HARTFORD

INDUSTRIAL CO.,LTD.

Service manual part engine

For CG-125/150

Issued date:April 1999

Chapter Contents

Chapter 1 Foreword

Hartford Industrial Co., Ltd.

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Hartford motorcycle engines state of the art power drivingpower , torque , output , smoothness of running , and fuelconsumption are the prime factors in determining the performance of a motorcycle engine .

At Hartford we focus on these critical points , striving to create an engine that offers the maximum in motorcycle driving performance .

At the heart of Hartford is engine production ability is our state of the art production facility , which is set up with Flexible Manufacturing System (FMS) . The FMS is planned and designed by Hartford is engineering staff , and is composed of a series of Hartford machining centers .

Our engine production capabilities do not end with engineering and production . Our commitment to quality is as modern and comprehensive as our facility . The most up to date testing and measurement devices are used to assure that the engines we ship will meet your most exacting standards .

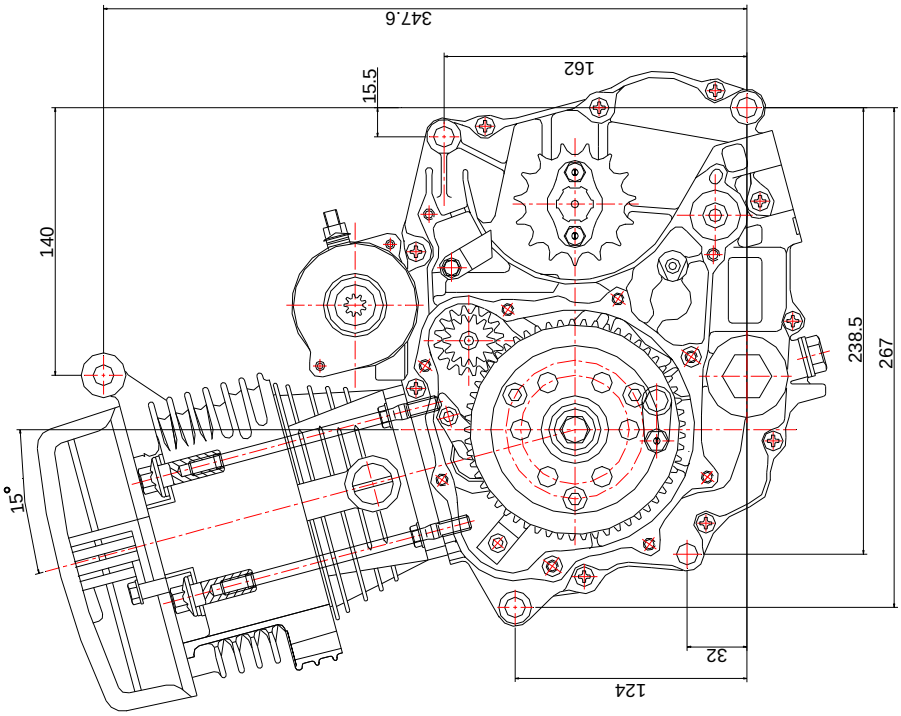
We also maintain a comprehensive spare parts inventory , with items available for immediate delivery . No matter what your type of motorcycle , we have the performance engines to meet your needs at the right price .

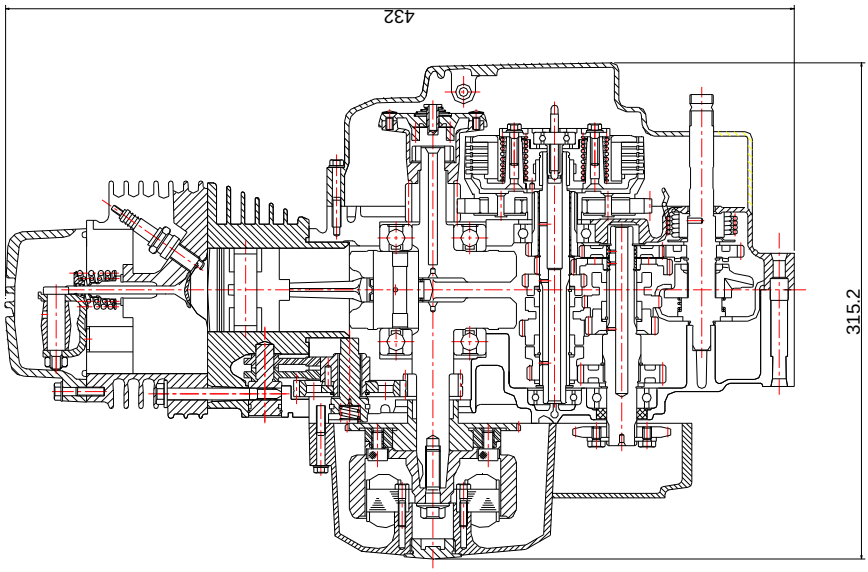
Hartford employs a wide variety of sophisticated testing instruments for rigorous testing of the engine performance .

Chapter 2 General Specifications

2.1 Profile diagram and Main part name

2.1.1 Profile diagram

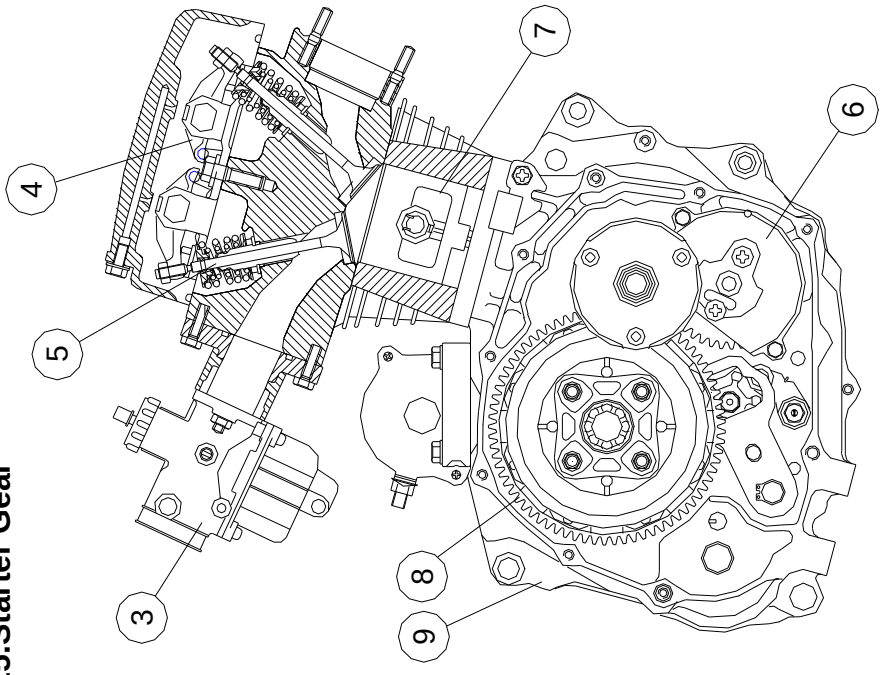


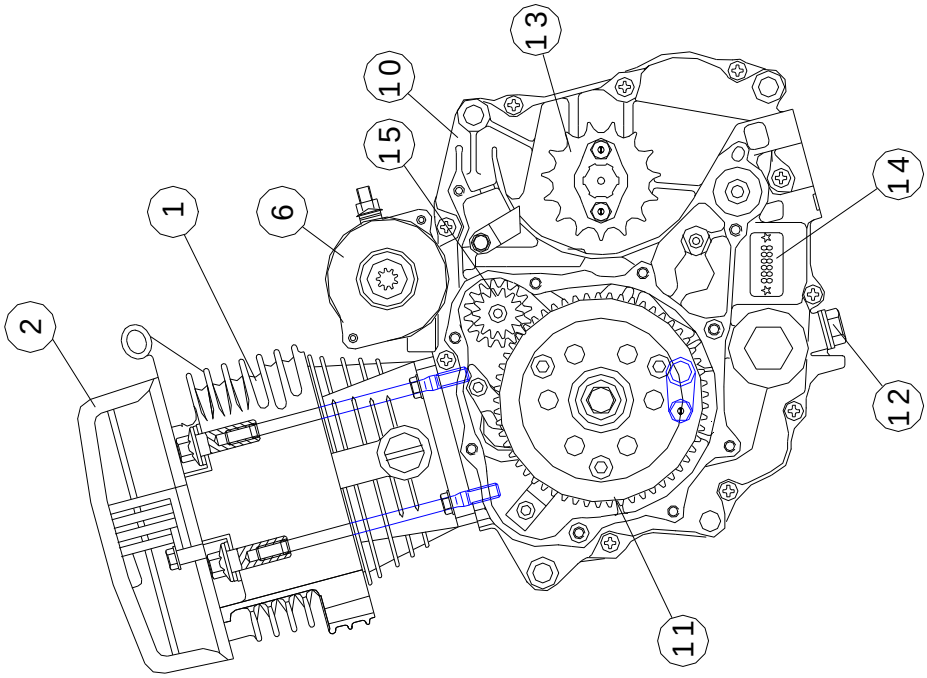


2.1.2 Main part name

Main part:

1.Cylinder	**2.Cylinder head**	**3.Carburetor**
4.Holder comp pkr	**5.Valve**	**6.Oil pump**
7.Piston	**8.Clutch**	**9.Right crank case**
10.Left crank case	**11.Generator**	**12.Leak bolt**
13.Drive sprocket	**14.Engine number**	**15.Starter Gear**





2.2 Engine Specifications

Item	125C.C.(4/5speed)	150C.C.(4/5speed)
Model (CG type)	Air-cooled, single-cylinder OHV four-stroke	Air-cooled, single-cylinder OHV four-stroke
Cylinder layout	Single cylinder canted 15 degrees	Single cylinder canted 15 degrees
Fuel requirement	90 octane or higher	90 octane or higher
Bore and stroke	56.5 x 49.5mm	62 x 49.5mm
Capacity	124cc	149cc
Compression ratio	9:1	9.6:1
Weight (dry / wet)	33kg	34kg
Intake valve timing	5 degrees BTDC / 35 degrees ABDC	16 degrees BTDC 22 degrees ABDC
Exhaust valve timing	30 degrees BBDC / 5 degrees ATDC	30 degrees BBDC / 5 degrees ATDC
Intake valve clearance	0.06-0.08mm	0.06-0.08mm
Exhaust valve clearance	0.06-0.08mm	0.06-0.08mm
Idle speed	1400 ± 100 rpm	1400 ± 100 rpm
Combustion chamber type	Hemispherical	Hemispherical
Valve operation	Single camshaft OHV	Single camshaft OHV
Max.power(ps/rpm)	9.5/8200	12/8300
Max.torque(kg-m/rpm)	0.95/8200	1.2/8300
Fuel economy (km/l)	45 more or less depends on road conditions	45 more or less depends on road conditions

2.3 Lubrication system

Item	125C.C.(4/5speed)	150C.C.(4/5speed)
Oil pump type	Gerotor	Gerotor
Oil filter type	Centrifugal and screen	Centrifugal and screen
Oil flow rate	4.4l/min @ 8500rpm	4.4l/min @ 8500rpm
Oil grade	SAE 10W/30	SAE 10W/30
Oil capacity	0.8 – 1.2L	0.8 – 1.2L
Oil delivery:		
Crankcase	2.44l/min @ 8500rpm	2.44l/min @ 8500rpm
Cylinder head	1.27l/min @ 8500rpm	1.27l/min @ 8500rpm
Transmission	1.63l/min @ 8500rpm	1.63l/min @ 8500rpm

2.4 Transmission

2.4.1 Clutch

Item	125C.C.(4/5speed)	150C.C.(4/5speed)
Clutch type	Wet multiple	Wet multiple
Operation	Left hand	Left hand
Torque rating	7.6kgm	7.6kgm
Number of plates	5	5

2.4.2Gear system

Item	125C.C.(4/5speed)		150C.C.(4/5speed)	
Gearbox type	(1)4 Gearbox(International) (2)4 Gearbox(Circulate) (3)5 Gearbox(International)		(1)4 Gearbox(International) (2)4 Gearbox(Circulate) (3)5 Gearbox(International)	
Operation	Left foot		Left foot	
Gear ratios	4 speed	5 speed	4 speed	5 speed
Primary reduction	4.055(73/18)	4.055(73/18)	4.055(73/18)	4.055(73/18)
1st gear	2.769(13/36)	2.4 (15/36)	2.769(13/36)	2.4 (15/36)
2nd gear	1.722(18/31)	1.882(17/32)	1.722(18/31)	1.882(17/32)
3rd gear	1.272(22/28)	1.400(20/28)	1.272(22/28)	1.400(20/28)
4th gear	1.000(25/25)	1.130(23/26)	1.000(25/25)	1.130(23/26)
5th gear		0.960(25/24)		0.960(25/24)
Final education	2.773(15/41)	2.773(15/41)	2.773(15/41)	2.773(15/41)

2.5 Other

2.5.1 Ignition system

Item	125C.C.(4/5 speed)	150C.C.(4/5 speed)
Type	CDI electronic ignition	CDI electronic ignition
Ignition advance at idle	15deg BTDC @ 1400rpm	15deg BTDC @ 1400rpm
Maximum advance	32~35deg @ 3500rpm	32~35deg @ 3500rpm
Combustion type	Cyclic	Cyclic
Ignition coil type	AS41	AS41
Spark plug type	NGK D7 or DR-8EA	NGK D7 or DR-8EA
Thread	12 x 19	12 x 19
Gap	0.6 ~ 0.7mm	0.6 ~ 0.7mm

2.5.2 Generator

Item	125C.C.(4/5 speed)	150C.C.(4/5 speed)
Type	ACG flywheel	ACG flywheel
Voltage regulator / rectifier	Solid state	Solid state
Maximum output	0.12kw / 5000rpm	0.12kw / 5000rpm

2.5.3 Base

Item	125C.C.(4/5 speed)	150C.C.(4/5 speed)
Starting	Kick and electric	Kick and electric
Battery capacity	12V 6AH	12V 6AH
Fuse rating	15A	15A

2.5.4 Torque settings

Reference settings	Torque kg-m
5mm UNT BOLT	0.45~0.6
6mm UNT BOLT	0.8~1.2
8mm UNT BOLT	1.8~2.5
10mm UNT BOLT	3.0~4.0
12mm UNT BOLT	5.0~6.0
5mm SCREW	0.35~0.5
6mm SCREW	0.7~1.1
6mm RAISED EDGE SCREW	1.0~1.4
8mm RAISED EDGE SCREW	2.4~3.0
10mm RAISED EDGE SCREW	3.0~4.0

2.5.5 Points for attention

1.After disassembling , replace all the washer , oil-ring and clips.

2.Fasten the nuts by the diagonal way.

3.Use the specified parts and lubricating oil.

4.Use the tools by the rules.

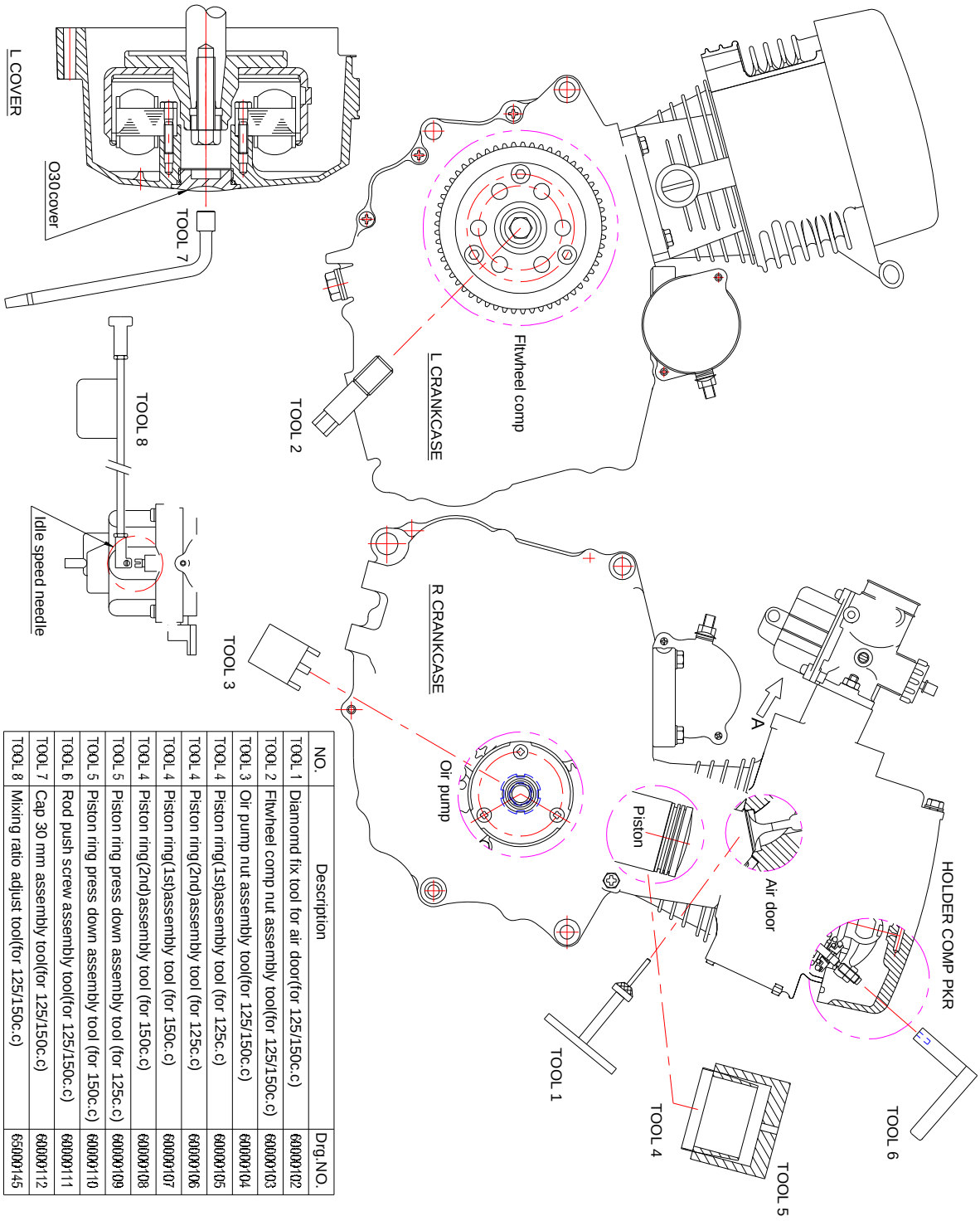
5.Use organic solvent to clean all the parts and smear with lubricating oil on their surface before assembling .

6.Add suitable grease by the rule.

7.Check the relative position of mechanism after assembling.

8.Pay attention to safety when you repair and maintain this machine.

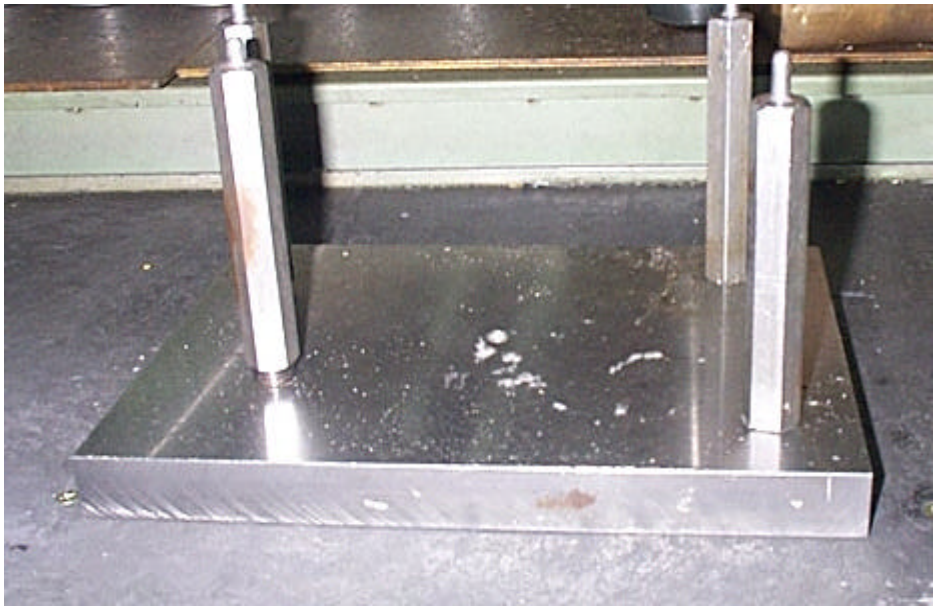
2.5.6 Special tools



NO.	Description	Drg.NO.
TOOL 1	Diamond fix tool for air door(for 125/150c.c)	60006102
TOOL 2	Fltwheel comp nut assembly tool(for 125/150c.c)	60006103
TOOL 3	Oir pump nut assembly tool(for 125/150c.c)	60006104
TOOL 4	Piston ring(1st)assembly tool (for 125c.c)	60006105
TOOL 4	Piston ring(2nd)assembly tool (for 125c.c)	60006106
TOOL 4	Piston ring(1st)assembly tool (for 150c.c)	60006107
TOOL 4	Piston ring(2nd)assembly tool (for 150c.c)	60006108
TOOL 5	Piston ring press down assembly tool (for 125c.c)	60006109
TOOL 5	Piston ring press down assembly tool (for 150c.c)	60006110
TOOL 6	Rod push screw assembly tool(for 125/150c.c)	60006111
TOOL 7	Cap 30 mm assembly tool(for 125/150c.c)	60006112
TOOL 8	Mixing ratio adjust tool(for 125/150c.c)	65006145

VALVE IN & OUT TOOL

(PART NO.:60000340)



CRANKCASE ASSEMBLY FRAMF

(PART NO.:60000310)

Chapter 3 Reason a breakdown

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	3.Reason a breakdown	NO	CG
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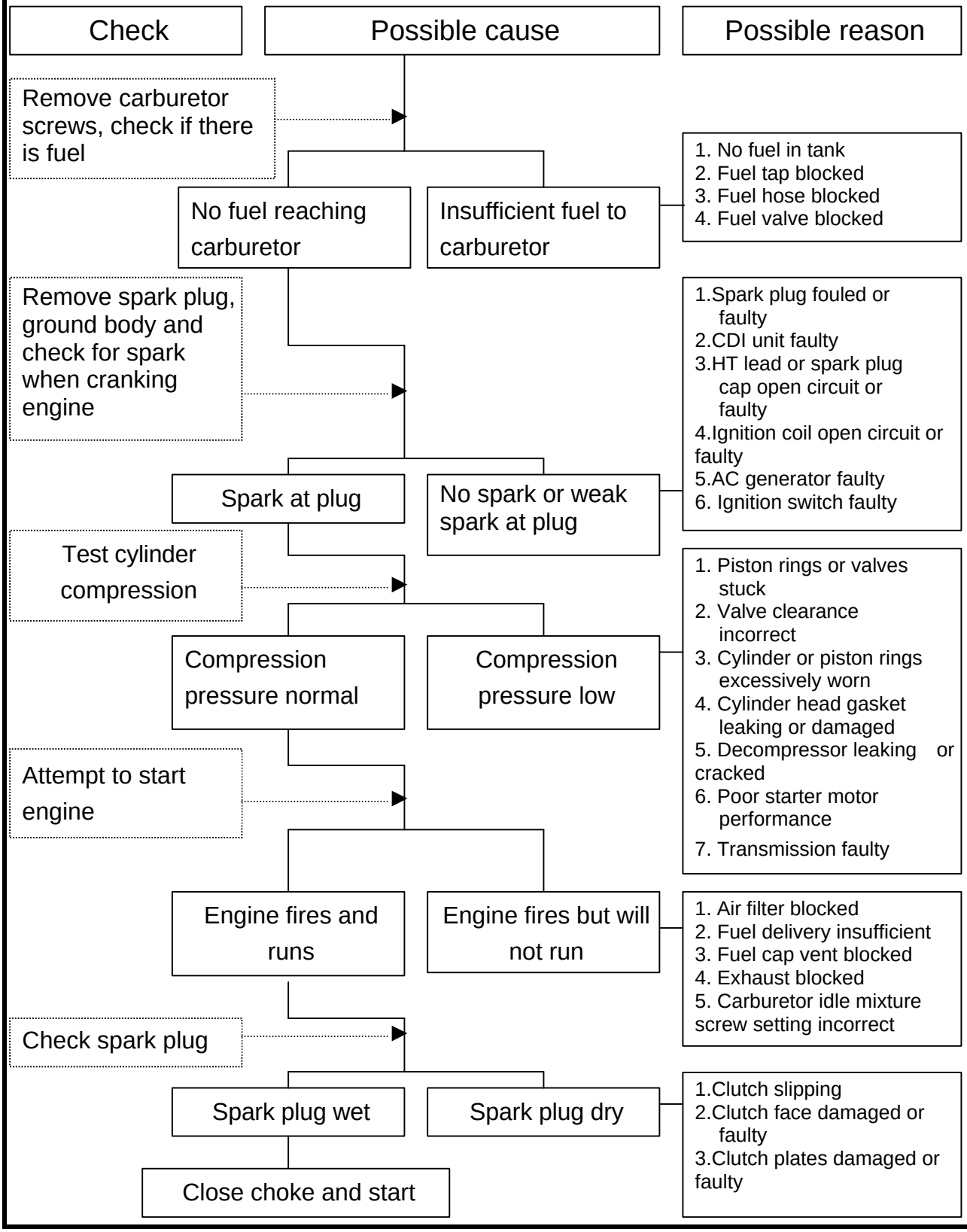
3.1 Engine is difficult or impossible to start



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	3.Reason a breakdown	NO	CG
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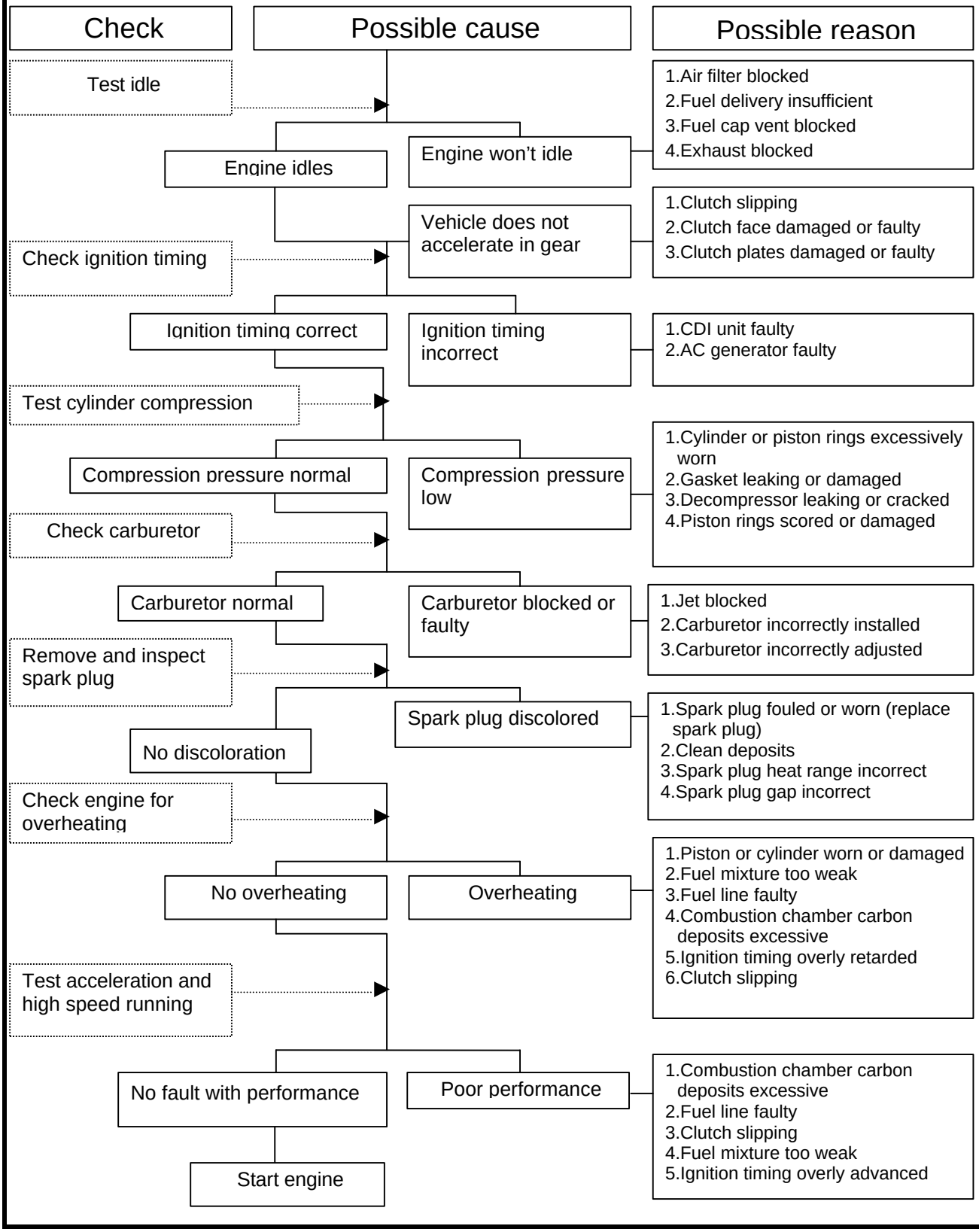
3.2 Engine output poor



	3.Reason a breakdown	NO	CG
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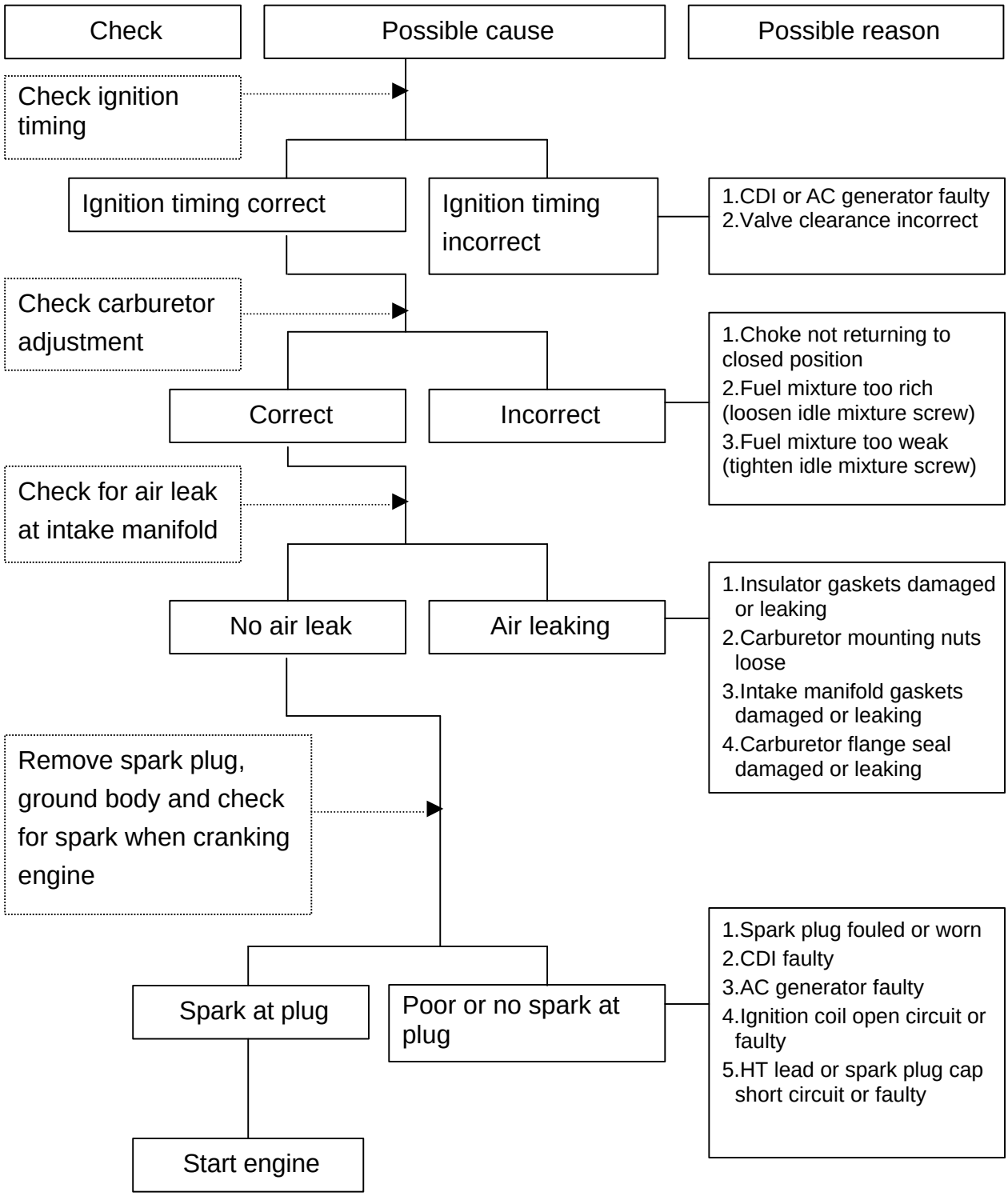
3.3 Idle or slow running poor



	3.Reason a breakdown	NO	CG
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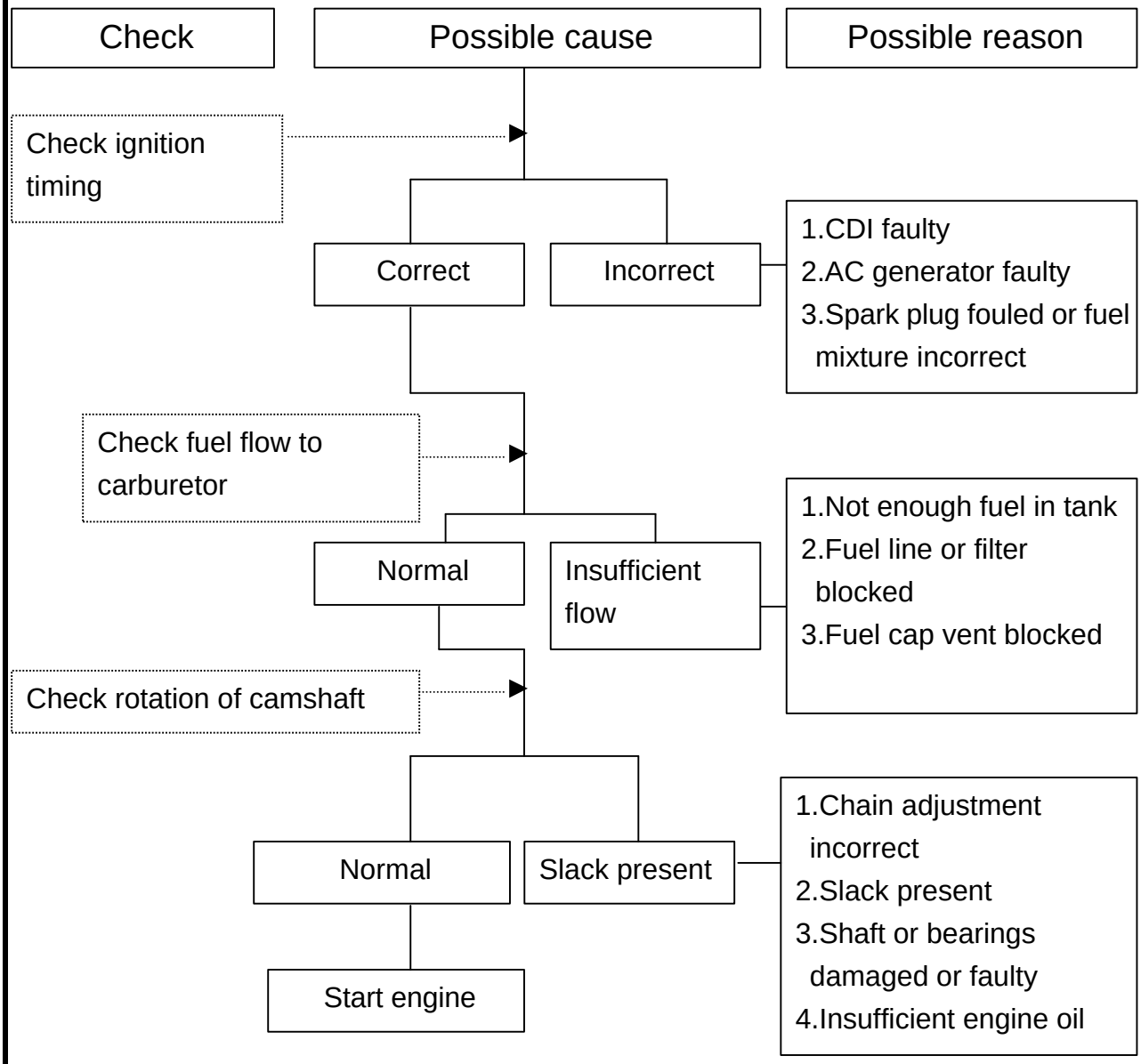
3.4 Poor high speed running



	3.Reason a breakdown	NO	CG
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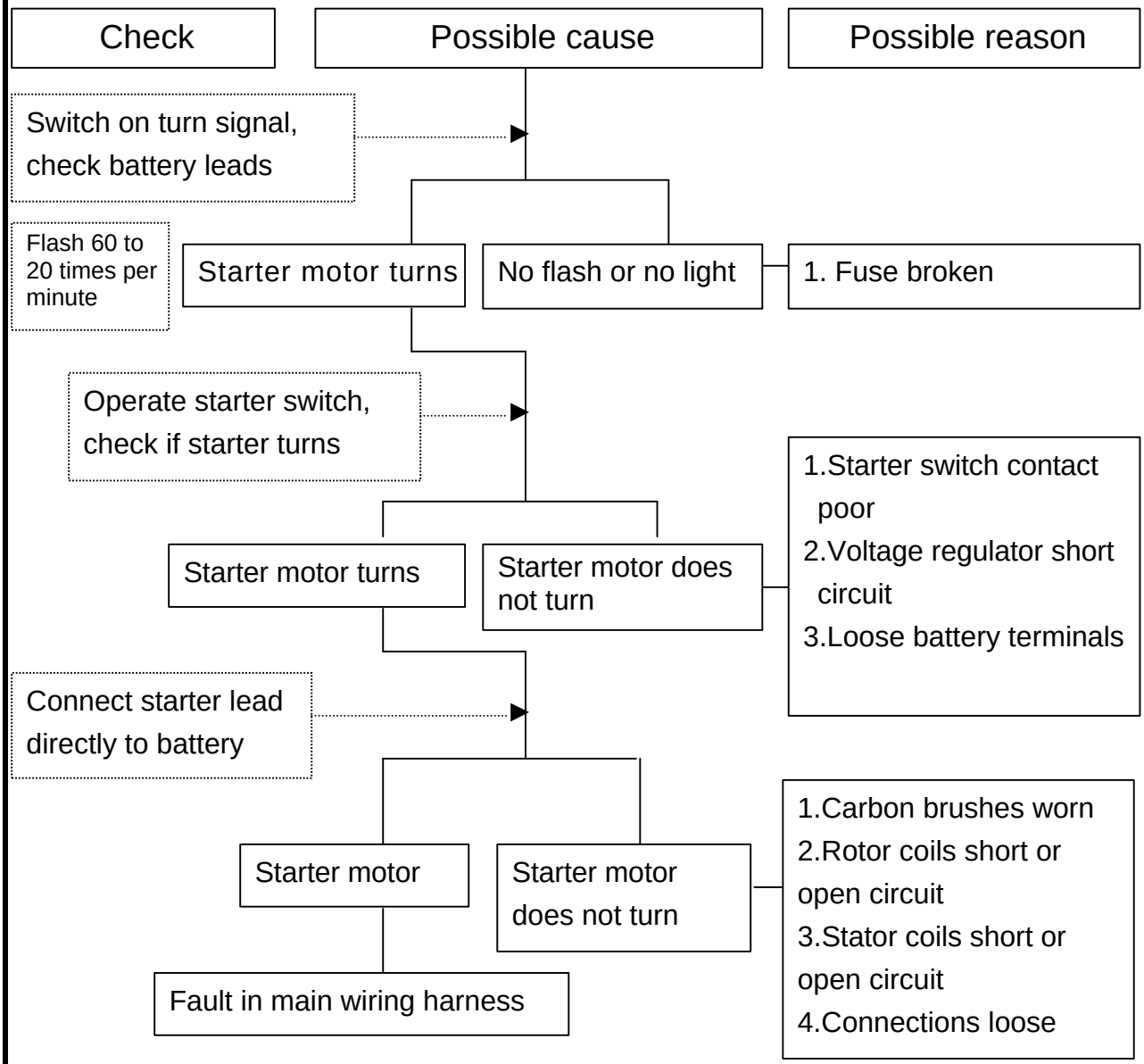
3.5 Starter motor inoperable



	3.Reason a breakdown	NO	CG
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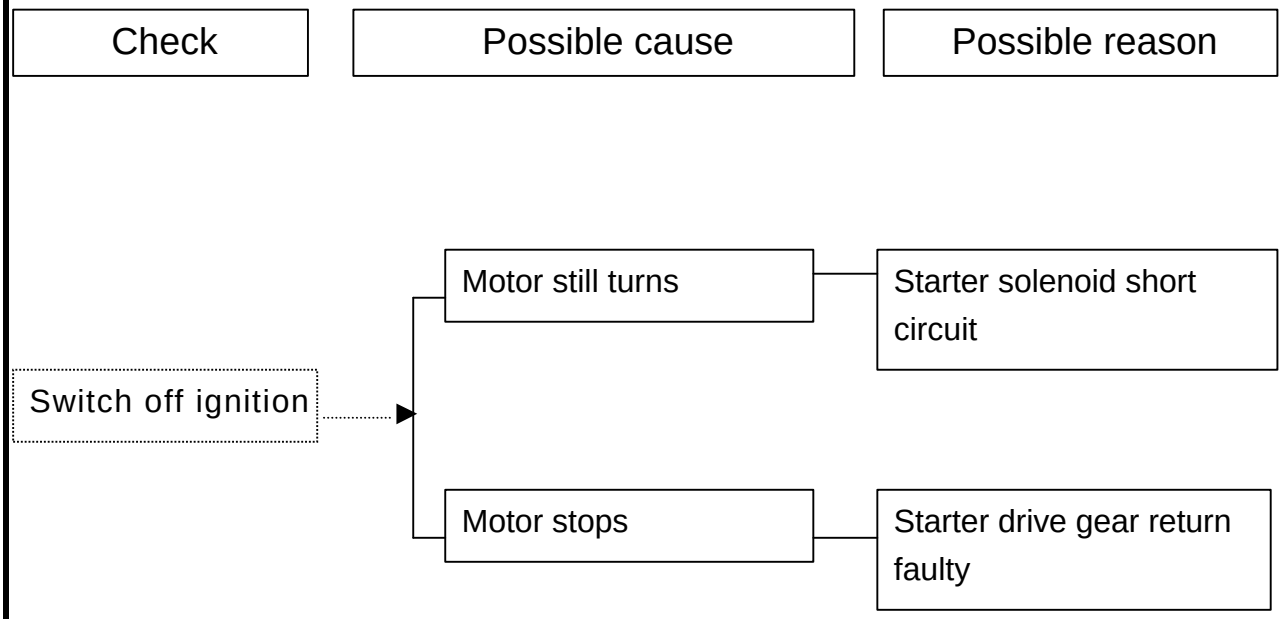
3.6 Starter turns constantly



3.7 Engine noisy

Possible cause	Possible reason
Tapping	1.Valve adjustment excessively loose 2.Valve rocker arms worn
Piston slap	1.Cylinder or piston worn 2.Combustion chamber carbon deposits excessive 3.Piston pin or connecting rod worn or damaged
Clutch noisy	1.Clutch drum drive tabs excessively worn
Starter or transmission noisy	1.Rear wheel cut drive worn or disintegrated 2.Primary gears worn 3.Transmission gears worn

3.8 High noxious emissions

CO level	HC level	Possible cause
High	Normal	1. Ignition system faulty a. Ignition timing incorrect b. Spark plug fouled or gap incorrect c. Voltage regulator faulty d. Ignition coil faulty e. Alternator plate or spark plug cap shorted 2. Exhaust valve worn 3. Cylinder worn
Low	High	1. Fuel mixture weak or ignition system faulty 2. Vacuum leak a. pressure pipe b. inlet manifold c. caps
High	High	1. Air filter blocked 2. Carburetor faulty a. Idle mixture too rich b. Float chamber incorrectly assembled c. Choke operation faulty d. Main jet loose e. Idle speed screw or needle seat worn

Chapter 4 Cylinder,cylinder head,valves and piston

	4.Cylinder,cylinder head,valves and piston	NO	CG
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4.1Reason a breakdown

Compression pressure low

Valves
Valve clearance incorrect.
Valve bent or burnt.
Valve timing incorrect.
Valve spring broken.

Cylinder head.
Cylinder head gasket damaged and leaking.
Cylinder head warped.
Compression too high.
Combustion chamber carbon deposits excessive

Piston.
Cylinder and piston worn or damaged. excessive.

Other causes
Combustion chamber carbon deposits

Engine noisy
Valve clearance incorrect.
Valve spring broken.
Pushrods and rocker spindles loose.
Push rods worn or bent
Cam lobes worn
Camshaft worn
Cylinder or piston worn
Excessive carbon deposits

Excessive smoke from exhaust
Valves, piston or piston rings worn or damaged
Piston rings installed incorrectly
Cylinder or piston scored

Note:
The rockers, rocker support and pushrods can be serviced with the engine installed in the chassis.
Oil to the valve train passes through the cylinder block into the head. Take care not to block the oil passage.
Replace the locating dowels.
Put some fresh engine oil into the cylinder head and a smear of grease on the valve cover when installing.
During service do not scratch or score the cylinder head

Torque settings:

Cylinder head nuts	2.8~3.0kgm
Cylinder head screws	2.8~3.0kgm
Cylinder head studs	1.0~1.4kgm
Rocker support	1.0~1.4kgm

Hartford	4.Cylinder,cylinder head,valves and piston	NO	CG
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4.2Specifications

Part	Item	Specification	Service limit
Rocker arms	Inner diameter	12.000~12.018mm	12.1mm
Rocker spindle	Outer diameter	11.984~11.966mm	12.0mm
Pushrod	Cup radius and length	6.5mm/141.5mm	----------
Outer valve spring	Free length	40.9mm	39.7mm
Inner valve spring	Free length	33.5mm	32.5mm
Outer valve spring	Pressure @ length	15.6kg/35.4mm	----------
Inner valve spring	Pressure @ length	7.1kg/30.7mm	----------
Inlet valve stem	Diameter	5.450~5.465mm	5.42mm
Exhaust valve stem	Diameter	5.430~5.445mm	5.40mm
Inlet valve guide	Inside diameter	5.484~5.488mm	5.50mm
Exhaust valve guide	Inside diameter	5.484~5.488mm	5.50mm
Inlet valve to guide	Clearance	0.010~0.035mm	0.08mm
Exhaust valve to guide	Clearance	0.030~0.035mm	0.10mm
Cylinder(125cc)	Bore	56.500~56.513mm	56.6mm
	Out of round	----------	0.05mm
	Obliqueness	----------	0.05mm
Cylinder (150cc)	Bore	62.000~62.013mm	62.1mm
	Out of round	----------	0.05mm
	Obliqueness	----------	0.05mm
Piston(125cc)	Diameter	56.460~56.480mm	56.360mm
Piston pin hole	Diameter	15.002~15.008mm	15.05mm
Piston pin	Outer diameter	14.993~15.00mm	14.85mm
Piston / bore		0.020~0.050mm	0.11mm
Piston(150cc)	Diameter	61.990~61.970mm	61.890mm
Piston pin hole	Diameter	15.002~15.008mm	15.05mm
Piston pin	Outer diameter	14.993~15.00mm	14.85mm
Piston / bore		0.020~0.050mm	0.11mm
Piston ring to Clearance	1st	0.025~0.055mm	0.13mm
	2nd	0.015~0.045mm	0.12mm
Installed end gap	1st	0.15~0.35mm	0.5mm
	2nd	0.15~0.30mm	0.5mm
	Oil ring	0.20~0.50mm	----------
Piston Thickness	1st	1.160~1.185mm	1.15mm
	2nd	1.175~1.190mm	1.16mm

4.3 Removing the cylinder

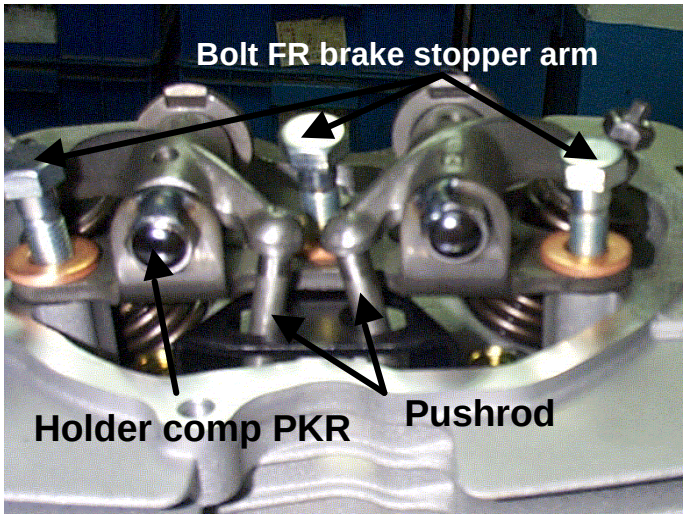
4.3.1 Removing the cylinder head cover

Remove the 6mm x 12mm screws
Remove three 6mm x 28mm cylinder head screws
Remove the valve cover and gasket

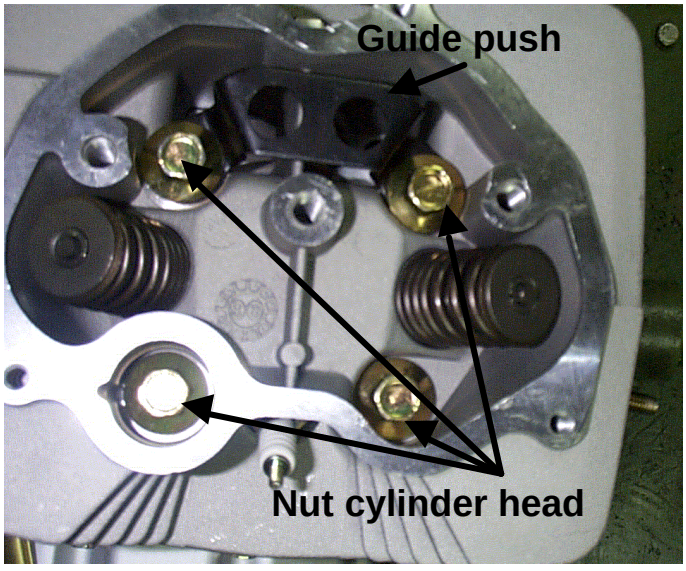
Note: to preserve seal and prevent oil and / or air leaks, do not damage the cylinder head or valve cover mating faces.

4.3.2 Removing the cylinder head

Rotate the engine and find TDC on the compression stroke
Remove the three rocker support bolts
Remove the rocker support
Remove the pushrods



Remove the four cylinder head bolts
Remove the pushrod guide plate
Remove the cylinder head and gasket
Remove the valve retaining collets
Remove the three 10 x 20mm cylinder locating dowels



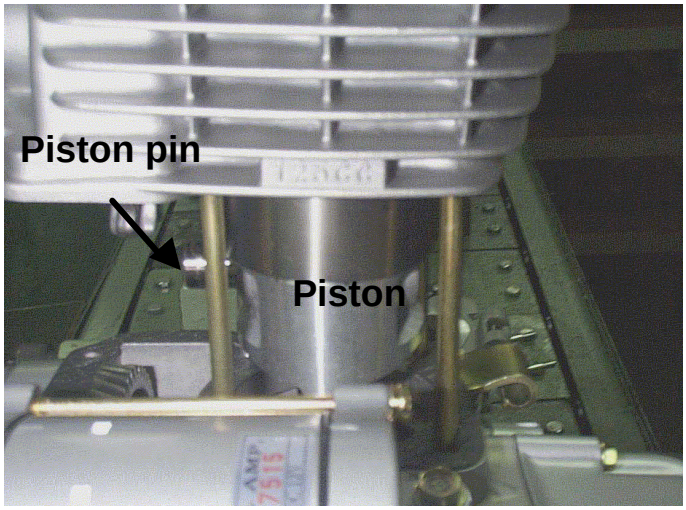
4.3.3 Removing the cylinder

Removing the cylinder

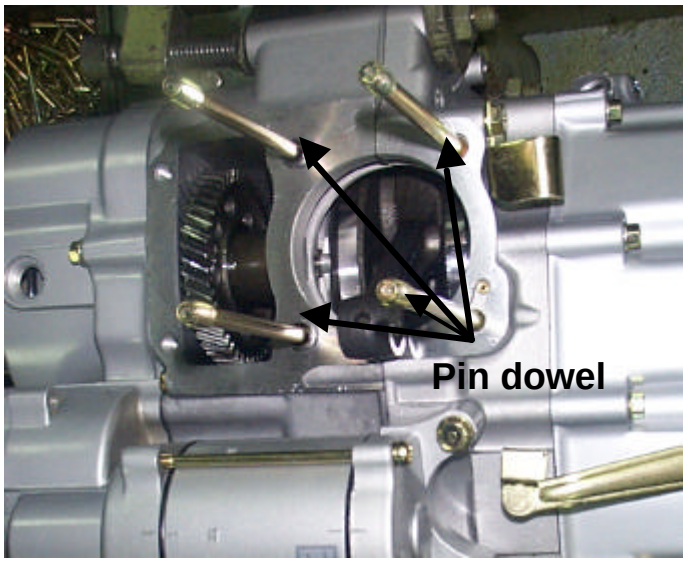
Note: to prevent distortion or damage to the cylinder or piston, avoid the use of excessive force disassembling

Remove the piston pin clips and piston pin

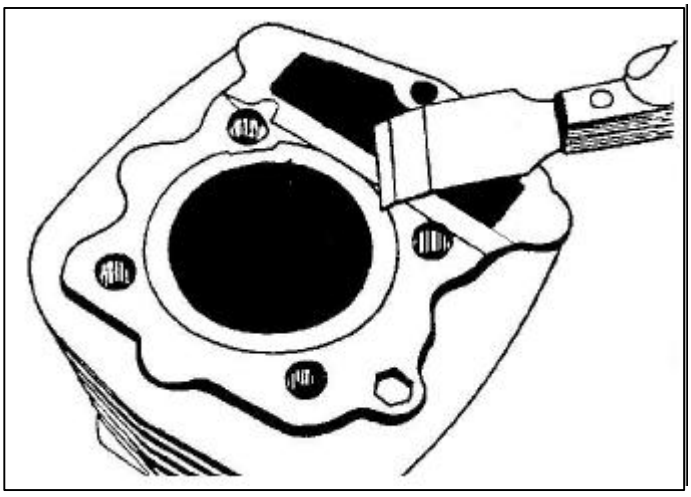
Remove the piston, do not allow the piston pin or clips fall into the crankcase



Remove the cylinder base gasket
Remove the four cylinder studs
Remove the four cylinder locating dowels



Remove and discard the cylinder head gasket
Remove and discard the cylinder base gasket
Remove the traces of gasket sealant from the cylinder and head



Note: to preserve seal and prevent oil and / or air leaks, do not damage the cylinder head or valve cover mating faces.

	4.Cylinder,cylinder head,valves and piston	NO	CG
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4.4 Inspection and overhaul

4.4.1Check the holder comp pkr

Inspect the rocker support and pushrod cups for wear or damage

Check the rocker spindle bore for wear, scuffing or burning

Rocker bore service limit: 12.1mm

4.4.2 Check the pushrod

Check the pushrod ends for wear or damage

Check the pushrods for bending or distortion

If unserviceable, replace

4.4.3Check the guide pushrod

Check the plate damage or rusting

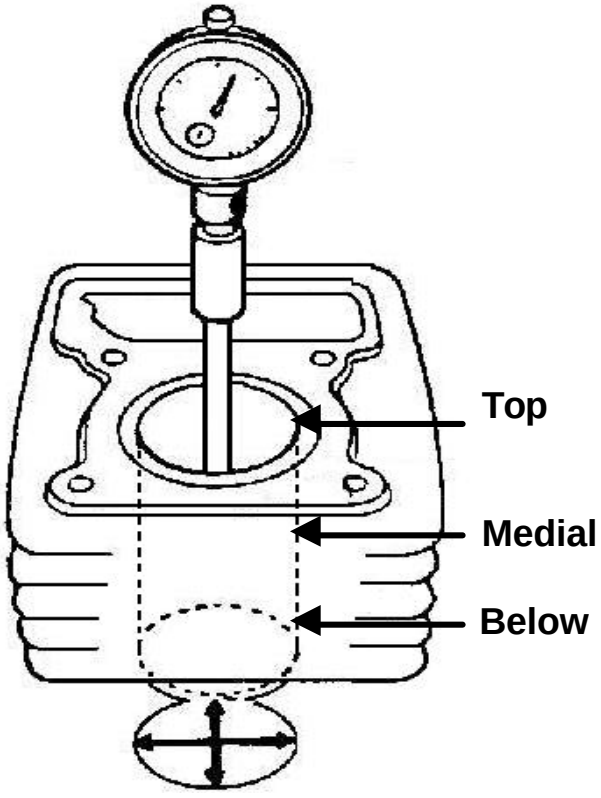
If the pushrods do not move freely, replace the plate

4.4.4Check the cylinder

Check the cylinder bore for scoring or burning

Measure the cylinder bore

Use a dial indicator to measure for bore out of round



Service limits

Out of round : 0.050mm

Obliqueness: 0.050mm

Bore diameter(125cc):56.60mm
Bore diameter(150cc):62.1mm

	4.Cylinder,cylinder head,valves and piston	NO	CG
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4.4.5Check the piston

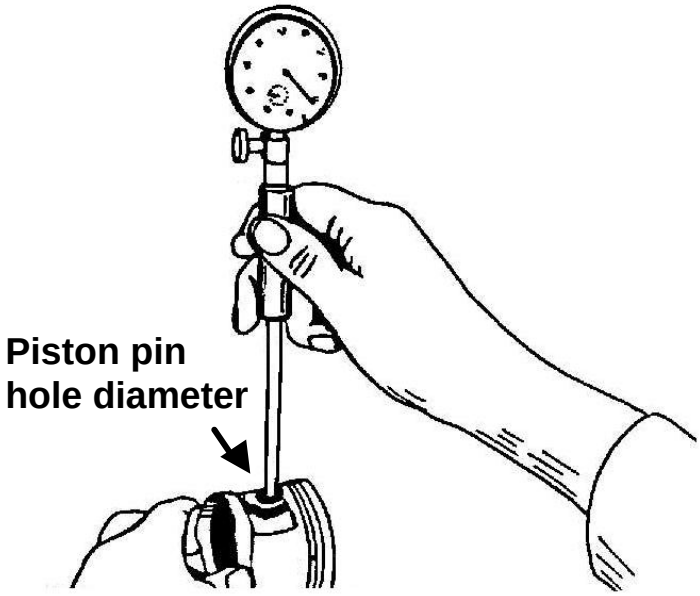
Measure the piston ring to groove clearance Remove the piston rings Inspect the piston rings for scoring or damage. Measure the piston pin hole diameter and ovality

Service limit : 15.05mm

Measure the diameter of the piston

Service limit (125cc):56.36mm

(150cc):61.89mm



Measure the 1st piston ring thickness

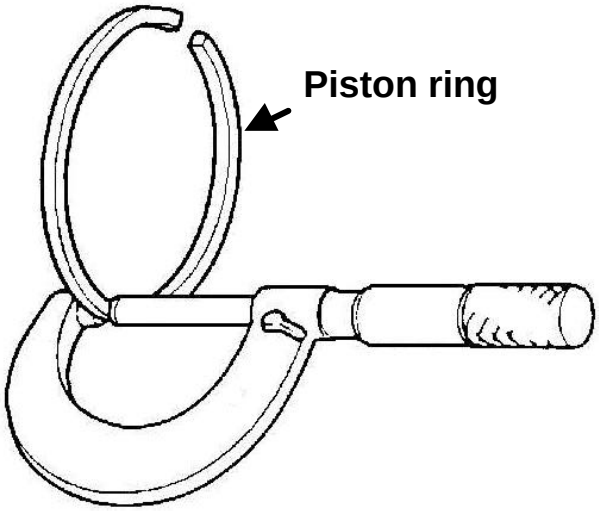
Service limit: 1.15mm

Measure the 2nd piston ring thickness

Service limit: 1.16mm

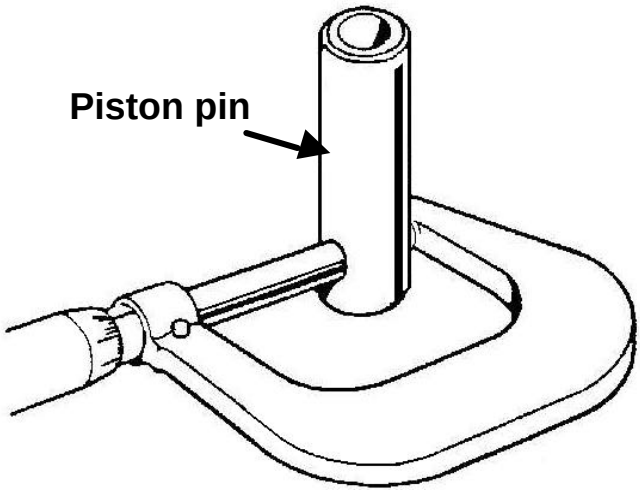
Insert the piston rings into the bore and measure the ring gap

Piston ring gap service limit: 0.5mm



Measure the piston pin outer diameter

Service limit : 14.85mm



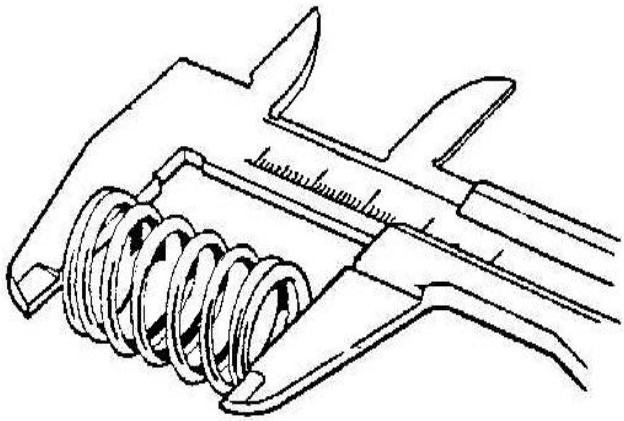
4.4.6Check the spring valve

Measure the free length of the valve springs Inspect the piston rings for scoring or damage

Measure the piston pin hole diameter and ovality

Outer spring service limit: 39.7mm

Inner spring service limit: 32.5mm

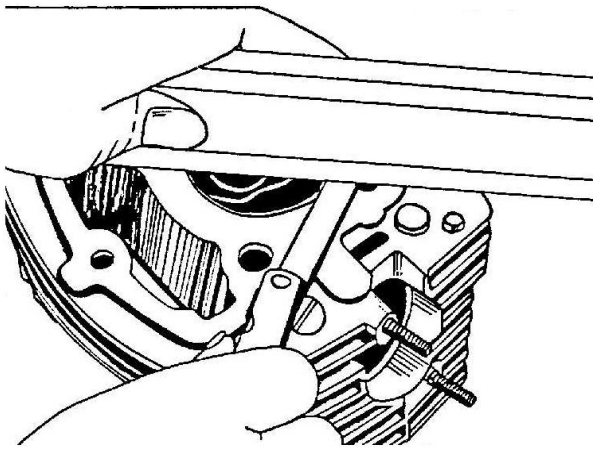


4.4.7Check the cylinder head

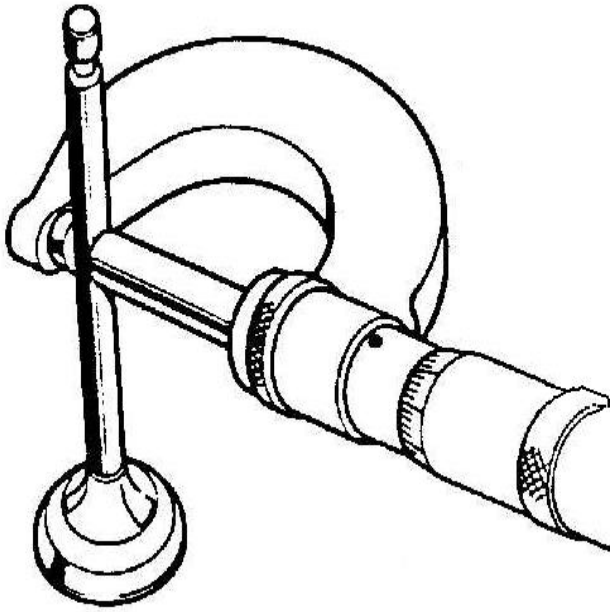
Check the cylinder head for scoring or damage

With a straight-edge and feeler gauges,check the head gasket surface for warping or distortion

Service limit : 0.10mm



4.4.8 Inspect the valves and valve guides



Inspect the valve stems for scoring, damage or burning.

Check that the valves move freely inside the valve guides.

Measure the diameter of the valve stems Valve guide inside diameter service limit.

Inlet valve service limit: 5.42mm

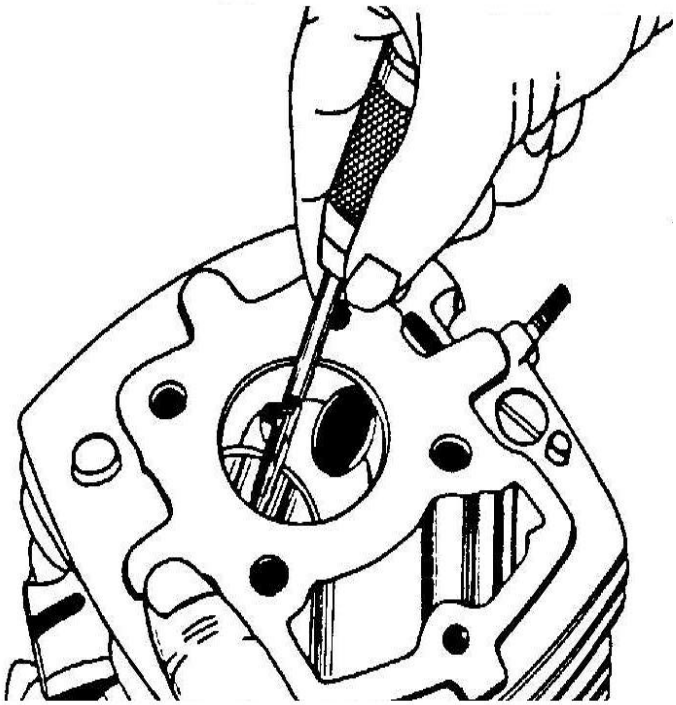
Inlet valve service limit: 5.40mm

Valve guide inside diameter service limit

Inlet valve: 5.50mm

Exhaust valve: 5.40mm

Before measuring the valve guide diameter, remove carbon deposits



Subtract the stem diameter from the valve guide inside diameter and obtain the clearance

Inlet valve: 0.08mm

Exhaust valve: 0.10mm

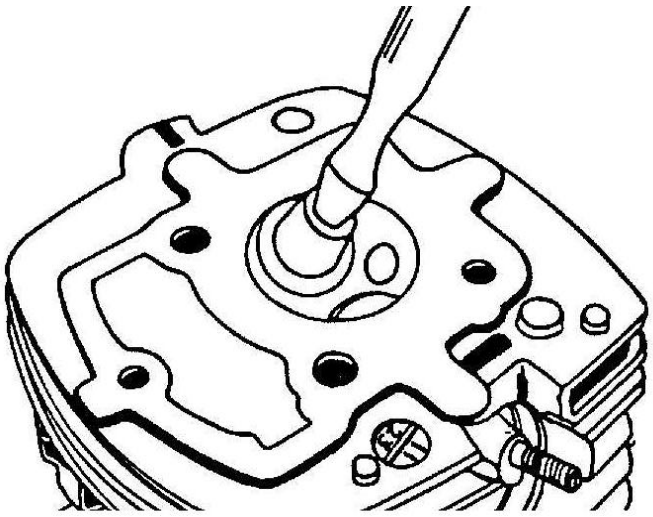
If the clearance exceeds the service limit,replace the valve and / or the valve guide

Note: when replacing the valve or guide, the valve seat must be ground

Hartford	4.Cylinder,cylinder head,valves and piston	NO	CG
		Page	4-9

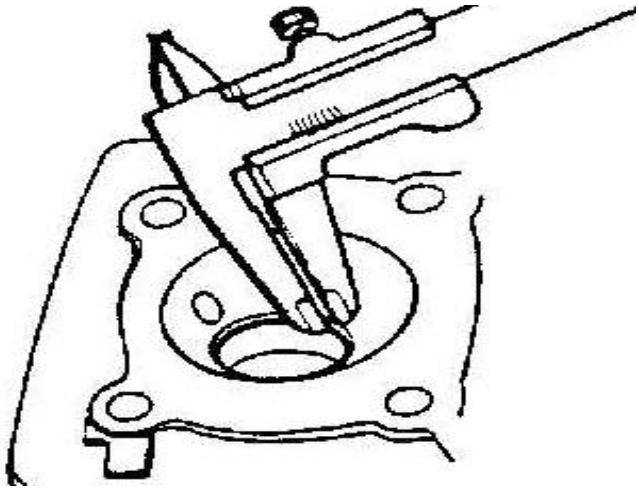
4.4.9 Inspect / overhaul the valve seats

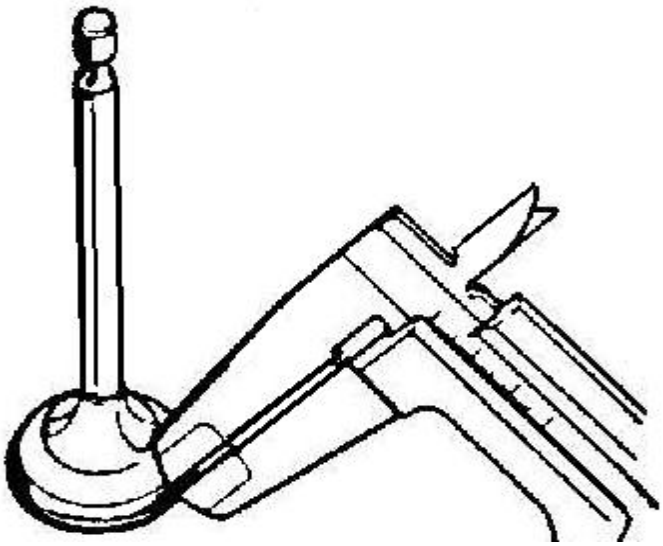
Remove the carbon deposits from the inlet and exhaust valves.
Place a smear of red ink on the valve contact face and rotate the valve in it's seat twice.Observe the width and regularity of the contact patch



Replace with new parts valves that are bent or burnt

If the valve seat is pitted or burnt it must be ground
Use 4 to 5 kg of pressure and a right – left rocking motion to re-finish the valve seat surface. Use oil.First use a 45 degree cutter to face the valve seat, then a 32 degree cutter to face the next ¼ of the total seat width. The 60 degree cutter is used to face the next ¼ of the total seat width. Finally, the 45 degree cutter is used again to finish the lower part of the seat If the valve seat edge is too high, use a 37.5 degree angle cutter to remove material, and a 45 degree cutter to correct the angle If the valve seat edge is too low, use a 63.5 ° degree angle cutter to remove material,and a 45 degree cutter to correct the angle.
Remove the abrasive residue from grinding to prevent premature wear and encourage god sealing of the valve.





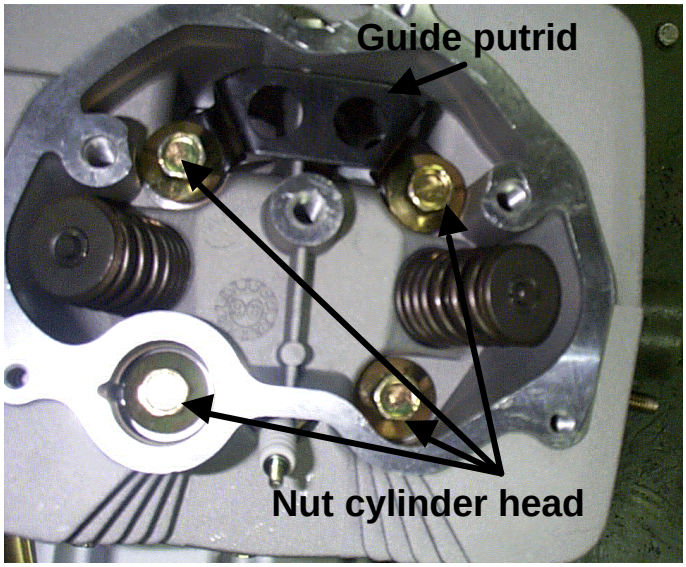
4.5Install the cylinder

4.5.1Install the cylinder

Always install new valve stem seals when replacing the valves

Lubricate the valve stems with oil and replace them

Install the valve springs retainers and collets



Do not over-compress the valve springs with the valve spring compressor

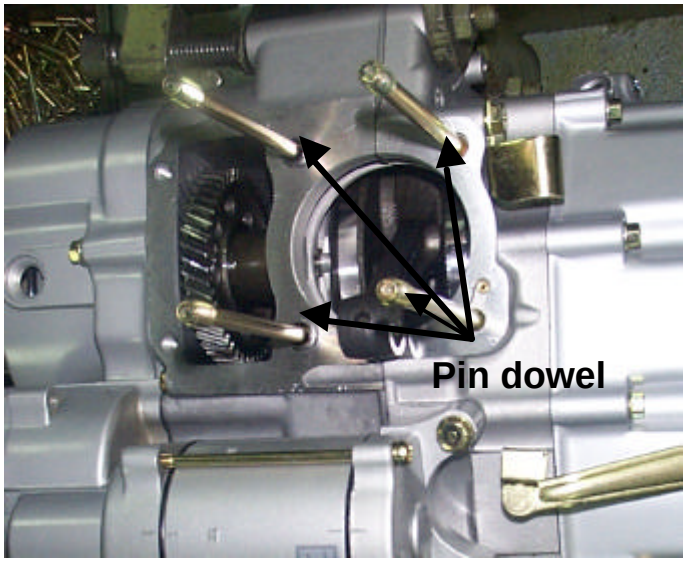
Make sure the retainers and collets are correctly install or serious engine damage is likely.

Reinstalling the cylinder

Fit a new cylinder base gasket

Reinstall the locating dowels and the four cylinder studs.

Tighten the studs into the crankcase with1.0~1.4 kg-m of torque

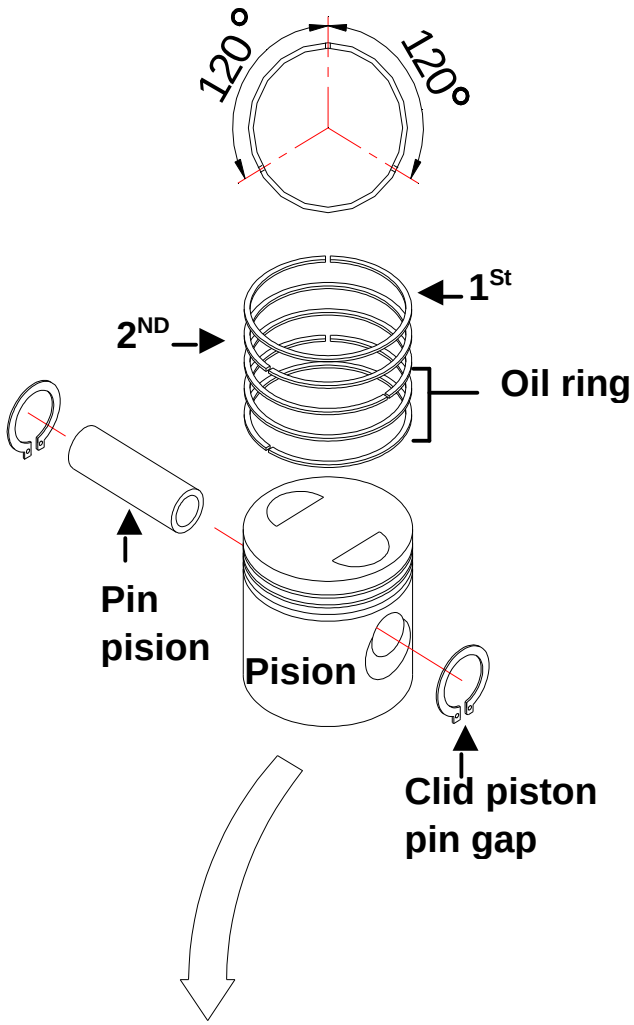


Take care not to drop any debris into the crankcase

4.5.2Reinstall the piston rings

Reinstall the piston rings with the gaps spaced at 120 degrees around the piston

Avoid damaging the piston or rings during installation
The mark on the piston ring indicates the upper side
The rings should move freely in their grooves

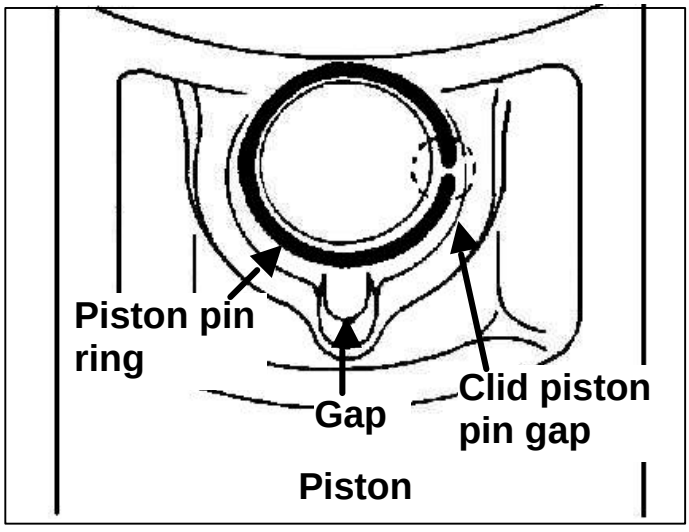


Install into cylinder as far as the piston pin boss.Align with the connecting rod and replace the piston pin.Use long nose pliers to reinstall the locating

New circlips should used
The ends of the circlip should not touch when reinstalled

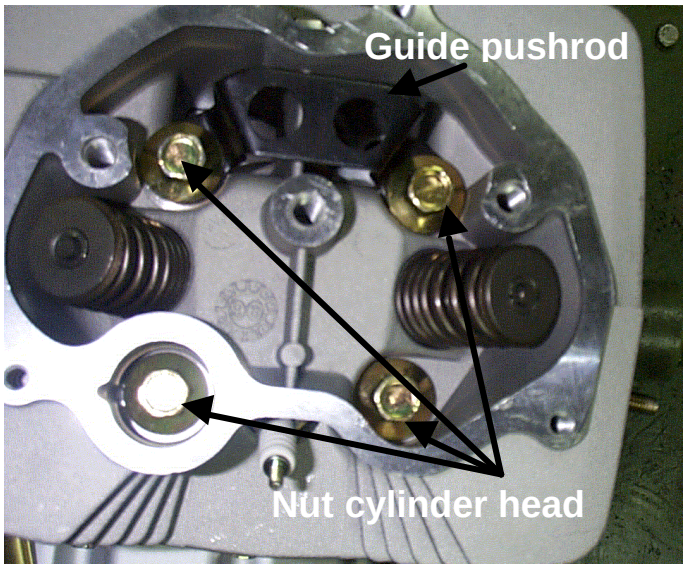
Take care not to drop a circlip into the crankcase

Be sure that the piston is at TDC on the compression stroke

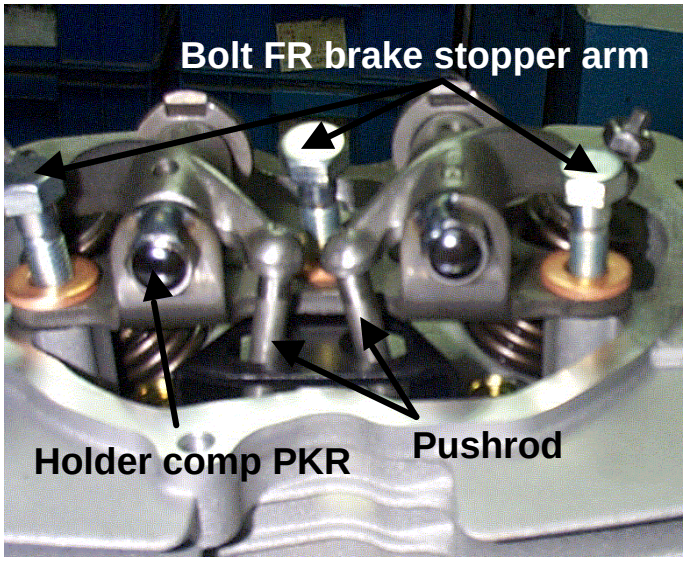


4.5.3Install cylinder head

Replace the three 10mm x 20mm cylinder head locating dowels.
Replace the cylinder head with a new gasket.
Replace the rocker arms and support assembly.
Replace the four cylinder head nuts
Tighten to 2.8~3.0kgm torque

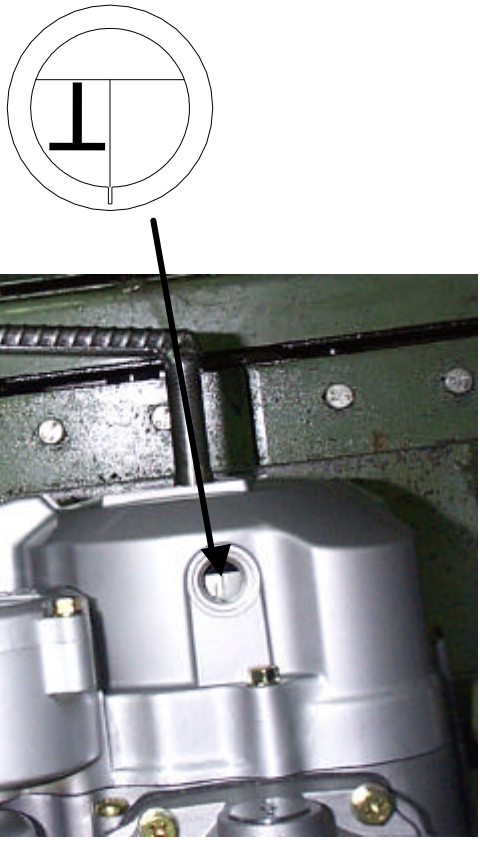


Install the pushrods
Install the three bolts
Tighten to 1.0~1.4kgm



	4.Cylinder,cylinder head,valves and piston	NO	CG
		Page	4-13

Smear some grease into the rocker arm and before engaging the pushrods
Pour a little fresh engine oil into the cylinder head.
Check that the“T”mark on the alternator still aligns with pointer in the alternator case



Be sure that the piston is at TDC on the compression stroke

Adjust by loosening the locking screws and rotating the adjusting screw.Re-tighten and check clearance again
Valve clearance should be 0.06~0.08mm inlet and exhaust

Reinstall the valve cover with a new rubber O-ring and oil lightly
Replace the three 6 x 28mm cylinder head screws
Tighten to 2.8~3.0kg-m torque
Replace the 6 x 12mm screws and tighten to 1.0~1.4kg-m torque

Chapter 5 Generator/Start motor

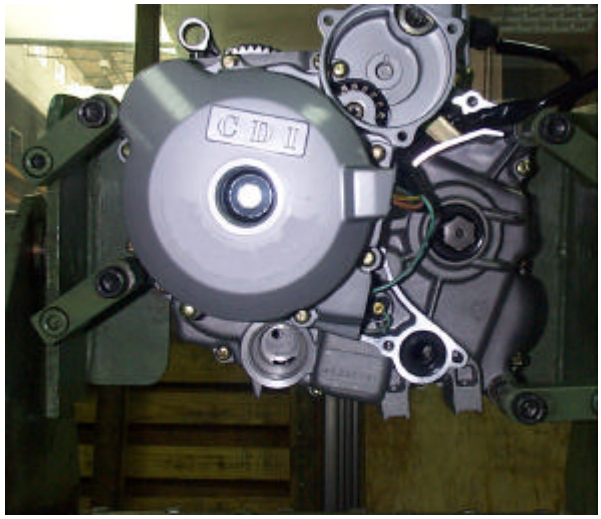
Hartford	5.Generator/Start motor	NO	CG
		Page	5-1

5.1Generator

5.1.1Removing the lift crank case

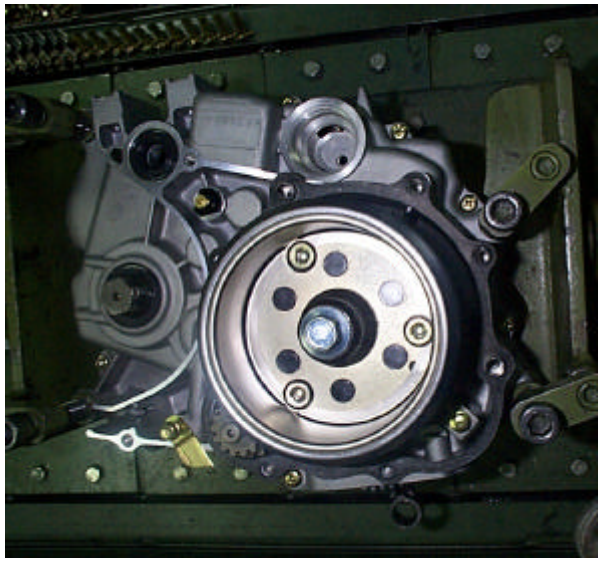
Remove the starter gear cover
Remove the gearshift pedal
Remove the alternator cover

The alternator is retained in the cover by four screws which can be removed to dissemble it



5.1.2 Removing the generator rotor

Remove the alternator cover
Remove the alternator retaining bolt
Remove the alternator rotor
Remove the alternator stator coil from the cover

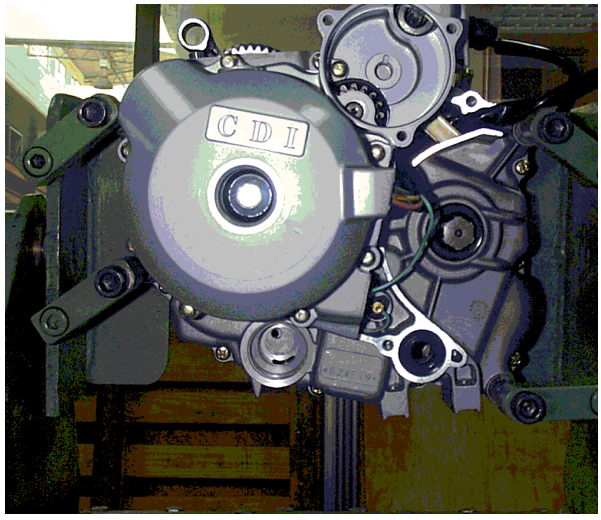


5.1.3Installing the generator rotor

Inspect the coils for damage from contact with the rotor
Inspect the coils for signs of short circuit or broken wires
Replace the coil with a new part if necessary.
Replace the coil taking care to avoid the coil or its leads touching the rotor.
Replace the rotor and tighten the retaining bolt to 2.6~3.2kgm torque

5.1.4Installing the lift crank case

Replace the alternator cover with the stator coil installed
Refit the electrical connector block
Replace the electrical wire to the neutral indicator switch
Replace the rear half of the left side engine cover
Replace the gearshift pedal
Replace the starter gear cover

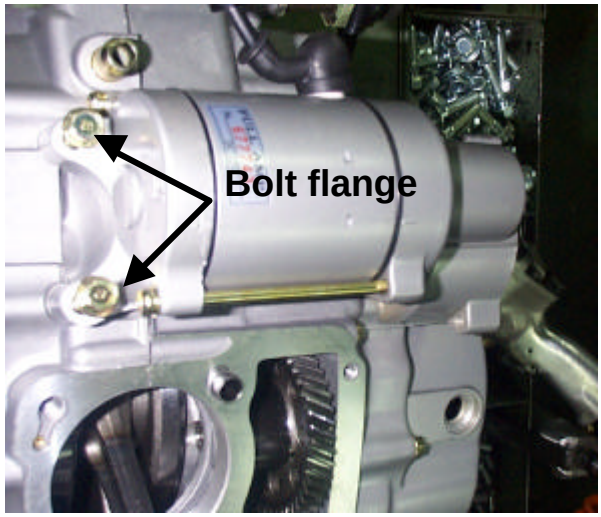


5.2 Start motor

5.2.1Removing start motor

Remove the starter motor cable from the terminal

Remove the starter motor retaining screws. Remove the starter motor

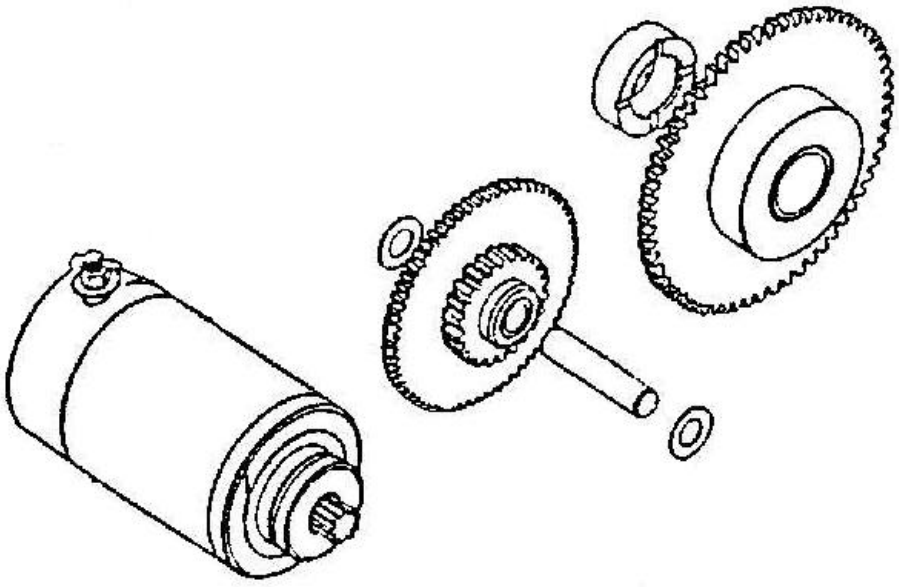


5.2.2 Removing the starter drive gears

Remove the starter motor drive gear shaft

Remove the starter reduction gear and shaft

Reassemble is the reverse of disassembly



5.2.3Installing the starter motor

Reassemble is the reverse of disassembly

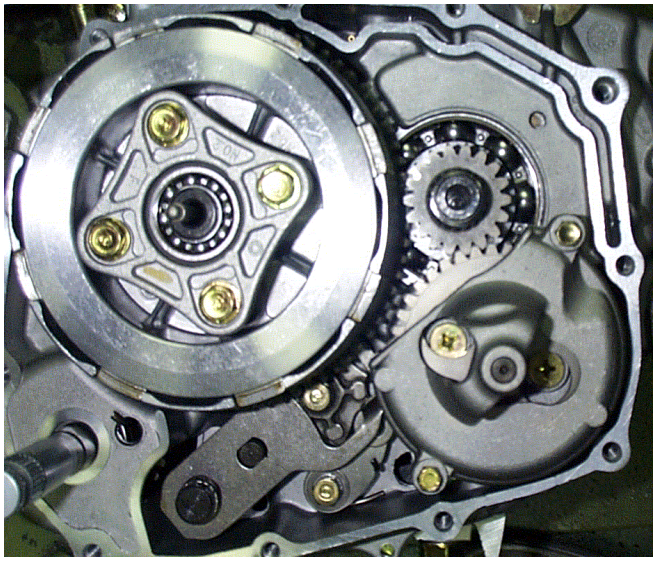
Replace the starter motor and tighten the retaining bolts to 0.8~1.2kg-m

Chapter 6 Clutch/Transmission

Hartford	6.Clutch/Transmission	NO	CG
		Page	6-1

6.1 Reason a breakdown

If the clutch operation is faulty, first attempt to cure the condition by adjusting the clutch cable.

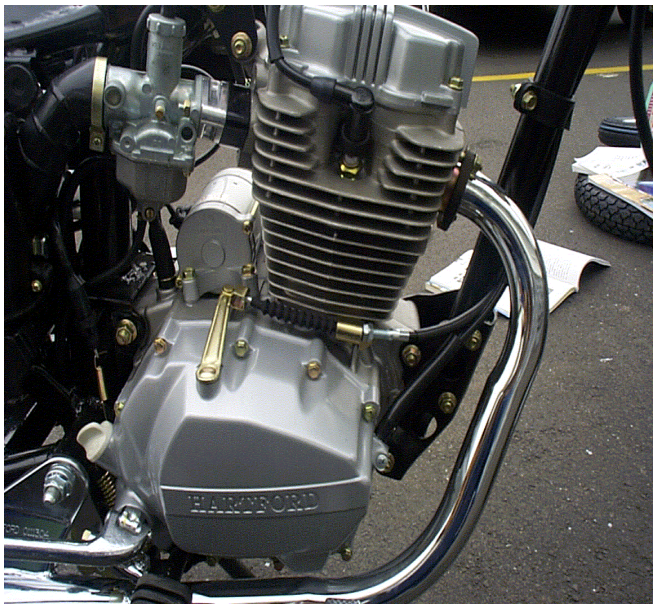


A)Clutch slips under acceleration

1.No slack in the clutch cable
2.Clutch plates worn
3.Clutch springs weak

B)Clutch fails to release (vehicle creeps in gear)

1.Too much slack in clutch cable
2.Distorted clutch parts



C)Clutch lever loose

1.Clutch cable
2.Clutch operating mechanism worn or damaged

D)Difficulty changing gear

1.Gearshift plate distorted
2.Clutch cable adjustment incorrect

E)Gearshift pedal detent poor

1.Gearshift return spring broken or displaced
2.Gearshift shaft distorted

F)Transmission jumps out of gear

1.Gearshift cam detent spring broken

G)Low oil pressure

1.Oil pump gears worn
2.Oil pump faulty

Special tools

Four-leg socket wrench

Air impact wrench

Tightening torque

Clutch cover screws:0.8~1.2 kg/m

Oil filter cover screws:4.0~5.0 kg/m

Item	New specification	Service limit
Clutch operating arm free slack	10~20mm	
Clutch spring free length	35.5mm	32.4mm
Clutch friction plate thickness	3.0mm	2.5mm
Clutch plate distortion	0.2mm	
Oil pump inner rotor clearance	0.30mm	0.35mm
Outer rotor to body clearance	0.30~0.36mm	0.40mm
Oil pump cover plate clearance	0~0.06mm	0.11mm

6.1.1Removing the right crank case cover

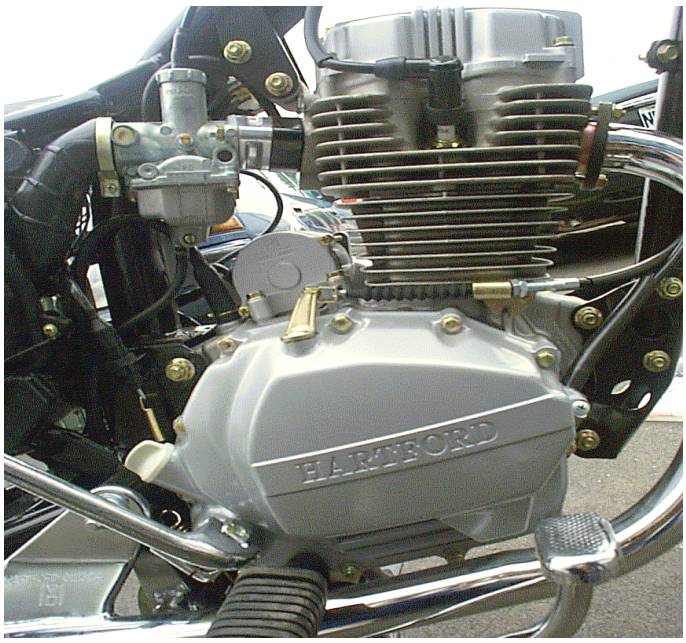
Remove the exhaust

Remove the footrests

Remove the clutch cable

Remove the kickstarter

Remove the right crank case cover



6.2Clutch

6.2.1Removing the clutch

Remove the clutch pushrod.

Remove the centrifugal oil filter body.

Use the four-leg socket wrench and air impact wrench to remove the16 mm retaining nut.

Remove the oil filter body.

Remove the oil seal and clutch pushrod.

Remove the clutch center 20mm C clip.

Remove the clutch spring pressure plate screws.

Remove the clutch spring pressure plate and springs.

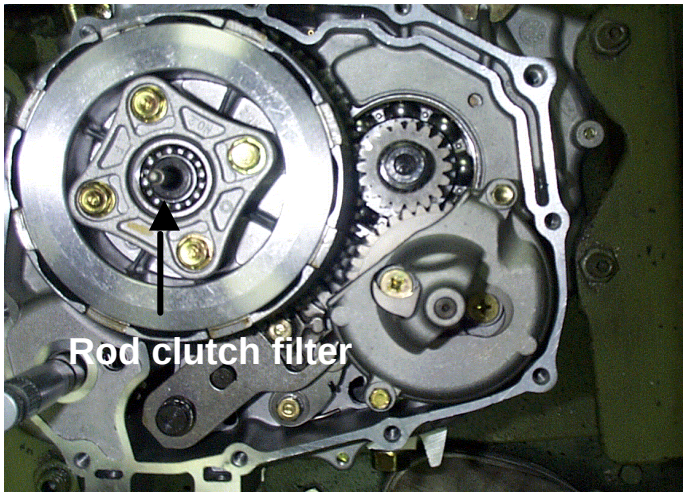
Remove the clutch center.

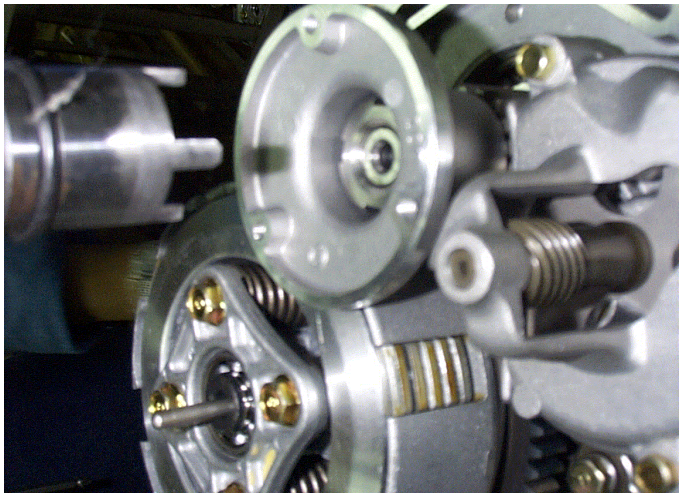
Remove the clutch friction plates.

Remove the clutch plates and pressure plate.

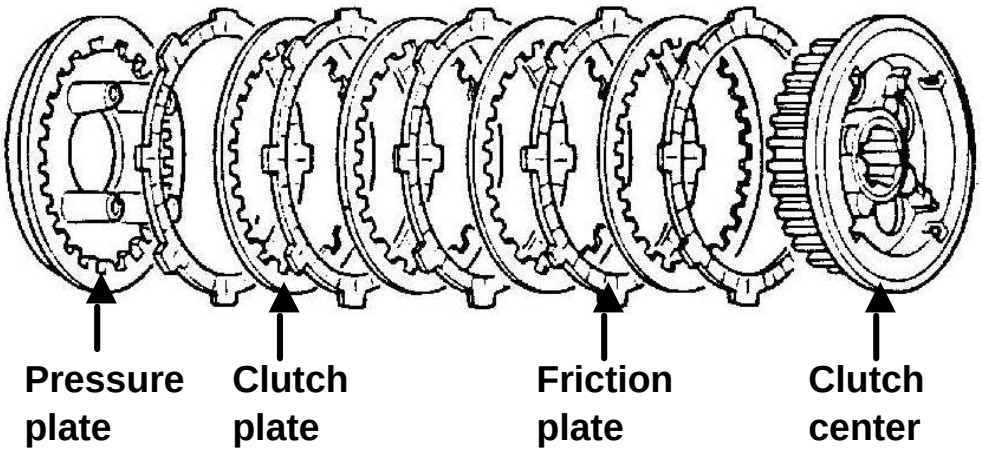
Remove the 20mm retaining ring washer.

Remove the clutch basket.





6.2.2Check the clutch



- Inspecting the friction plates
  Measure the thickness of the friction plates and inspect for wear, scoring or damage.
  Replace as complete set if necessary
  Service limit: 2.5mm

- Inspecting the clutch basket
  Remove the 20mm washer and the clutch basket.
  Check the faces of the drive slots for indentation

- Inspecting the clutch springs
  Measure the free length of the four clutch springs
  Service limit: 32.4mm

- Inspecting the clutch plates
  Measure the distortion of the plates with a feeler gauge and a flat surface
  Service limit: 0.2mm

- Replacing the clutch
  Reassembly is the reverse of disassembly

When replacing the clutch springs, tighten the four spring pressure plate screws evenly in sequence tighten to 4.0~5.0kg-m^2

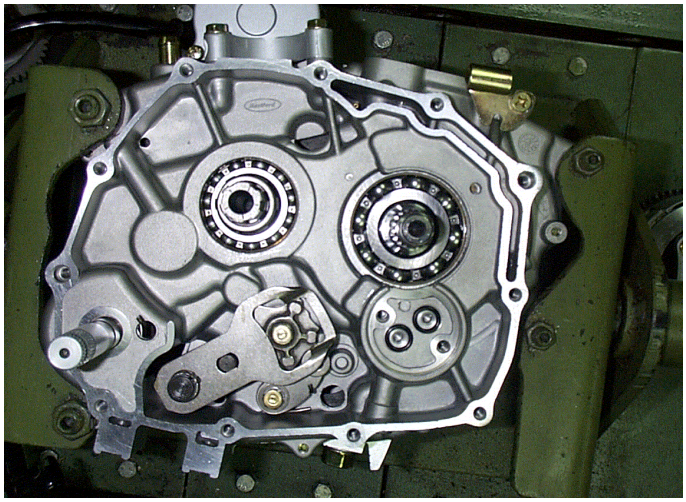
6.3 Transmission

6.3.1Removing the gearshift mechanism

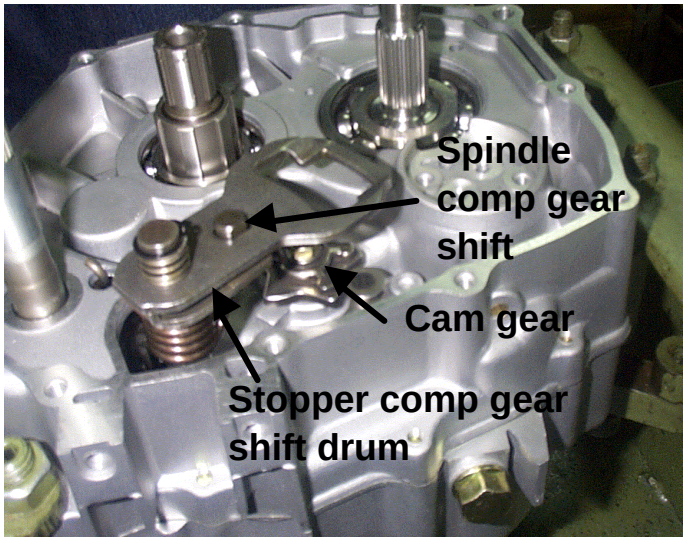
Remove the gearshift mechanism

Remove the clutch

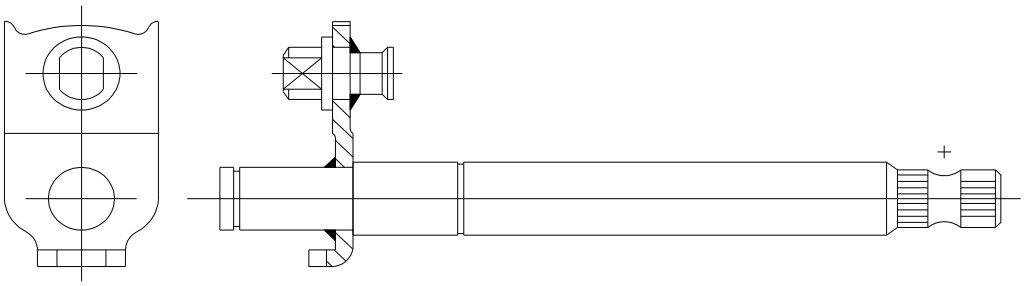
Remove the gearshift pedal



Remove the gearshift shaft



Note:when removing the gearshift shaft,note the gearshift shaft return spring hooked on the lug located on the crankcase

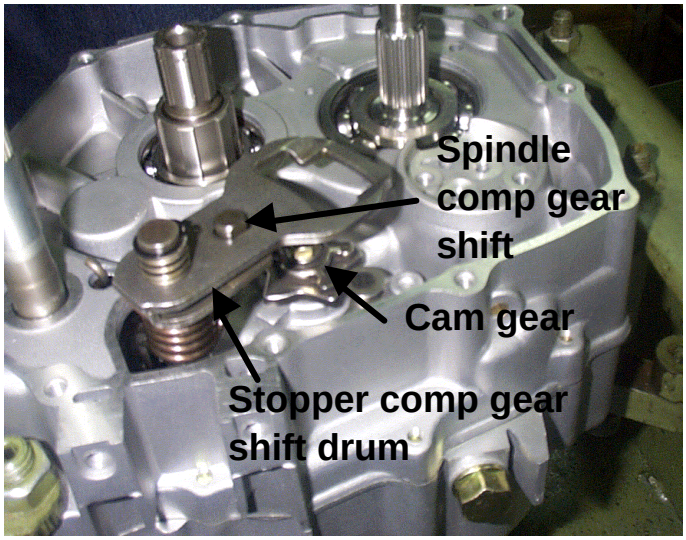


Gear shift spindle comp

Remove the gearshift detent arm

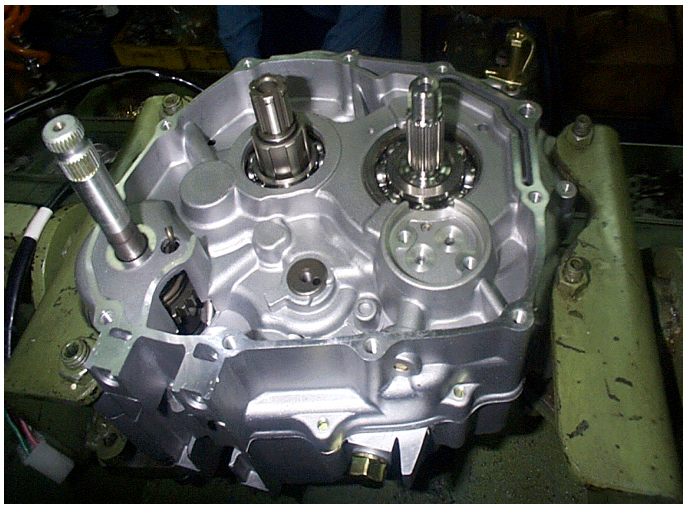
Remove the gearshift cam

Check all parts for wear or damage



Reassembling the gearshift mechanism

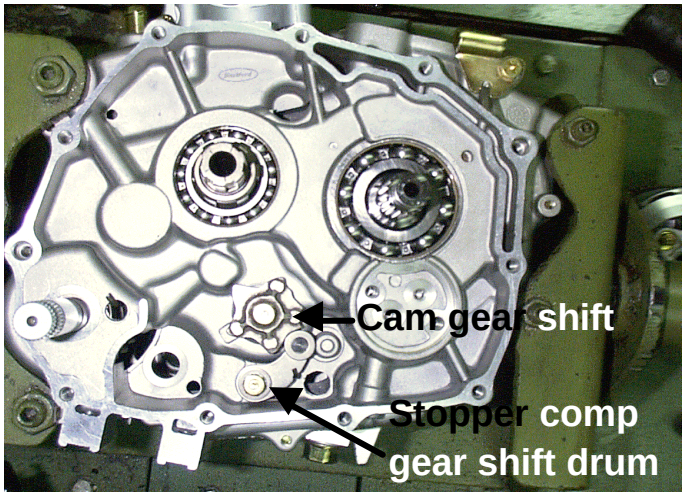
Locate the rollers and install the gearshift cam



Reinstall the gearshift shaft and plate

Installing the gearshift shaft

Install the gearshift pedal and check the smooth operation of the gearshift mechanism

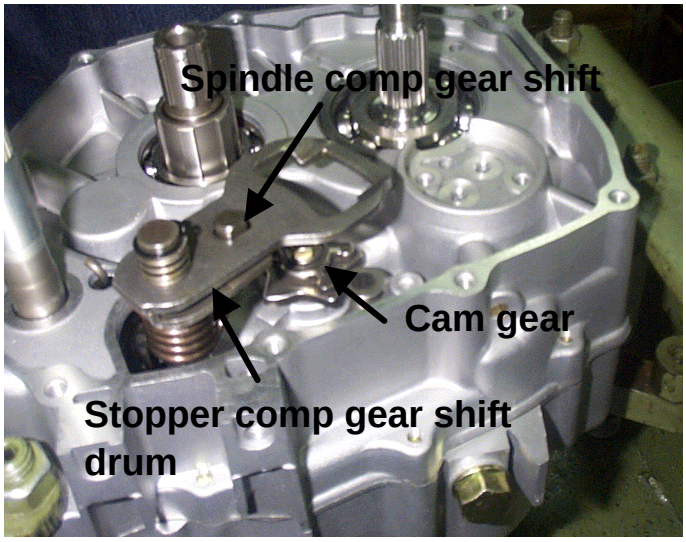


Replace the clutch

Replace the oil pump

Replace the clutch cover locating dowels and gasket

Note:the gearshift shaft return spring should locate against the lug in the crankcase



6.3.2Installing the clutch cover

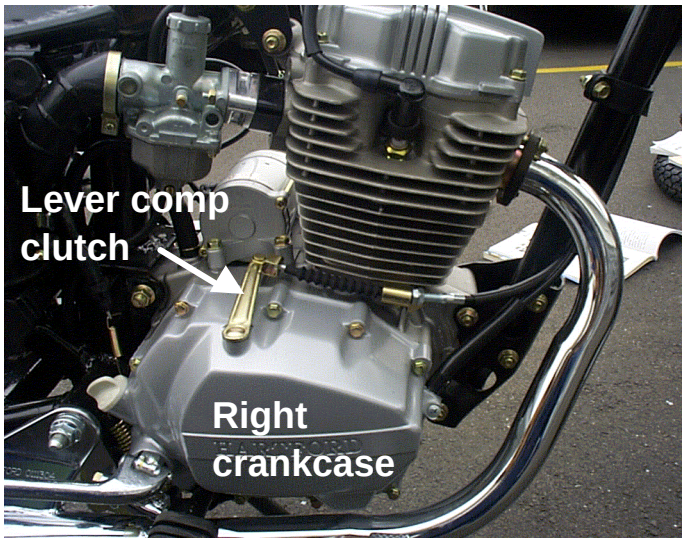
Install the clutch cover

Install the clutch cable

Install the kickstarter and exhaust pipe

Refill the engine with fresh oil

Adjust the clutch cable free slack



Chapter 7 Carburetor

7.1 Reason a breakdown

Engine fires but doesn’t run.

No fuel in the fuel tank.
Fuel not reaching the carburetor.
Fuel mixture excessively rich.
No spark at spark plug (ignition system faulty).
Air-filter blocked.

Poor idling

Idle speed incorrect
Ignition system faulty
Low cylinder compression
Fuel / air mixture excessively rich
Fuel / air mixture excessively lean
Air-filter blocked
Fuel dirty or contaminated

Fuel/air mixture excessively lean.

Carburetor jets blocked.
Carburetor body air passages blocked.
Fuel pipe blocked.
Float level too low
Fuel filter blocked
Float needle faulty or damaged

Fuel/air mixture excessively rich

Choke valve seized
Float level too high
Float needle faulty or damaged

Remedy

Clean the carburetor and restore normal combustion
Adjust the float level

7.2Carburetor

7.2.1Names of carburetor parts

Throttle valve

Air control lever

Oil cup

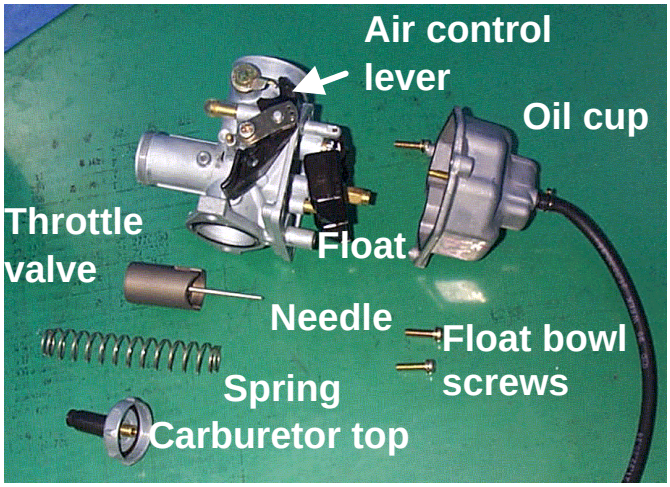
Float

Needle

Spring

Carburetor top

Float bowl screws



7.2.2Removing the carburetor

Turn the fuel valve to the “OFF” position
Remove the fuel line

Drain the fuel from the carburetor

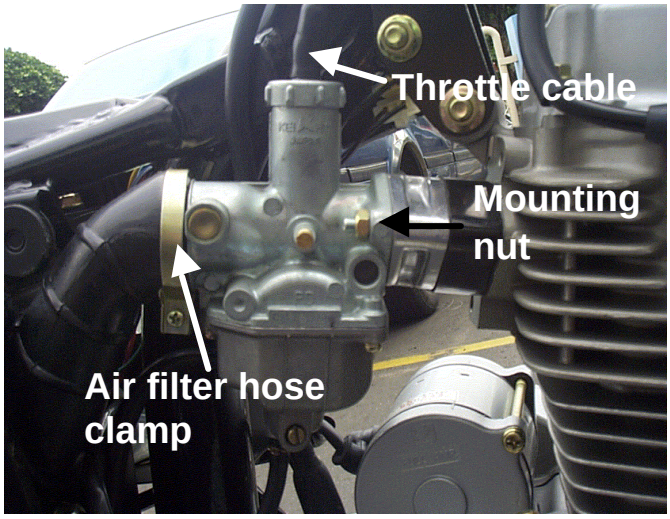
> Note: Fuel is flammable and should be washed off the vehicle if spilled

Remove the air filter hose clamp

Remove the throttle cable

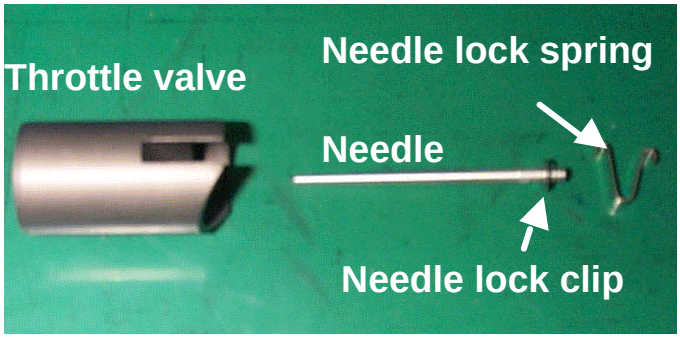
Remove the carburetor mounting nut

Remove the carburetor



7.2.3Throttle valve

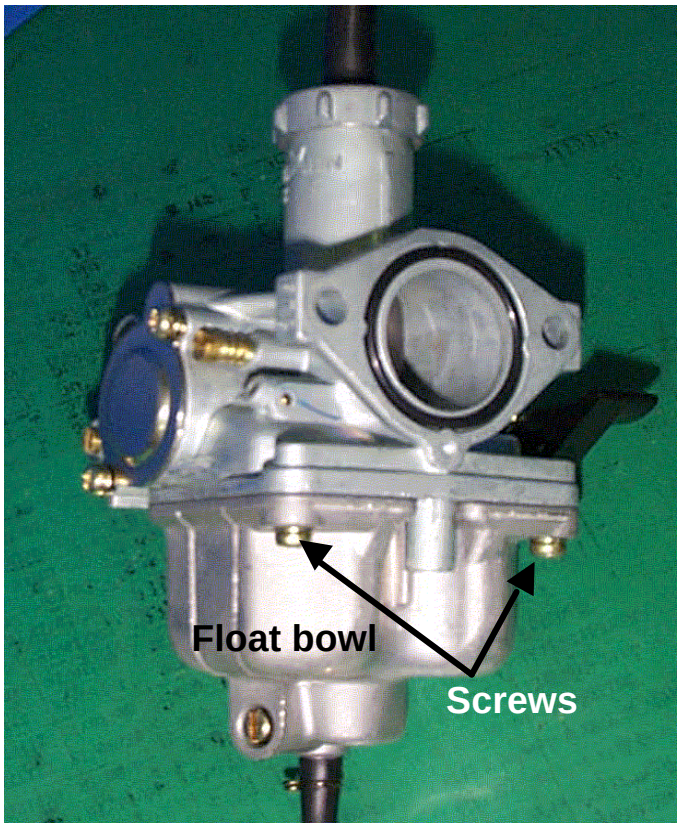
Remove the needle lock spring
Remove needle,needle lock clip
Examine needle and throttle valve
for wear or damage



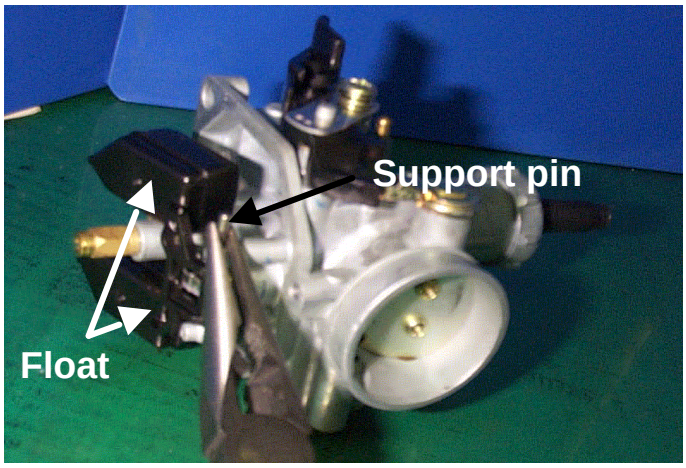
7.2.4Removing the float and float needle

Remove the three M4 x 16mm screws
Remove the float bowl

Return the fuel inside to fuel tank



Remove the support pin with long
nose pliers
Remove the float and Float needle



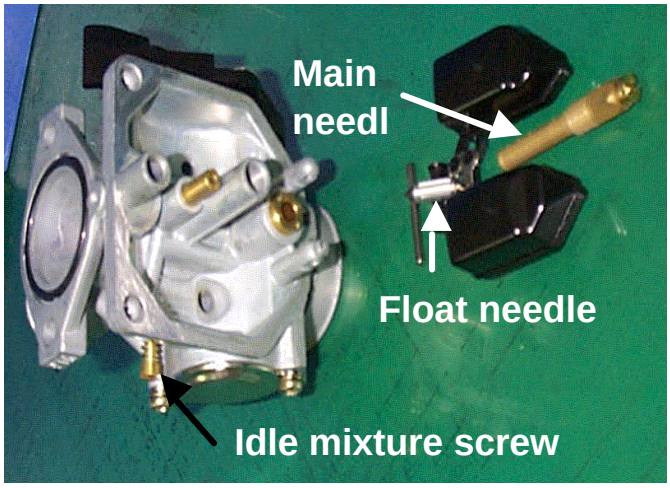
Remove the jets,float needle and needle valve seat.

Note: Do not damage the jets

Remove the idle mixture screw

Note: Before removing the idle mixture screw. Screw the adjuster screw in. Fully counting the turns

The standard position for the idle screws two turns back form fully screwed in.

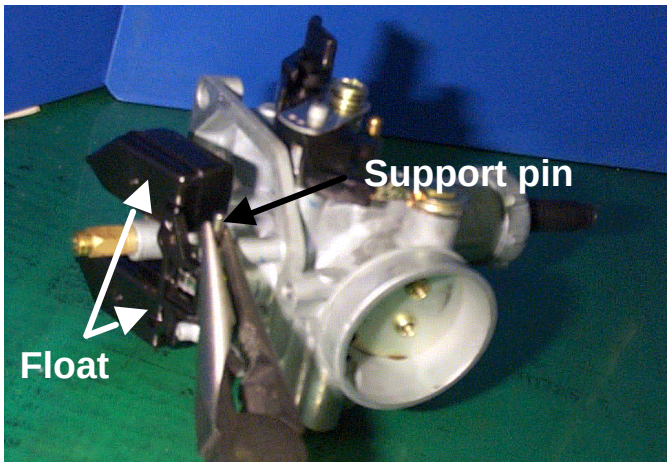


7.2.5Installing the float and float needle

Inspect all parts for wear or damage and replace as necessary.

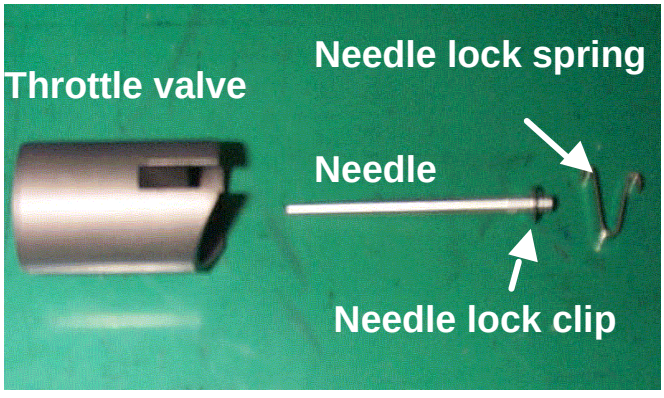
Note: Take care during reassemble not to damage any of the parts.

Reassemble the float needle and needle seat.
Install the jets and idle mixture screws.
Replace the float bowl



7.2.6Replace the throttle slide

Replace the needle ,Needle lock clip and needle lock spring
Replace throttle cable



Replace the missing chamber cap and the air filter connecting hose.

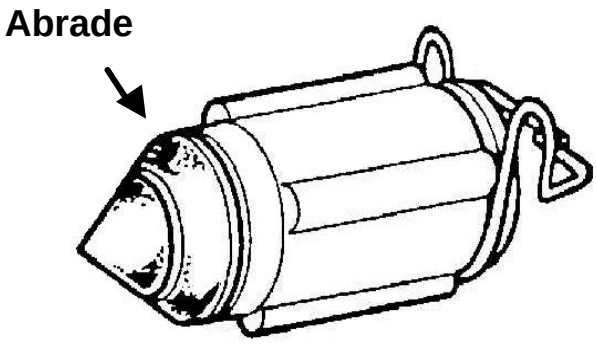
Check the free closing of the throttle at all handlebar positions.

Hartford	7.Carburetor	NO	CG
		Page	7-5

7.2.7Inspecting the float needle

Examine the float and float needle for wear

or damage

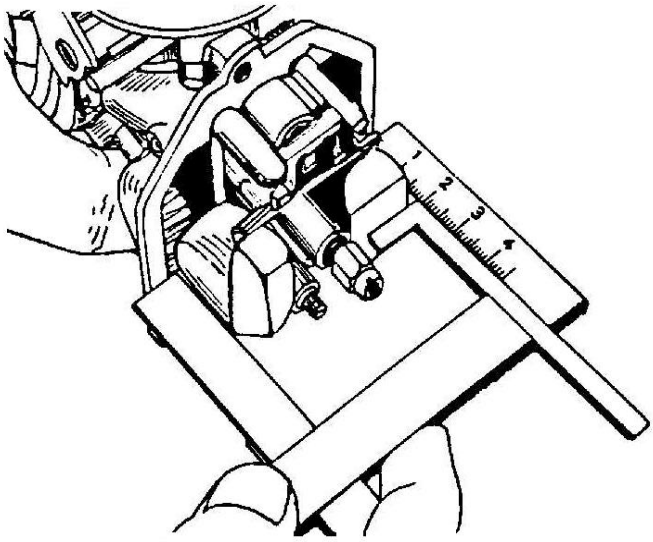


7.2.8Adjusting the float height

The float height is set by bending the float tang

Use the special gauge to measure the float height

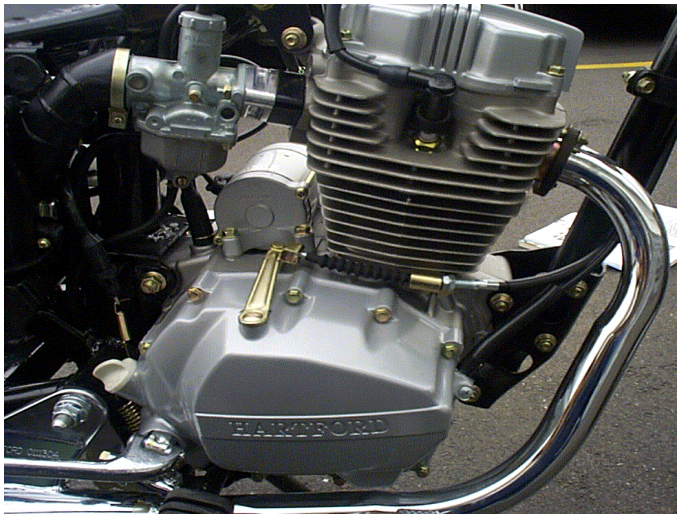
Correct float height----- 125C.C:14.5mm(Model PD026A)
150C.C:14mm (Model PD19D)



Chapter 8
Removing and installing the engine

8.1Removing and installing the engine

8.1.1Removing the engine



Drain the engine oil

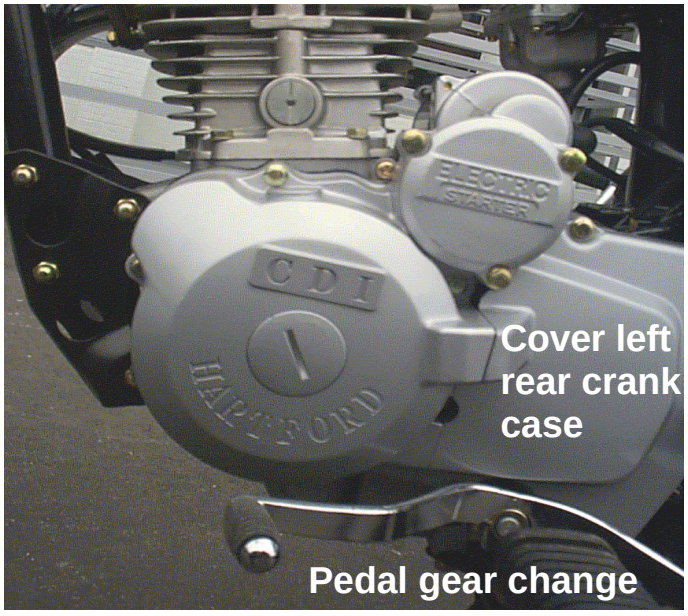
Turn the fuel valve to the “OFF” position.

Remove the cover left rear crank case and pedal gear change.

Remove the generator wires

Remove the control cables and retaining nuts.

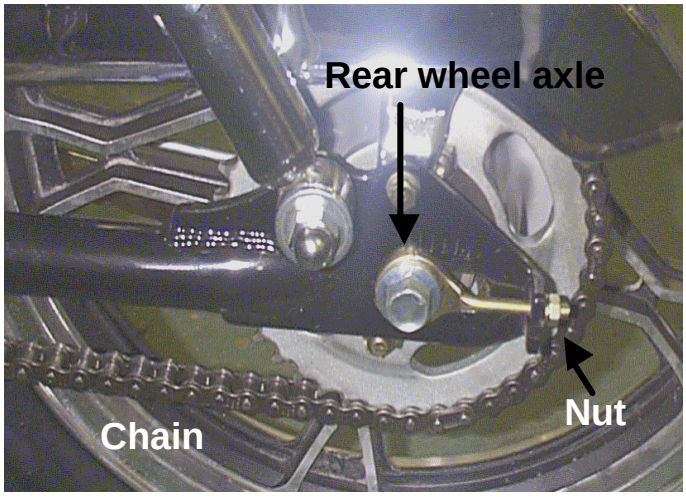
Remove the tachometer cable



Loosen the rear wheel axle

Loosen the chain adjusters and slide the rear wheel forward

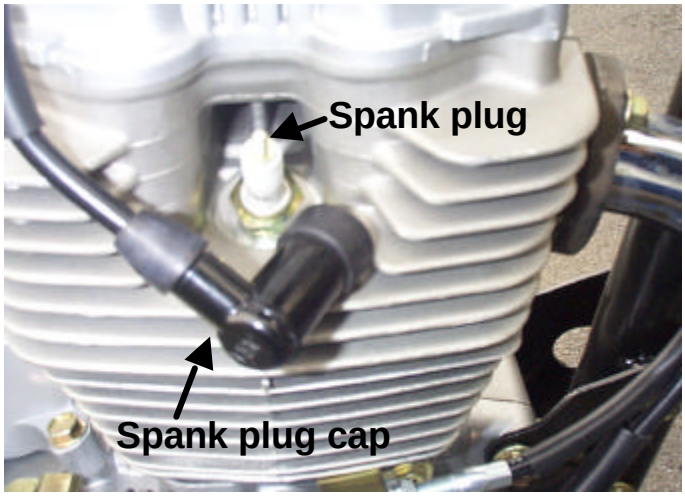
Remove the master link and release the drive chain



	8.Removing and installing the engine	NO	CG
		Page	8-2

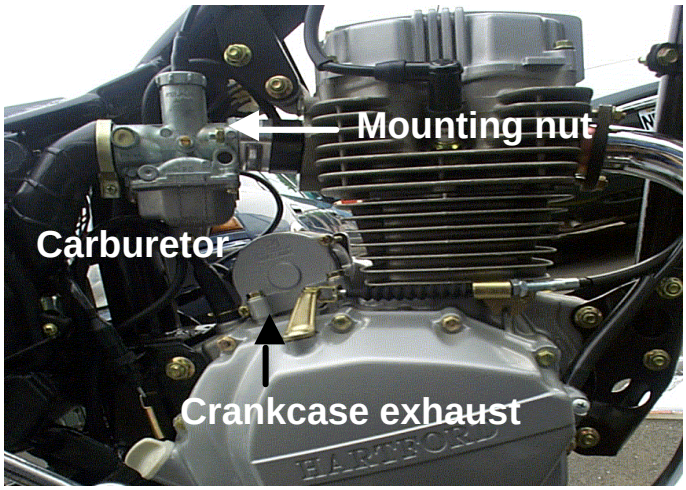
Removing the spark plug cap

Removing the spank plug



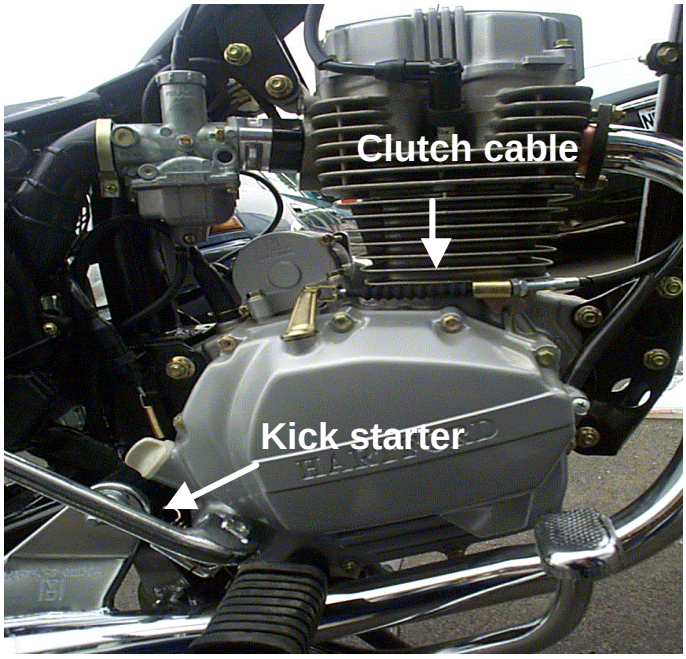
Removing the carburetor mounting nuts and dismount the carburetor.

Remove the crankcase exhaust hose.



Removing the clutch cable

Removing the kick starter



	8.Removing and installing the engine	NO	CG
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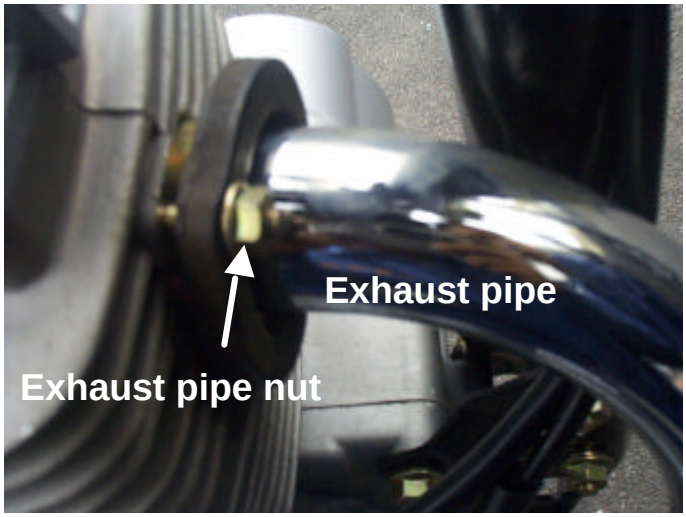
Removing the exhaust pipe nuts

Removing the exhaust pipe

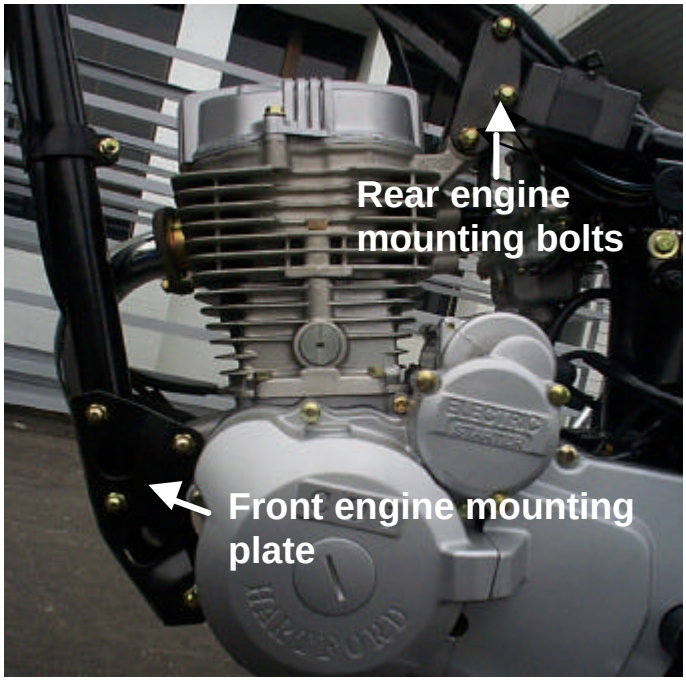
Removing the bar comp step



Removing the front engine mounting plate

Note: Before removal, support the front of the engine with a suitable stand or block of wood

Removing the starting motor cable
Remove the rear engine mounting 8mm bolts.
Remove the above engine mounting bolts.
Remove the engine
Remove the tachometer



Note: when removing the engine take care to avoid damaging any cables or wires

8.1.2Installing the engine

Installation is reverse of disassembly
Note:

- Take care to correctly reinstall the control cables and electrical wires
- Adjust the throttle cable slack
- Adjust the clutch cable slack
- Refill the engine with the approved oil (SAE10W - 30)

Chapter 9 Maintenance

9.1Engine oil/Oil filter

9.1.1Check the engine oil

1.Place the motorcycle on the main stand.

2.Remove the dipstick and wipe it clean with cloth.

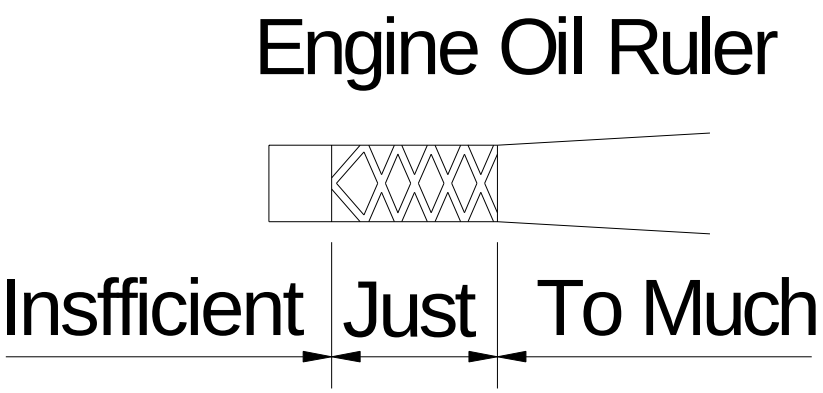
3.Insert the dipstick back into the engine.

4.Remove the dipstick once more and observe the level.

5.Add oil as necessary to replenish to the mark.

6.Do not over-fill as this may damage the engine.

7.Check the level again after filling.



9.1.2Change the Engine oil

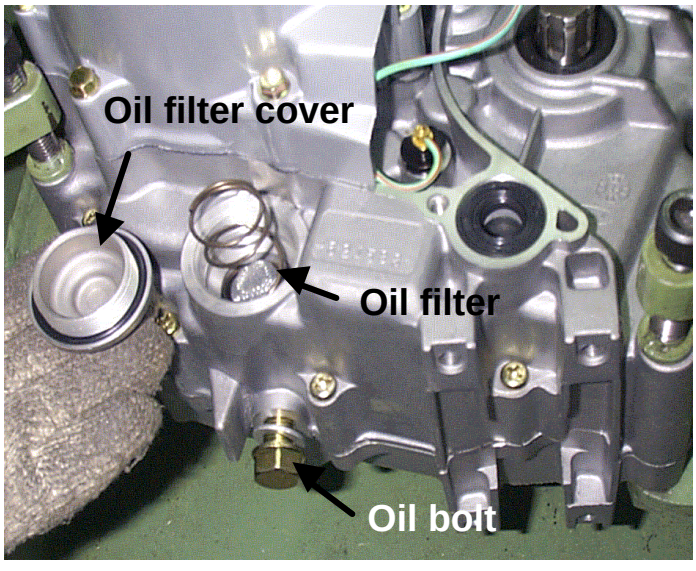
Note: Before changing the oil, run the engine for 5 minutes to bring it operating temperature

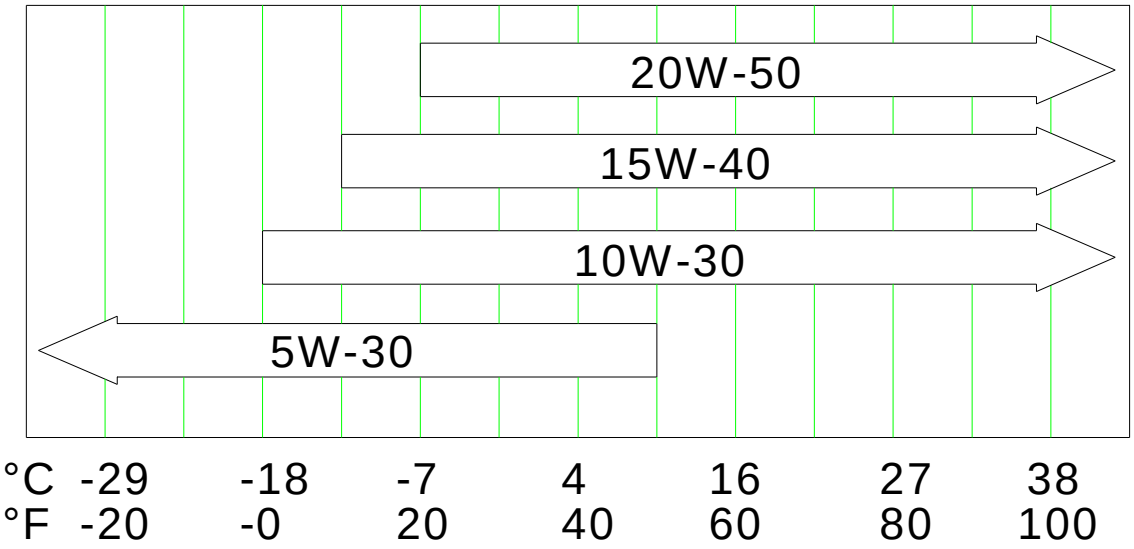
Remove the drain plug and release the engine oil

Check the condition of the drain plug seal

Refill with 0.8 ~ 1.0 liters of oil

Recommended oil:SAE10W- 30





Engine oil to suit thermometer

Recommended oil for use:

Use APISG rated oil or a premium grade engine oil.

Recommended oil viscosity

1. In normal climates use SAE 10W-30 or premium grade.
2. In colder weather use SAE 5W-30.
3. The engine oil should be changed after covering the first 300km.
4. The engine oil should then be changed every 1000km.

9.1.3Clean the oil filter room

Remove the exhaust pipe

Remove the footrests

Remove the clutch cable

Remove the kickstarter

Remove the clutch cover

Remove the oil filter cover

Clean as necessary

Clean the oil filter screen

9.1.4Clean the oil filter screen

Remove the oil filter cover and screen

Clean with compressed air

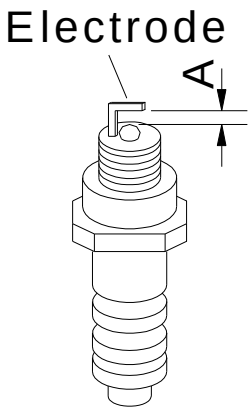
9.1.5Chenk the spark plug

1.Fouling or excessive gap(A) will cause incomplete combustion.

2.Use a wire brush to clean deposits from the electrodes.

3.Replace spark plugs at 3000~5000km intervals.

- SPARK PLUG TYPE(NGK):



TYPE	D-7EA	D-8EA	DR-8EA
A	0.6~0.7mm	0.6~0.7mm	0.6~0.7mm

9.2Periodic maintenance and check

I:Inspect A:Adjust C:Clean R:Replace T:Tighten

Inspection period / Item to inspect /replace	After the first 300km and every 1000km	Every month 1000~1500km	Every 3000km	Every 6000km
Engine oil	R	R		
transmission oil	R		R	
Clutch	I/A		I/A	
Valve clearances	A		A	
Ignition timing	A		A	
Carburetor			A/C	
Clean oil filter	C		C	
Main screw	I/T		I/T	
Spark plug				R

*COVERAGE PROVIDED BY THE WARRANTY:

BEFORE 1000km OF NEW MOTORCYCLE HAVE RIDED,PLASE KEEP SPEED LOWER THAN 60km/hr , IF SPEED IS HIGHER THAN LIMIT , THE ENGINE BREAKS WOULD NOT PROVIDED BY THE WARRANTY .

Chapter 10 Electrical system

Hartford Industrial Co., Ltd.

Hartford	10.Electrical system	NO	CG
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10.1 CDI

CDI(Capacitor Discharge Ignition):

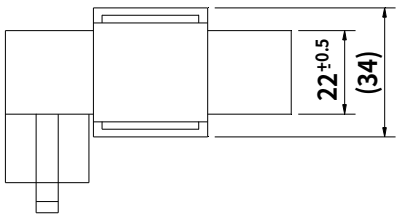
The design of engine on per RPM needs to match the angle ignition that can make engine to own the ideal operaion , The main job of CDI is . to provide convenience from the storage of source coil . In fact , the ignition Coil occurs the second side high Voltage to let Pulg . onto ignite , therefore , the gas is ignited .

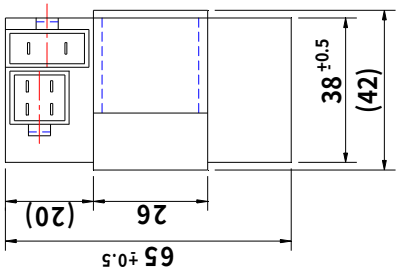
Figure 1: Ext(Source Coil) provides energy by capacitor 2.2u/400v.

PU(pickup coil) produces a signal to privide CDI to calculate when the action of tritter will be happened . Also , it stores energy on capacitor then it will be sent from point of IGN to ignition coil.

Figure 2: Ignition Flow chat

The calculation of CDI is to do the Flow Chart to.find out where the angle of Ignition





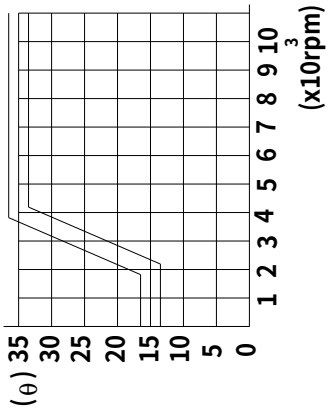


FIGURE 2

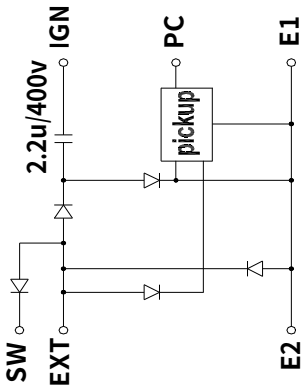


FIGURE 1

	10.Electrical system	NO	CG
		Page	10-2

10.2 Start switch assy

SPECIFICATION:

NOMINAL VOLTAGE: DC12V

NOMINAL CURRENT: 150A

ENERGIZATION CURRENT: equal or below 3V

OPERATING VOLTAGE: equal or below 7.5V

RETURN VOLTAGE: equal or below 3V

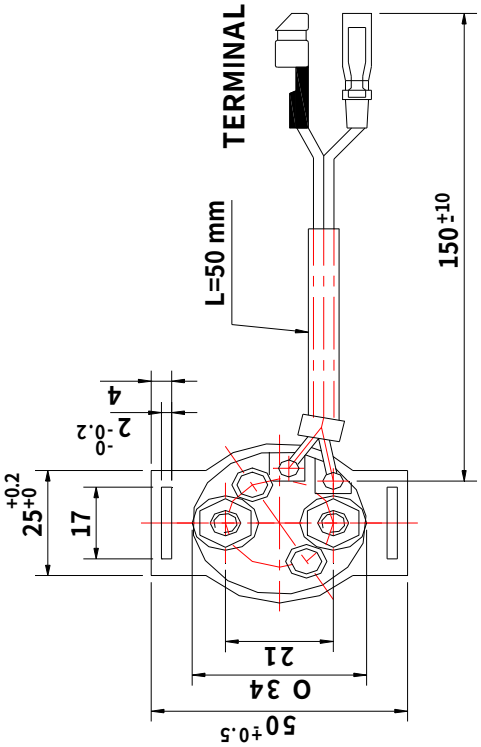
INSULATION RESISTANCE: more or equal 1M Ω

RESISTANCE VALUE: 3.4 Ω ±10% in 20 ° c

OPERATION DURABILITY:

8V150A.5sec ON / 20sec OFF.
reciprocation 1000 times

VOLTAGE DROPAT CONTACT POINT:
equal or below 0.2V



10.3 Regulator

REG RELT COMP : As a result magnetor Armature Coil generates Voltage . to AC signal . Thus , it must pass through regulator to change DC signal . To examine the Voltage of Battery by coutrolling circuit to know whether it needs to send power for Battery Charge . The main job of regulator is to regulate and to provide adeguate Voltage for the battery charge and the usage of load .

Figure 1 : Armature Coil in regulator produces AC signal Y(yellow line) P (pink line) to input to D1,D2,D3,D4 it will change AC signal to DC signal and control circuit . The purpose to examine R(red line)(which looks battery and load is to find out how much energy should be .
SCR(S1,S2) can drain the left energy .

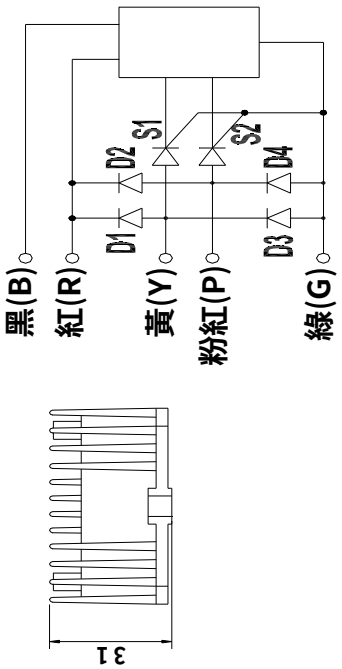
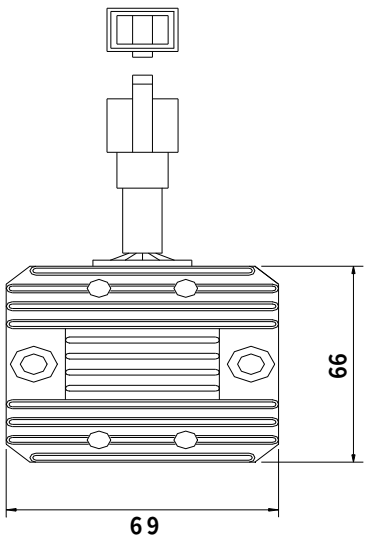
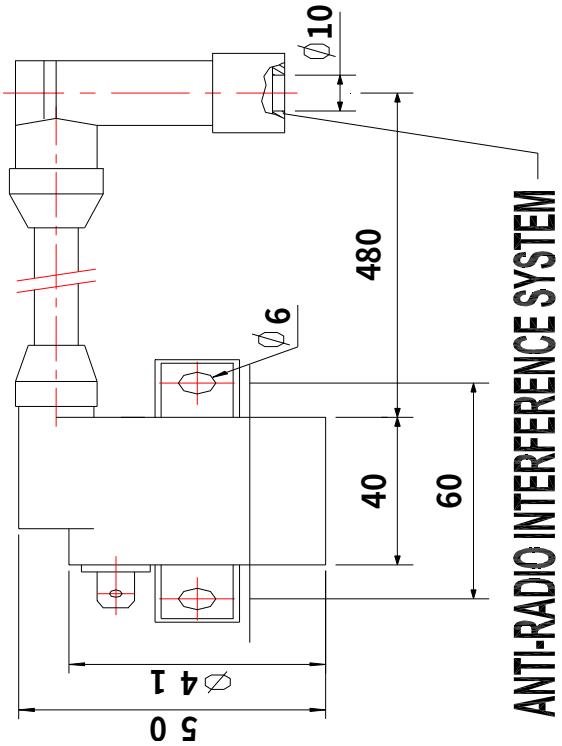


Figure 1



	10.Electrical system	NO	CG
		Page	10-4

10.4 Coil comp



STATICAL RESISTANCE: R1:0.31±0.03 Ω ,R2:4.0±0.4 Ω

LOWEST RPM. FOR CONTINUOUS IGNITION:
equal or below 300rpm /6mm

CONTINUOUS IGNITION RPM. RANGE:
equal or below 300~1000rpm /6mm

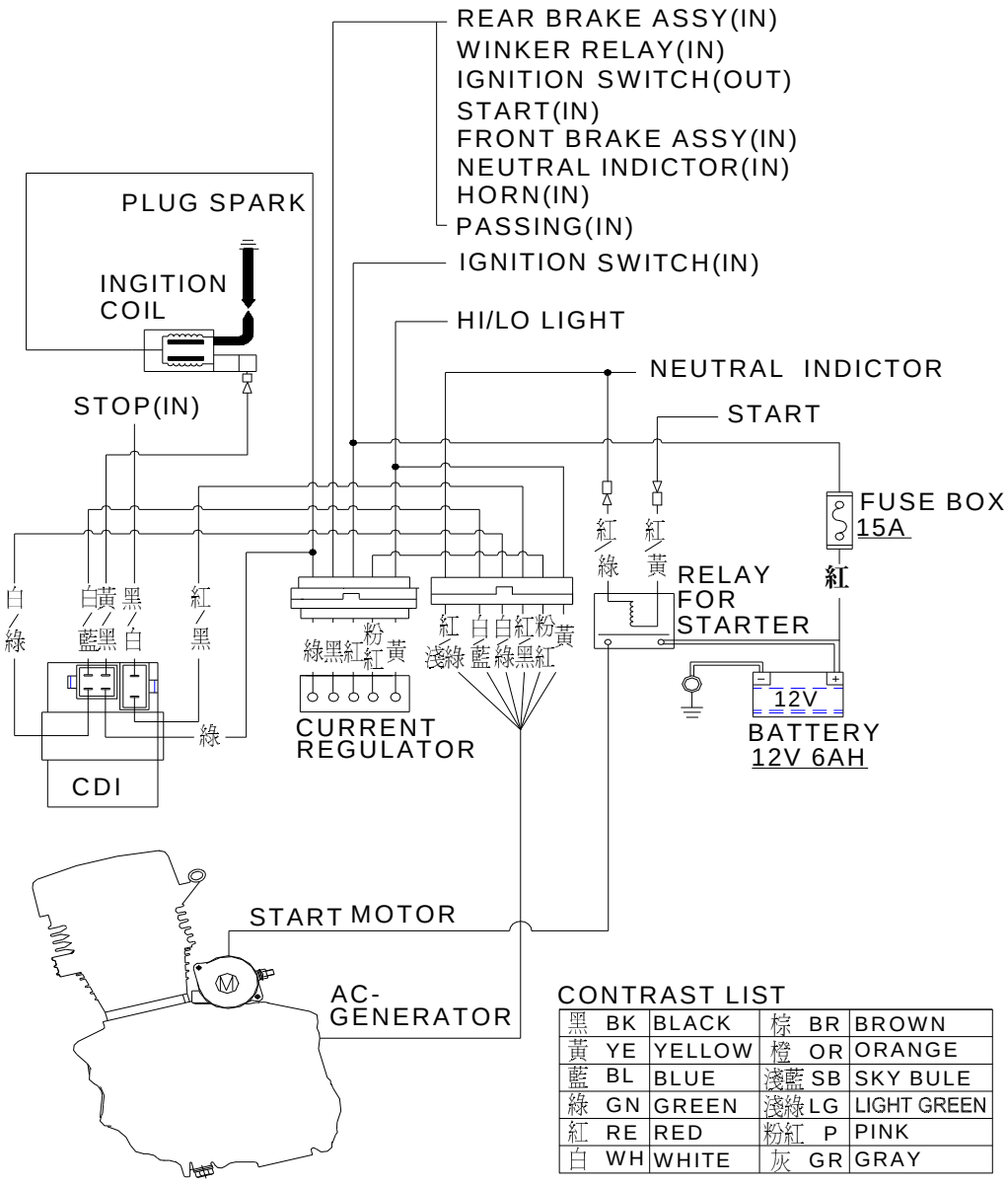
DIELECTRIC RESISTANCE: over1000M Ω

HIGH TEMP TEST:
80 ° Constant Temperature.over1hour.NO change.

NOTE:
ANTI-RADIO INTERFERENCE SYSTEM: 125C.C. UP 10 Ω,
100C.C. DOWN 5 Ω

	10.Electrical system	NO	CG
		Page	10-5

10.5 Electrical assembly draw



CONTRAST LIST

黑 BK	BLACK	棕 BR	BROWN
黃 YE	YELLOW	橙 OR	ORANGE
藍 BL	BLUE	淺藍 SB	SKY BULE
綠 GN	GREEN	淺綠 LG	LIGHT GREEN
紅 RE	RED	粉紅 P	PINK
白 WH	WHITE	灰 GR	GRAY