

Product: KYMCO GR1 Motorcycle Service Repair Workshop Manual
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KYMCO

SERVICE MANUAL

GR1

KYMCO
OVERSEAS SALES DEPARTMENT
OVERSEAS SERVICE DIVISION

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PREFACE

This service manual describes the servicing procedures and special inspection/adjustment instructions for the KYMCO GR1.

In this manual, many illustrations and drawings are used for better understanding. The information and contents included in this manual may be different with the motorcycle in case specifications are changed.

KWANG YANG MOTOR CO., LTD.
SERVICE DIVISION
EDUCATION SECTION

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SPECIFICATIONS

● SPECIFICATIONS 1 — 2

SPECIFICATIONS

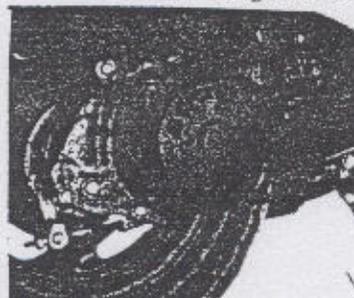
SPECIFICATIONS

Name & Model		KYMCO GRI		Lubricating Oil Capacity (ℓ)		0.9			
Overall Length (m)		1.590		Air Cleaner Type & No.		Full-flow Filtration, 1			
Overall Width (m)		0.590		Fuel Capacity (ℓ)		3.0			
Overall Height (m)		0.990		Carburetor		Type			
Wheel Base (m)		1.165				PB 80			
Engine Type		AF18E				Piston Dia. (mm)		13	
Displacement (cc)		49 cc		Venturi Dia.		14 equivalent			
Weight (Kg)		Front Wheel		Ignition System Type		CDI Electromagnetic Ignition			
		Rear Wheel		Ignition Timing F Mark		17° BTDC / 1,800rpm			
		Total		56		Spark Plug		NGK BR6HSA, BR7HSA, BR8HSA	
Seating Capacity		1		ND W20FSR, W22FSR, W24FSR					
Dry Weight (Kg)		Front Wheel		Spark Plug Gap (mm)		0.6 ~ 0.7			
		Rear Wheel		Battery Capacity (AH)		3 (10)			
		Total		111		Power to Transmission Gear		Power gear - transmission gear - Clutch	
Tires		Front Wheel		Reduction Ratio of Power to Transmission Gear					
		Rear Wheel		3.00-8 2PR		Clutch Type		Dry Multi-disc Clutch	
Ground Clearance (m)		0.100		Transmission Gear Operation Type		Automatic Centrifugal Type			
Braking Distance (m) (Initial Speed km/h)		3.5 (20)		Transmission Ratio		1 Speed 3.000 ~ 0.850			
Min. Turning Radius (m)		1.8		Reduction Gear		Type		2-speed Reduction	
Starting System		Starting Motor and Kick Starter				1st Reduction Ratio		3.076	
Type		Gasoline, 2-stroke Motor Oil				2nd Reduction Ratio		3.461	
Cylinder Arrangement		Single Cylinder Flat		Transmission Gear Type		Non-stage Transmission			
Combustion Chamber Type		Semi-sphere		Tire Pressure (kg/cm ²)		Front 1.50			
Valve Arrangement		Reed Valve with Piston		Rear		1.75			
Bore x Stroke (mm)		39.0 × 41.4 mm		Turning Angle		45° Right and Left			
Compression Ratio		7.2:1		Brake System Type		Front External Expanding			
Compression Pressure (kg/cm ² rpm)		10.0 kg/cm ² - 600rpm		Rear		External Expanding			
Max. Output (ps/rpm)		6.8 ps / 7000 rpm		Suspension Type		Front Bottom Link Type			
Max. Torque (kg m/rpm)		0.73 kg-m / 6500 rpm		Rear		Swing Arm Type			
Port Timing		Intake		Open		Automatic Controlled			
		Close		Automatic Controlled					
		Exhaust		Open		84° BBDC			
		Close		84° BBDC					
		Scavenge		Open		58° BBDC			
Close		58° ABDC		Absorber Type		Front Simple Double Action			
Idle Speed (rpm)		1,800 ± 100 rpm		Rear		Simple Single Action			
Lubrication Type		Separate Type		Frame Type		Back Bone			
Oil Pump Type		Plunger Type							
Oil Filter Type		Full-flow Filtration							

GENERAL INFORMATION

● FRAME SERIAL NUMBER/IDENTIFICATION

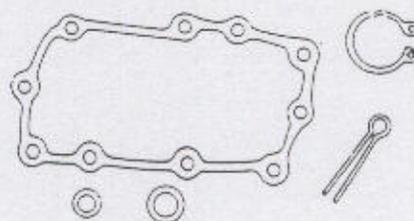
Location of Engine Number



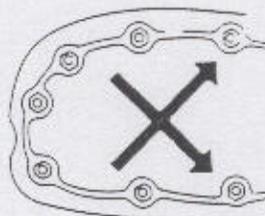
GENERAL INFORMATION

OPERATION PRECAUTIONS

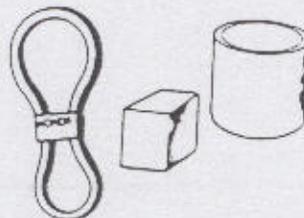
- Make sure to install new gaskets, O-rings, ring clamps, cotter pins, etc. when reassembling.



- When tightening bolts or nuts, begin with larger-diameter to smaller ones at several times, and tighten to the specified torque diagonally.



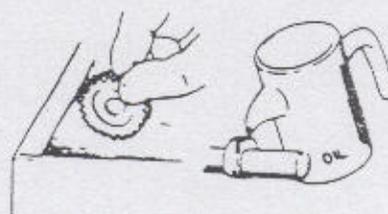
- Use genuine parts and lubricants.



- When servicing the motorcycle, be sure to use special or common tools for removal and installation.

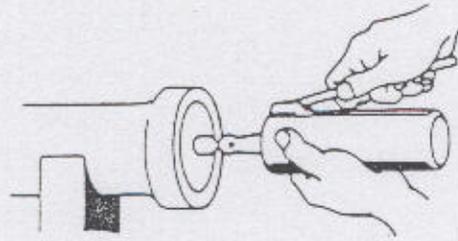


- After disassembly, clean removed parts. Lubricate sliding surfaces with engine oil before reassembly.

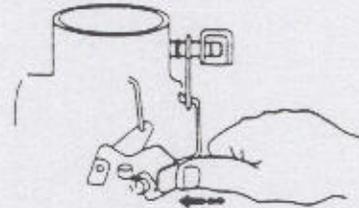


GENERAL INFORMATION

- Apply or add designated greases and lubricants to specified lubrication points.



- After reassembly, check all parts for proper installation and operation.

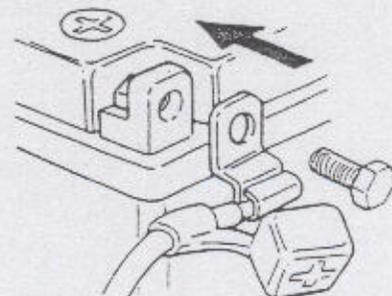
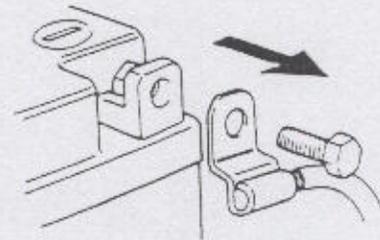


- When two persons work together, pay attention to the mutual working safety.

- Disconnect battery negative (-) terminal before operation.
- When using spanner and other tools, make sure not to damage the motorcycle surface.

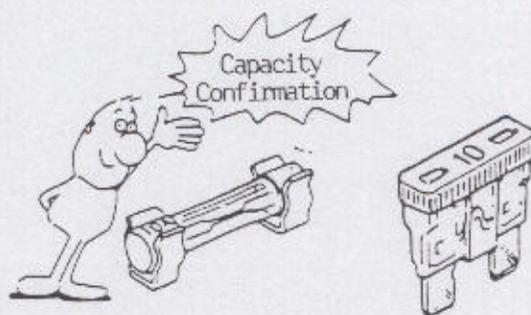


- After operation, check all connecting points, fasteners and lines for proper connection and installation.
- When connecting the battery, the positive (+) terminal shall be connected first.
- After connection, apply grease to battery terminals.
- Terminal caps shall be securely installed.

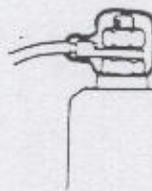


GENERAL INFORMATION

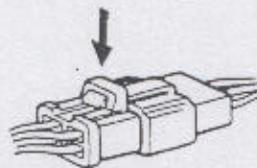
- If the fuse is burned out, find the cause and repair it. Replace with a new fuse according to designated specification.



- After operation, terminal caps shall be securely installed.

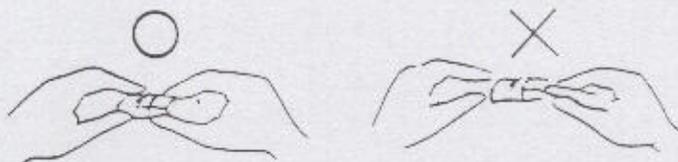


- When taking out the connector, the lock on connector shall be released before operation.

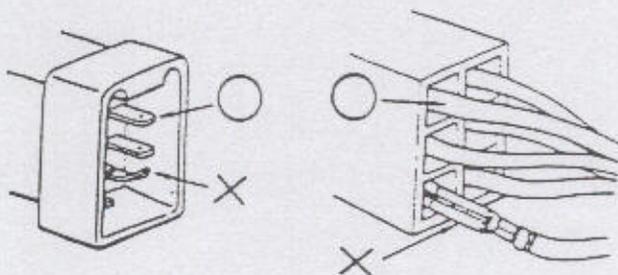


- Hold the connector body when connecting or disconnecting it.

- Do not pull the connector wire.

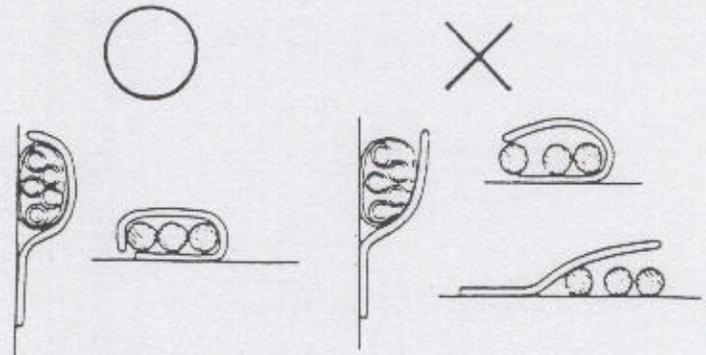


- Check if any connector terminal is bending, protruding or loose.

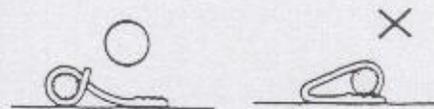


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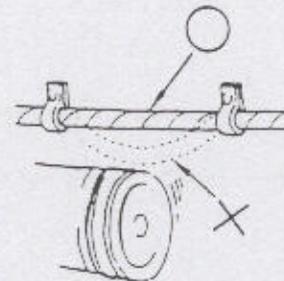
- The wire harness shall be firmly held by clips.



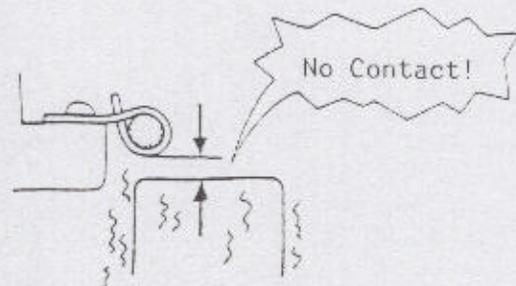
- For any clip welded on the motorcycle, do not make it hold wire at the welding point.



- When fixing the wire harness, do not make it contact the rotary, vibrating or movable parts.

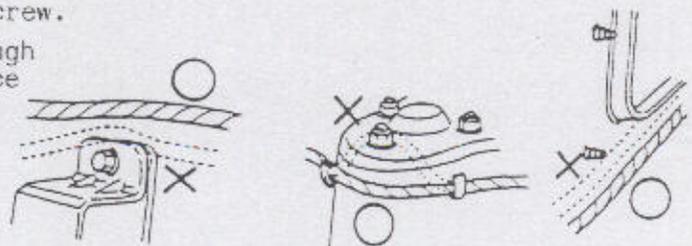


- When fixing the wire harness, do not make it contact the parts which will generate high heat.



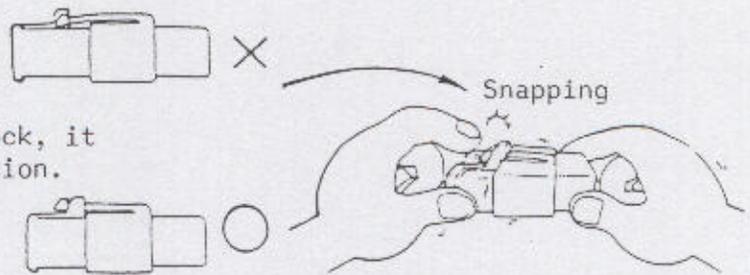
- The wire harness shall pass through the side of sharp angle and do not place it on the pointed top of screw.

- The wire harness shall pass through the side of screw and do not place it on the pointed top of screw.

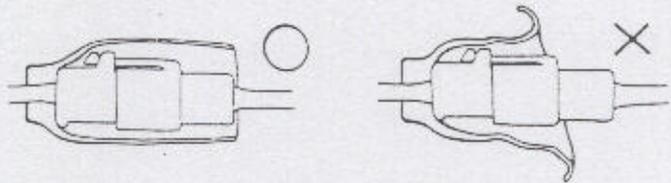


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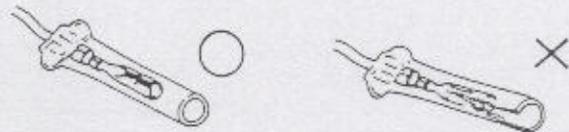
- The connector shall be completely inserted.
- If the double connector has a lock, it shall be locked at correct position.
- Check if there is any loose wire.



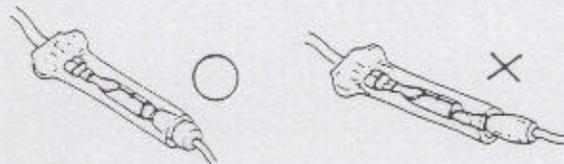
- Check the double connector cover for proper coverage and installation.



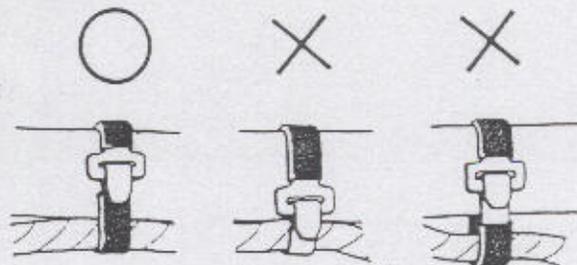
- Before connecting a terminal, check for damaged terminal cover or loose negative terminal.



- Completely insert the terminal.
- Check the terminal cover for proper coverage.
- Do not make the opening of terminal cover face up.

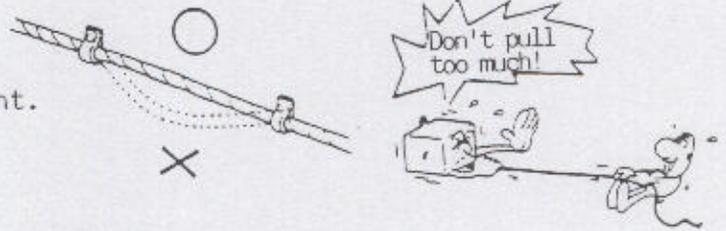


- The wire harness binding belt shall be securely fastened on the specified position. The insulator on the aluminium binding belt shall be fixed with the wire harness.

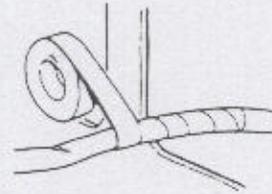


GENERAL INFORMATION

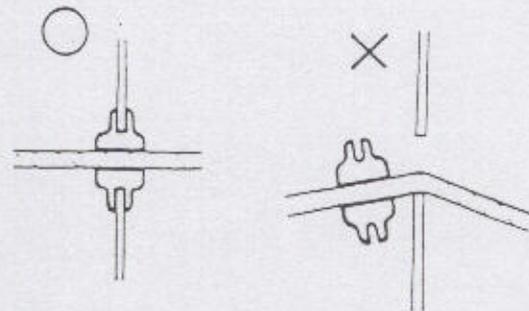
- The wire harness shall not be installed too loose or too tight.



- When wire harness has to contact sharp edge or angle, it shall be wrapped by tube or tape for protection.

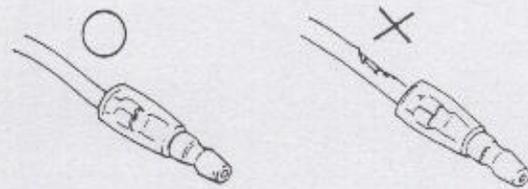


- When rubber protecting cover is used to protect the wire harness, it shall be securely fixed.

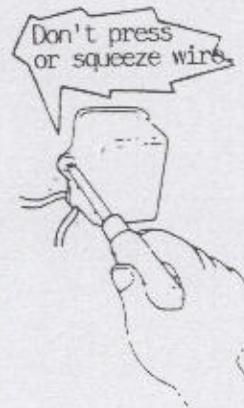


- Do not break the sheath of wire.

- If wire sheath is broken, wrap it with tape or replace it with a new one.

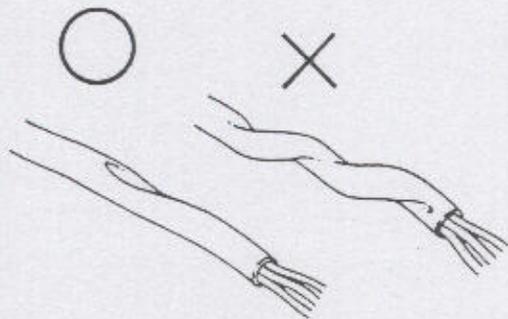


- When installing other parts, do not press or squeeze the wire.



GENERAL INFORMATION

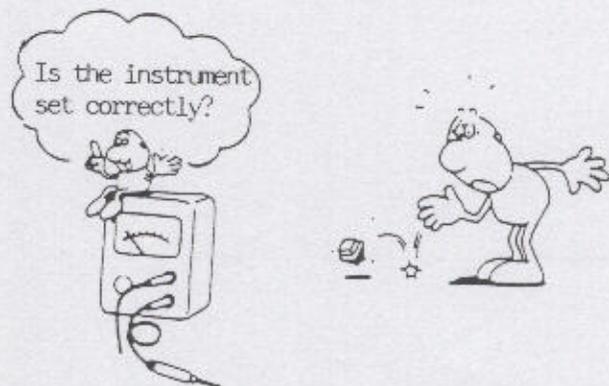
- Do not twist the wire harness during installation.



- Check if the wire harness is too loose, too tight, bending or rubbing sharp angle when the handlebar is turned right and left.



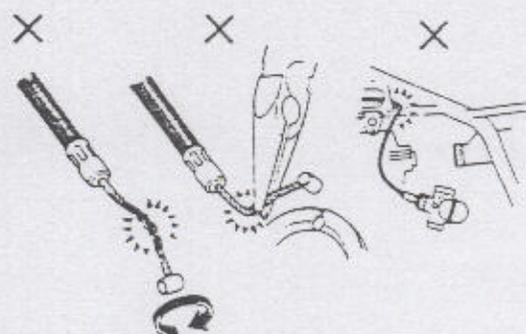
- When a testing device is used, make sure to understand the operating methods thoroughly and operate according to the operating instructions.



- Be careful not to drop any parts.



- When rust is found on a terminal, remove the rust with sand paper or equivalent before connecting.



- Squeezed, bending or damaged cable is the cause for poor operation.

GENERAL INFORMATION

■ Symbols:

The following symbols represent the servicing methods and cautions included in this service manual.



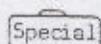
:Apply engine oil to specified points
(Use designated engine oil for lubrication)



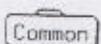
:Apply grease for lubrication



:Transmission gear oil (90#)



:Use special tool



:Use common tool



:Cautions



:Warning

(⇒12-3) :Refer to Page 12-3

GENERAL INFORMATION

● SERVICE INFORMATION

● ENGINE

Item	Standard (mm)	Service Limit (mm)
Cylinder head warpage	—	0.01
Piston O.D. (4mm from bottom of piston skirt)	38.960—38.965	38.90
Cylinder-to-piston clearance	0.035—0.050	0.10
Piston pin hole I.D.	12.002—12.008	12.03
Piston pin O.D.	11.994—12.000	11.98
Piston-to-piston pin clearance	0.002—0.014	0.03
Piston ring end gap (top, second)	0.10—0.25/0.10—0.25	0.40/0.40
Connecting rod small end I.D.	17.005—17.017	17.03
Cylinder bore	39.000—39.005	39.05
Drive belt width	18	17
Drive pulley bushing I.D.	20.035—20.085	20.130
Drive pulley boss O.D.	20.010—20.025	19.97
Weight roller O.D.	15.92—16.08	15.40
Clutch outer I.D.	107.0—107.2	107.5
Driven pulley spring free length	98.1	92.8
Driven pulley bushing O.D.	33.965—33.985	33.94
Driven pulley bushing I.D.	34.000—34.025	34.06
Connecting rod big end side clearance	0.15—0.55	0.60
Connecting rod big end radial clearance	0.007—0.019	0.04
Crankshaft runout A/B	0.05/0.03	0.15/0.10

● CARBURETOR

Venturi dia.	1.4 mm equivalent
Identification number	PA31W
Float level	122
Main jet	#88
Idle jet	#35
Air screw opening (turns out)	$1\frac{1}{2} \pm \frac{1}{4}$
Idle speed	1800 ± 100 rpm
Throttle grip free play	2—6mm
Jet needle clip notch	3rd notch

GENERAL INFORMATION

● FRAME

Item		Standard (mm)	Service Limit (mm)
Axle shaft runout		—	0.2
Front wheel rim runout	Radial	—	2.0
	Axial	—	2.0
Front shock absorber spring free length		184	178
Rear wheel rim runout		—	2.0
Brake drum I.D.	Front/Rear	80/95	80.5/95.5
Brake lining thickness	Front/Rear	4.0/4.0	2.0/2.0
Rear shock absorber spring free length		229	222

● ELECTRICAL EQUIPMENT

Battery	Capacity	12V3AH
	Voltage	13.0~13.2V
	Charging rate	STD:0.4A/5hrs; Quick:4A/0.5hr
Spark plug		NGK BR6HSA BR7HSA BR8HSA ND W20FSR · W22FSR · W24FSR
Spark plug gap		0.6~0.7mm
Ignition coil resistance	Primary coil	0.2~0.3Ω
	Secondary coil (with spark plug cap)	8.0~9.5KΩ
	Secondary coil (with-out spark plug cap)	3.0~4.5kΩ
Pulser coil resistance (20°C)		50~200Ω
Ignition Timing		17° BTDC/1800rpm

GENERAL INFORMATION

TIGHTENING TORQUE

ENGINE

Item	Thread Dia (mm)	Torque (kg-m)	Remarks
Cylinder head bolt	6	0.8-1.2	(cold)
Front axle nut	10	3.5-4.0	
Drive pulley nut	10	3.5-4.0	
Clutch outer nut	10	3.5-4.0	
Driven face nut	28	5.0-6.0	
Oil level check bolt	8	1.0-1.5	
Engine mounting bolt	8	3.2-4.5	Flange U-nut
Engine hanger bolt	10	3.5-4.5	Flange U-nut
Exhaust pipe joint lock nut	6	1.0-1.4	Flange nut
Exhaust pipe lock bolt	8	2.4-3.0	Flange screw
Spark plug	—	1.1-1.7	(cold)

FRAME

Item	Thread Dia (mm)	Torque (kg-m)	Remarks
Handlebar lock bolt	10	4.0-5.0	Flange screw/U-nut
Steering stem nut	25.4	8.0-12.0	
Top ball race lock nut	25.4	0.5-1.3	
Front axle nut	10	4.0-5.0	Flange U-nut
Rear axle nut	14	8.0-10.0	Flange U-nut
Rear brake arm screw	5	0.4-0.7	Flange nut
Front shock absorber nut	8	2.4-3.0	Flange screw/U-nut
Front shock absorber bottom bolt	8	0.08-0.12	Cross head
Front shock absorber bottom nut	8	1.5-2.0	
Front damper lock nut	8	1.5-2.5	Apply screw locking agent
Front rocker shaft bolt	8	2.4-3.0	Flange screw/U-nut
Rear shock absorber nut	10	3.0-4.5	Flange nut
Rear shock absorber bottom bolt	8	2.0-3.0	
Rear damper lock nut	8	1.5-2.5	Apply screw locking agent

Torque specifications listed above are for important fasteners. Others should be tightened to standard torque values below.

STANDARD TORQUE VALUES

SH bolt: 6mm Flange 6mm bolt

Item	Torque (kg-m)	Item	Torque (kg-m)
5mm bolt and nut	0.45-0.6	5mm screw	0.35-0.5
6mm bolt and nut	0.8-1.2	6mm screw and SH bolt	0.7-1.1
8mm bolt and nut	1.8-2.5	6mm flange bolt and nut	1.0-1.4
10mm bolt and nut	3.0-4.0	8mm flange bolt and nut	2.4-3.0
12mm bolt and nut	5.0-6.0	10mm flange bolt and nut	3.5-4.5

GENERAL INFORMATION

● SPECIAL AND COMMON TOOLS

● SPECIAL TOOLS

Tool Name	Tool No.	Remarks	Ref. Page
Universal bearing puller	07631-0010000	Crankshaft bearing removal	10
Lock nut wrench 39mm	07916-187002	Drive face disassembly/ assembly	8
Lock nut wrench	07916-1870100	Top ball race holding	13
Lock nut wrench	07916-km10000	Steering stem nut removal/ installation	13
Crankcase puller	07935-GK80000	Crankcase disassembly	10
Crankcase puller	07935-KG80000	Crankcase disassembly	10
Bearing remover set 12mm (Remover set 12mm) (Block)	07936-1660001 (07936-1660100) (07741-0010201)	Drive shaft bearing removal	9
Bearing Remover set 15mm (Remover set 15mm) (Remover head 15mm) (Remover shaft)	(07936-kc10000) (07936-kc10500) (07936-kc10200) (07936-kc10100)	Final gear bearing removal	9
Bearing outer driver 28x30mm	07946-1870100	Bearing installation	13
Bearing driver	07945-GC80000	Driven outer bearing installation	8
Clutch spring compressor	07960-KM10000	Driven face disassembly/ assembly	8
Crankshaft assembly socket	07965-GM00100	Driven shaft, crankshaft, crankcase assembly	9·10
Crankshaft assembly shaft	07965-GM00300	Driven shaft, crankshaft, crankcase assembly	9·10
Rear shock absorber Remover A	07967-GA70101	Front shock absorber dis- assembly/assembly	13
Ball race driver	07946-GA70000	Steering stem bearing race	13
Rear shock absorber Remover B	07967-GA70200	Rear shock absorber dis- assembly/assembly	14
Absorber Compressor	07967-KM10100	Front shock absorber dis- assembly/assembly	13

● COMMON TOOLS

Tool Name	Tool No.	Remarks	Ref. Page
Float level gauge	07401-0010000	Carburetor fuel level check	11
Universal holder	07725-0030000	Flywheel holding	7·8
Flywheel puller	07733-0010000	Flywheel removal	7
Driver pilot 12mm	07746-004200	Drive shaft bearing installation	9

GENERAL INFORMATION

Tool Name	Tool No.	Remarks	Ref. Page
Bearing outer driver 32x35mm	07746—0010100	Drive shaft bearing and final gear bearing installation	9
Driver pilot	07746—0040300	Final gear bearing installation	9
Bearing outer driver 37x40mm	07746—0010200	Drive shaft bearing, final gear bearing and crankshaft bearing installation	9 10 - 13
Outer Remover 24x26mm	07746—0010700	Drive face bearing installation	8
Driver pilot 10mm	07746—0040100	Front wheel bearing installation	113
Bearing driver pilot 17mm	07746—0040400	Drive face bearing installation	8 - 9
		Drive shaft bearing, final gear bearing and crankshaft bearing installation	10
Bearing outer driver 42x47mm	07746—0010300	Crankshaft bearing installation	10
Driver pilot 20mm	07746—0040500	Crankshaft bearing installation	
Bearing outer driver handle (A)	07749—0010000	Bearing installation Drive in ball race	8 - 9 0 - 13
Bearing puller	07746—0050100	Front wheel bearing removal	13
Bearing puller head 10mm	07746—0050200	Front wheel bearing removal	13
Absorber spring compressor	07959—3290001	Front/rear shock absorber disassembly/assembly	13 - 14
Pressure Tester Set	07410—0010000 (07410—0020100) (07410—0020200)	Cylinder compression gauge	3

GENERAL INFORMATION

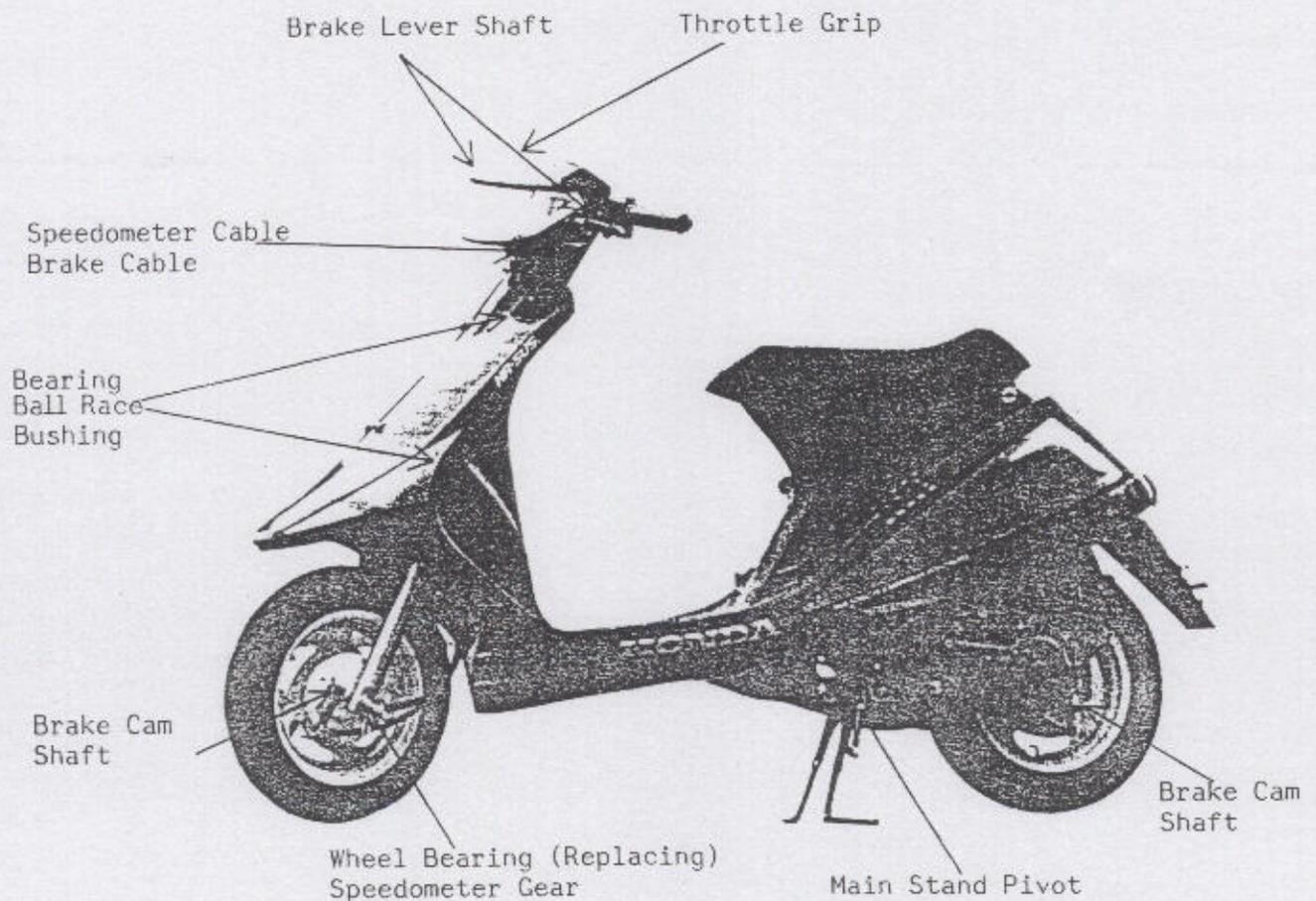
LUBRICATION CHART

ENGINE

NO	Lubrication Points	Lubricant	Remarks
1	Crankcase sliding & movable parts	KYMCO ULTRA 2-stroke Motor Oil	
2	Cylinder sliding parts		
3	Drive gearbox (Final gear)	KYMCO SIGMA Gear Oil 90#	0.09ℓ
4	Kick starter spindle bushing	IDEMITSU Grease	
5	Movable drive face	IDEMITSU Grease オートレットB	10-15g
6	Drive pinion	IDEMITSU Grease オートレットB	

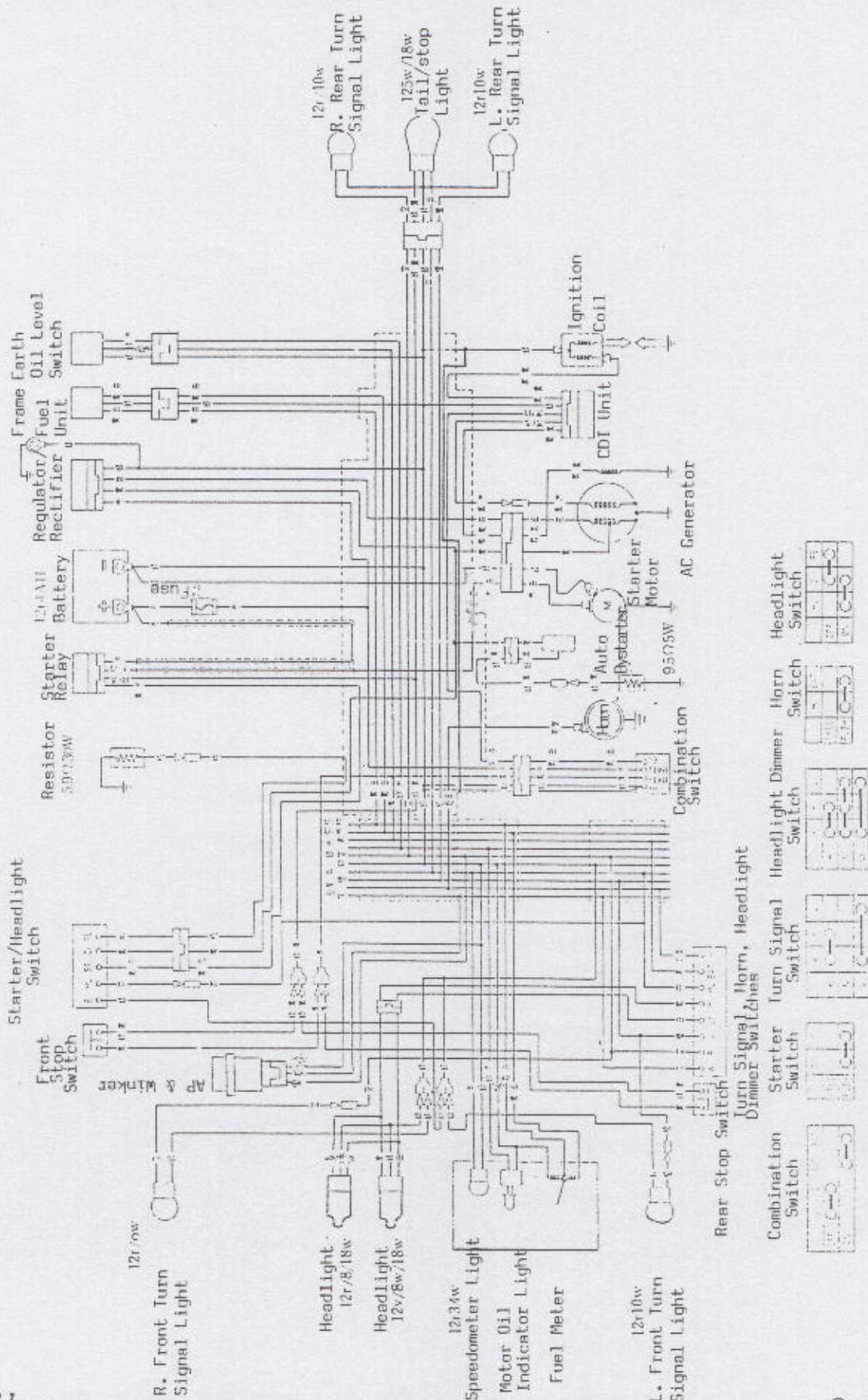
FRAME

Apply clean engine oil or grease to movable parts not specified. This will avoid abnormal noise and rise the durability of the motorcycle.



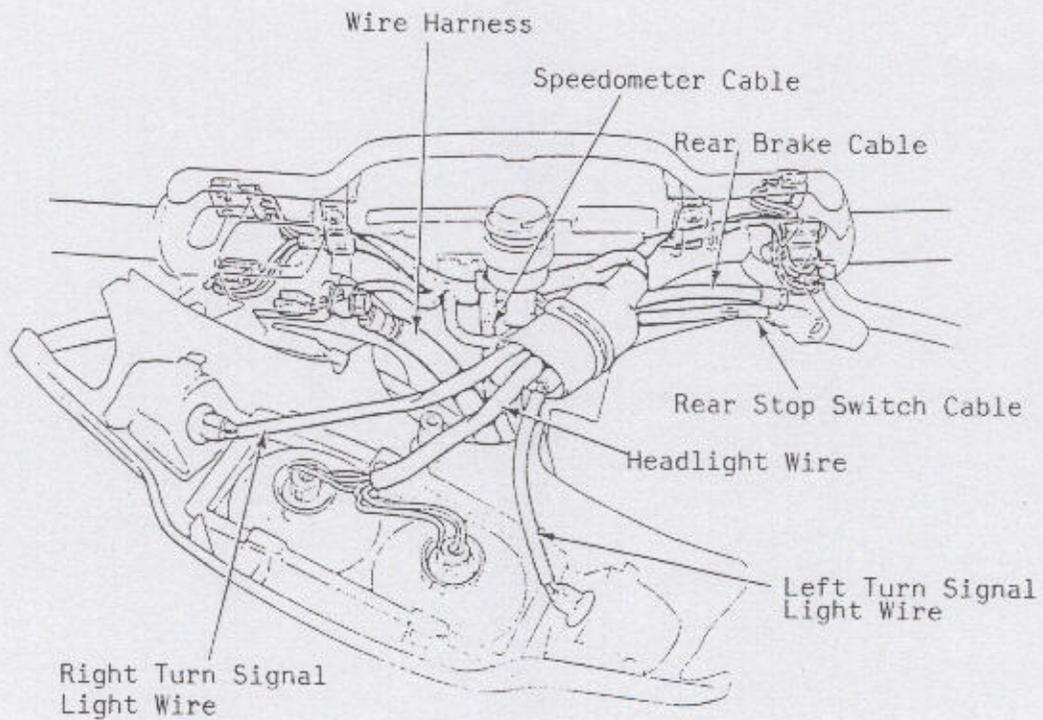
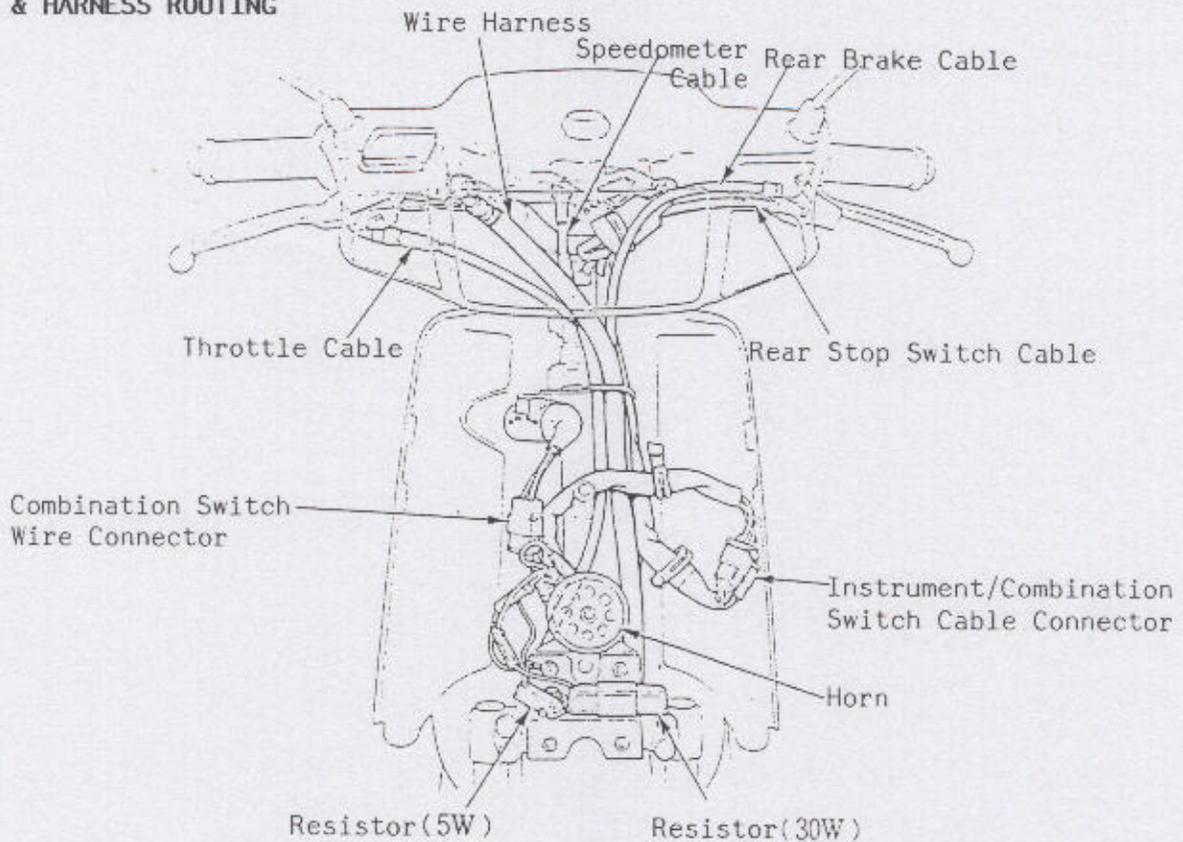
GENERAL INFORMATION

WIRING DIAGRAM

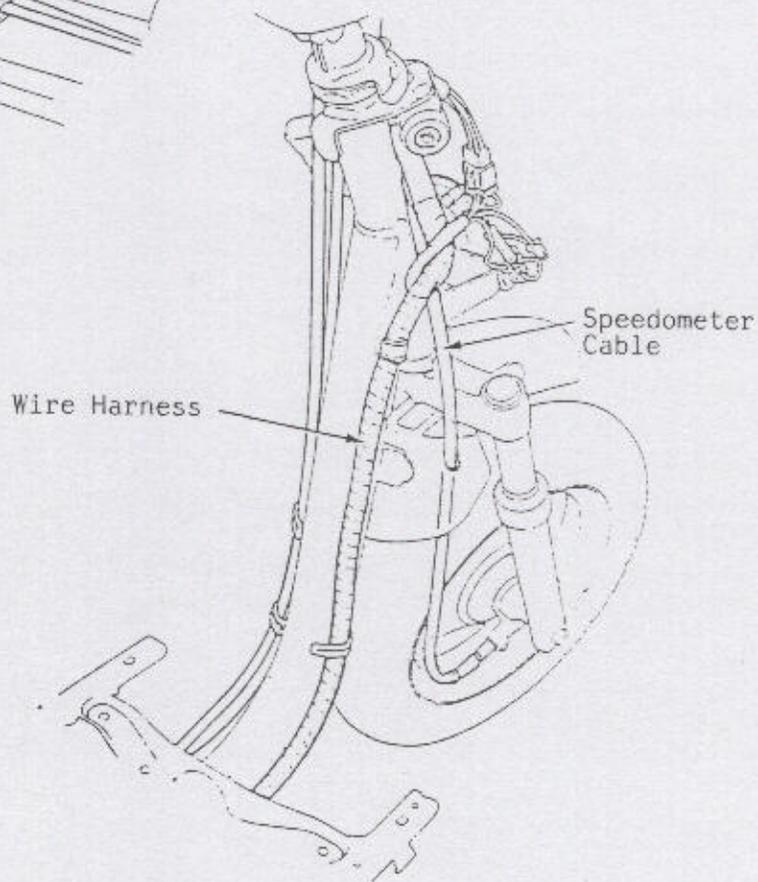
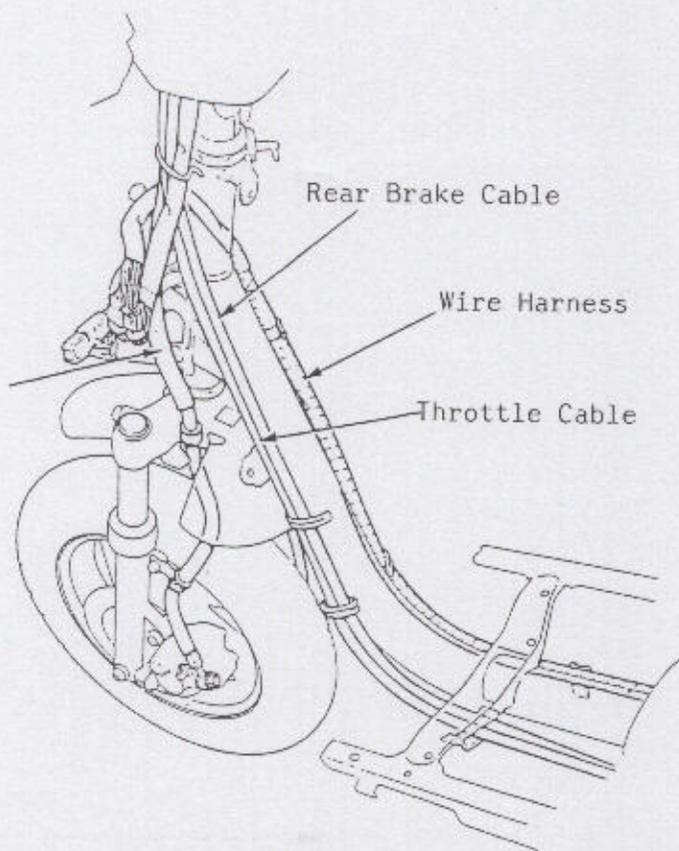


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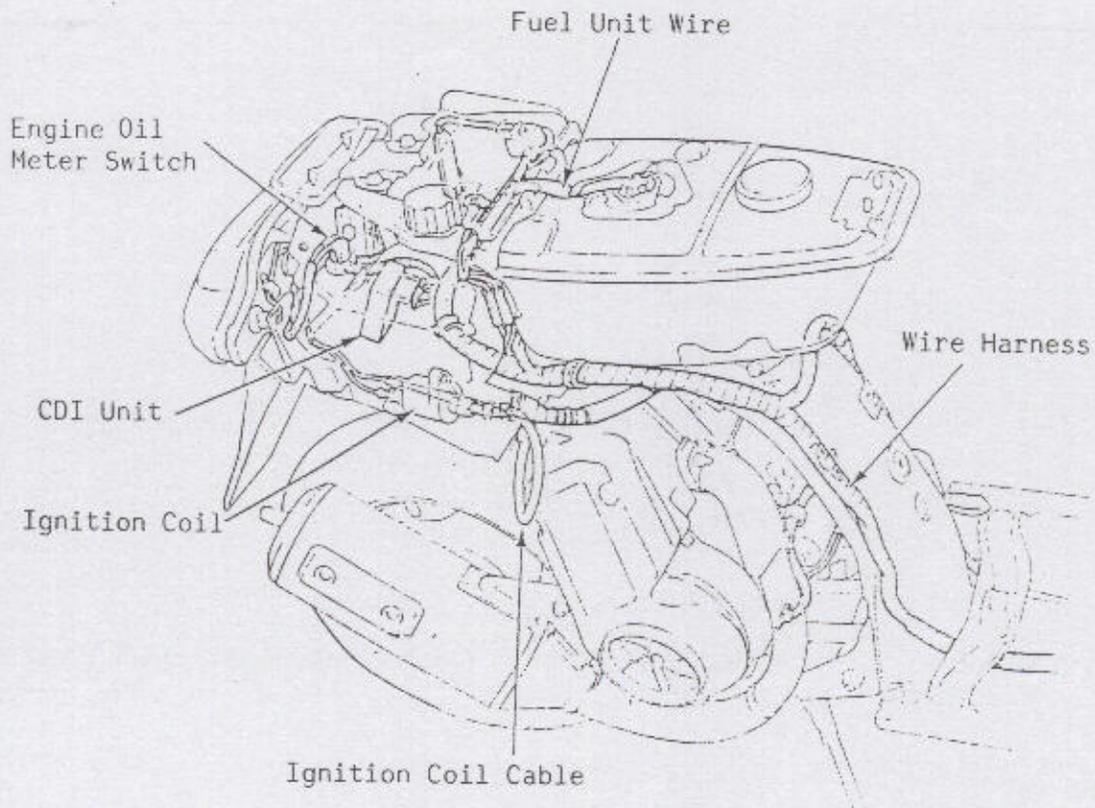
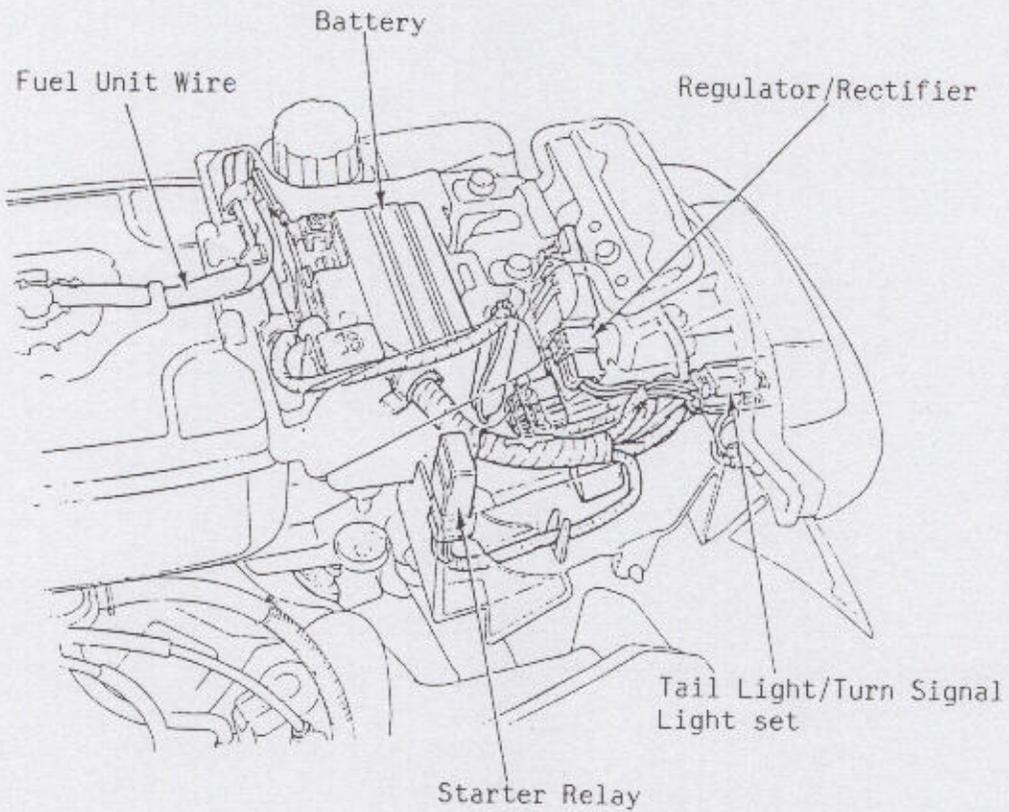
CABLE & HARNESS ROUTING



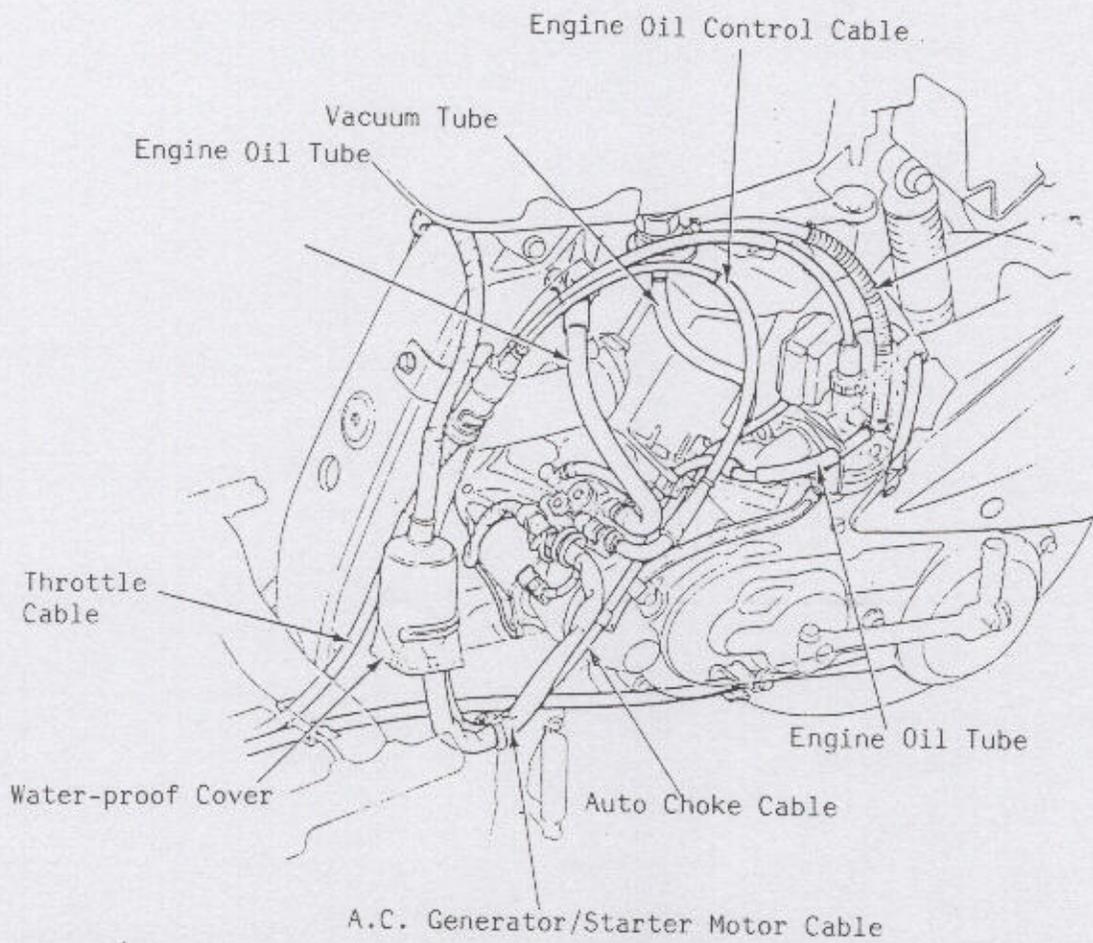
GENERAL INFORMATION



GENERAL INFORMATION



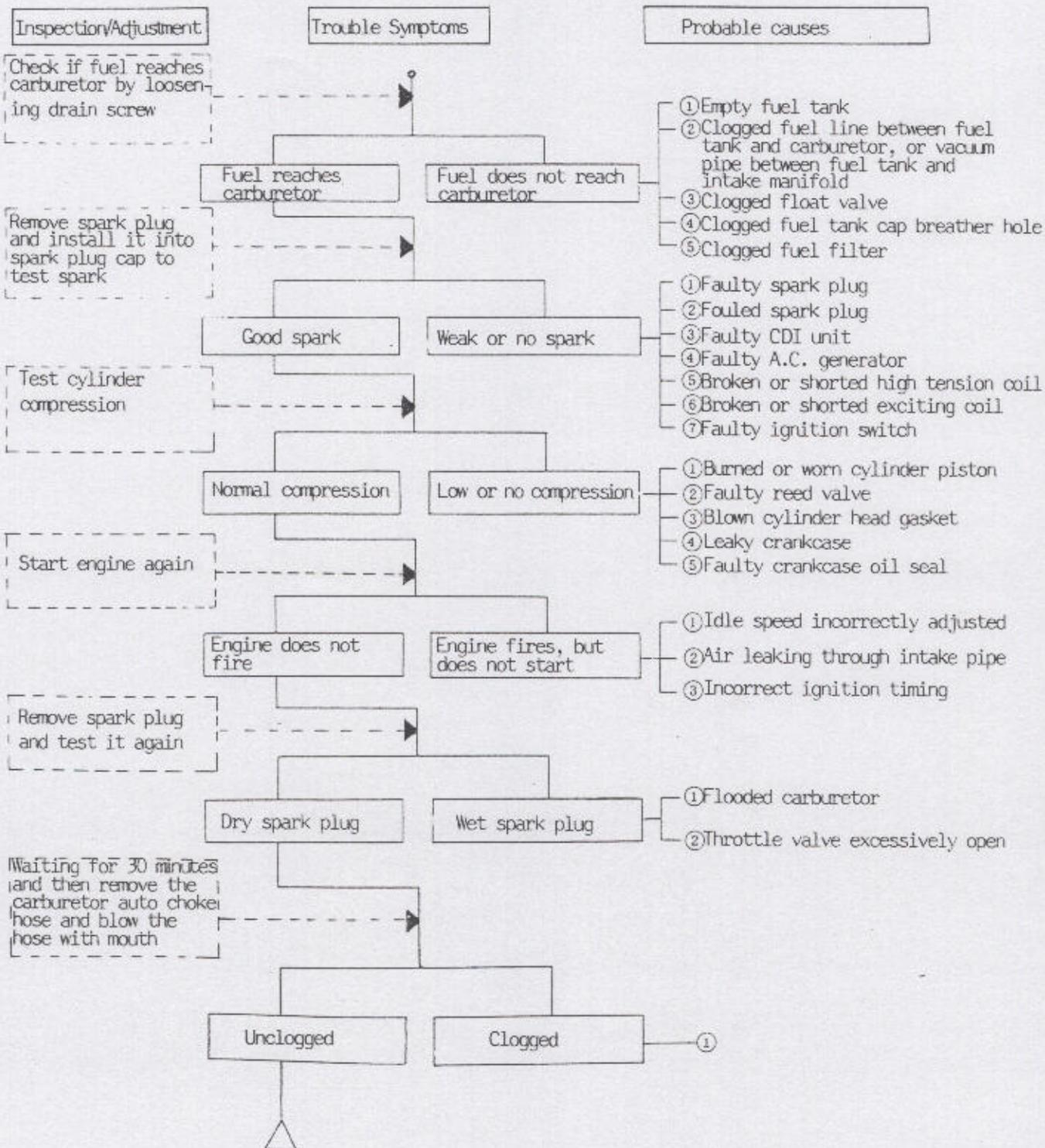
GENERAL INFORMATION



GENERAL INFORMATION

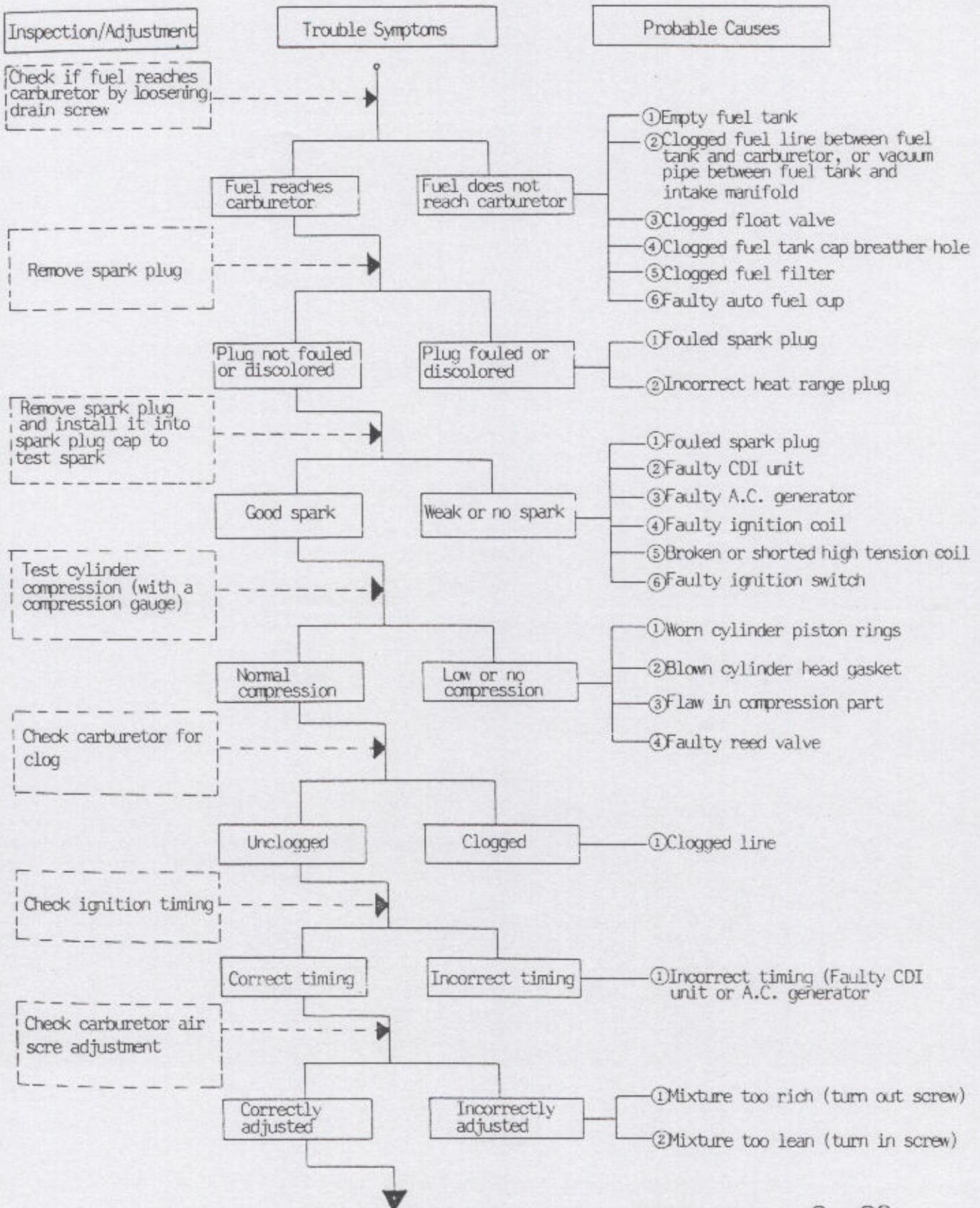
● TROUBLESHOOTING

● ENGINE WILL NOT START OR IS HARD TO START

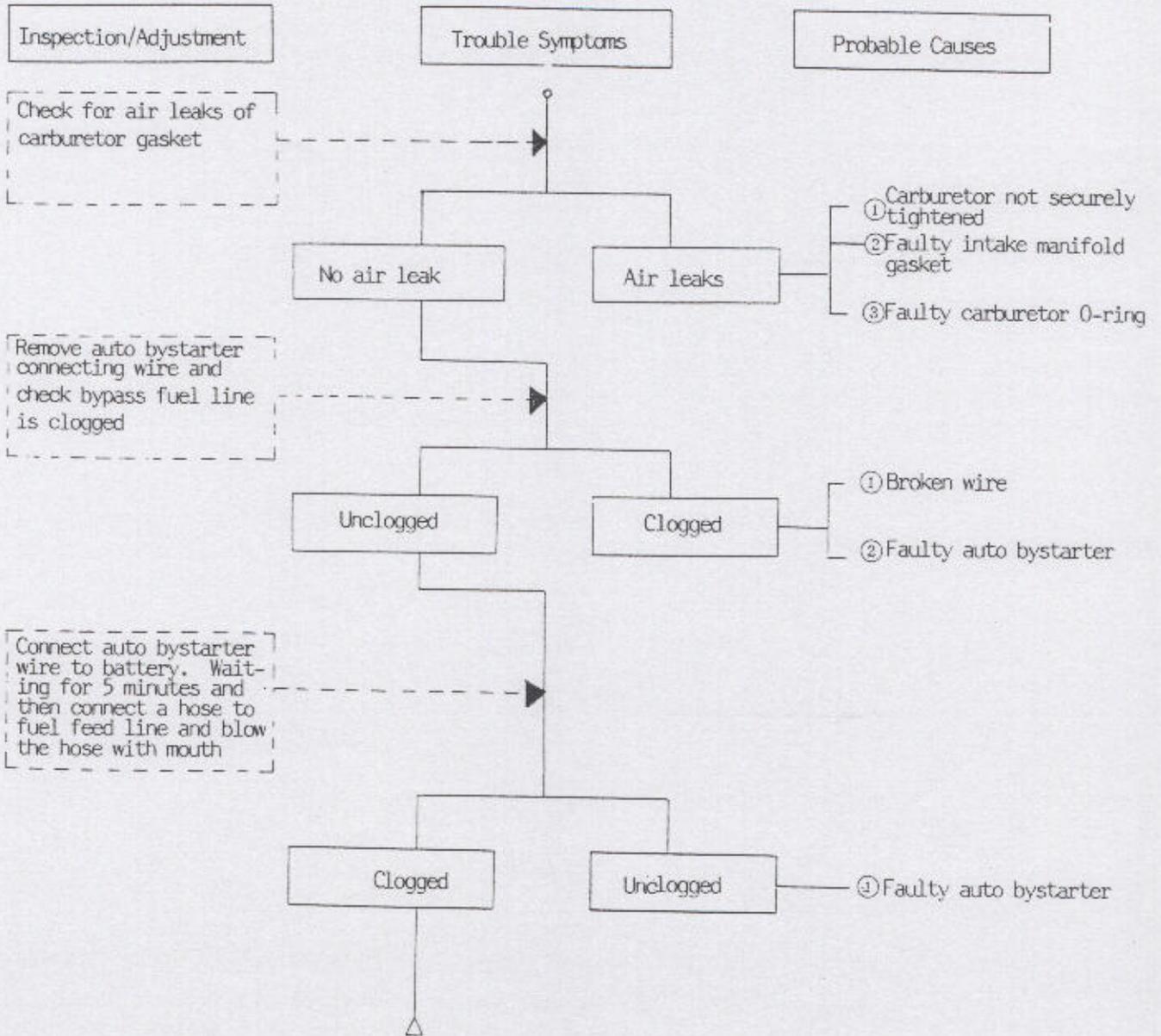


GENERAL INFORMATION

● ENGINE STOPS IMMEDIATELY AFTER IT IS STARTED



GENERAL INFORMATION



GENERAL INFORMATION

● ENGINE LACKS POWER

