SERIVCE MANUAL 2004

PA 100 / 125

PREFACE

This manual offers all service specialists with the technological procedures of maintenance, repairing for PA-100 / PA125 detailedly show those whom may concern how to maintain, repair, change parts, troubleshoot and reassemble, etc.

At every important section we illustrate by assembly, explosion diagrams and photographs, if necessary, please check the diagrams already shown.

Though we have tried our best, please kindly instruct us any faults found in this manual.

MOTIVE POWER INDUSTRY CO., LTD.

CONTENTS

1. **Specification**	•**Chassis steel pipe**
	•**Suspension**
•**Name PA-100**	**front: telescopic**
•**Model PA-100**	**rear: 4-bar linkage,**
•**Dimension**	**uni-absorber**
Overall length:**1780mm**	•**Transmission**
Overall width: 645mm	**primary reduction :direct drive**
Overall height:**1060mm**	**second reduction:43/15*42/13**
Overall base: **1210mm**	**clutch type: centrifugal dry type**
•Weight	selector : V belt ,C.V.T.
Total net weight: **98kg**	•Wheel
front: **35kg**	**front: 3.5-10**
rear: **63kg**	**rear: 3.5-10**
Carrying capacity:	•Tire
2 passengers:150kg	
Total weight:**208kg**	**front 1.50kg/cm2**
Front: **61kg**	**rear 1.75kg/cm2**
Rear: **147kg**	•Brake
•**Performance**	**front: 190mm hydraulic**
Fuel consumption: 45km/L	**disk brake**
	rear: drum brake
•Gradient ability:19	•**Speedometer 130km/hr**
•**Engine**	•Lamp
Model: **C3**	**front: 12V-35W/30W*1**
Fuel: unleaded or leaded	
Cooling system: forced air cooling	
by fan	**license plate: 12V-5WX1**
	brake lamp: 12v-21W/5W X 1
Cylinder	**signal lamp : 12V-10W X 4**
bore: 51.5mm	•**Horn AC12V**
stroke: 48.5mm	•**Silencer: diffusible absorption**
number 1	**closed type**
Arrangement: horizontal	
Displacement: 101.0cc	Trail: 71mm
Compression ration 8.7:1	Front wheel travel: 55.5 mm
Ignition: CDI	Rear wheel travel: 61 mm
Start: kick or electric start	
Lubrication: pressuring and spraying	

1. **Specification**	**•Chassis steel pipe**
	•Suspension
•Name PA-125	**front: telescopic**
•Model PA-125	**rear: 4-bar linkage,**
•Dimension	**uni-absorber**
Overall length:**1780mm**	**•Transmission**
Overall width: 645mm	**primary reduction :direct drive**
Overall height:**1060mm**	**second reduction:42/15*42/13**
Overall base: **1210mm**	**clutch type: centrifugal dry type**
•Weight	selector : V belt ,C.V.T.
Total net weight: **101kg**	•Wheel
front: **35kg**	**front: 3.5-10**
rear: **64kg**	**rear: 3.5-10**
Carrying capacity:	•Tire
2 passengers:150kg	
Total weight:**211kg**	**front 1.50kg/cm2**
Front: **62kg**	**rear 1.75kg/cm2**
Rear: **149kg**	•Brake
•Performance	**front: 190mm hydraulic**
Fuel consumption: 42km/L	**disk brake**
	rear: drum brake
•Gradient ability:22	**•Speedometer 130km/hr**
•Engine	•Lamp
Model: **C2**	**front: 12V-35W/30W*1**
Fuel: unleaded or leaded	
Cooling system: forced air cooling	
by fan	**license plate: 12V-5WX1**
	brake lamp: 12v-21W/5W X 1
Cylinder	**signal lamp : 12V-10W X 4**
bore: 51.5mm	**•Horn AC12V**
stroke: 60.0mm	**•Silencer: diffusible absorption**
number 1	**closed type**
Arrangement: horizontal	
Displacement: 124.9cc	Trail: 71mm
Compression ration 9.2:1	Front wheel travel: 55.5 mm
Ignition: CDI	Rear wheel travel: 61 mm
Start: kick or electric start	
Lubrication: pressuring and spraying	

2. Service information:

(1) The operation notice:

1. Always replace gasket, O ring, cotter, pins and clip whenever reassembled.
2. When tighten screws or nuts, lock tightly as per specified locking torque, and in the sequence of cross direction.
3. Use PGO, or PGO Recommended parts.
4. After dismantling please wash all parts necessary for checking and grease all contact surface when reassembling.
5. Use grease recommended by P.G.O.
6. When removing battery, please dismantle the negative pole (-) first, when assembling please connect positive pole (+) first.
6. Before installing a new fuse, confirm the specification is correct or not.
7. After reassembling, please re-check that all connecting point, locking parts, circuits, polar characteristics are good, before selling out.

(2) TORQUE VALUE

1. Engine:

NO	Locking location	Q'TY	Thread dia. (mm)	Locking torque (kg-m)	Remark
1	Cylinder head bolt A (intake)	2	6	0.9~1.1	
2	Cylinder head bolt B (Exhaust)	2	8	2.2	
3	Cap, oil filter graze	1	30	1.5~2.0	
4	Flange nut, cam shaft base	4	8	2.2	
5	Fixing nut, air valve adjustment	2	5	0.7	Greasing on thread
6	Guiding pin bolt, inner chain adjustment	1	6	0.9~1.1	
7	Oil bolt	1	8	1.7~2.0	
8	Fixing nut, clutch outer	1	12	5.0~6.0	
9	Nut, driven plate	1	12	5.0~6.0	
10	Nut, driving plate	1	12	5.0~6.0	
11	Spark plug	1	10	1.2~1.3	
12	Nut, drive clutch	1	22	9.0~10.0	Left thread
13	Screw, inner chain adjuster	1	6	0.4~0.6	

2. Chassis:

NO	Locking location	Q'TY	Thread dia. (mm)	Locking torque (kg-m)	Remark
1	Locking nut, steering stem	1	10	4.5	
2	Front axle nut	1	12	4.5 ~ 5.5	U type nut
3	Rear axle nut	1	16	11~ 13	U type nut
4	Rear shock absorber bolt(upper)	1	10	4.0	
5	Rear shock absorber bolt(lower)	1	8	2.4 ~ 3.0	
6	Front brake caliper bolt	2	8	2.0 ~ 3.0	
7	Chassis bolt, engine hanger bracket	2	10	3.5 ~ 4.5	
8	Engine bolt, engine hanger bracket	1	10	3.0 ~ 4.0	
9	Brake hose bolt	2	10	3.0 ~ 3.5	
10	Air release valve	1	6	0.6	
11	Front drum brake arm bolt	1	6	1.0	
12	Rear drum brake arm bolt	1	6	1.0	

3.Other parts please refer the following table:

Standard torque values:

NO	Item	Torque (kgf-m)
1	5mm bolt and nut	0.45-0.6
2	6mm bolt and nut	0.8-1.2
3	8mm bolt and nut	1.8-2.5
4	10mm bolt and nut	3.4-4.0
5	12mm bolt and nut	5.0-6.0
6	5mm screw	0.35-0.5
7	6mm screw	0.7-1.1
8	6mm flange bolt and screw	1.0-1.4
9	7mm flange bolt and screw	1.0-1.4
10	8mm flange bolt and screw	2.0-3.0
11	10mm flange bolt and screw	3.0-4.0

(3)Lubrication instruction:

A. Engine

NO	Lubrication location	Oil type	Remarks
1	crankcase:rotating part, sliding part	premium 4 stroke motorcycle oil or SAE15W40	Auto-separated Lubrication Total 900 c.c. Replacement 800c.c
2	cylinder:rotating part, sliding part.		
3	drive gear box	SAE85-140	Total 110 c.c. Replacement 90c.c
4	gasket of starter shaft	clean grease	(#3)
5	start idle gear sliding parts	clean grease	(#3)

B.CHASSIS

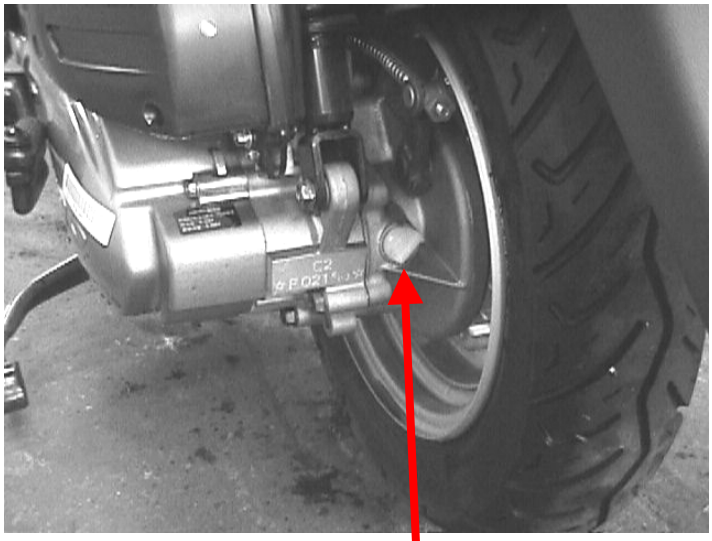
Steel ball, steering

Front brake fluid

Front brake cam

C.WHEEL BEARING

Motor oil



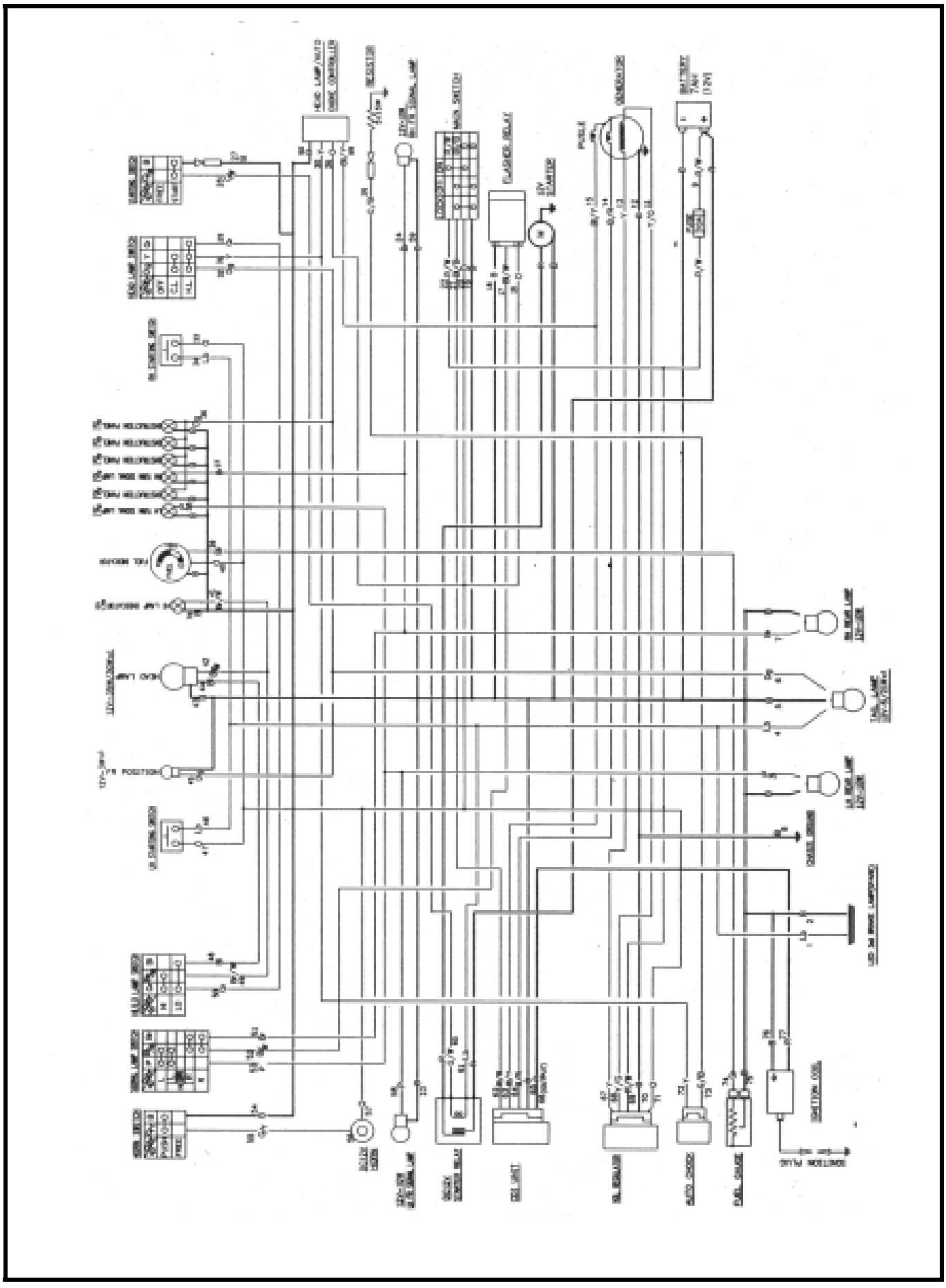
Final transmission mechanism

gear oil

Speedometer gear-clean grease

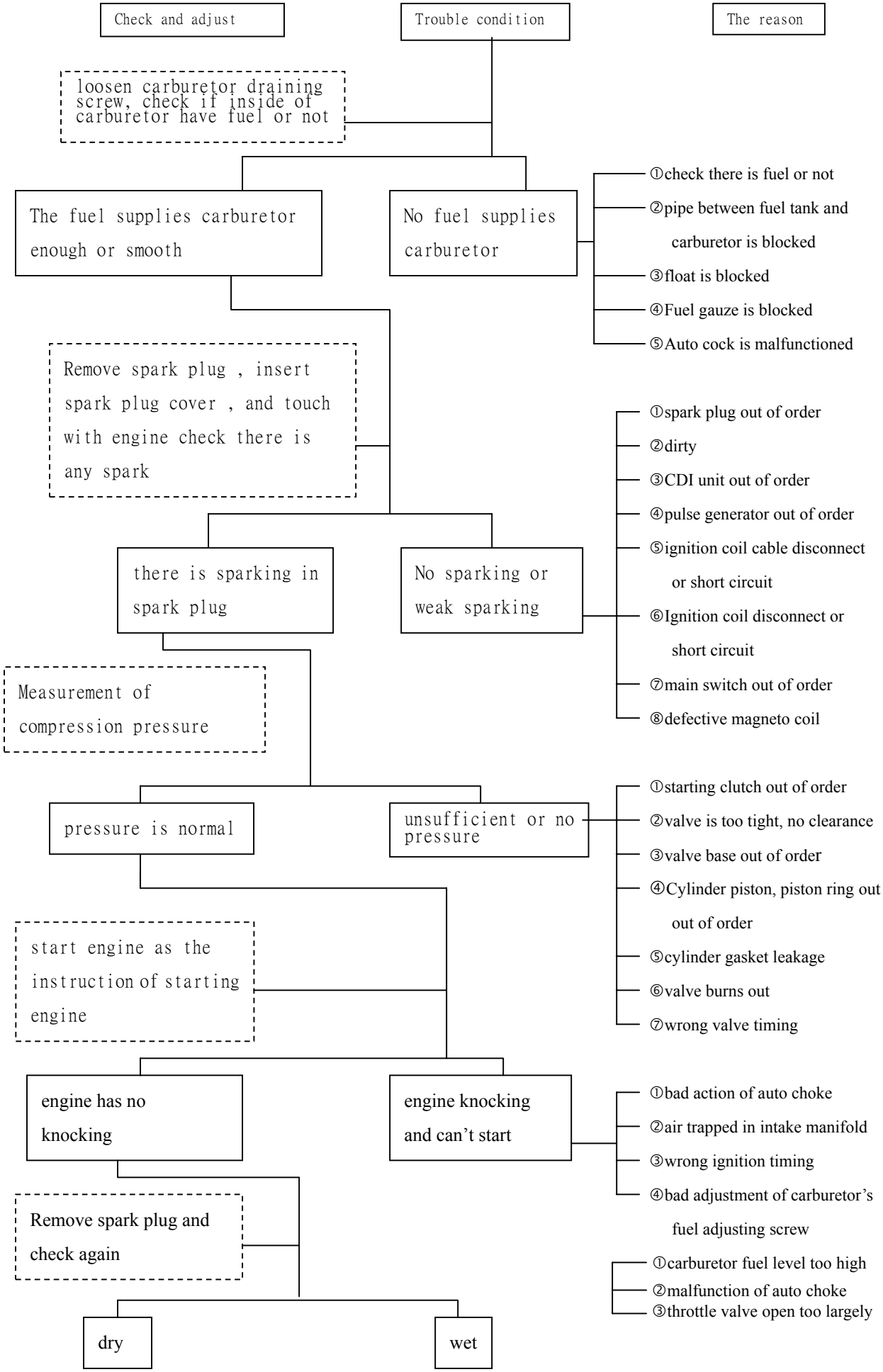
Front wheel bearing-clean grease

(4)Wiring diagram.

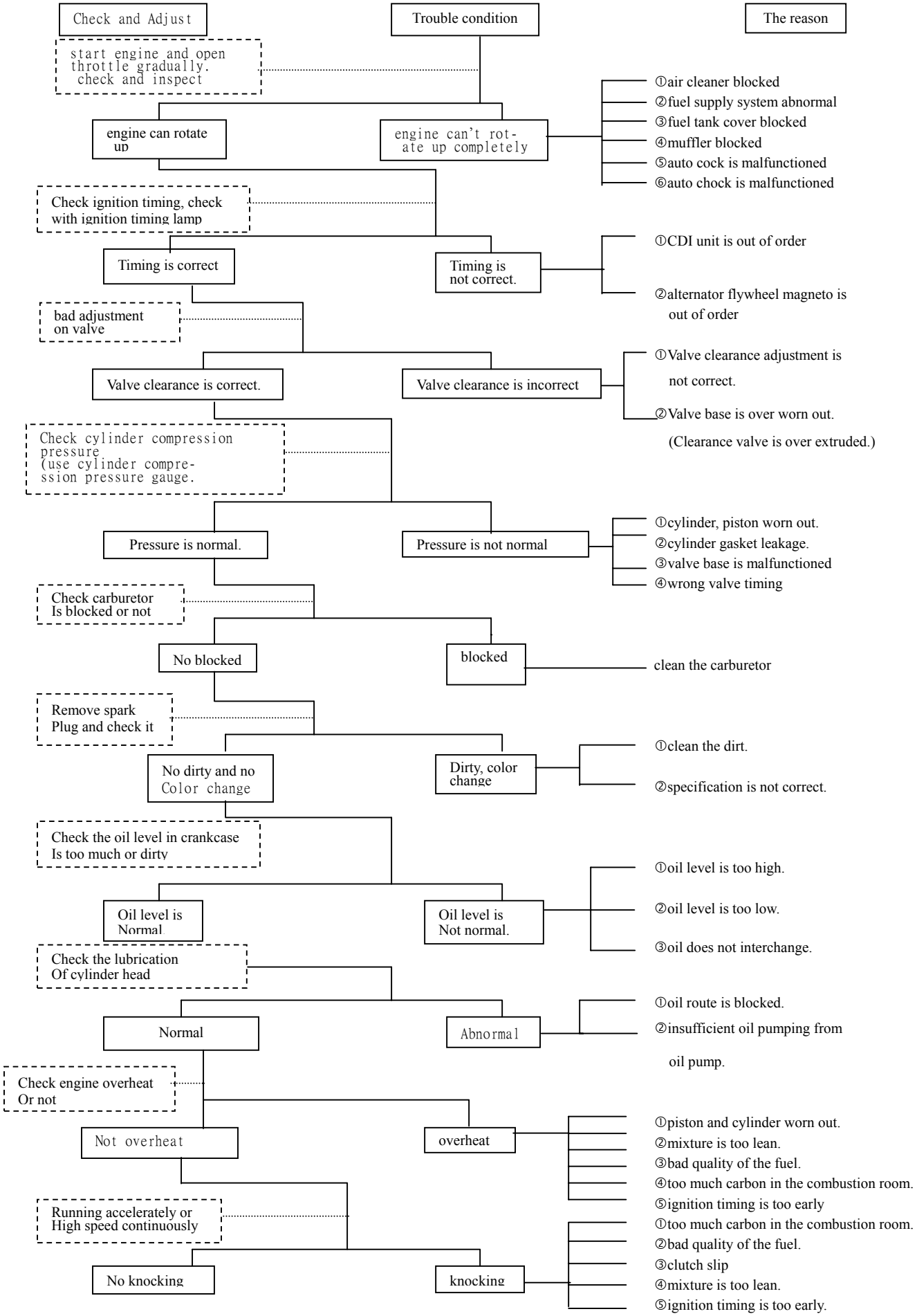


(5)Trouble shooting:

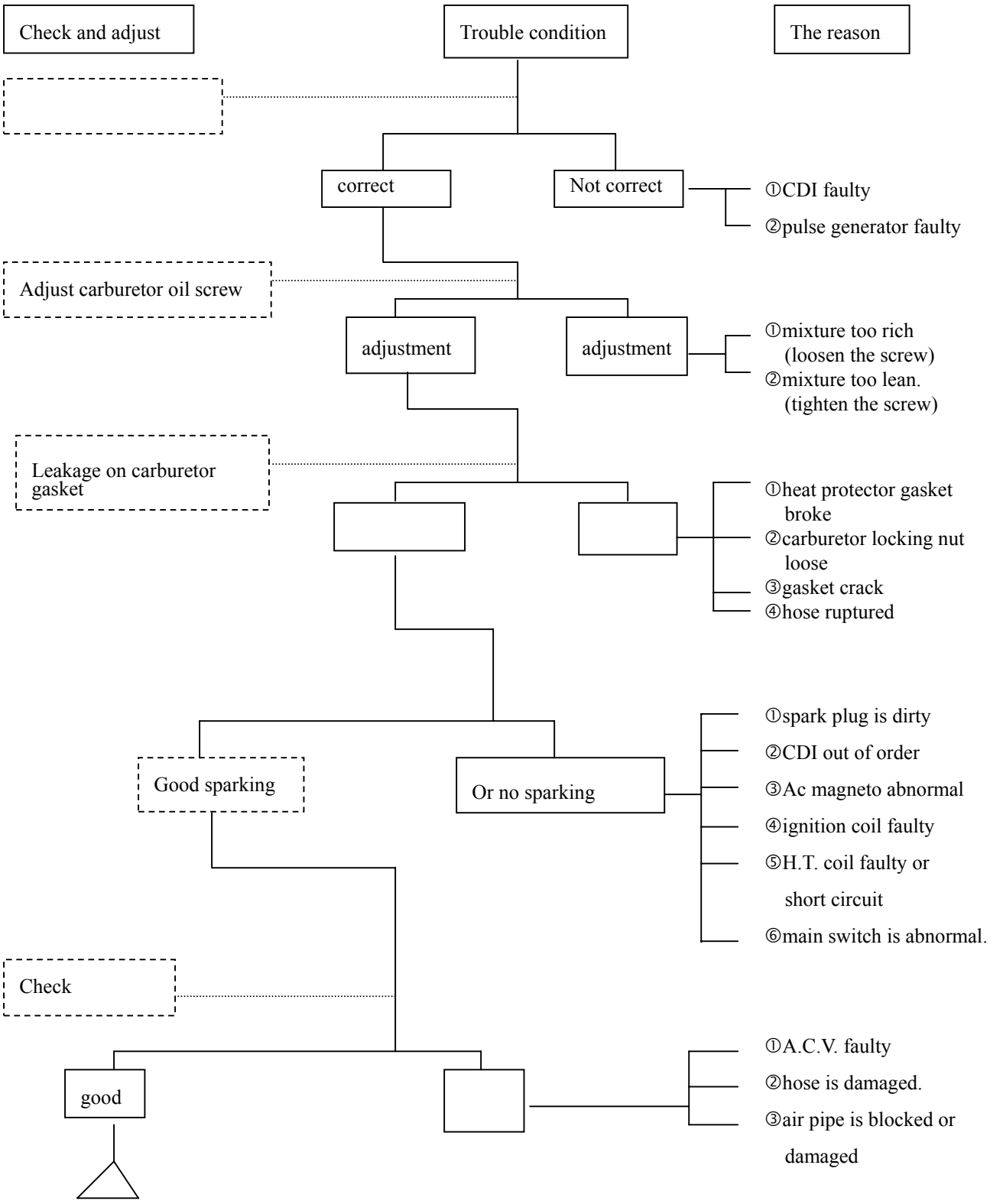
1.Hard starting or can't start:



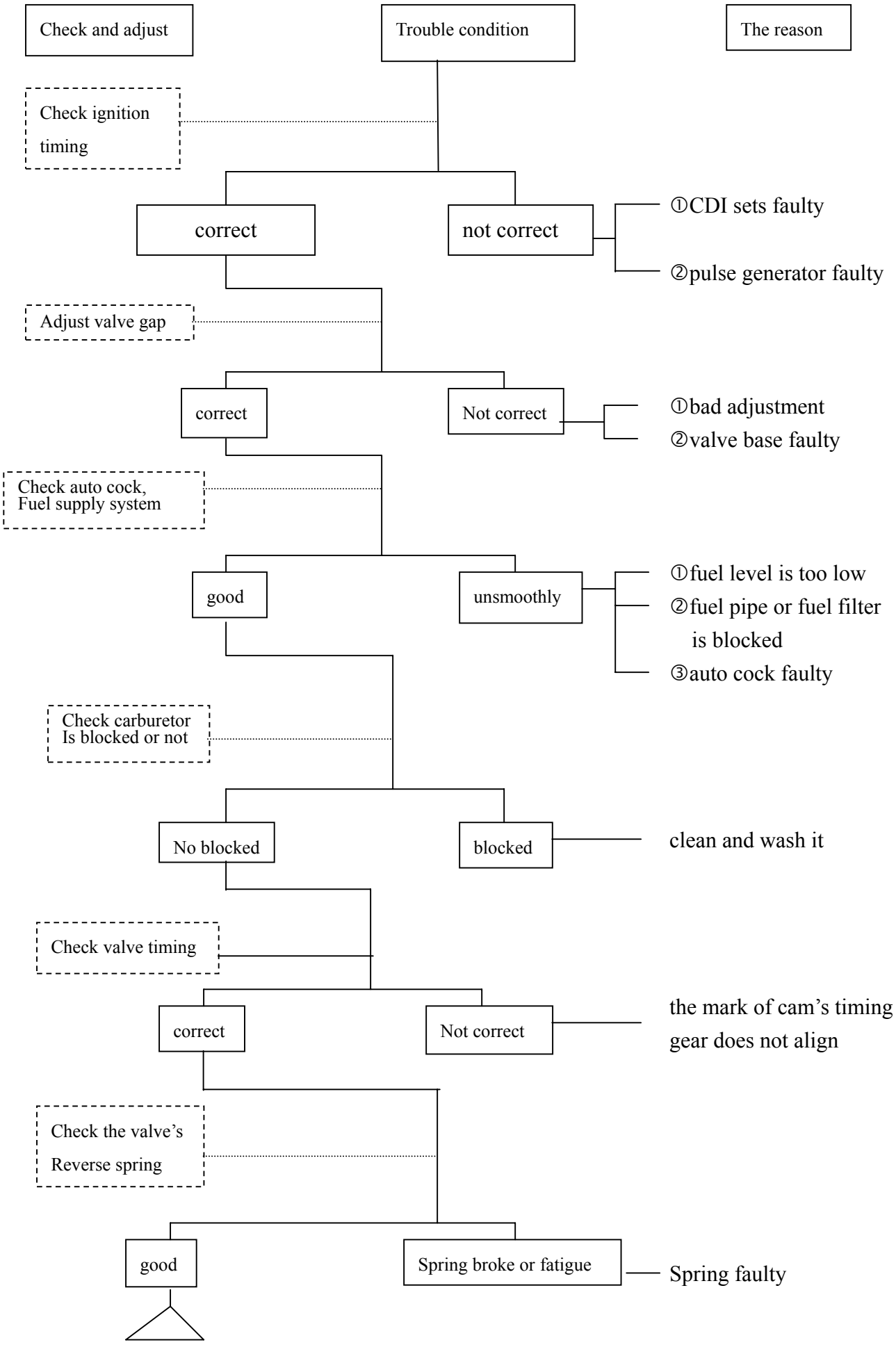
2.Unsmooth rotation(Weak acceleration ; inefficient horsepower)



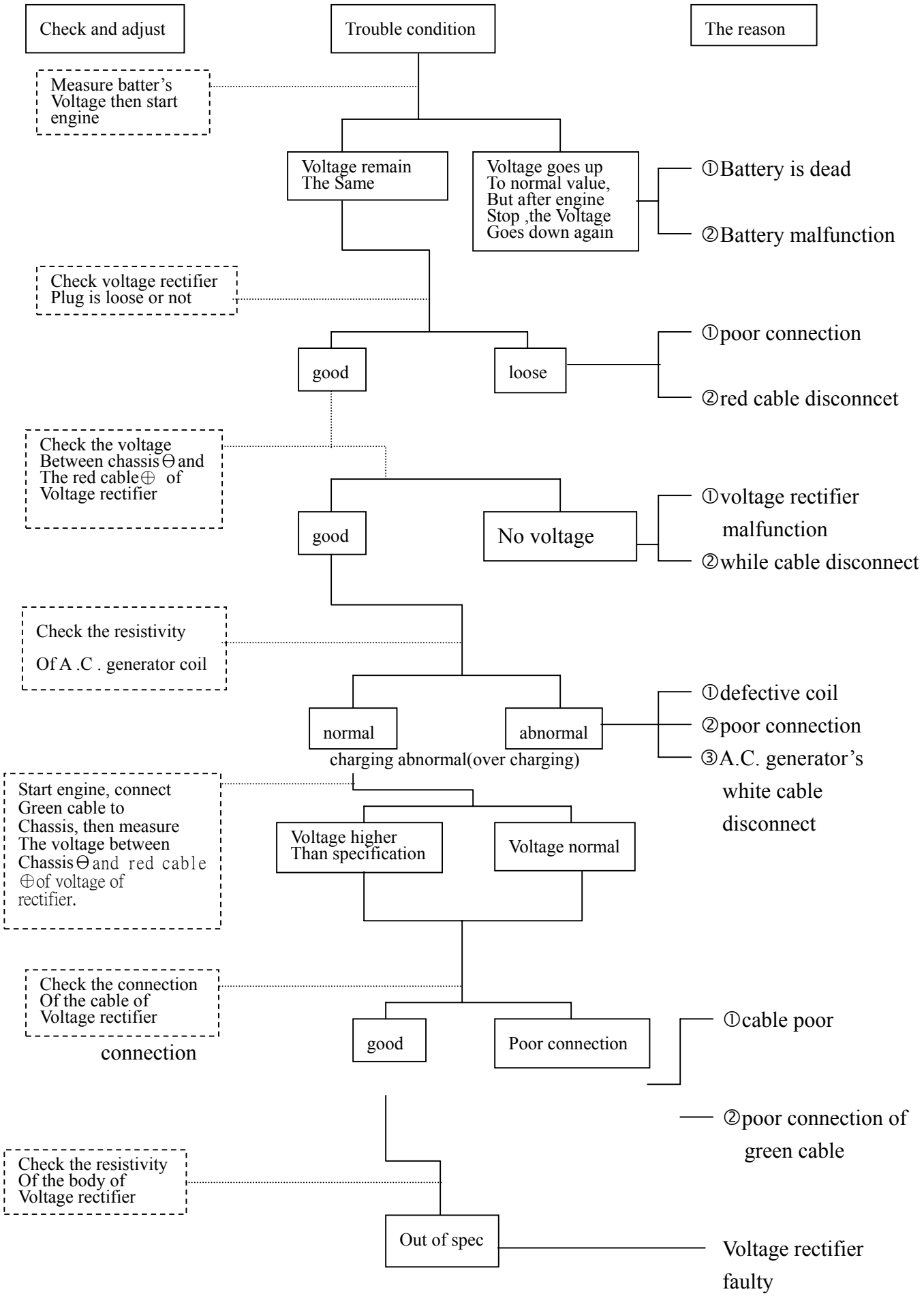
3.Engine running not smoothly(low speed and idling):



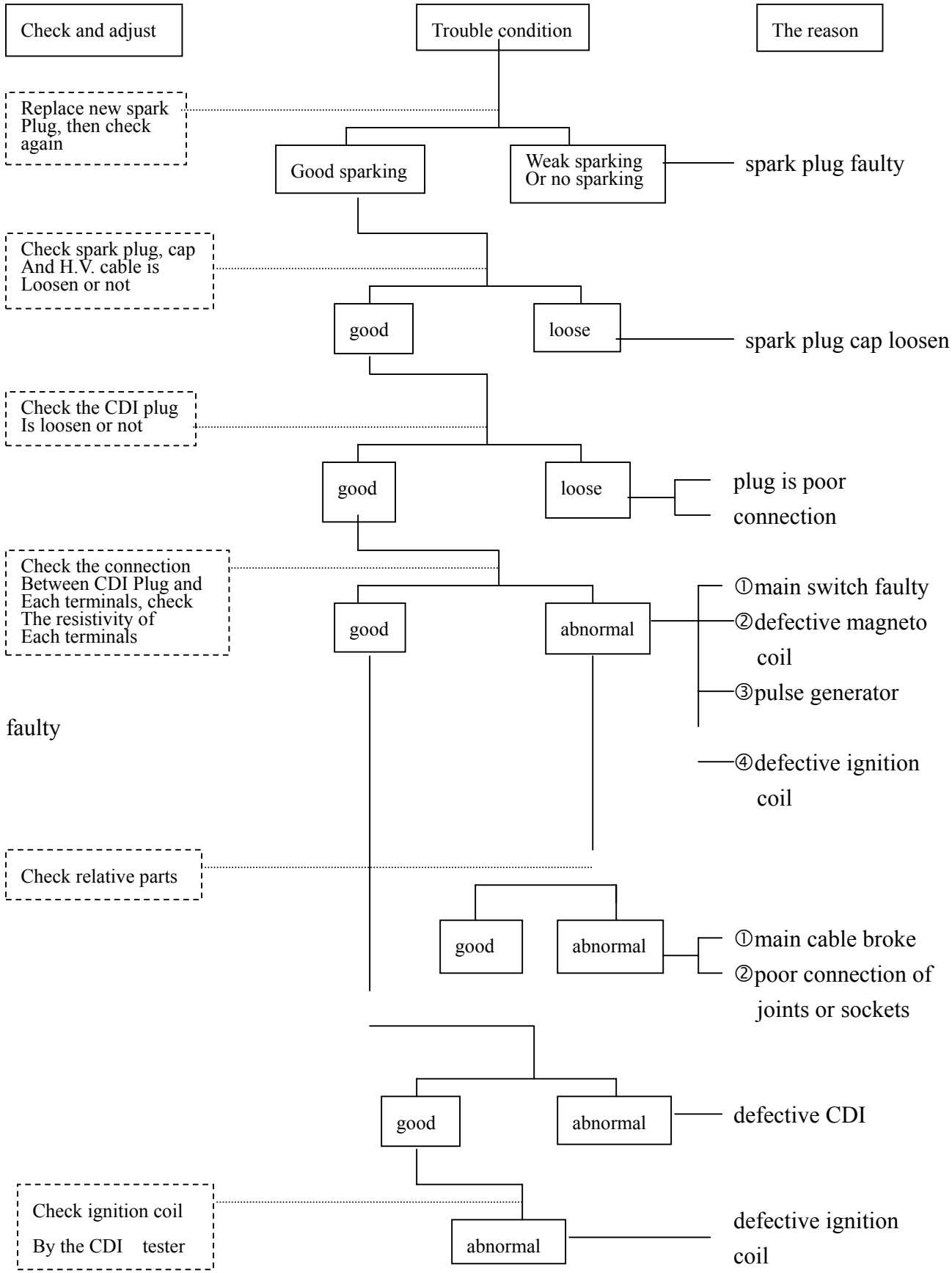
4.Engine running unsmoothly(high speed)



5.Charging abnormal(battery over charing, or over discharging)



6.No sparking, spark plug



3.Checking and Adjustment:

(1)Periodical checking table
(2)Battery
(3)Clean air cleaner
(4)Oil screen
(5)The final reduction mechanism oil
(6)Spark plug
(7)Cylinder pressure
(8)Valve clearance
(9)Ignition timing
(10)Idle adjustment
(11)Front brake adjustment
(12)Rear brake adjustment
(13)Tire
(14)Throttle cable adjustment

(1) Periodical checking table:

1.[◯] mark indicates periodical checking

2.[＊] indicates changing the parts

Check item		Checking period							Judgement standard	Remark
		Gen-eral che-cking	First Month Or Initial 500km			Office				
				Months Or 5000km	months or 1000km	Per1 Months Or 1000km	per3 months or 2500km	per12 months or 10000km		
A Suspension Steering Handlebar	Loose,swing	◯		◯	◯	◯	◯	◯		
	performance	◯		◯	◯	◯	◯	◯		
Suspension: turning angle					◯			◯		
Front fork	a.cracked			◯	◯	◯	◯	◯		
	b.shaft fixed condition			◯	◯	◯	◯	◯		From steering column
	c.shaft:loose				◯	◯		◯		
B: Brake									Clearance:	Check from Steering column
Brake lever	a.clearance	◯		◯	◯	◯	◯	◯	Front:10-20mm Rear :10-20mm	
	b.movement of brake	◯	◯	◯	◯	◯	◯	◯		
brake	Loose or damage		◯	◯	◯	◯	◯	◯		
	Brake cables change								※per 2 years	
Brake cam	Worn out							◯		
Brake drum And brake shoe	a.clearance between drum and plate			◯	◯	◯	◯	◯		
	b.brake shoe and br ake plate worn out				◯		◯	◯		
	c.brake drum worn and damage				◯			◯	Standard dia: Rear:130.0mm Limit of use: Rear:131mm	mark type
wheel	front axle:dam-age or cracked							◯		
	rear axle:worn or damage							◯		Check rear Axle
	Wheel pressure	◯	◯	◯	◯	◯	◯	◯	Unit:kg/c ㎡:ldriver U 2.0 2.0	
	Wheel cracked Or damage	◯		◯	◯	◯	◯	◯		
	Wheel gap and worn	◯		◯	◯	◯	◯	◯	Gaplimit:front wheel: 0.8mm rear wheel 0.8mm	
	Wheel surface Or other metals	◯		◯	◯	◯	◯	◯		
	Axle nut screw Pin tightness			◯	◯	◯	◯	◯	Front axle screw torque 5.6-6.0kg-m rear axle torque 11..0-13.0kg-m	Nut location
	Wheel rim swi-Ngness and da-Mage condition			◯	◯	◯	◯	◯	Swingness ofr front Rear wheel rim. Vertical swing:2mmbelow Horizpmta;":2mm b;epw	

Check item			Checking period							Judgement standard	Remark
			General checking	First Month Or Initial 500km			Office				
					Months Or 5000km	months or 1000km	Per1 Months Or 1000km	per3 months or 2500km	per12 months or 10000km		
Wheel	Front Bearing of axle, Looseness			○	○	○	○	○	○		
	Rear				○				○		
Damper	Rear damper spring cracked		○		○	○	○	○	○		
	ass' part loose or damage				○	○	○	○	○		
	Connecting part Loose					○			○		
	Bracket loose or Damage					○			○		
	Suspen-sion	Connecting Part loose				○			○		
	damper	Oil leakage				○		○	○		
		Cracked				○		○	○		
		assy's part, Loose				○		○	○		
Power Transmi-Ssion	Clutch and Change Speed mechanism				○	○	○	○	○		
					○	○	○	○	○		
	Supply grease				○	○	○	○	○	※per 2 year	
Electric Install-Ment	Ignition				○	○	○	○	○	Clearance: 0.6~0.7mm NGK:C7HSA OR SAME SPEC	
	Start mechanis m	Starting Motorpinion Meshing				○		○	○		
	wiring	Recharge Effect			○	○	○	○	○		
	battery	Electroly-Te quantit			○	○	○	○	○	Level between "UPPER" AND "LOWER"	
		Electroly-Te s. gra-vity				○		○	○	WHEN 20℃ SPECIFIC GRAVITY: 1.270-1.290	
	wire circuit	Wire conn-ecting Loose or cracked			○	○	○	○	○		

Check item			Checking period							Judgement standard	Remark
			General checking	First Month Or Initial 500km			Office				
					Months Or 5000km	months or 1000km	Per1 Months Or 1000km	per3 months or 2500km	per12 months or 10000km		
Engine	Engine parts	Performance, noise			○	○	○	○	○		
		Low speed, Accleration			○	○	○	○	○	Idling:1700± 100rpm	
		Exhaustion	○		○	○	○	○	○		Check the clolr Or exhausting -air
		Air cleaner			○	○	○	○	○		
		Cylinder, cylinder head inlet Pipe, locking Condition							○	Locking torque Cylinder head: (cold) 1.0-1.2kg/m inlet pipe⊗cp;d) 1.0-1.2kg/m	
		Compression pressure				○			○	Using stating Motor. 12kg/c ㎡(750rpm)	
	Lubricat-Ion Syst-em	Oil leakage			○	○	○	○	○		
		Oil quantity, Dirty			○	○	○	○	○	Change every 1000kml	
		Oil quantity,	○	○							
		Oil filter			○	○		○	○	Change every 5000km	
	fuel syst-em	Fuel quantity	○								
		Fuel leakage			○	○	○	○	○		
		Carburetor Parts dirty			○	○	○	○	○		
		Carburetor throttle and choke Performance			○	○	○	○	○		
		Carburetor Float height			○	○	○	○	○		
		Carburetor Adjustment			○	○	○	○	○		
		Fuel pipe Changing								※per 4 years	

Check item		Checking period							Judgement standard	Remark
		Gen-eral che-cking	First Month Or Initial 500km			Office				
				Months Or 5000km	months or 1000km	Per1 Months Or 1000km	per3 months or 2500km	per12 months or 10000km		
Lamp system	Performance	○		○	○	○	○	○		
	Dirty, cracked	○		○	○	○	○	○		
Horn turn Signal Reflector	Performance	○		○	○	○	○	○		Horn Turn signal
lock	Performance			○	○	○	○	○		
Rear view mirror	Check the illumination	○		○	○	○	○	○		
Blinker linc-Nese plate nu-Mber&mark	Dirty cracked	○								
Instrument board	performance	○		○	○	○	○	○		
Muffler silencer	Ass'y part Loose cracked			○	○	○	○	○		
	performance				○		○	○		
chassis	loose or cracked				○		○	○		
The earlier Abnormal condition	Confirm it does Not happen again	○								
others	Chassis Lubrication			○	○	○	○	○		
	Decoking mixer ,muffler, silencer				○			○		

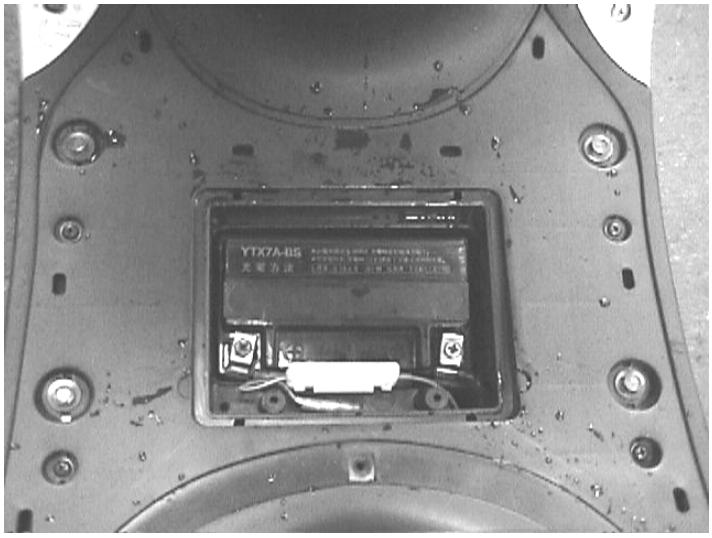
(2) Battery: Recharge when run out of it

1.Remove the floor mat.

2.Screwing out the two screws on the battery cover; remove the battery cover.

3.Remove the negative cable and then the positive cable, take out the battery to recharge.

4.Re-assembling the battery as the opposite procedure of disassembling after recharging.



Note:

A. Do not take out the sealed bolt when recharging.

B. Without refilling water for the battery.

Please recharging (12V) as the following current.

Time standard: 0.7A*5~10Hr or Rapid: 3A*1Hr

(3) Clean air cleaner

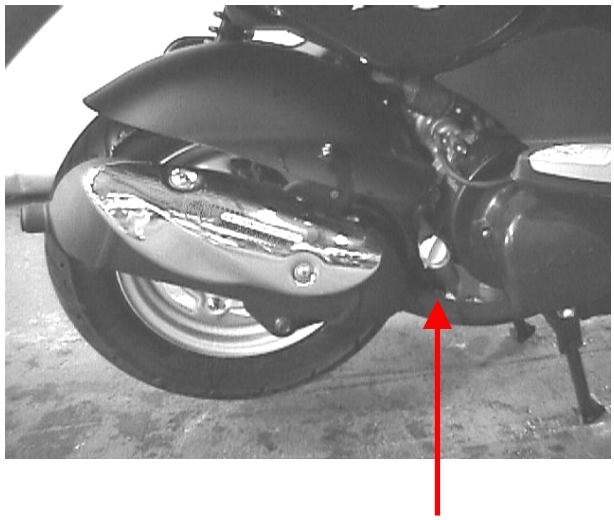
1. Remove air cleaner cover.
2. Take out the air cleaner filter.
3. Clean the filter by compressed air.
4. Assemble the air cleaner by the opposite procedure.

Attn: Do not start engine when air cleaner is not installed.

MOTOR OIL

Oil volume

Note:
A. The vehicle must park on the flat ground Before checking.
B. Start engine for 2-3 min., and stop engine For 2-3 min., then check the oil volume.



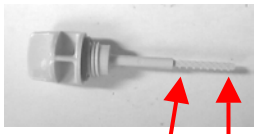
1. Take out the oil meter to check the oil Volume.
2. Refill oil to upper limit when oil volume Is below the lower limit.

Exchange Oil

Note: The oil will flow out easier when the engine is warm.

1. Turn off the engine and remove the oil meter.
2. Screw out the oil draining bolt on the bottom

Oil meter



Upper limit

Lower limit

Torque: 1.5kg-m

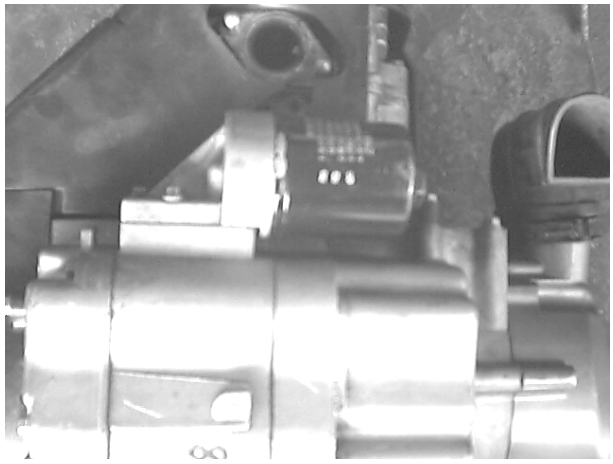
Engine oil volume : **Disassembling : 0.90 liter**

Exchanging : 0.80~0.85liter

When checking the leakage of oil, start the engine
At idling for a few minutes, then check the oil volume.

(4) Oil screen

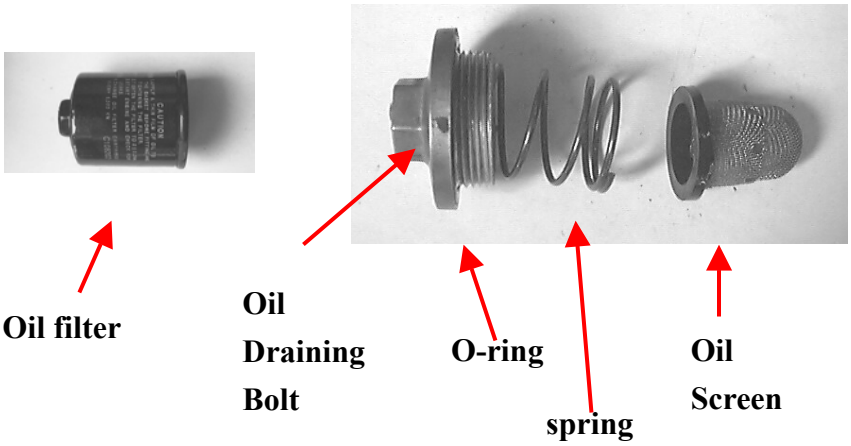
Cleaning for the oil screen



- Drain the Oil in the engine, remove the Oil draining bolt the spring and the Screen.
- If any adherent material is found, please use detergent to clean the screen.
- Check the 0-ring. If it is damaged, change a new one.
- Re-install the screen, the spring, 0 ring and the Oil draining bolt.
  Locking torgue:1.5kg-m

2.Second oil filter

- **Replace it per 5000km**
- **Torque: 8±0.2 N-M**



(5) The final reducing mechanism oil

1.Change the oil in the gear box:

a. Turn off the engine after warm up.

b. Put a bowl under the engine.

c. Remove the draining bolt and filling bolt to drain the gear oil off.

d. Lock the draining bolt before refill 110c.c. gear oil and then lock the filling bolt.

e. Locking torque:1.8kg.m

(6)Spark plug

1.Remove spark plug.

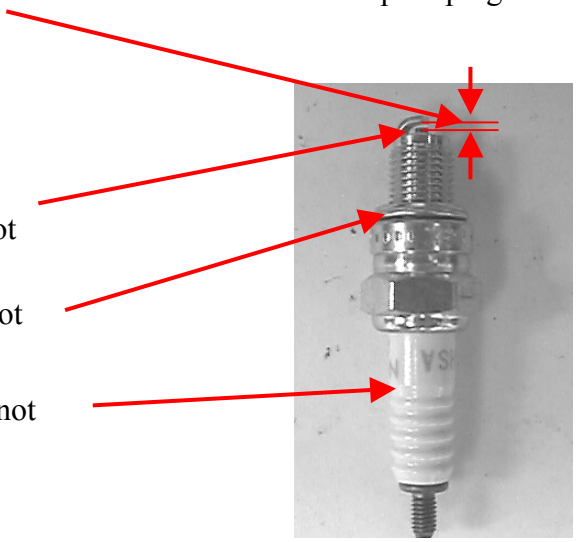
2.Check the spark plug electrode and see whether it is burnt out/ carbonized or not.

3.Clean the electrode, if it is dirty.

●Spark plug specification

NGK: C7HSA or C7HSA equivalent

Gap of spark plug:0.6~0.7mm



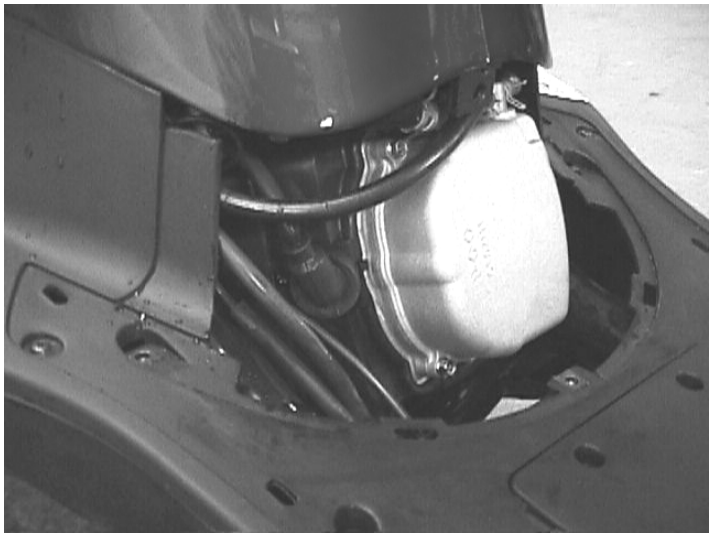
(7) Cylinder Pressure

1.Measure it when the engine is warm.

2.Remove the cover at the right hand of the step floor.

3.Remove the spark plug then place cylinder pressure gauge. Then fully open the throttle and act on the starter motor to measure the compression pressure.

Compression pressure: 12kg/cm^2 at 750 rpm



＊When the compression pressure is too low, check the following:

a. Valve leakage or not

b. Valve clearance

c. Gasket of the cylinder head is damaged.

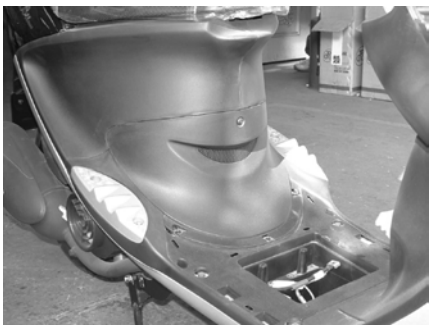
d. Piston ring worn-out

e. Piston or cylinder worn-out

＊The cylinder compression pressure is usually too high when there is too much carbonization in the combustion chamber and the piston tip.

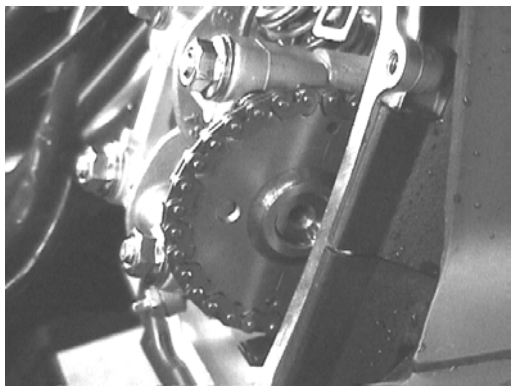
(8)Valve Clearance

Note: Checking and adjustment of valve clearance only can be done under 35°C of engine temperature.



1.Remove cylinder head cover.
2.Remove intake pipe from the cover of cylinder head.
3.Screw out the cap nut.
4.Remove cylinder head.
5.Rotate cooling fan, the mark on cam shaft gear must reach
The upper dead position, the “T” mark on generator fly must align with the crankcase mark.

Note: There is depressure reverse rotation device on cam shaft. So never rotate cam shaft reversal when adjusting, otherwise valve can not be adjusted.



●Valve clearance:IN-0.08mm
Ex-0.08mm
●Loosen locking nut, then rotate adjusting nut to adjust the valve clearance.

Note: Re-check valve clearance after lock the nut.

(9) Ignition Timing

Note: It is no need to adjust ignition timing and CDI set. When ignition timing is not correct, just check the ignition system.

1.Remove the checking hole cover of ignition timing.
2.Using the ignition timing light to assure the ignition timing is correct.
3.Under idling, it means in good function when crankcase’s mark matches to the “F” on the flywheel.
4.Raise the engine revolution to 5000 rpm slowly, it means in good function, if the crankcase's mark matches with Entering point of the flywheel.