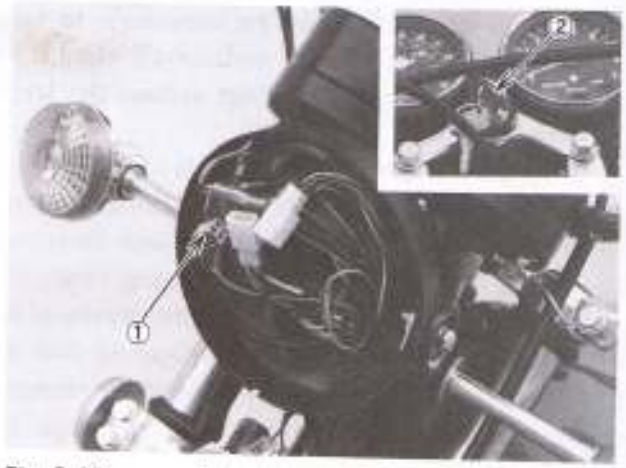


Fig. 9-13 1. Ignition switch
2. Ignition switch lead wire

FRONT BRAKE LAMP SWITCH

Place tester probes on WHITE ① and ORANGE ② lead wires, and check switch function and circuit continuity by measuring resistance when the front brake lever is squeezed and then released; values obtained should be 0Ω and ∞, respectively, for the two conditions.

NOTE:
To increase activation sensitivity of this switch, reposition it. This is accomplished by loosening the ② screws securing the switch to the body.

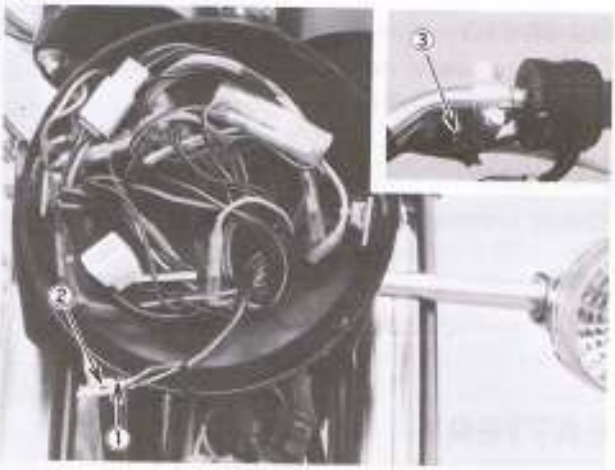


Fig. 9-14 3. Front brake lamp switch

REAR BRAKE LAMP SWITCH

Place tester probes on WHITE ① and ORANGE ② leads, and check switch function and circuit continuity by measuring resistance when the brake pedal is depressed and released; values should be 0Ω and ∞, respectively.

NOTE:
To make the switch more sensitive to slight pressure on the brake pedal, move the switch upward. Lowering has the opposite effect.

Fig. 9-15.

Fig. 9-17.

Fig. 9-18.

HORN

Use a tester to check continuity of the horn circuit. Check the horn, itself, by connecting a 6V battery across it. If the horn sound is not correct, replace the horn.

Fig. 9-16.

TURN SIGNAL SWITCH

Disconnect the lead wires from the turn signal switch ① and check circuit by placing the probes of the tester on LIGHT GREEN ② and LIGHT BLUE ③ leads (for right-hand switch) and to LIGHT BLUE and BLACK leads (for left-hand switch).

LIGHTING SWITCH

Continuity should be obtained, in accordance with the chart below, when lighting switch ① is checked with a circuit tester.

Fig. 9-19.

Fig. 9-20.

Lighting circuit test chart

For Netherlands and West Germany

Switch position	Br/W	—	Gr	Y/R	Y/W	W/R	G/W	O	Br
ON		○	○	○	○	○		○	○
S	○	○	○	○	○	○		○	○
OFF						○	○		

Br/W..... Brown with White tracer
Gr..... Gray
Y/R..... Yellow with Red tracer
Y/W..... Yellow with White tracer
W/R..... White with Red tracer
G/W..... Green with White tracer
O..... Orange
Br..... Brown

For others

Switch Position	GRAY	RED/ YELLOW	WHITE/ YELLOW	RED/ WHITE	GREEN/ WHITE	ORANGE	BROWN
OFF				○	○		
ON	○	○	○	○		○	○

Fig. 9-21.

KILL SWITCH

Check this switch in the same way that the lighting switch is checked.

Kill switch

Switch position	WHITE/ BLACK	YELLOW/ BLACK
OFF	○———	———○
ON		

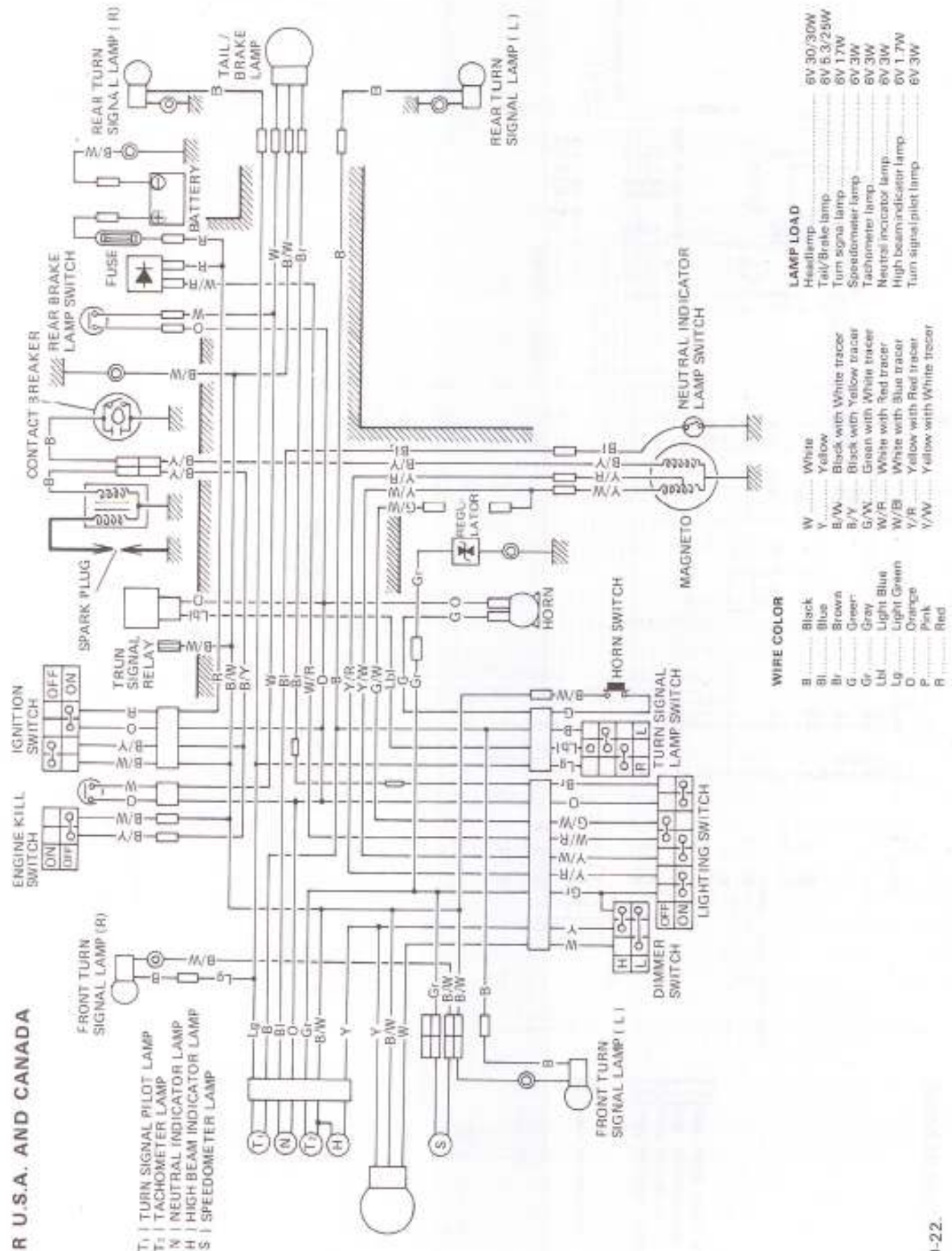
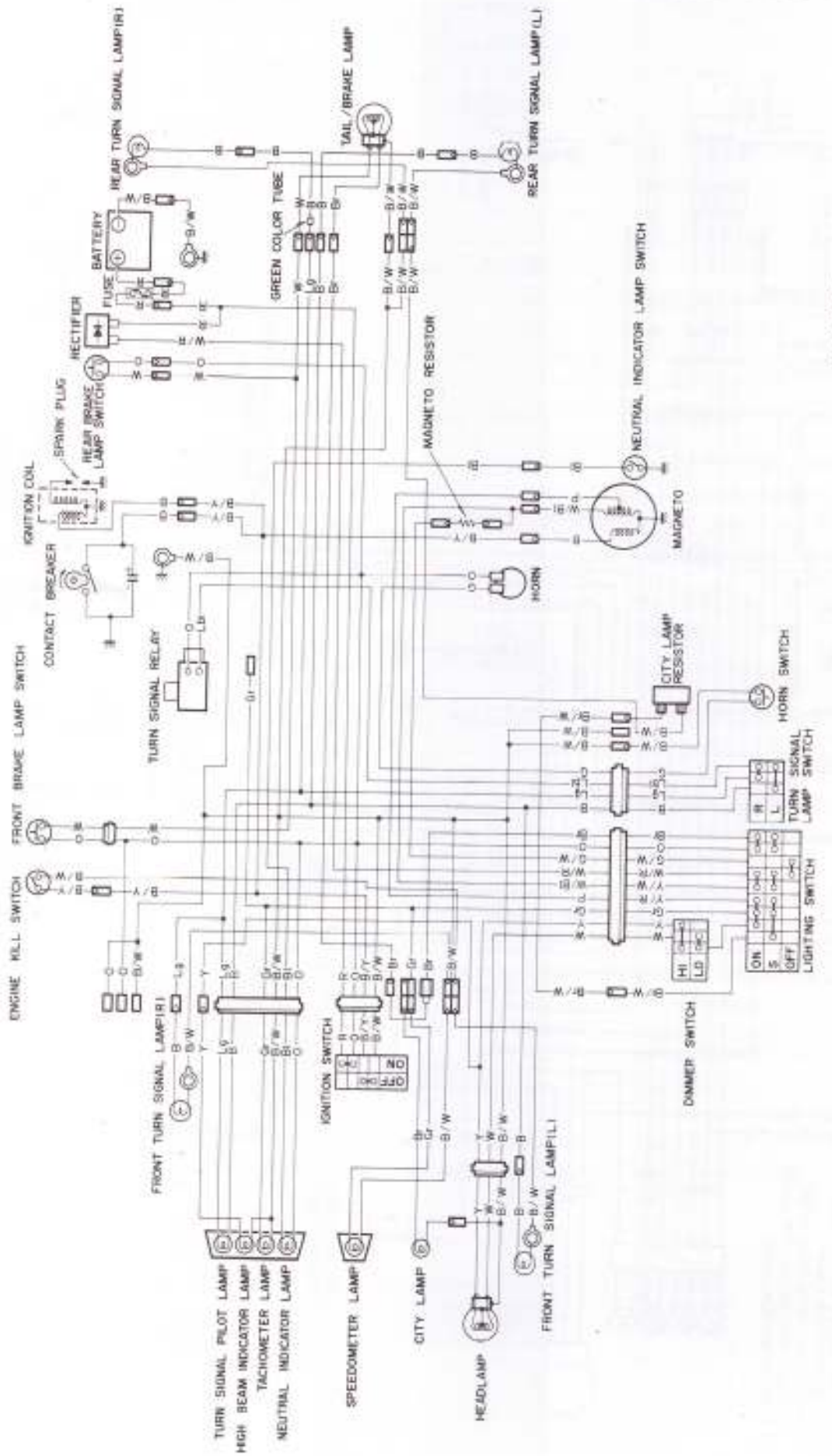

FOR U.S.A. AND CANADA
REAR TURN SIGNAL LAMP (R)
TAIL/ BRAKE LAMP
REAR TURN SIGNAL LAMP (L)
BATTERY
FUSE
REAR BRAKE LAMP SWITCH
CONTACT BREAKER
SPARK PLUG
TRUN SIGNAL RELAY
REGU LATOR
MAGNETO
NEUTRAL INDICATOR LAMP SWITCH
HORN
HORN SWITCH
IGNITION SWITCH
ENGINE KILL SWITCH
TURN SIGNAL LAMP SWITCH
LIGHTING SWITCH
DIMMER SWITCH
FRONT TURN SIGNAL LAMP (R)
FRONT TURN SIGNAL LAMP (L)
(T1) TURN SIGNAL PILOT LAMP
(T2) TACHOMETER LAMP
(N) NEUTRAL INDICATOR LAMP
(H) HIGH BEAM INDICATOR LAMP
(S) SPEEDOMETER LAMP
WIRE COLOR
B ..... Black
Bl ..... Blue
Br ..... Brown
G ..... Green
Gr ..... Gray
Lbl ..... Light Blue
Lg ..... Light Green
O ..... Orange
P ..... Pink
R ..... Red
W ..... White
Y ..... Yellow
B/W ..... Black with White tracer
B/Y ..... Black with Yellow tracer
G/W ..... Green with White tracer
W/R ..... White with Red tracer
W/Bl ..... White with Blue tracer
Y/R ..... Yellow with Red tracer
Y/W ..... Yellow with White tracer
LAMP LOAD
Headlamp 6V 30/30W
Tail/Brake lamp 6V 8.3/25W
Turn signal lamp 6V 17W
Speedometer lamp 6V 3W
Tachometer lamp 6V 3W
Neutral indicator lamp 6V 3W
High beam indicator lamp 6V 17W
Turn signal pilot lamp 6V 3W

Fig. 9-22.

FOR NETHERLANDS



LAMP LOAD

Headlamp	6V 33/35W
Tail/Brake lamp	6V 5/21W
Turn signal lamp	6V 21W
Speedometer lamp	6V 3W
Tachometer lamp	6V 3W
Neutral indicator lamp	6V 1.7W
High beam indicator lamp	3V 1.7W
Turn signal pilot lamp	3V 3W
City lamp	3V 4W

WIRE COLOR

B	Black	O	Orange
Bl	Blue	P	Pink
Br	Brown	R	Red
G	Green	W	White
Gr	Gray	Y	Yellow
Lbl	Light Blue	B/W	Black with White tracer
Lg	Light Green	B/Y	Black with Yellow tracer
G/W	Green with White tracer		
W/R	White with Red tracer		
W/Bl	White with Blue tracer		
Y/R	Yellow with Red tracer		
Y/W	Yellow with White tracer		

Fig. 9-23

FOR WEST GERMANY

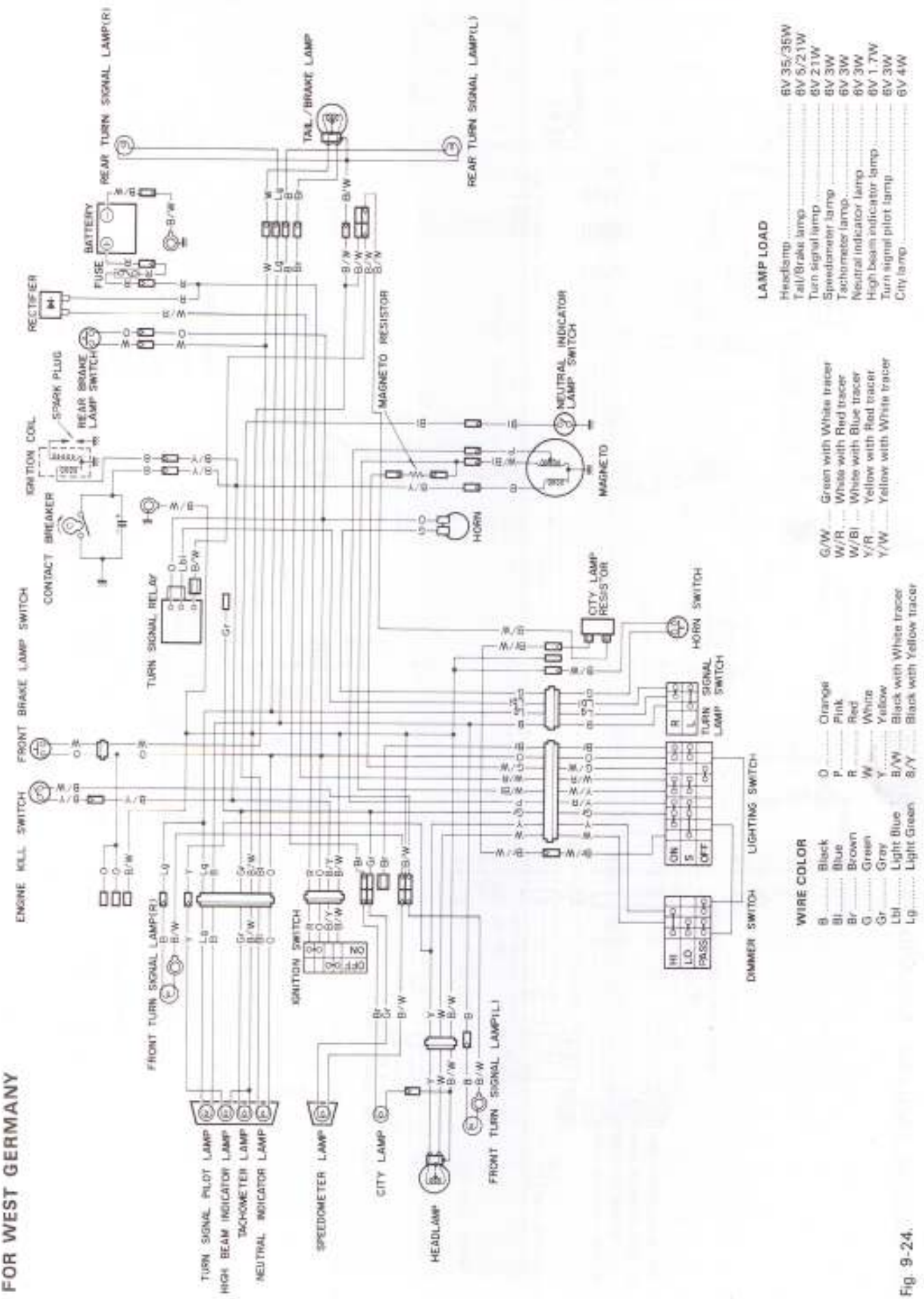
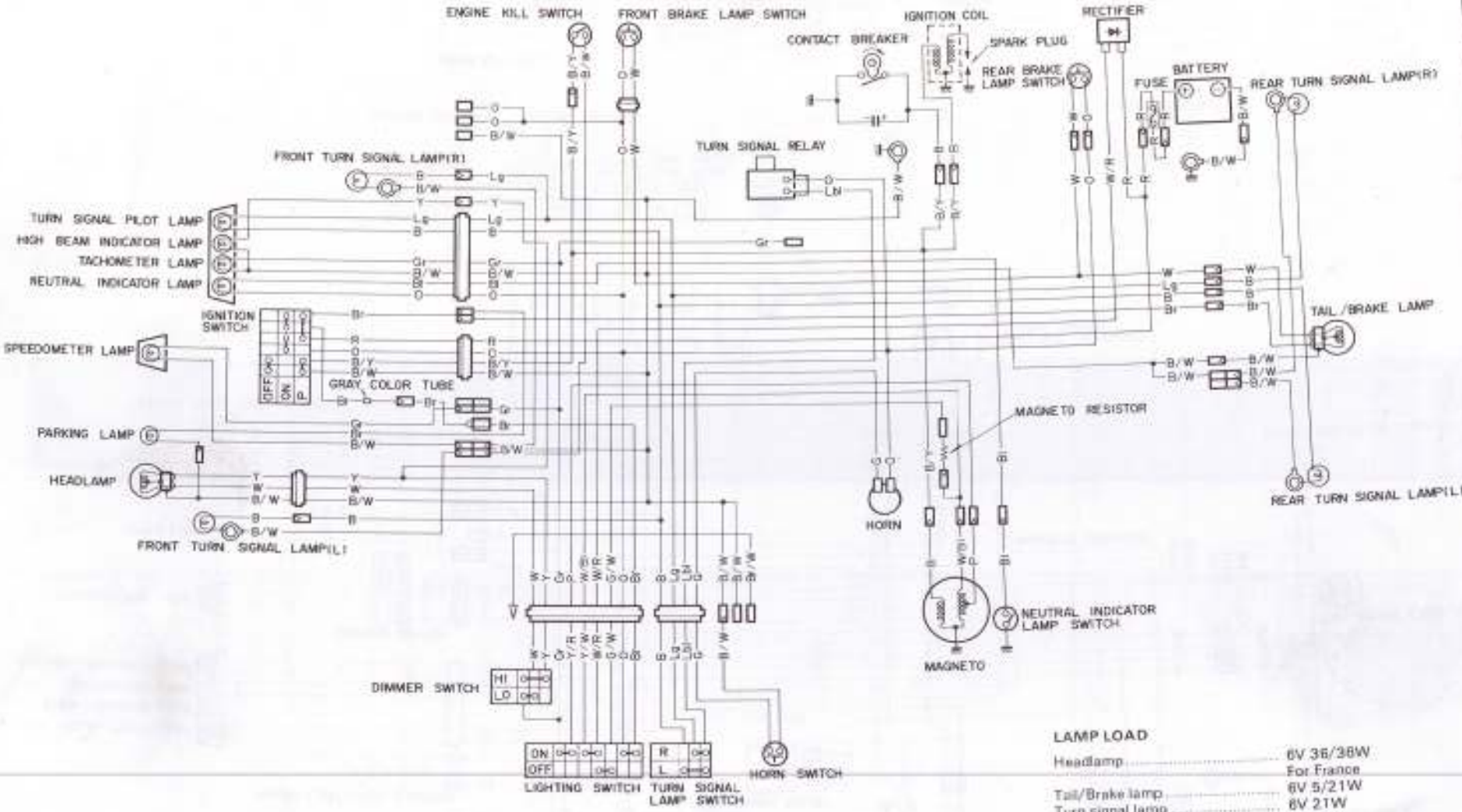


Fig. 9-24.

FOR BELGIUM, ENGLAND, FINLAND, FRANCE AND SWEDEN



WIRE COLOR

B	Black	O	Orange	G/W	Green with White tracer
Bl	Blue	P	Pink	W/R	White with Red tracer
Br	Brown	R	Red	W/Bl	White with Blue tracer
G	Green	W	White	Y/R	Yellow with Red tracer
Gr	Gray	Y	Yellow	Y/W	Yellow with White tracer
Lbl	Light Blue	B/W	Black with White tracer		
Lg	Light Green	B/Y	Black with Yellow tracer		

LAMP LOAD

Headlamp	6V 36/36W For France
Tail/Brake lamp	6V 5/21W
Turn signal lamp	6V 21W
Speedometer lamp	6V 3W
Tachometer lamp	6V 3W
Nautral indicator lamp	6V 3W
High beam indicator lamp	6V 1.7W
Turn signal pilot lamp	6V 3W For England and France
Parking lamp	6V 4W For Finland, Sweden, and Belgium

Fig. 9-25

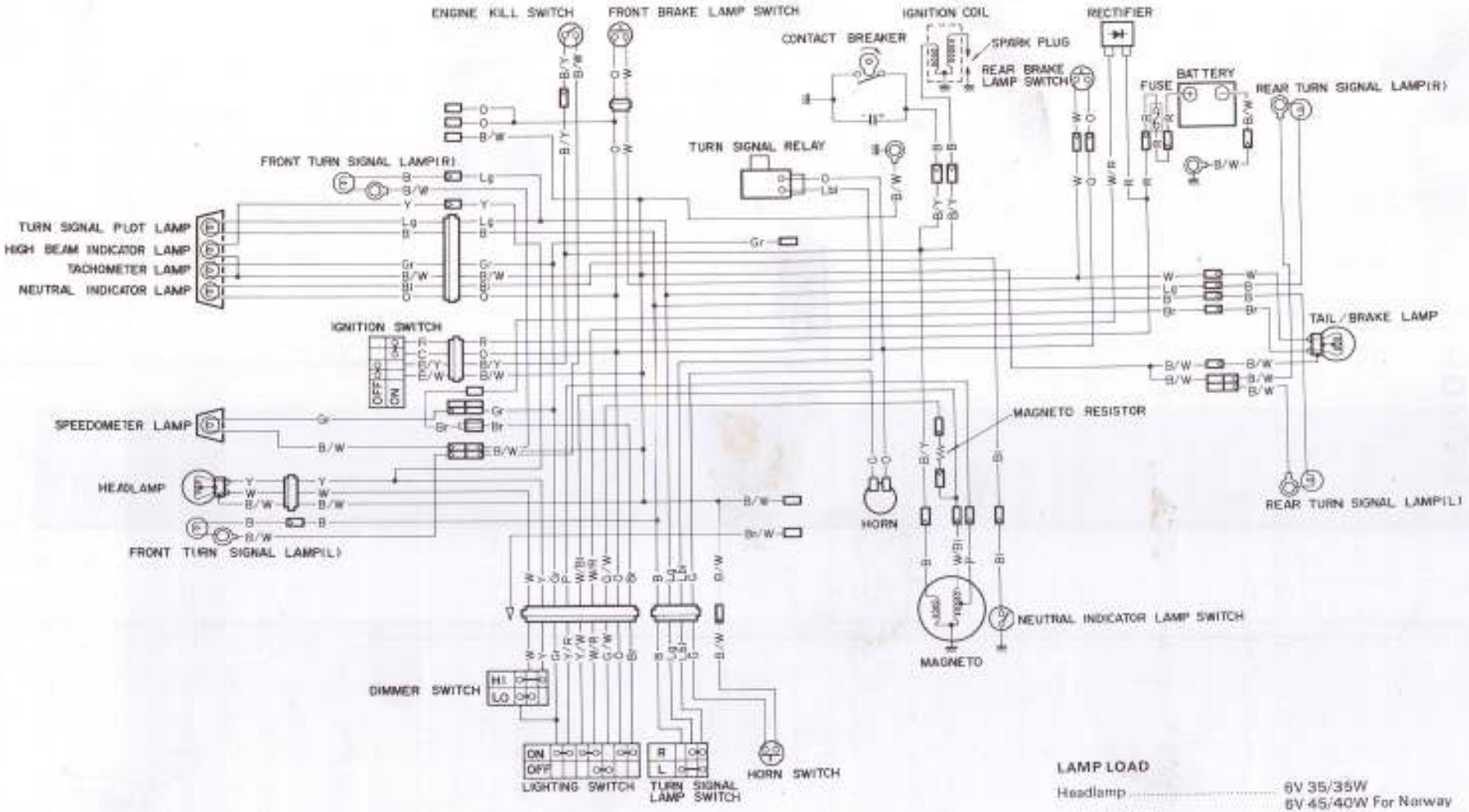


Fig. 9-26.

WIRE COLOR

B	Black	O	Orange	G/W	Green with White tracer
Bl	Blue	P	Pink	W/R	White with Red tracer
Br	Brown	R	Red	W/Bl	White with Blue tracer
G	Green	W	White	Y/R	Yellow with Red tracer
Gr	Gray	Y	Yellow	Y/W	Yellow with White tracer
Lbl	Light Blue	B/W	Black with White tracer		
Lg	Light Green	B/Y	Black with Yellow tracer		

LAMP LOAD

Headlamp	6V 35/35W 6V 45/40W For Norway
Tail/Brake lamp	6V 5.3/25W 6V 5/21W For Norway
Turn signal lamp	6V 17W 6V 21W For Australia and Norway
Speedometer lamp	6V 3W
Tachometer lamp	6V 3W
Neutral indicator lamp	6V 3W
High beam indicator lamp	6V 1.7W
Turn signal pilot lamp	6V 3W

CHASSIS

CONTENTS

FRONT WHEEL

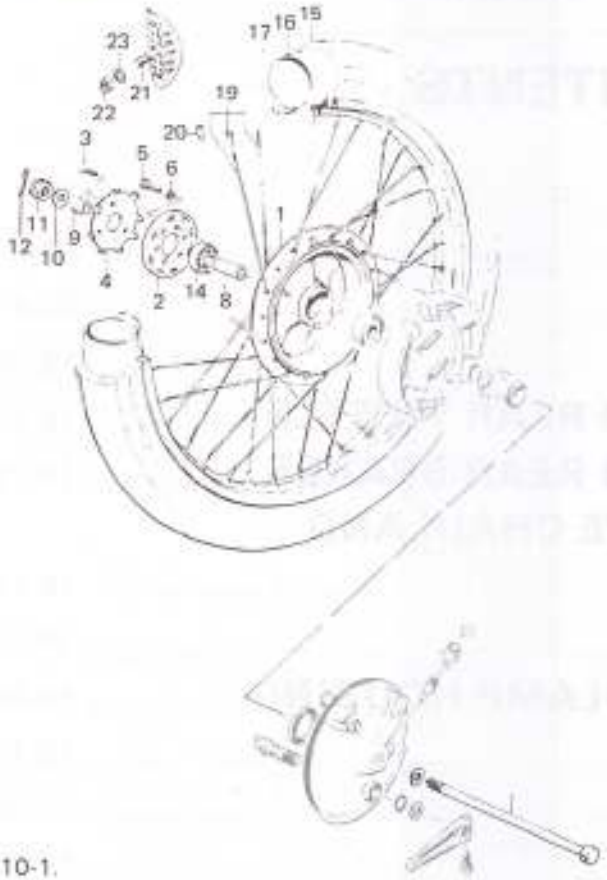


Fig. 10-1.

1. Wheel hub
2. Front hub flange, RH
3. Screw
4. Hub bearing holder, RH
5. Bolt
6. Lock washer
7. Front axle
8. Spacer
9. Spacer, RH
10. Washer
11. Nut
12. Cotter pin
13. Bearing
14. Bearing
15. Front tire
16. Inner tube
17. Inner tube protector
18. Wheel rim
19. Spoke set
20. Wheel balancer
21. Bead stopper
22. Nut
23. Washer

DISASSEMBLY

1. Raise the front wheel, and place a stand (09940-81611) under the frame at the position shown in Fig. 10-2.

NOTE:
Place the stand correctly to keep the motorcycle balanced during work.

Fig. 10-2.

2. Remove screw ① clamping the brake calbe.

Fig. 10-3.

3. Pull off cotter pin ① and remove axle nut ②. Draw out the axle shaft.

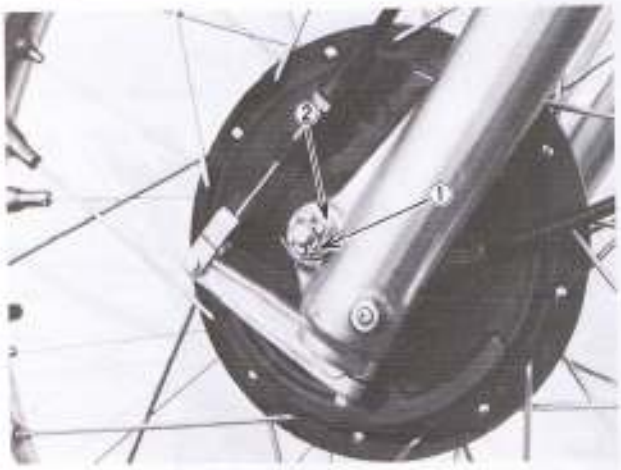


Fig. 10-4.

4. Take off front wheel.

Fig. 10-5.

5. Disconnect speedometer cable at the wheel.

Fig. 10-6.

6. Remove wheel bearing ①.

Fig. 10-7.

REASSEMBLY

Reverse the disassembling procedure. Make sure that brake shoes, hub drum bore and other brake parts are clean of dust and grease. Additional instructions are given below.

1. To install the ball bearing, grease the bearing and hub in advance. Put in the spacer first, and fit the bearing as shown.

Special tool:

Bearing and oil seal installing tool	09913-75820

Fig. 10-8.

2. Place front brake panel ① and bush ② on the hub, then mount the hub in the fork, and tighten to the specified torque.

NOTE:
Position recess ③ on the brake panel on boss ④ of the fork.
Apply a small amount of grease to axle ⑤.

Tightening torque:

36 ~ 52 N.m (3.6 ~ 5.2 kg-m, 26.0 ~ 37.5 lb-ft)

Fig. 10-9.

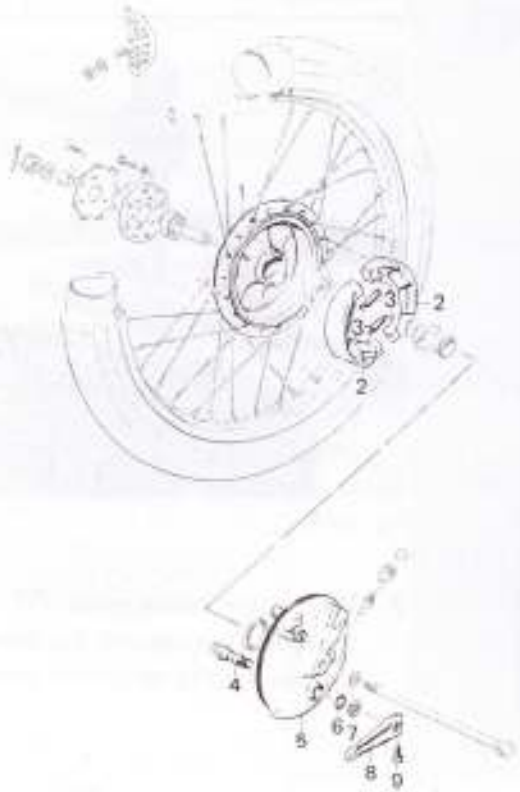
3. Insert cotter pin ① into the axle correctly.

NOTE:
Always use a new cotter pin.

Fig. 10-10.

4. Adjust the front brake, referring to page 3-11.

FRONT BRAKE



1. Wheel hub
2. Brake shoe
3. Spring
4. Brake cam
5. Panel
6. "O" ring
7. Wahser
8. Brake cam lever
9. Bolt

Fig. 10-11.

DISASSEMBLY

Take off the front wheel referring to page 10-2.

1. Pull off cotter pin ① and remove front brake cable pin ②.

Fig. 10-12.

2. Spread out brake shoes ①, and take the shoes off, complete with shoe springs ②.

Fig. 10-13.

3. Remove 6-mm bolt ① and take off brake cam lever ② and cam ③.

Fig. 10-14.

REASSEMBLY

1. Apply small amount of grease to the brake cam as shown in Fig. 10-15, and insert into the brake panel.
   Next, place the brake cam lever on the brake panel, positioning it at the correct angle as shown in Fig. 10-16.

Tightening torque:

5 ~ 8 N.m (5.0 ~ 8.0 kg-m, 36.5 ~ 57.5 lb-ft)

Fig. 10-15.

Fig. 10-16.

2. Place the brake shoes, with the springs stretched between them, into the brake panel.

NOTE:
Handle shoes with clean hands. Take care not to smear shoe linings with grease, etc.

Fig. 10-17.

3. Mount the front wheel, with the brake panel fitted to it, on the fork.
   Refer to page 10-3 for assembling.

4. Adjust the front brake in the following manner:
a. Inspect the distance between the front brake lever and throttle grip. The Distance ① should be 20 ~ 30 mm (0.8 ~ 1.2 in.).

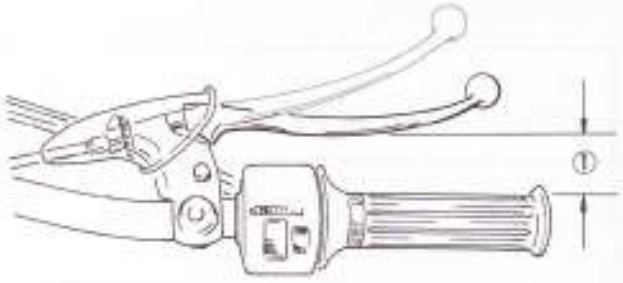


Fig. 10-18.

b. If adjustment is necessary, turn the front brake adjuster ② in or out after loosening the lock nut ③.

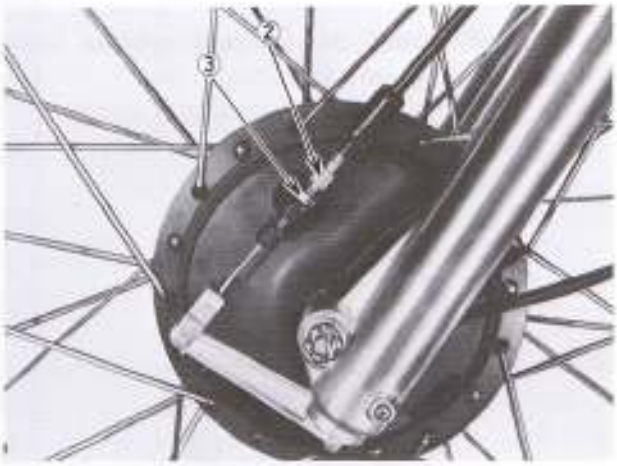
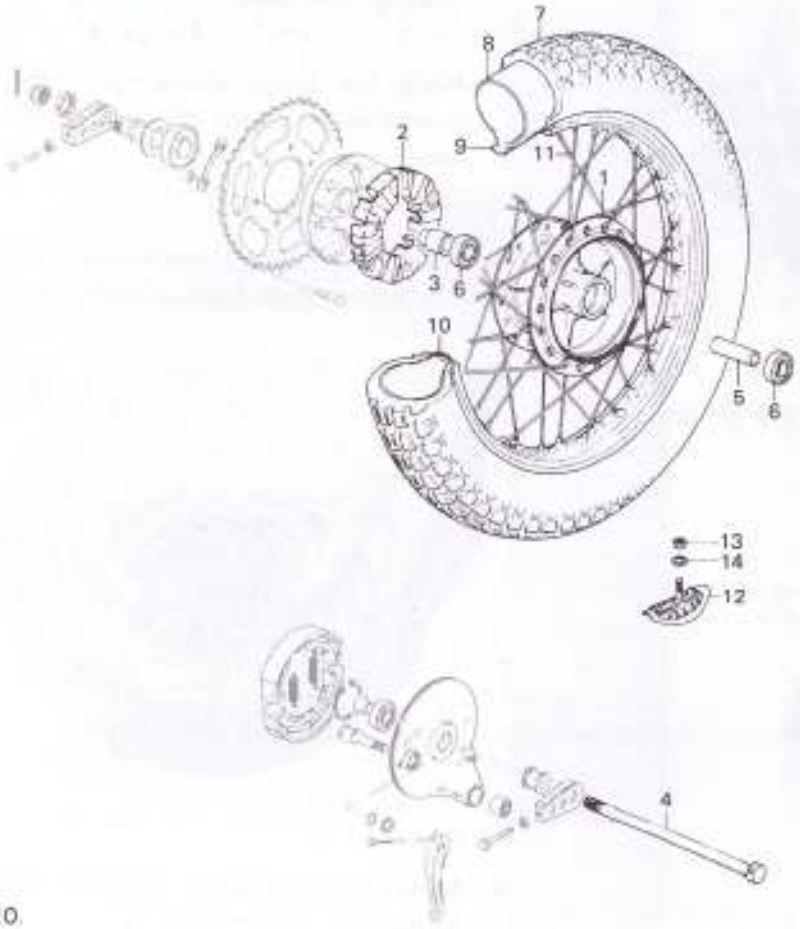


Fig. 10-19.

REAR WHEEL



1. Hub
2. Hub cushion
3. Sprocket holder
4. Rear axle
5. Spacer
6. Bearing
7. Tire
8. Inner tube
9. Protector
10. Rim
11. Spoke set
12. Bead stopper
13. Nut
14. Washer

Fig. 10-20.

DISASSEMBLY

1. Raise the rear wheel, and place stands under the frame at the position shown in Fig. 10-21.

NOTE:
Place the stand correctly to keep the motorcycle balanced during the work.

Fig. 10-21.

2. Unscrew torque link nut ① and bolt ②.

Fig. 10-22.

3. Pull off cotter pin ①, and remove brake cable pin ②.
4. Loosen lock nut ③, and take brake cable adjuster ④ off the brake panel.

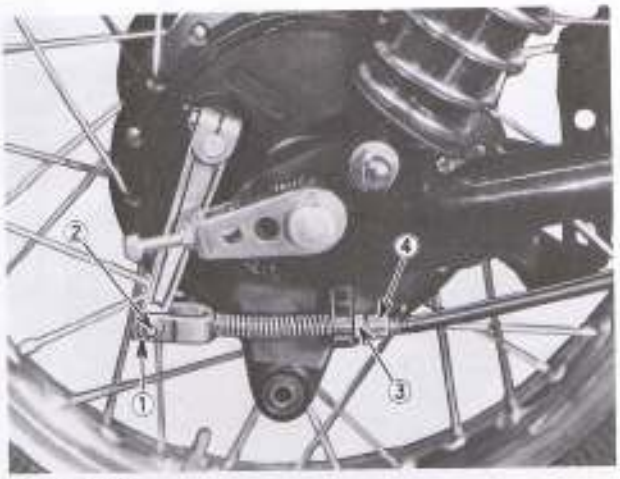


Fig. 10-23.

5. Pull off cotter pin ① and remove axle nut ②. Draw out the axle shaft.

Fig. 10-24.

6. Take off rear wheel.

Fig. 10-25.

7. Remove wheel bearings ①.

Fig. 10-26.

REASSEMBLY

Reverse the disassembling procedure. Make sure that brake shoes, hub drum bore and other brake parts are clean of dust and grease. Additional instructions are given below.

1. To install the ball bearing, grease the bearing and hub in advance. Put in the spacer first, and fit the bearing as shown.

Special tool:

Bearing and oil seal installing tool	09914-79610

Fig. 10-27.

2. Place right chain adjuster ② on the swinging arm ①.

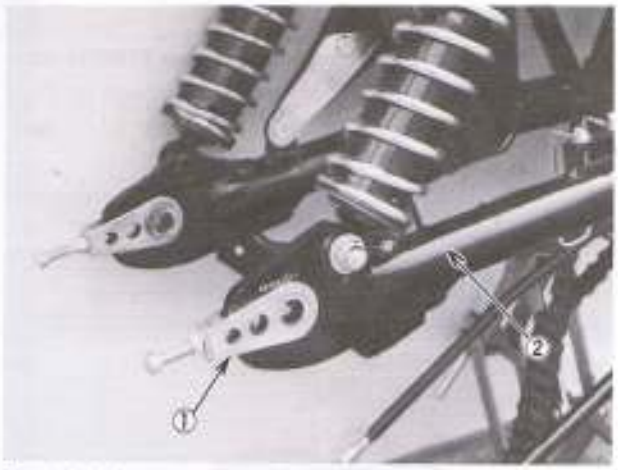


Fig. 10-28.

3. Place sprocket mounting drum ③, hub panel ④, left spacer ⑤, and right spacer on hub ②.
   Then mount the hub and swinging arm ① on rear axle ⑥.

NOTE:
Tighten the rear axle nut ⑦ temporarily.

Fig. 10-29.

4. Place drive chain ① on rear sprocket ②, and fit chain joint clip ③ as shown in Fig. 10-30.

NOTE:
Chain joint clip ③ must be fixed on the chain, with its open end facing in the opposite direction to chain movement.

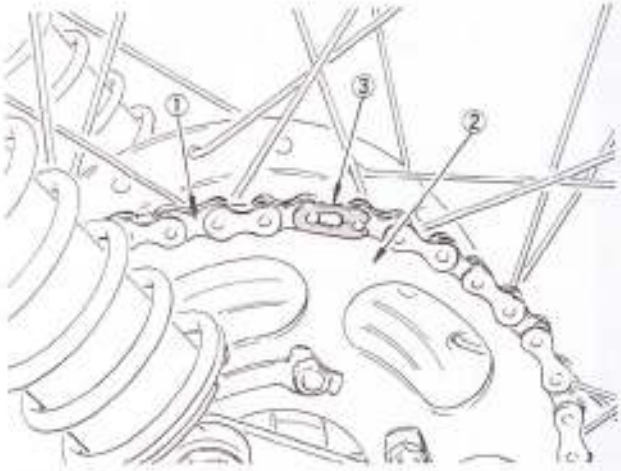


Fig. 10-30.

5. Fit torque link ①, and clamp nut ② temporarily.

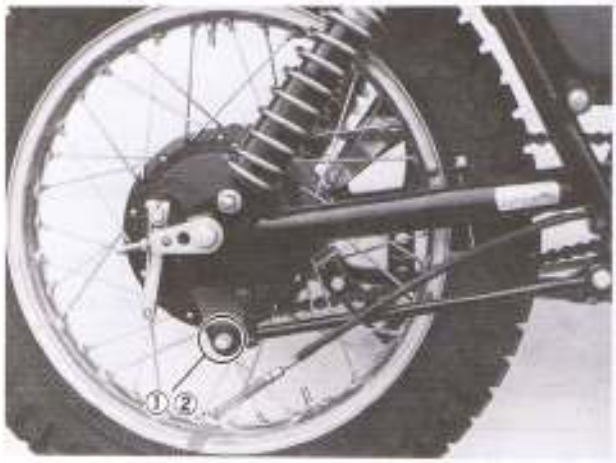


Fig. 10-31.

6. After connecting the rear brake cable to the brake pedal, fit the cam lever and a split pin securely.

Fig. 10-32.

7. Confirm that marks ② on both chain adjusters are set to the same scale reading ① on each side of the rear swinging arm.
Also confirm that chain sag is 15 ~ 20 mm (0.6 ~ 0.8 in.) ③.
If these settings are not correct, adjust them referring to page 3-10.

Fig. 10-33.

Fig. 10-34.

8. Tighten axle nut ① to the specified torque, then insert cotter pin ② correctly.

NOTE:
Always use a new cotter pin.

Tightening torque:

50 ~ 80 N.m (5.0 ~ 8.0 kg-cm, 36.5 ~ 57.5 lb-ft)

Fig. 10-35.

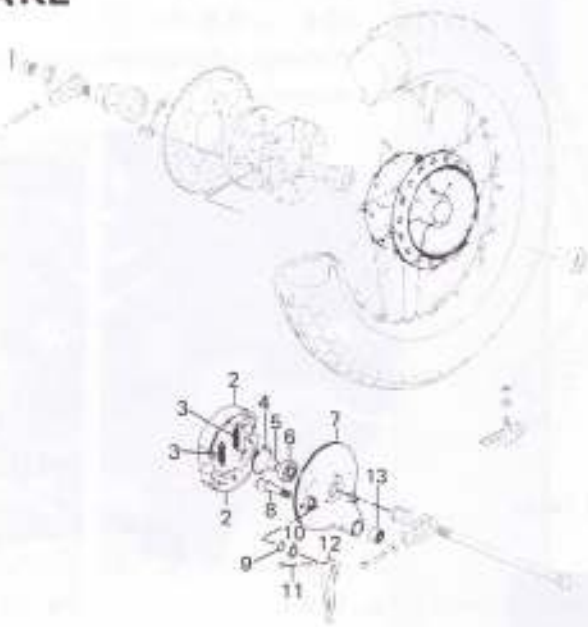
9. Tighten the torque link nut to the specified torque.

Tightening torque:

20 ~ 30 N.m (2.0 ~ 3.0 kg-m, 14.5 ~ 21.5 lb-ft)

10. Adjust the rear brake, referring to page 3-12.

REAR BRAKE



1. Hub
2. Brake shoe
3. Spring
4. Circlip
5. Spacer
6. Bearing
7. Panel
8. Brake cam
9. "O" ring
10. Washer
11. Bolt
12. Brake cam lever
13. Bushing

Fig. 10-36.

DISASSEMBLY

Take off the rear wheel referring to page 11-7.

1. Spread out brake shoes ①, and take the shoes off, complete with shoe springs ②.

Fig. 10-37.

2. Remove 6-mm bolt ① and take off brake cam lever ② and cam ③.

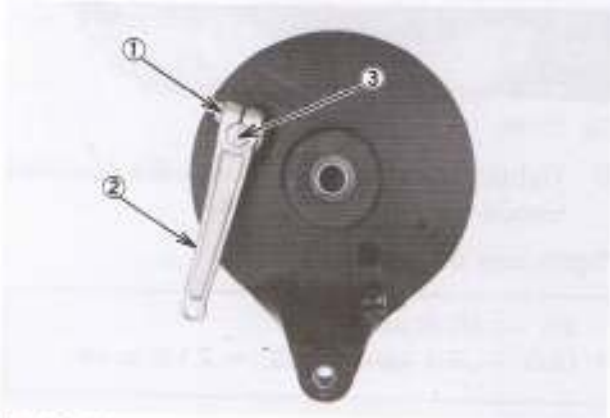


Fig. 10-38.

REASSEMBLY

1. Apply a small amount of grease to the brake cam as shown in Fig. 10-39, and insert into the brake panel.
   Next, place the brake cam lever on the brake panel, positioning it at the correct angle as shown in Fig. 10-40.

Tightening torque:

5 ~ 8 N.m (0.5 ~ 0.8 kg-m, 4.0 ~ 5.5 lb-ft)

Fig. 10-39.

Fig. 10-40.

2. With the springs mounted to the brake shoes, mount the brake shoes to the brake panel.

NOTE:
Handle shoes with clean hands. Take care not to smear shoe linings with grease, etc.

Fig. 10-41.

3. With the rear panel mounted to the rear wheel, mount the rear wheel to the rear swinging arm.
   Refer to page 10-8 for assembling.
4. Adjust the rear brake in the following manner:
   Turn adjuster ② to obtain a pedal free travel ① of 20 ~ 30 mm (0.8 ~ 1.2 in.), then tighten lock nut ③.

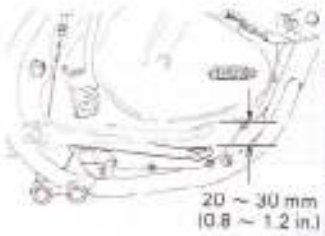


Fig. 10-42.

Fig. 10-43.

CHECKING FRONT AND REAR WHEELS

RIM RUNOUT

Make sure that rim runout, checked as shown, does not exceed the service limit. Excessive runout is usually due to worn or loose wheel bearings and can be reduced by replacing the bearings. If bearing replacement fails to reduce runout, adjust the tension of the spokes and, if this proves to be ineffective, replace the rim.

Wheel rim runout

	Limit
Face runout	2.0 mm (0.08 in.)
Radial runout	2.0 mm (0.08 in.)

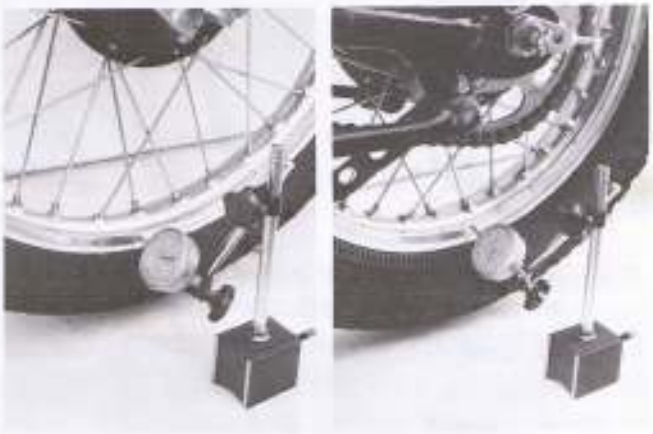


Fig. 10-44.

2. Confirm that all nipples are tight, and retighten them as necessary using special tool (09940-60112). Loose spoke nipples are likely to result in spoke damage or in rim distortion.

Tightening torque:

4 ~ 5 N.m (0.4 ~ 0.5 kg-m, 3.0 ~ 3.5 lb-ft)

Fig. 10-45.

3. Visually inspect the wheel hub bore, from which the bearings have been extracted, for evidence of abnormal wear caused by possible creeping of bearing outer races.

CHECKING WHEEL BEARING

1. Raise the front or rear wheel, placing a stand ① under the frame at the position shown in Fig. 10-46, 10-47.

Fig. 10-46.

Fig. 10-47.

2. Check looseness of wheel bearings by hand as shown in Fig. 10-48, 10-49.

Fig. 10-47.

Fig. 10-49.

3. If looseness ①, as shown in the figure, is larger than the limit value, the bearings must be replaced with new ones.

Limit of wheel bearing looseness:

Service limit	3.0 mm (0.12 in.)

Fig. 10-50.

TIRE WEAR LIMIT

Inspect the tire for wear and damage; and check the tire tread depth as shown. Replace a badly worn or damaged tire. A tire with tread worn down to the limit (in terms of tread depth) must be replaced.

Tread depth service limit

Front	1.6 mm (0.06 in.)
Rear	2.0 mm (0.08 in.)

Fig. 10-51.

Fig. 10-52.

AXLE SAHFT

Check axle shaft ① for deflection with dial gauge ②, and if deflection is in excess of the limit, replace axle shaft.

Front, rear axle shaft deflection

Standard	Service limit
0.15 mm (0.006 in.)	0.25 mm (0.010 in.)

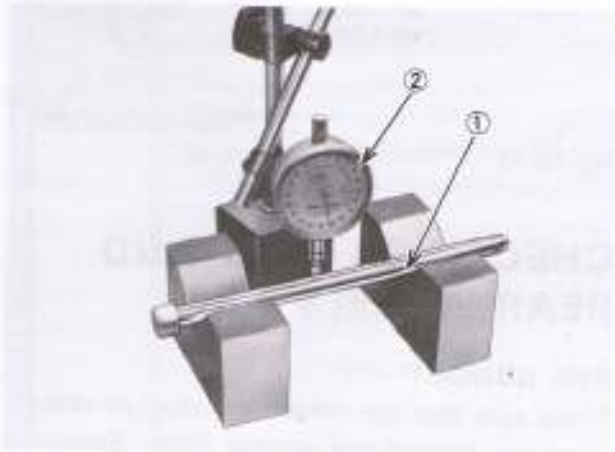


Fig. 10-53.

TIRE PRESSURE

Be sure that pressure is correct at all times. If the tire pressure is too high, the machine will tend to bounce up and down. Conversely, if the pressure is too low, steering will be adversely affected. Therefore, maintain the correct tire pressure for good roadability, or shorter tire life will result.

Operating the motorcycle with the excessively worn tires will decrease riding stability and consequently invite a dangerous situation.

TIRE INFLATION PRESSURE (to be measured when tire is cold condition.)

COLD INFLATION TIRE PRESSURE	FRONT		REAR	
	SOLO RIDING	DUAL RIDING	SOLO RIDING	DUAL RIDING
Normal riding	150 kPa (1.5 kg/cm², 21 psi)	150 kPa (1.5 kg/cm², 21 psi)	150 kPa (1.5 kg/cm², 21 psi)	200 kPa (2.0 kg/cm², 28 psi)
Continuous high speed riding	175 kPa (1.75 kg/cm², 25 psi)	175 kPa (1.75 kg/cm², 25 psi)	200 kPa (2.0 kg/cm², 28 psi)	250 kPa (2.5 kg/cm², 36 psi)

CHECKING FRONT AND REAR BRAKES

1. Measure the brake drum inside diameter. If the diameter is larger than the limit written inside the brake drum, the drum must be replaced with a new one.

NOTE:
Measurement of brake drum inside diameter is required only when the brake panel is disassembled to change the brake shoes, since the wear can be checked by means of the brake lining wear limit indicator on the brake panel.

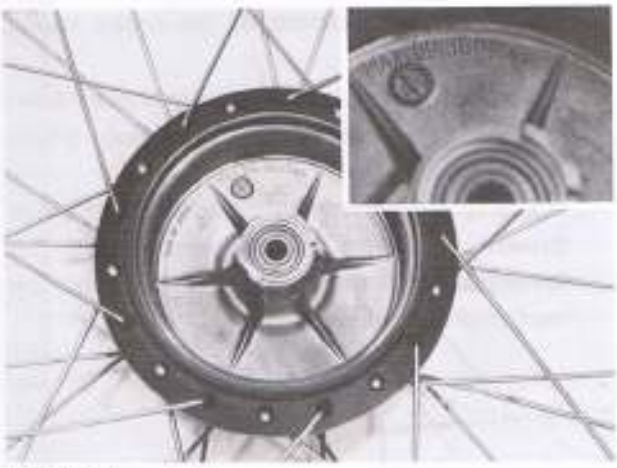


Fig. 10-54

2. Measure the wear of brake shoes when they are set in the brake panel.
   Measure the wear twice, once before disassembling, and then after assembling (even though brake shoes have been replaced with new ones).

NOTE:
Replace the brake shoes by a set, otherwise braking performance will be adversely affected.

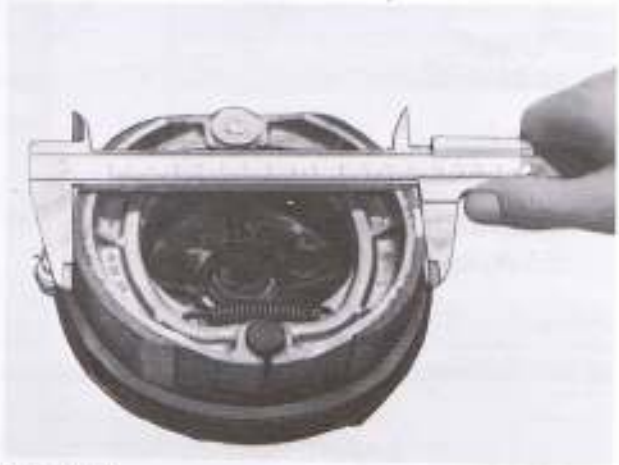


Fig. 10-55

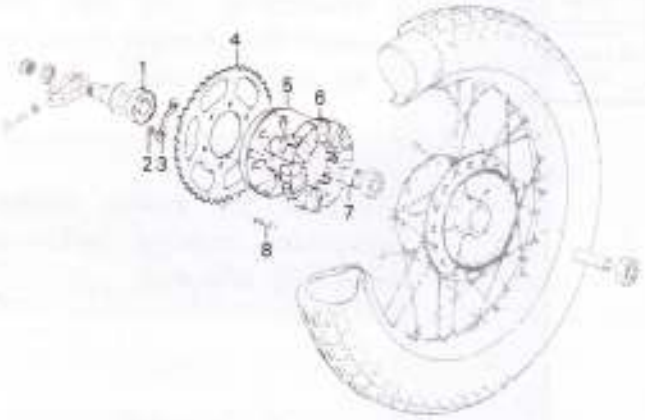
Brake shoe

Standard	Service limit
149.7 mm (5.89 in.)	146.0 mm (5.75 in.)

3. Visually check contact of the brake shoes and brake drum.
   Irregular contact may make the brake noisy. Modify the contact surface using #100 sandpaper.
   If the brake shoes are smeared with oil or grease, braking performance will be lowered, and the brake shoes must be replaced with new ones.

Fig. 10-56.

REAR SPROCKET, DRIVE CHAIN AND MOUNTING DRUM



1. Bearing
2. Nut
3. Washer
4. Rear sprocket
5. Sprocket mounting drum
6. Hub cushion
7. Sprocket holder
8. Bolt

Fig. 10-57.

DIASSEMBLY

Take off the rear wheel referring to page 11-6.

1. Separate sprocket from the sprocket mounting drum by removing the 6 nuts ①.

Fig. 10-58.

2. Remove bearing from the sprocket mounting drum.

Special tool:

Bearing installing tool	09913-70122

NOTE:
The removed bearing should be replaced with a new one.

Fig. 10-59.

3. Remove the drive chain joint clip ① and take out the drive chain.

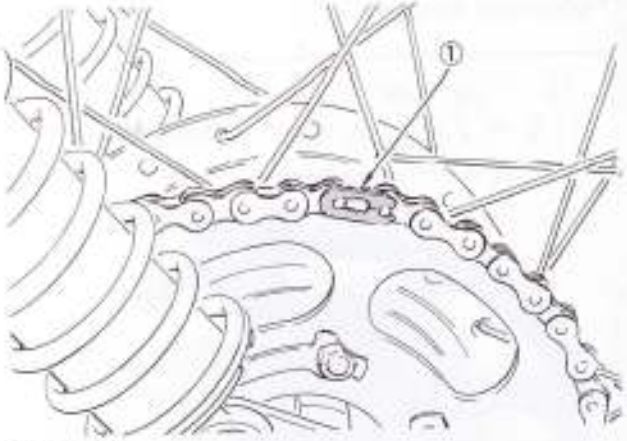


Fig. 10-60.

INSPECTION

Rear sprocket wear

Sprockets that have become excessively worn cause chain noise and greatly accelerate chain and sprocket wear. The sprockets should be checked for wear when the chain is removed. Visually inspect the sprocket teeth. If they are worn as illustrated, replace the sprocket.

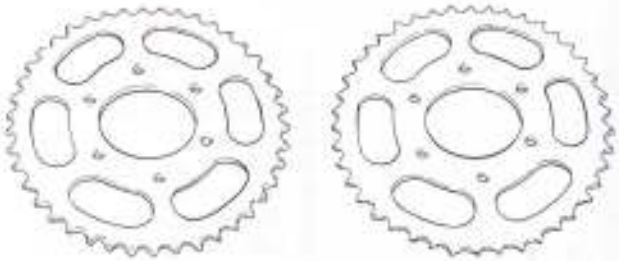


Fig. 10-61.

Checking drive chain

Inspect the drive chain for the abnormalities listed below (lift the rear wheel, place a jack or block under the engine, and turn the rear wheel slowly by hand, with the transmission in NEUTRAL position).

1. Loose pins
2. Damaged rollers
3. Rust
4. Twisted or bound links
5. Excessive wear

If any of the above conditions are found, the drive chain must be replaced.

Fig. 10-62.

Measure drive chain elongation

Remove the chain case. Using a caliper rule, measure the center-to-center distance between two pins 20 pitches apart 19 pins in between the two points). If the distance exceeds 323.0 mm (12.7 in), replace the chain with a new one. The standard distance is 317.5 mm (12.5 in.).

NOTE:
Measure elongation of the drive chain using a prop stand, while strongly pressing the chain as shown in Fig. 10-63.

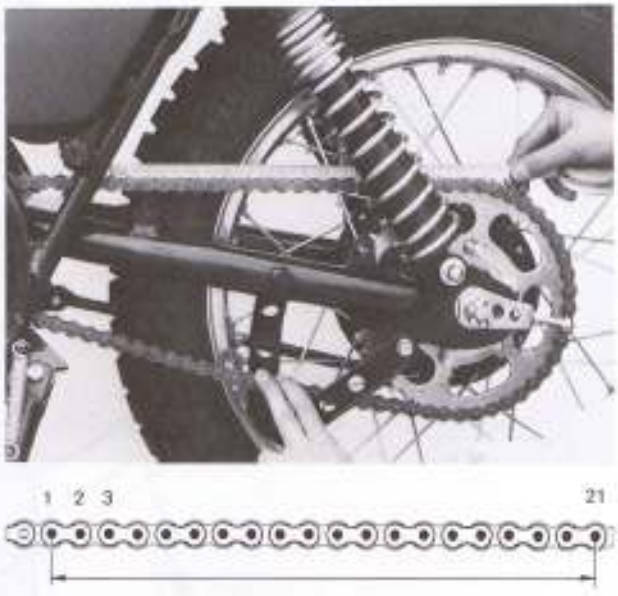


Fig. 10-63.

Oiling drive chain

Wash the chain in cleaning solvent. After washing and drying the chain, lubricate it with chain lube or motor oil.

REASSEMBLY

1. Before installing the ball bearing, grease the bearing and fit the bearing as shown.

Special tool:

Bearing installing tool	09913-70122

Fig. 10-64.

2. After securing the sprocket, be sure to lock the 6 nuts by bending the tongues of washer ① firmly against the nut flats.

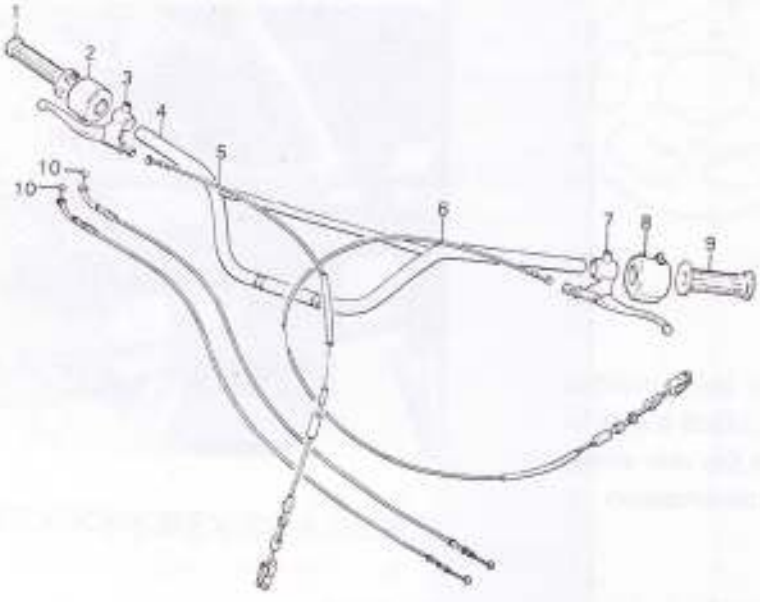
Tightening torque:

15 ~ 25 N.m (1.5 ~ 2.5 kg-m, 11.0 ~ 18.0 lb-ft)

Fig. 10-65.

3. Fit the rear wheel referring to the item: Rear Wheel. Adjust the rear brake properly referring to page 10-11.

HANDLEBAR



1. Throttle grip
2. Right handle switch
3. Brake lever ass'y.
4. Handlebar
5. Front brake cable
6. Clutch cable
7. Clutch lever ass'y.
8. Left handle switch ass'y.
9. Left grip
10. Throttle cable

Fig. 10-66.

DISASSEMBLY

1. Take front brake cable ① off brake lever ②.

Fig. 10-67.

2. Take clutch cable ① off clutch lever ②.

Fig. 10-68.

3. Take off head lamp ①, and disconnect the wiring inside the headlamp housing.

Fig. 10-69.

Remove screws from the right handle switch box, and take off throttle cables Ⓐ and Ⓑ.

NOTE:
By the employment of coercive open-and-close carburetor, there are two throttle cables.
To identify these cables, place labels on each cable as shown in Fig. 10-70.

Fig. 10-70.

5. Disconnect wiring ① from the right handle switch at the back of the headlamp housing.

Fig. 10-71.

6. Unscrew handlebar holder bolts ①, and take off handlebar ②.

Fig. 10-72.

7. Remove left grip ①, left handle switch ②, clutch lever ③, and brake lever from the handlebar.

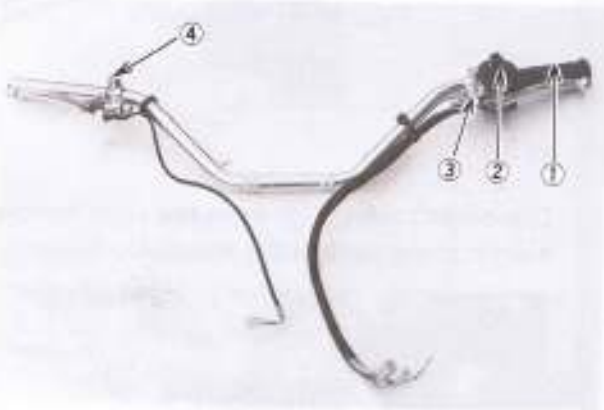


Fig. 10-73.

REASSEMBLY

1. Assemble in the order of brake lever ①, clutch lever ②, left handle switch ③, and left grip ④ on the handlebar.

NOTE:
To fix the left grip ④, apply adhesive to handlebar ⑤.

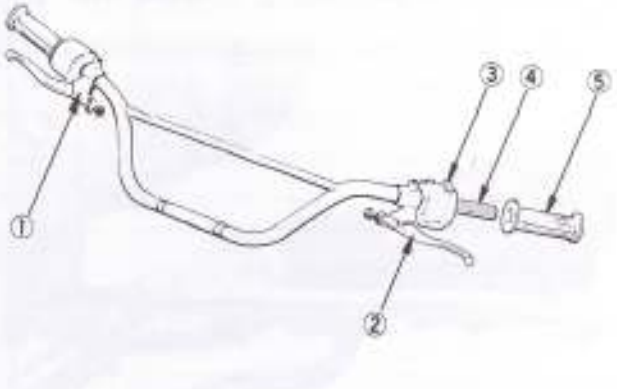


Fig. 10-74.

2. Mount the handlebar on the steering stem head together with the ignition switch ①.

Fig. 10-75.

NOTE:
Place the handlebar, so that punch mark ① is located as shown in Fig. 10-76. Tighten bolts ③, leaving an equal clearance at front and back of holder ②, then tighten the bolts using a torque wrench.

Tightening torque:

12 ~ 20 N.m (1.2 ~ 2.0 kg-m, 9.0 ~ 1.4 lb-ft)

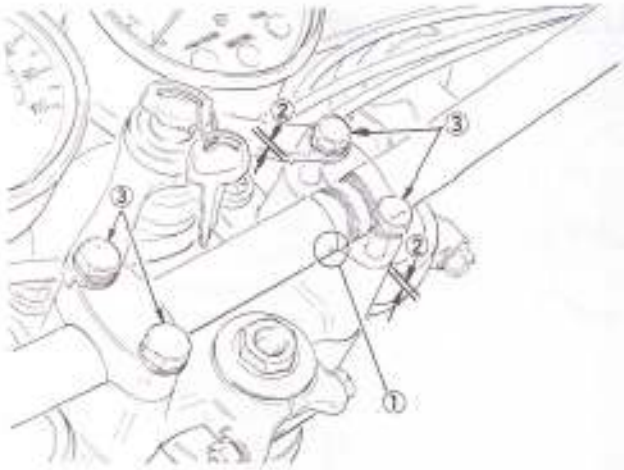


Fig. 10-76.

3. Fit wiring harness band ① on the handlebar correctly as shown in Fig. 10-77, then connect the wiring.
   Fix the wiring in the headlamp housing with clamps ②.

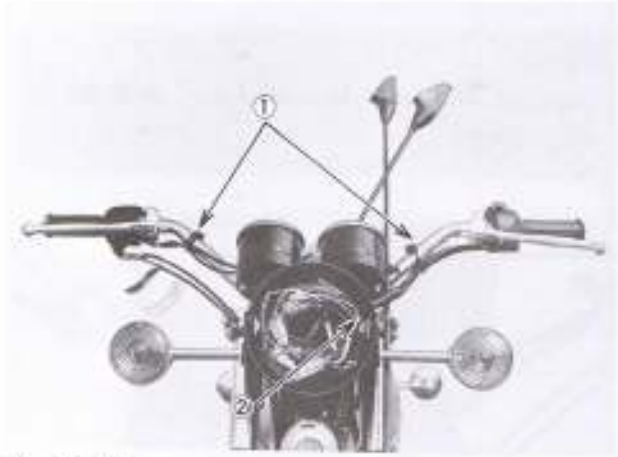


Fig. 10-77.

4. Mount the headlamp.
5. Fit the clutch and brake calbes on each lever.

NOTE:
Fit the clutch and brake cables correctly, referring to Fig. 10-78.

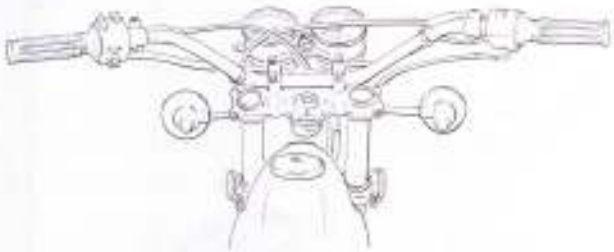


Fig. 10-78.

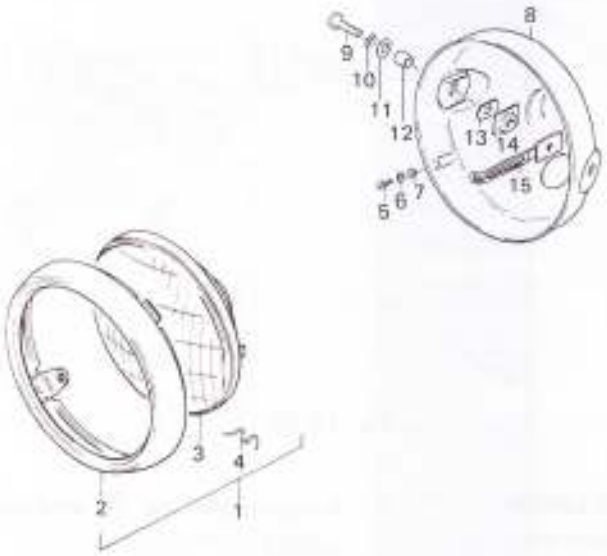
6. Attach opening ① and clocing ② throttle cables correctly.

NOTE:
Thread throttle cable properly referring to Fig. 10-79.

Fig. 10-79.

7. Finally, adjust the play in the clutch, brake and throttle cables.
   For throttle cable, see page 3-9.
   For clutch cable, see page 3-10.
   For brake cable, see page 3-11.

HEADLAMP AND HEADLAMP HOUSING



1. Headlamp ass'y
2. Rim
3. Unit
4. Spring
5. Screw
6. Washer
7. Lock washer
8. Headlamp housing
9. Bolt
10. Lock washer
11. Washer
12. Spacer
13. Cushion
14. Plate, RH
15. Plate, LH

Fig. 10-80.

DISASSEMBLY

1. Unscrew head lamp screws ①, and take off the headlamp.
   Next, disconnect wiring ② in the housing.

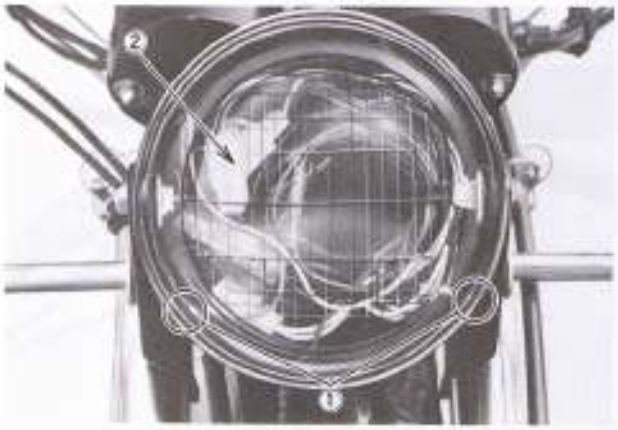


Fig. 10-81.

2. Unscrew housing clamping bolts ①, and remove housing ②.

Fig. 10-82.

REASSEMBLY

To assemble reverse the order of disassembly.

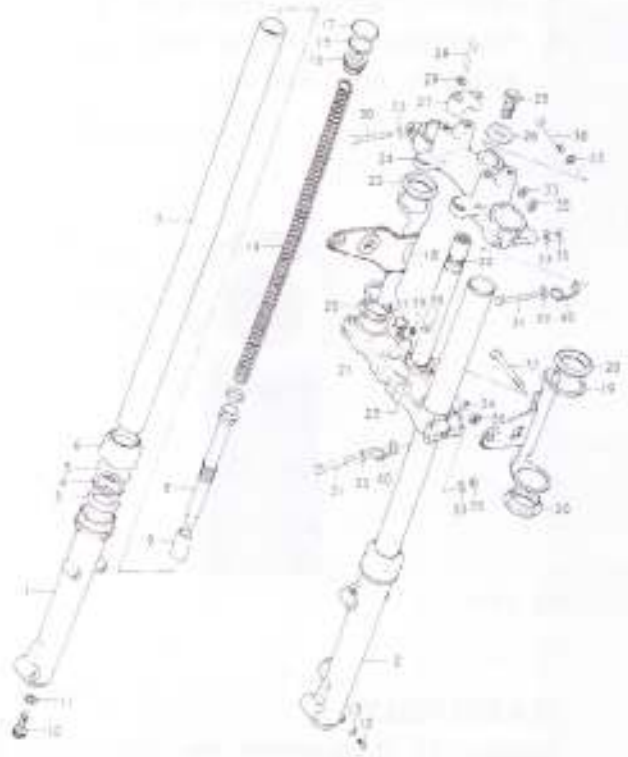
NOTE:
Connect the wiring correctly, and fix it with clamp ①.

Fig. 10-83.

ADJUSTMENT

Check and adjust the headlamp main beam angle, if the headlamp housing has been taken off.

FRONT SUSPENSION



1. Outer tube, RH
2. Outer tube, LH
3. Oil seal
4. Washer
5. Snap ring
6. Dust seal
7. Inner tube
8. Cylinder
9. Piece, oil lock
10. Bolt
11. Gasket
12. Screw
13. Gasket
14. Spring
15. "O" ring
16. Cap
17. Cap
18. Headlamp housing bracket, RH
19. Headlamp housing bracket, LH
20. Gasket
21. Steering stem
22. Steering shaft
23.51. Outer race
24. Steering stem
25. Bolt
26. Washer
27. Handle holder
28. Bolt
29. Lock washer
30. Bolt
31. Bolt
32. Bolt
33. Washer
34. Lock washer
35. Nut
36. Nut
37. Clip
38. Screw
39. Lock washer
40. Clip

Fig. 10-84.

REMOVAL

1. Remove the front wheel referring to the Item: Front Wheel.
   Remove the handle bar ass'y referring to the Item: Handlebar.
2. Take off the speedometer and tachometer cables, then remove the meter assembly.

Fig. 10-85.

Fig. 10-86.

3. Loosening clamping bolt ① and nuts ②, take off the steering stem head.

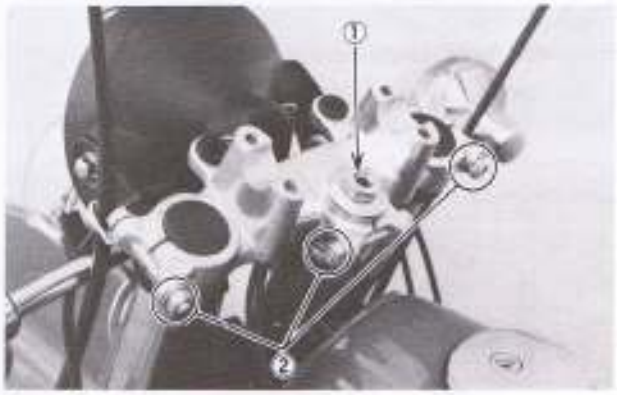


Fig. 10-87.

4. Remove the headlamp housing bracket ①.

Fig. 10-88.

5. Remove the front fender ① and front brake cable guide ②.

NOTE:
Do not lose spacer ③ and washer ④ when removing the front fender.

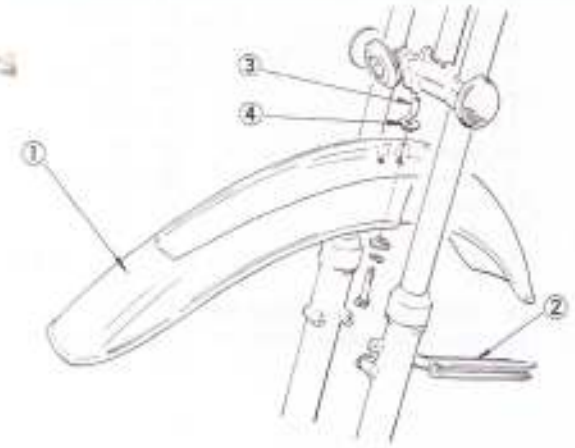


Fig. 10-89

6. Unscrew steering stem nut ① with the special tool (09940-101222), then the front fork can be taken off downward.

NOTE:
Do not lose steel balls ② when taking off the fork.

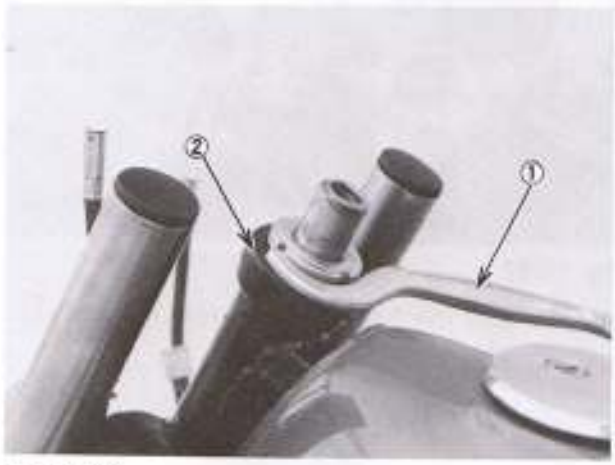


Fig. 10-90

INSPECTION

Inspect and check the removed parts for the following malconditions:

1. Handlebar distortion
2. Handle holder wear at the inside surface in contact with the handlebar.
3. Broken cables and lead wires
4. Race wear and brinelling
5. Worn or damaged steel balls ①
6. Distortion of steering stem and handle stoppers, right and left.

Fig. 10-91

REASSEMBLY

Reassembly is generally the reverse of disassembly, but the following additional steps must be taken:

1. Grease the inner race ① before fitting the steel balls.

Number of steel balls

TOP	BOTTOM
18	18

Fig. 10-92

2. Use the special tool to tighten stem nut to secure the stem after passing it through the frame head pipe and fitting the outer race.

Special tool:

Steering stem lock nut wrench	09940-10122

NOTE:
While tightening the stem nut with the special tool, turn the stem right and left to feel its "heaviness" and stop tightening before it becomes too heavy.

Fig. 10-93.

3. Mount the steering head ①, and tighten nut ②.

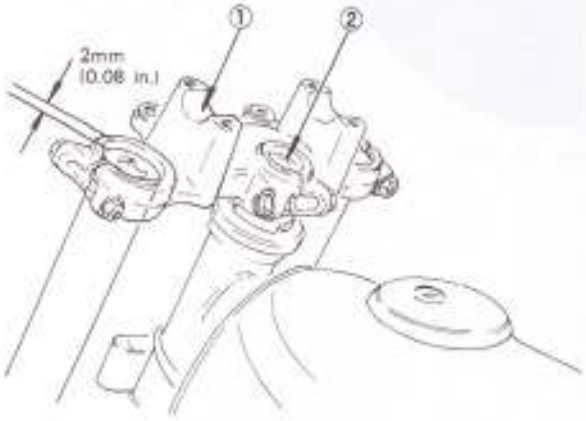


Fig. 10-94.

NOTE:
Check that the inner tube is positioned against the steering stem as shown in Fig. 10-94. If not, loosen bolts ③ at the bottom of the steering stem, and adjust the inner tube position.

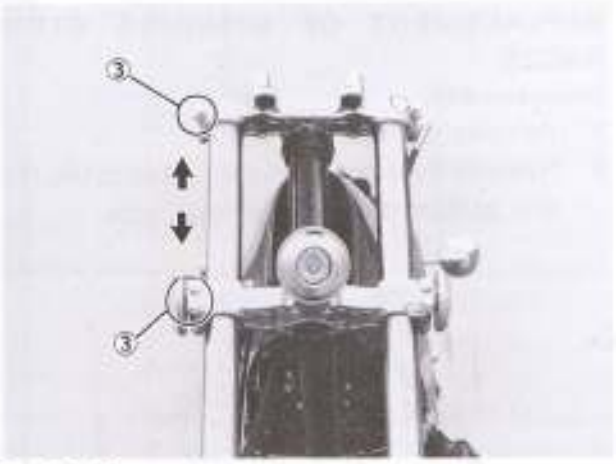


Fig. 10-95.

4. Fig. 10-96 indicates important clamping bolts and nuts.
Confirm that they are tightened to the specified torque.

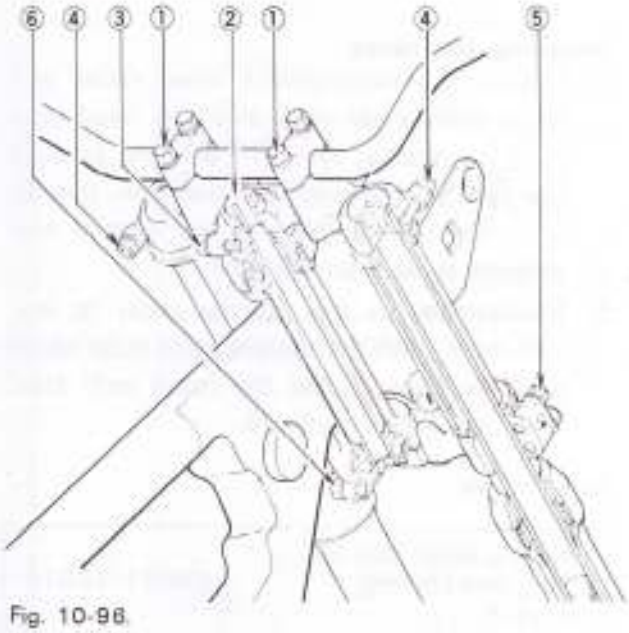


Fig. 10-96.

Tightening torque:

①	12～20 N.m (1.2～2.0 kg-m, 9.0～14.0 lb-ft)
②	35～50 N.m (3.5～5.0 kg-m, 25.5～36.6 lb-ft)
③	15～25 N.m (1.5～2.5 kg-m, 11.0～18.0 lb-ft)
④	15～25 N.m (1.5～2.5 kg-m, 11.0～18.0 lb-ft)
⑤	15～25 N.m (1.5～2.5 kg-m, 11.0～18.0 lb-ft)
⑥	20～30 N.m (2.0～3.0 kg-m, 14.5～21.5 lb-ft)

5. Mount the front wheel, referring to page 10-3.

REPLACEMENT OF STEERING STEM RACES

Disassembly

1. Remove the steering stem.
2. Remove the two inner races fitted to the top and bottom ends of the head pipe.

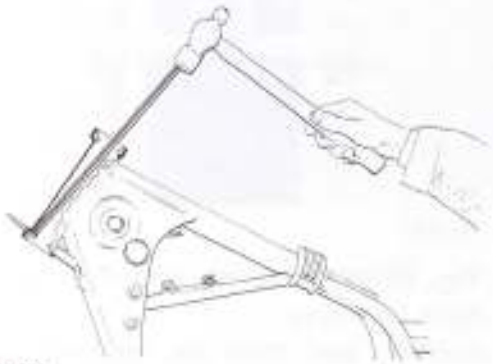


Fig. 10-97.

Installing the races

1. Grease the replacement inner races and force each inner race into the head pipe with the special tool ①. Be sure to push the race all the way into the pipe, that is, until the jacking bolt of the special tool refused to turn any further.
2. Reassemble in the reverse order to disassembly, with the replacement outer races properly fitted. Load the races with steel balls as already outlined.

Special tool:

Steering inner race and swing arm bearing installer	09941-34510

Operate the special tool in the manner illustrated:

Fig. 10-98.

3. The outer race on the steering stem can be taken off with a chisel and puller.

Fig. 10-99.

4. Remove the steering lock after taking out the front fork.

Fig. 10-101.

FRONT DAMPER

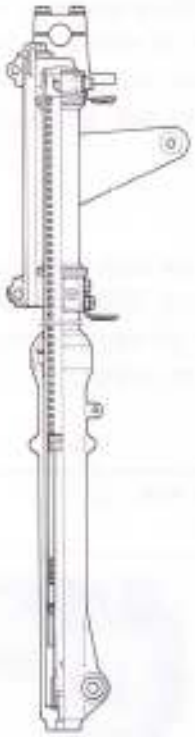


Fig. 10-102.

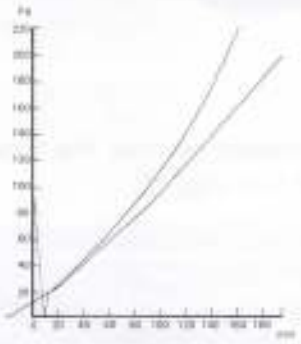


Fig. 10-103.

The model SP370 employs a telescopic oleo damper of the long stroke motorcross type for the front suspension, providing an excellent damping performance.
A variable rate coil spring, with the characteristics shown in Fig. 10-103, is used as the fork spring. Aluminum outer tubes which decrease the unsprung weight and inner tubes (36 mm (1.41 in.) in dia.) made of high tension steel which reinforce front fork rigidity are employed.

DISASSEMBLY

1. Remove the front wheel assembly, referring to page 10-2.
2. With the upper and lower tightening of the fork sufficiently loosened, remove the front fork by drawing it out.

Fig. 10-104.

FRONT FORK OIL SEAL

The front fork oil seal can be easily removed in the following manner:

Disassembly

1. Remove front fork caps ① and ②, then take off fork spring ③.

Fig. 10-105.

2. From the bottom end of each fork, remove the hexagon socket head bolt by torquing it with "L" type hexagon wrench ① which has a "T" handle ②. This is accomplished by clamping the outer tube in a vice and using the fork assembling tool (09940-34511), as shown.

Special tool:

1	"L" type hexagon wrench	09911-71510
2	Front fork assembling tool	09940-34511
3	"T" handle	09940-34520
4	Attachment **G**	09940-34561

Fig. 10-111.

INSPECTION

Inner tubes

Inspect the sliding surface of each inner tube for wear or damage. A tube in badly worn or damaged condition must be replaced.

Fig. 10-112.

FRONT DAMPER ASSEMBLY

Reverse the sequence of disassembling. Observe the following instructions.

1. Use of THREAD LOCK CEMENT (99000-32040) is prescribed for the hexagon socket head bolt ①. Be sure to tighten this bolt to the following torque value.

Tightening torque:

15 ~ 25 N.m (1.5 ~ 2.5 kg-m, 11.0 ~ 18.0 lb-ft)

Fig. 10-113.

2. For the fork oil, use SAE 10W/20 motor oil.

Fork oil capacity (one leg)

252 cc (8.52/8.87 US/Imp oz)

Fork oil level (maximum compression)

181 mm (7.13 in.)

Fig. 10-114.

3. Fit the inner tube to the steering stem, positioning the top end as shown in Fig. 10-115.

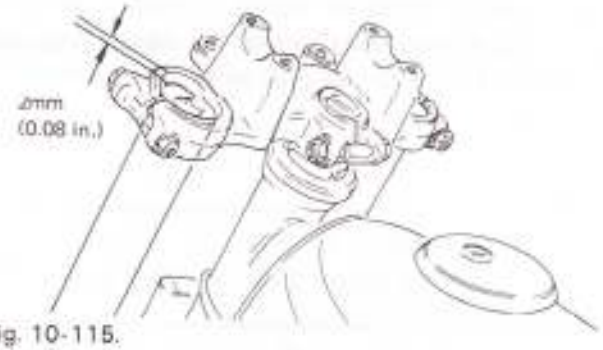


Fig. 10-115.

REAR SUSPENSION

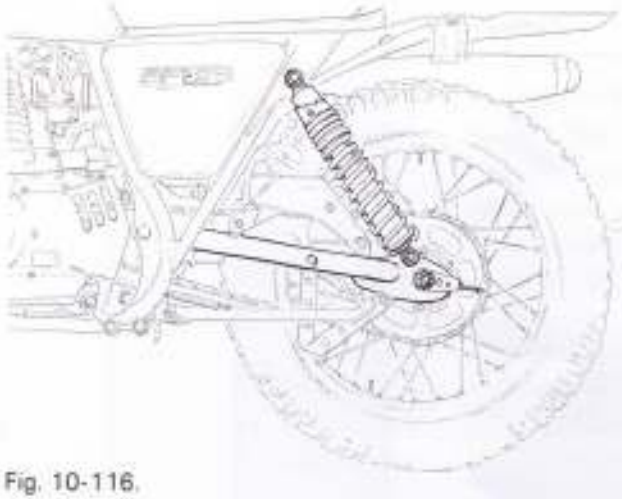


Fig. 10-116.

A high-pressure nitrogen gas-oil shock absorber is used for the rear suspension.
By employment of TRU-TRAC suspension in which the shock absorber is inclined forward, the rear wheel is provided with a long stroke vertical movement, preventing push-up at the rear to maintain stability when riding over a rough surface.

REAR SHOCK ABSORBER

The high-pressure nitrogen gas in the absorber is isolated by a free piston from the oil, so that no oil foaming occurs to reduce the damping performance. Since the oil is always pushed down by the high-pressure gas, the absorber as a whole responds, without any hesitation, even to small up-and-down movements of the rear wheel; and, because the absorber is of a single tube type, the heat generated in the oil is quickly dissipated. Long hours of sustained driving cannot weaken damping efficiency. This performance compares advantageously with the system employed in the SP370, which is of a conventioanl type using only oil as the damping fluid.

Fig. 10-117.

ASSEMBLY

1. Assemble in the reverse order to disassembling.

NOTE:
The number of washers on the top and bottom of the shock absorber is not the same.

2. Tighten to the torque specified:

Tightening torque:

20 ~ 30 N.m (2.0 ~ 3.0 kg-m, 14.5 ~ 21.5 lb-ft)

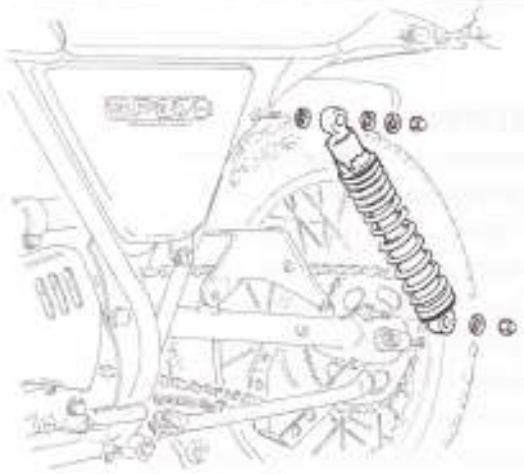


Fig. 10-118.

CAUTIONS:
Never throw away this absorber without depressurizing it when it becomes so used-up that it no longer serves its purpose. To depressurize it, place the gas tank in a plastic bag with a corner cut off, and drill into the tank, at the location indicated, through the bag, using a 3-mm drill. The bag is for protection; it prevents the drill chips from flying off when the gas rushes out.

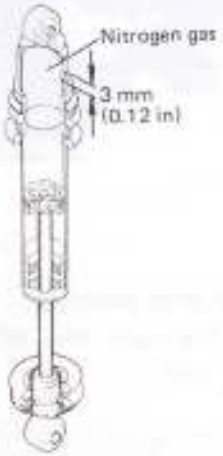
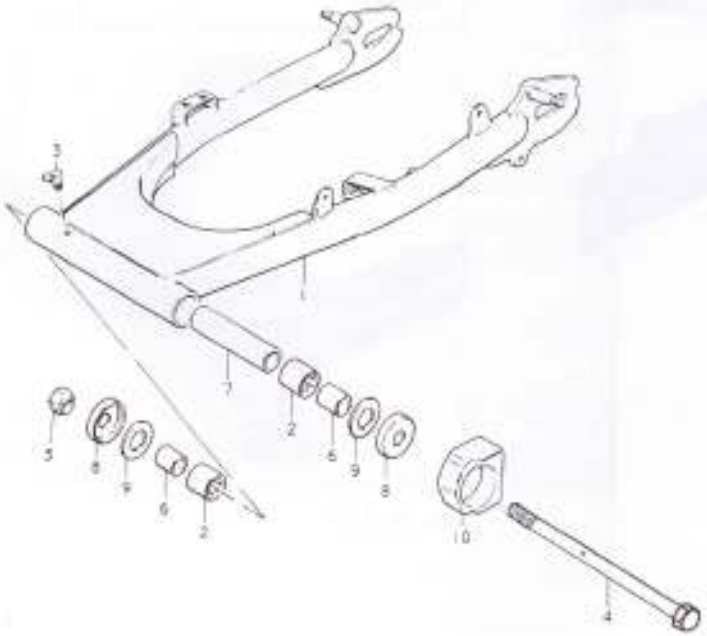


Fig. 10-119.

REAR SWINGING ARM



1. Rear swinging arm set
2. Bearing
3. Grease nipple
4. Pivot shaft
5. Nut
6. Spacer
7. Center spacer
8. Dust seal cover
9. Washer
10. Chain touch defense buffer

Fig. 10-120.

DISASSEMBLY

After removing the rear wheel and rear shock absorbers, proceed as follows:

Draw out pivot shaft ①, and remove swinging arm ②.

Fig. 10-121

Swinging arm bearing

Remove the right and left bearings from the swinging arm.

NOTE:
Discard the removed bearings. Use replacement bearings in reassembly.

Fig. 10-122

CHECKING

Inspect and check these items:

1. Swinging arm for distortion and damage.
2. Bearings for rattle (due to excessive wear of inner race).
3. Pivot shaft for distortion and wear.
4. Bearing dust seal cap for distortion.

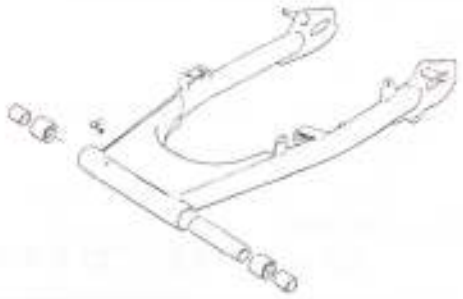


Fig. 10-123

ASSEMBLY

Reassembly is the reverse of disassembly. The following are additional instructions.

1. Install the right and left bearings with special tool ① in the manner illustrated. Be sure to clean the bore by wiping, and apply grease to the periphery of each bearing before installing it. Remember, the stamp marked side ② of the bearing comes to the outer side when the bearing is in place.

Special tool:

Steering inner race and swinging arm bearing installer	09941-34511

Fig. 10-124

2. Place center spacer ①, spacer ②, washer ③, and dust seal cover ④ on the rear swinging arm, and measure the clearance as shown in Fig. 11-126. If the clearance is larger than the limit value, decrease the clearance using washers ⑤.

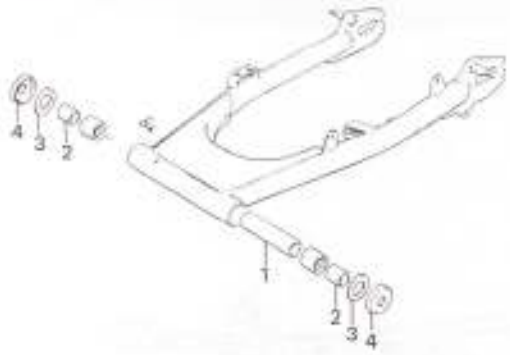


Fig. 10-125.

NOTE:
If the clearance is left larger than the limit, running performance will be adversely affected.

Fit the washer for adjustment as indicated in Fig. 10-126.

Adjusting washer:

Part No.	Remarks
61269-32900	14.5 × 40 × 1

Clearance limit:

Within 1.0 mm (0.04 in.)

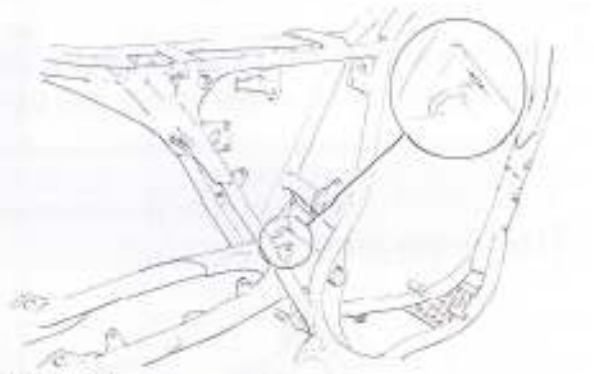


Fig. 10-126.

3. Apply a small amount of grease to the pivot shaft ① of the rear swinging arm, then insert the pivot shaft from the right side, and tighten it to the specified torque.

Tightening torque:

50 ~ 60 N.m (5.0 ~ 6.0 kg-m, 36.5 ~ 43.0 lb-ft)

Fig. 10-127.

FRAME

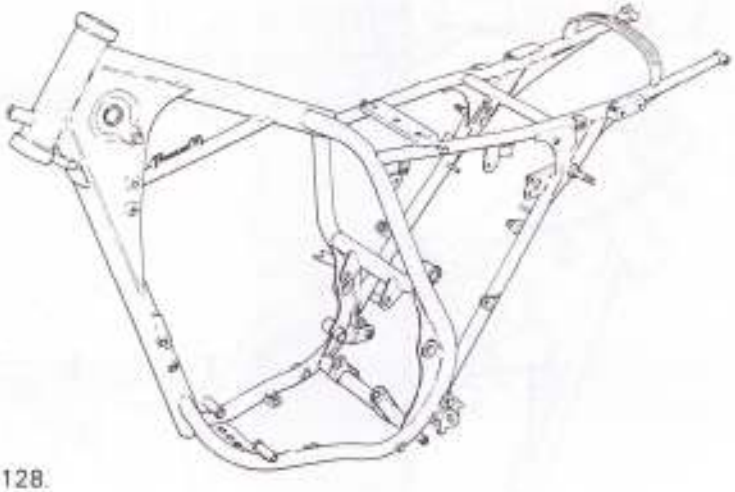


Fig. 10-128.

The semi-double cradle type frame is light in weight and yet has excellent rigidity. This outstanding ridigity makes the tubular frame ideal for the rough surfaces encountered in Motorcross riding.

REPLACEMENT

The replacement of the frame should be done as indicated in the flow chart on page 11-9. After assembling the frame, check rigidity and tighten if necessary.

NOTE:
Disassemble the frame only if absolutely necessary. Tie bolts and washers on the frame to avoid losing them.

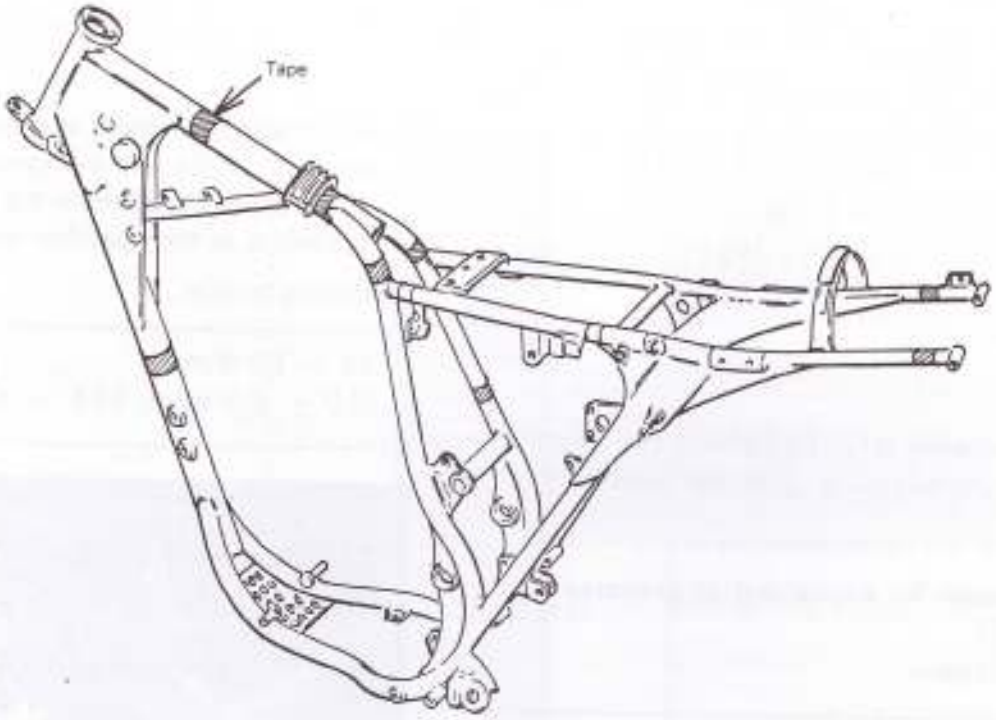


Fig. 10-129.

To attach the wire harness correctly, mark the clamping positions with tape before taking off the wire harness.

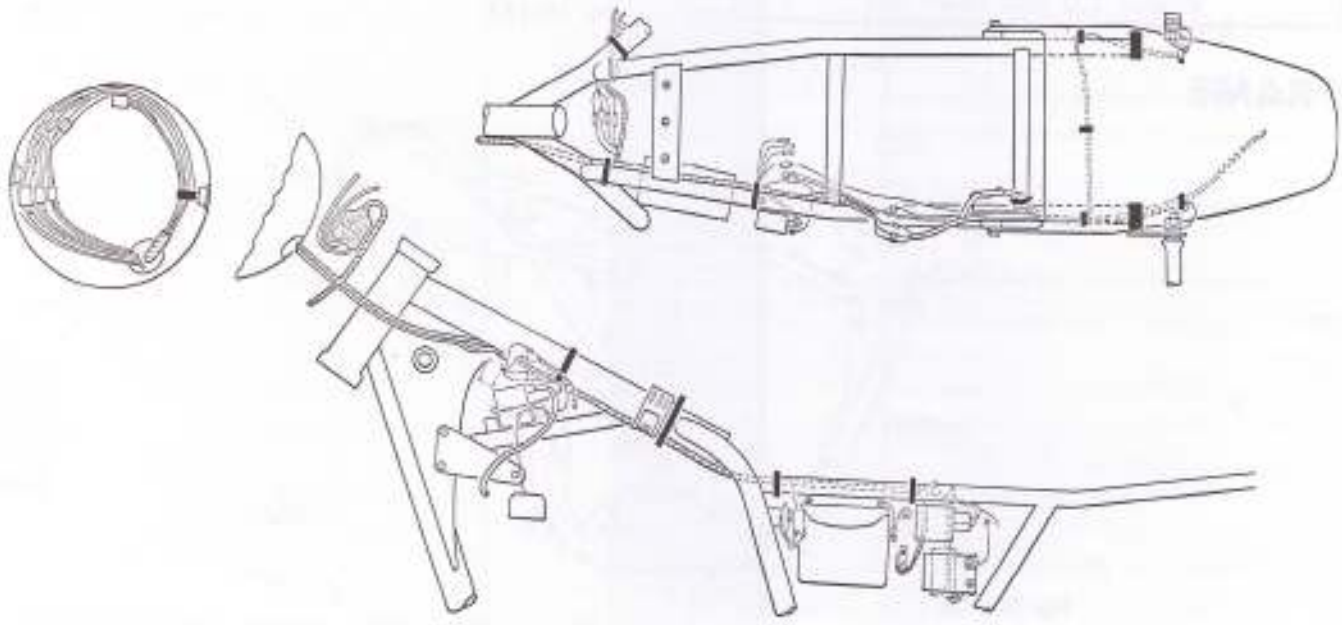
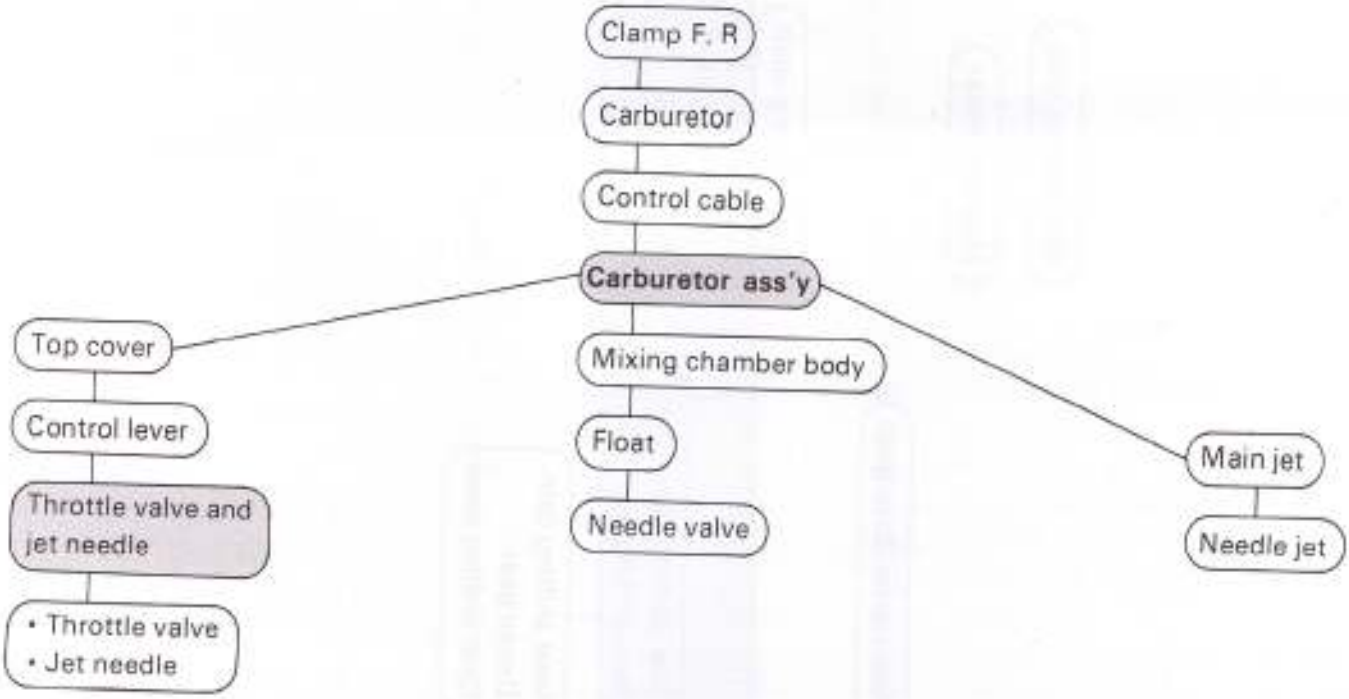
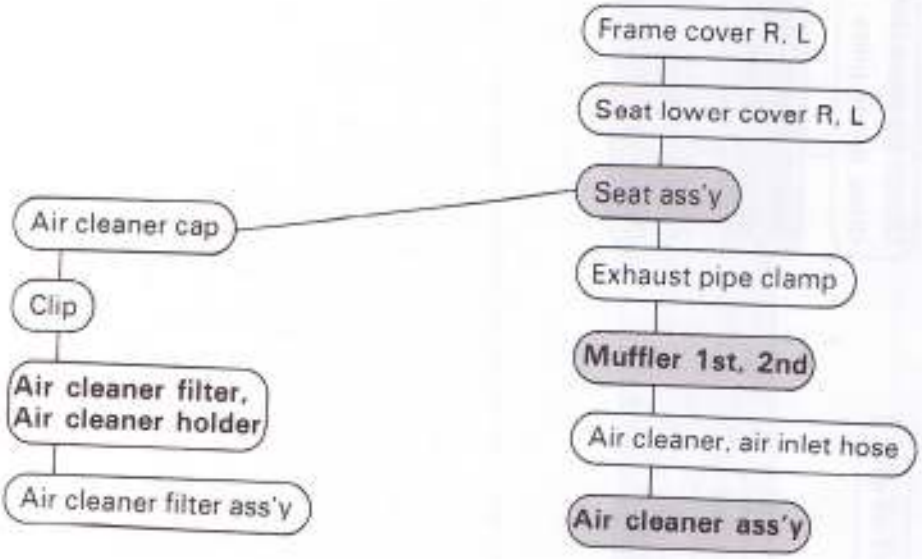


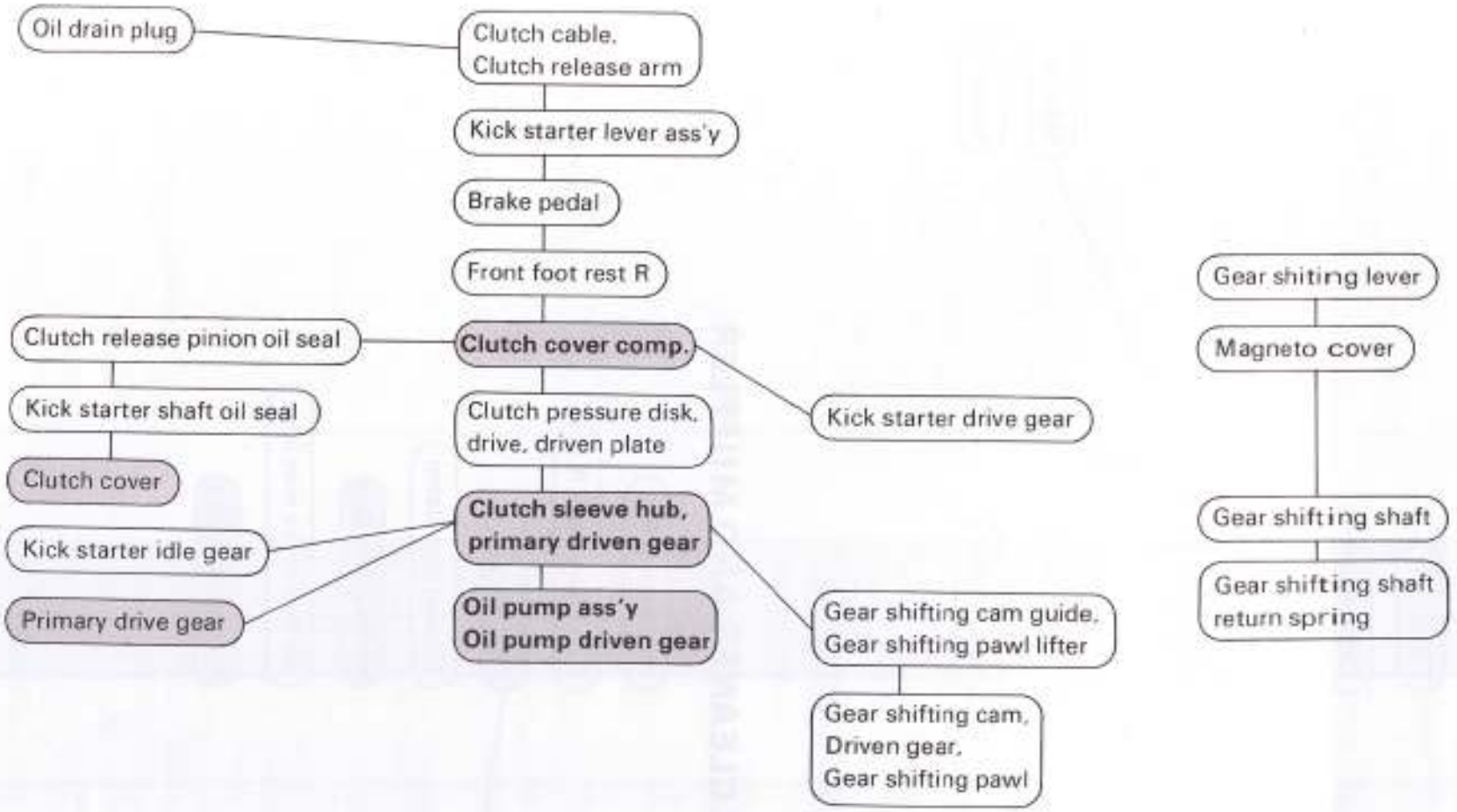
Fig. 10-130.

CARBURETOR ASSEMBLY

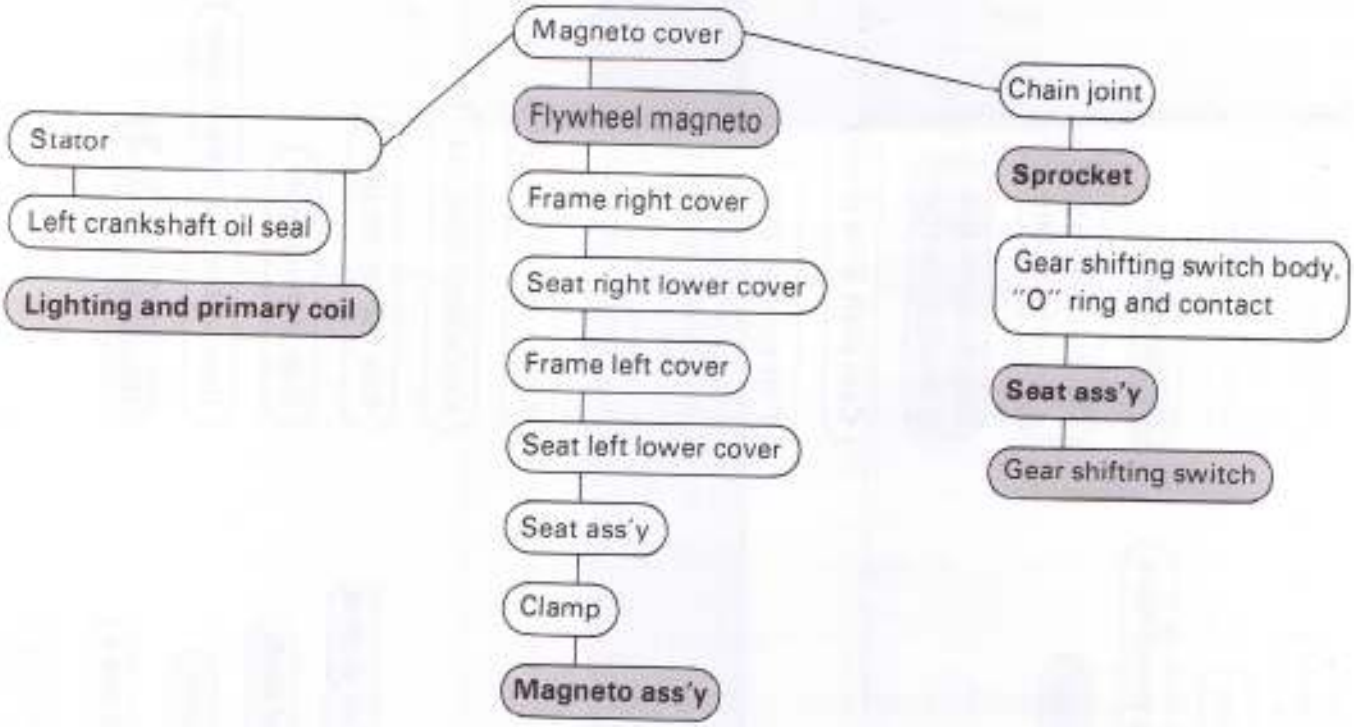


AIR CLEANER AND MUFFLER




Oil drain plug
Clutch cable,
Clutch release arm
Kick starter lever ass'y
Brake pedal
Front foot rest R
Clutch release pinion oil seal
Clutch cover comp.
Kick starter shaft oil seal
Clutch pressure disk,
drive, driven plate
Kick starter drive gear
Clutch cover
Clutch sleeve hub,
primary driven gear
Kick starter idle gear
Primary drive gear
Oil pump ass'y
Oil pump driven gear
Gear shifting cam guide,
Gear shifting pawl lifter
Gear shifting cam,
Driven gear,
Gear shifting pawl
Gear shiting lever
Magneto cover
Gear shifting shaft
Gear shifting shaft
return spring

MAGNETO


Magneto cover
Stator
Left crankshaft oil seal
Lighting and primary coil
Flywheel magneto
Frame right cover
Seat right lower cover
Frame left cover
Seat left lower cover
Seat ass'y
Clamp
Magneto ass'y
Chain joint
Sprocket
Gear shifting switch body, "O" ring and contact
Seat ass'y
Gear shifting switch

Frame cover R
Frame cover L
Seat lower cover R
Seat lower cover L
Seat ass'y
Fuel tank ass'y
Tachometer cable
Clutch cable
Brake pedal
Front footrest R
Carburetor ass'y
Exhaust pipe
Magneto cover
Gear shifting lever ass'y
Chain joint
Wirng harness
Removal of engine

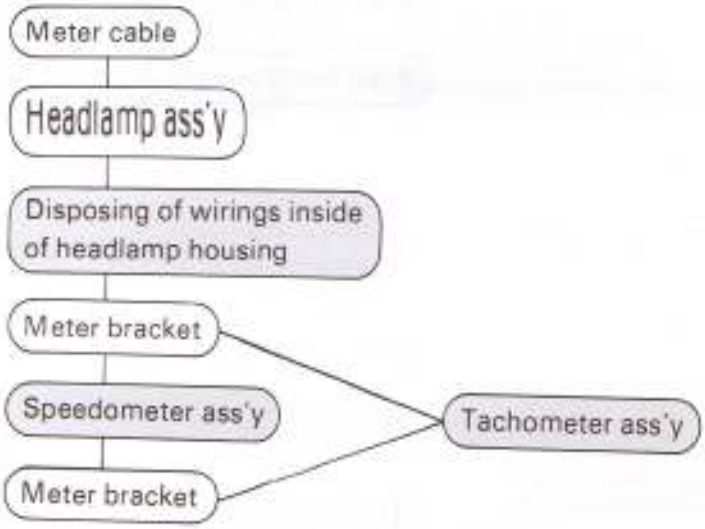
Spark plug
Contact breaker cover
Contact breaker ass'y
Advance governor ass'y
Cam chain tensioner ass'v
Cylinder head cover
Cam shaft and sprocket
Cylinder head ass'y
Cylinder
Piston and piston ring

Flywheel magneto
Magneto stator
Gear shifting switch body
Engine sprocket

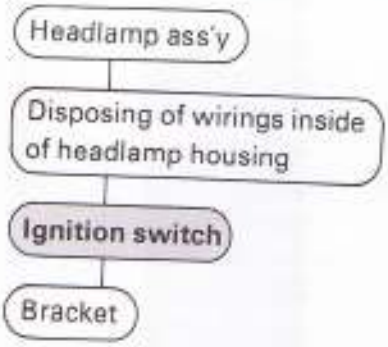
Separation of engine
Kick starter shaft
Transmission
Crankshaft ass'y
Crankcase ass'y

Kick starter lever ass'y
Clutch release arm
Clutch cover
Clutch pressure disk, drive, driven plate
Clutch sleeve, hub, primary driven gear
Cam shaft drive chain
Primary drive gear
Drive chain sprocket
Engine oil pump ass'y
Engine oil strainer cap
Kick starter drive gear
Kick starter idle gear
Gear shifting shaft
Gear shifting cam driven gear
Neutral cam stopper

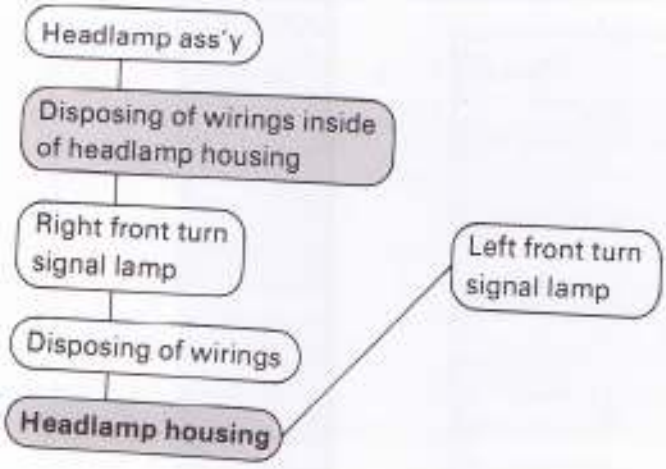
SPEEDOMETER AND TACHOMETER



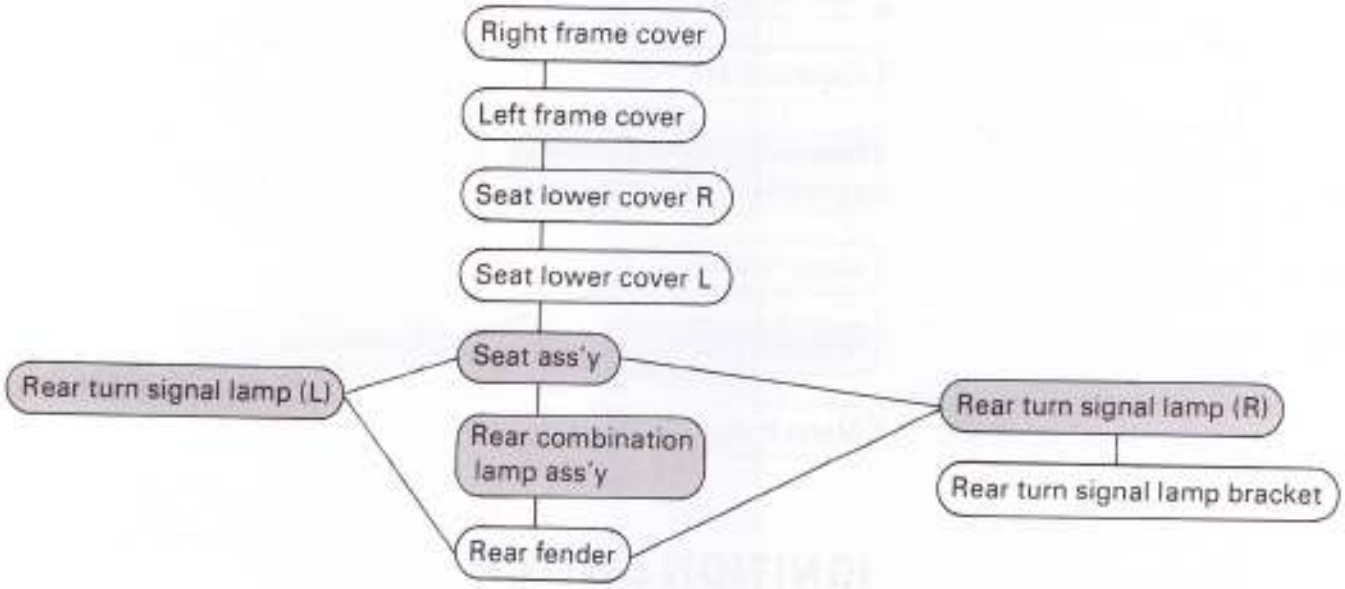
IGNITION SWITCH

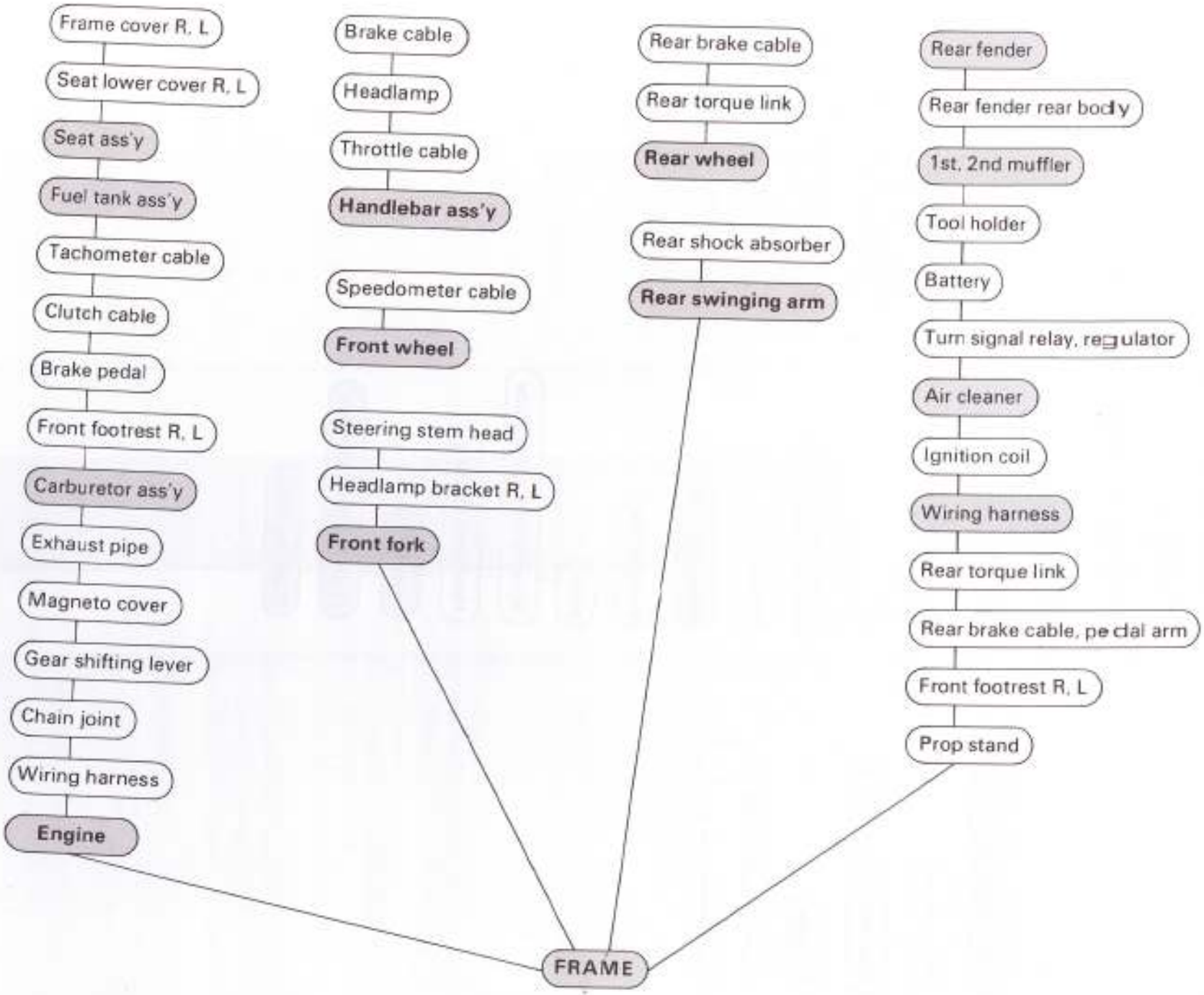


HEADLAMP, HEADLAMP HOUSING AND FRONT TURN SIGNAL LAMP



REAR TURN SIGNAL LAMP, COMBINATION LAMP AND REAR FENDER

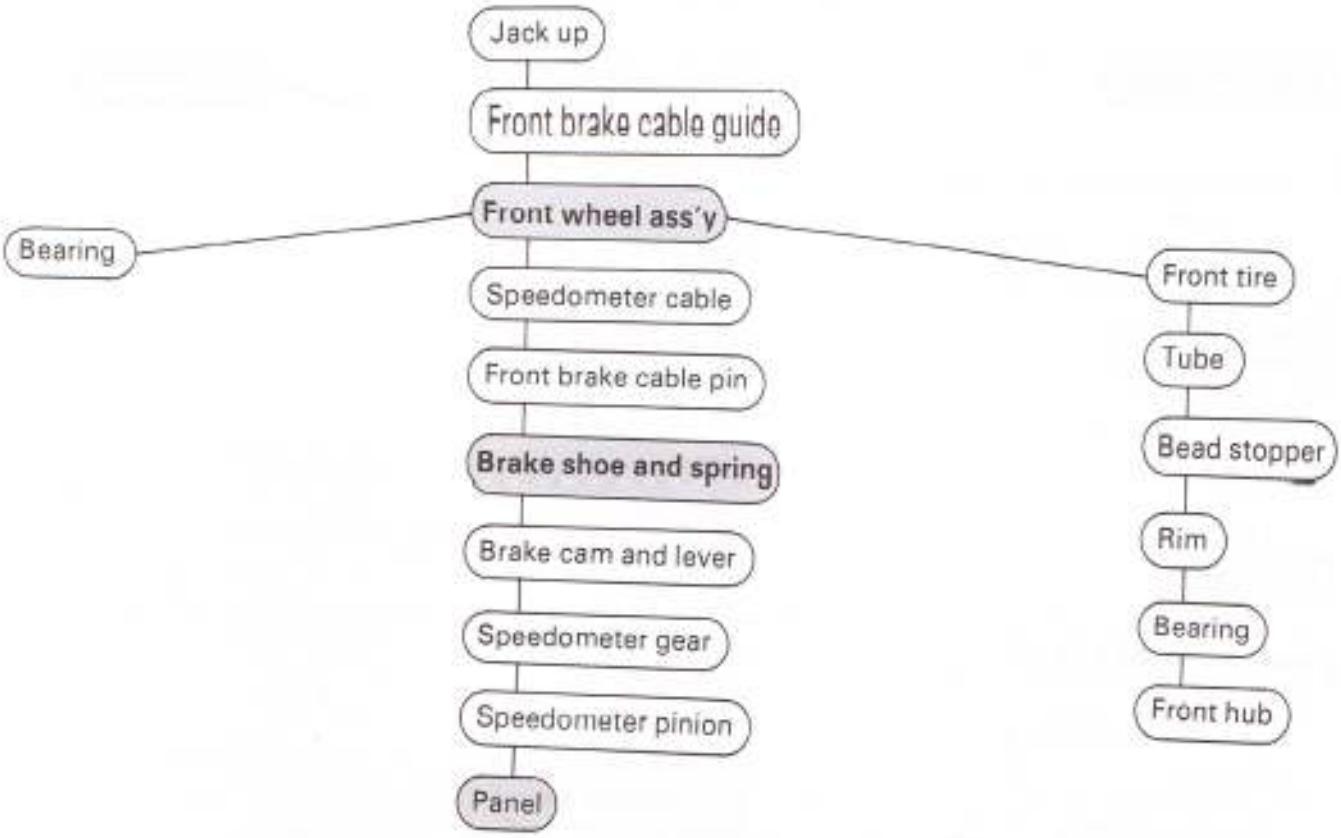



Frame cover R, L
Seat lower cover R, L
Seat ass'y
Fuel tank ass'y
Tachometer cable
Clutch cable
Brake pedal
Front footrest R, L
Carburetor ass'y
Exhaust pipe
Magneto cover
Gear shifting lever
Chain joint
Wiring harness
Engine
Brake cable
Headlamp
Throttle cable
Handlebar ass'y
Speedometer cable
Front wheel
Steering stem head
Headlamp bracket R, L
Front fork
Rear brake cable
Rear torque link
Rear wheel
Rear shock absorber
Rear swinging arm
Rear fender
Rear fender rear body
1st, 2nd muffler
Tool holder
Battery
Turn signal relay, regulator
Air cleaner
Ignition coil
Wiring harness
Rear torque link
Rear brake cable, pedal arm
Front footrest R, L
Prop stand
FRAME

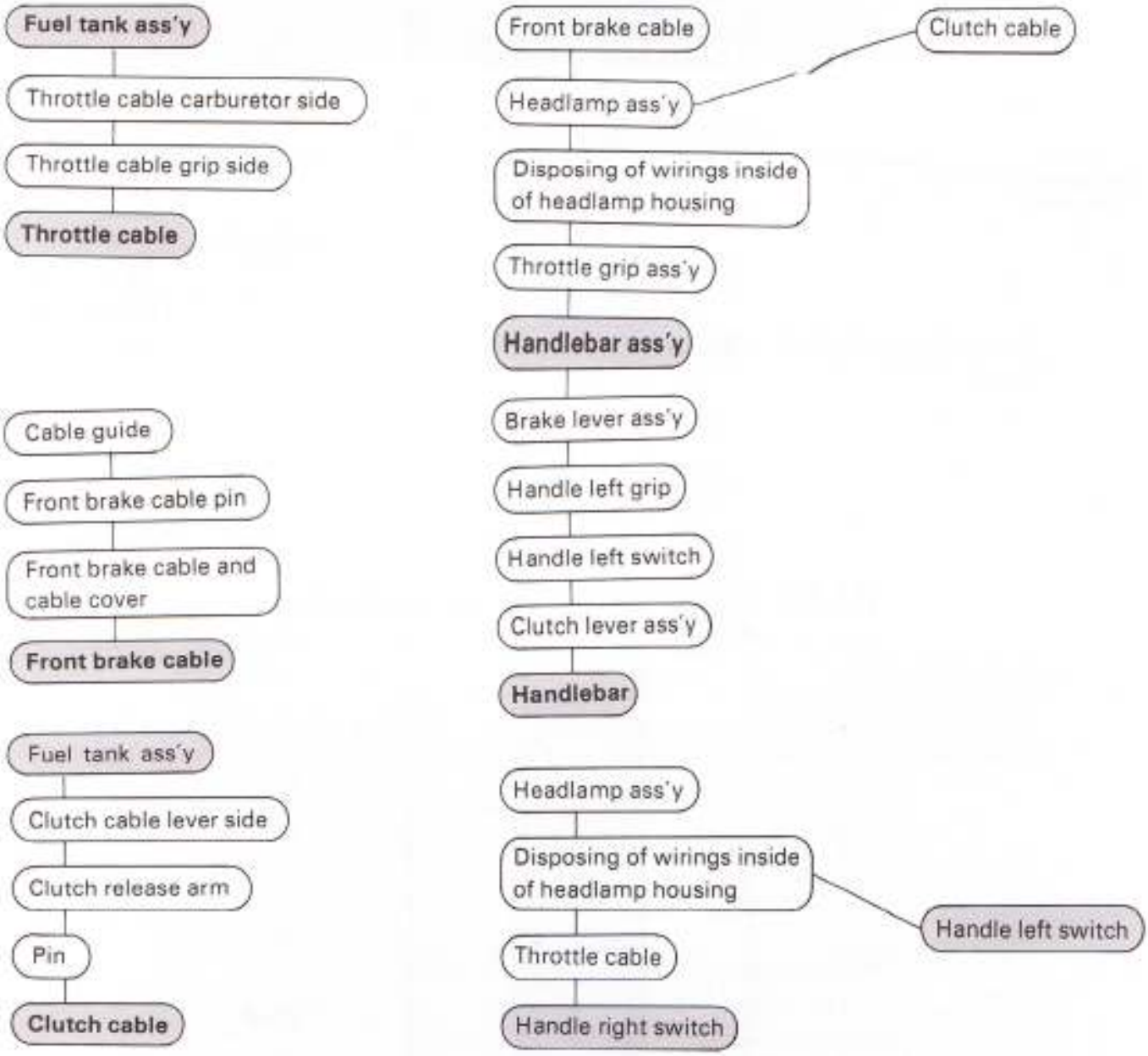
FRONT FORK


Jack up
Front brake cable guide
Front wheel ass'y
Handlebar ass'y
Meter cable
Meter ass'y
Steering stem head
Steering stem nut
Front fork ass'y
Front fender
Horn
Speedometer cable guide
Headlamp housing
Front fork
Front fork damper ass'y
Steering stem
Front fork damper ass'y
Front fork oil
Dust seal
Oil seal
Front fork outer and inner tube

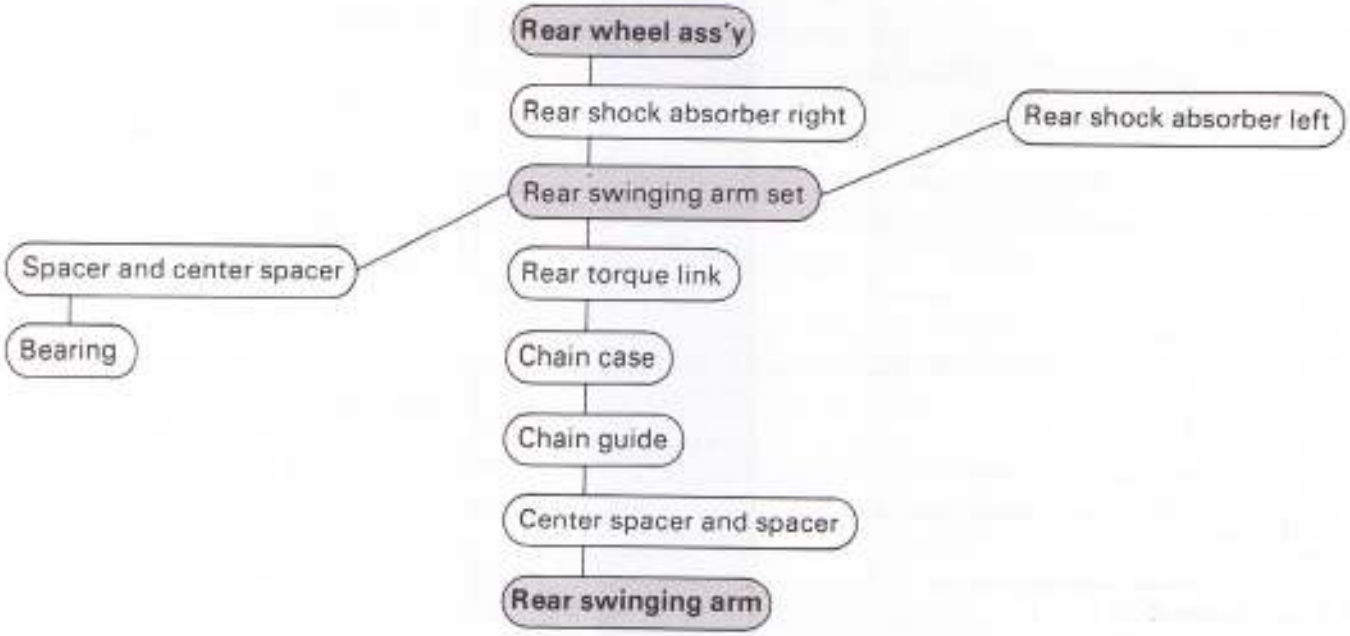
FRONT WHEEL AND FRONT BRAKE



HANDLEBAR, CONTROL CABLE AND HANDLE SWITCH



REAR SWINGING ARM



REAR WHEEL AND REAR BRAKE

Prepared by

SUZUKI MOTOR CO., LTD.

Service Department
Overseas Marketing Division

June 1978

Manual No. SR-6500
Printed in Japan