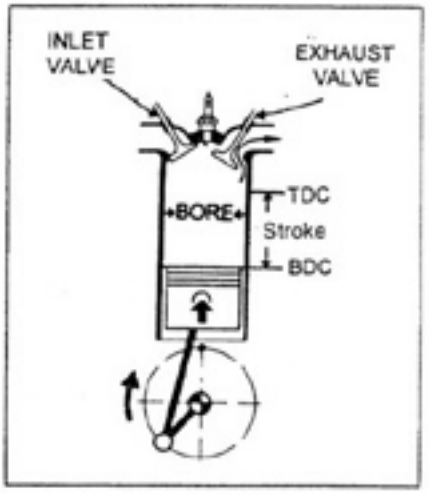
SOME TERMS AND DEFINITIONS

Boro :
Internal diameter of a cylinder.



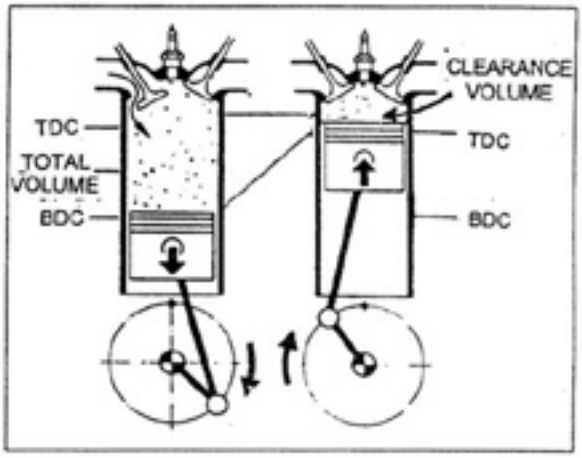
Top Dead Centre (TDC) :
The extreme upward travel limit of piston.

Bottom Dead Centre (BDC) :
The extreme downward travel limit of piston.

Stroke :
Movement of piston from one dead centre to the other.

Stroke length :
The distance between top and bottom dead centres.

Cubic Capacity (Swept Volume) :
The Volume the piston displaces when it moves from one dead centre to other.



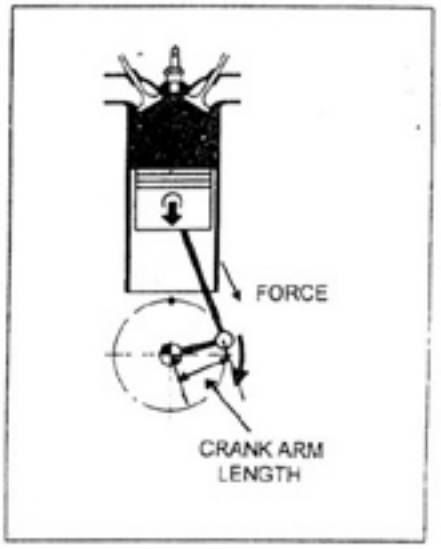
$$= \frac{\pi D2l}{4}$$

where, π = 22/7, D = Bore, l = Stroke length

Clearance Volume :
Volume of the Cylinder above the piston when it is at TDC.

Total Volume :
Volume of the cylinder above the piston when it is at BDC
= Swept Volume + Clearance Volume

Compression Ratio (CR) :
It is the ratio of the total volume to the clearance volume.
= Total volume : Clearance volume



Torque (Turning Effort) :
The work crank shaft is capable of doing
= Cr. arm length x Force.

Maximum torque occurs when maximum fuel burns per cycle in the cylinder in a given engine.

Power :
The rate of doing work.

SOME TERMS AND DEFINITIONS

Horse Power : (HP)

Mechanical unit of power

1 HP = 746 watts.

Brake Horse Power : (BHP)

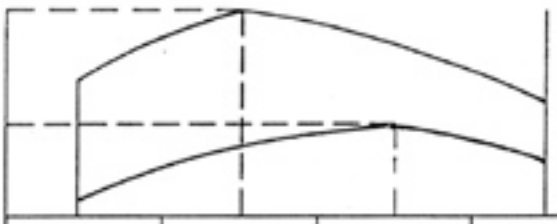
HP available at the crank shaft for doing usefull work

BHP = Torque x Engine speed.

For any given cubic capacity engine, the BHP can be increased by

1. increasing the torque by arranging to burn more fuel per cycle.
2. shifting the peak torque to higher rpm

A Typical BHP, Torque curve :

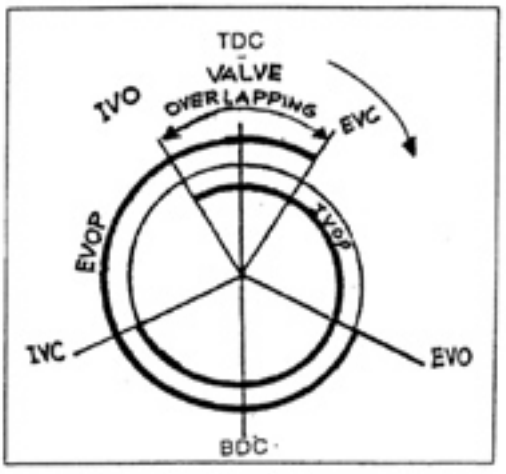


	Low idele rpm	Peak torque rpm	Rated rpm	High idle rpm
Load	Nil	Full	Full	Nil
Throttle Position	Fully Closed	Full Open	Full Open	Full Open
MAC A 350	950	3500	5500	7500
BULLET 350	950	2875	5675	7500
BULLET 500	950	3000	5500	-
LIGHTNING 535	950	4000	5500	-

Valve Timing :

Four Stroke Engines

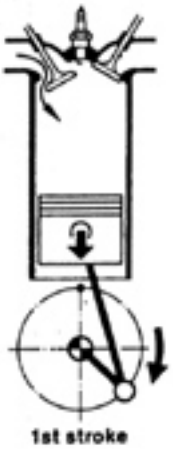
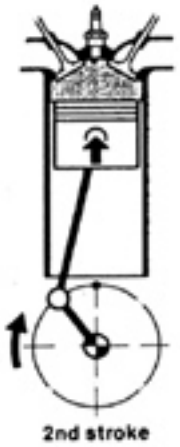
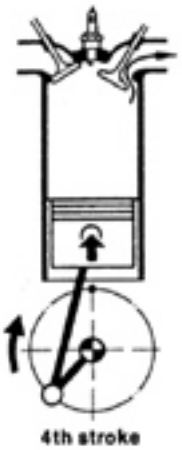
IVO - Inlet Valve Opening
IVC - Inlet Vaive Closing
IVOP - Inlet Value Open Period
EVO - Exhaust Valve Opening
EVC - Exhaust Valve Closing
EVOP - Exhaust Valve Open Period



Mismatching of timing marks and incorrect tappet adjustment
Change valve timing.

FOUR STROKE CYCLE OPERATION

SPARK IGNITION ENGINES

	SUCTION STROKE	COMPRESSION STROKE	POWER STROKE	EXHAUST STROKE
Inlet Valve	Open	Closed	Closed	Closed
Exhaust Valve	Closed	Closed	Closed	Open
Piston Movement	TDC to BDC	BDC to TDC	TDC to BDC	BDC to TDC
Gas Flow	Air petrol mixture is drawn into cylinder	Air petrol mixture gets compressed. Few degrees BTDC, spark plug produces spark.	Petrol burns. Gas expands. Piston is pushed down.	Exhaust gas flows out. Towards stroke end, fresh charge flows in.
	 1st stroke	 2nd stroke	 3rd stroke	 4th stroke
Gas Temperature	0...120°C	300...600°C	2000...3000°C	1300...1600°C
Pressure load	0 to 0.8 kg/cm²	8 to 15 kg/cm²	30 to 50 kg/cm²	4 to 5 kg/cm²
Crank angle	0° TDC / 90°	180° BDC / 270°	360° TDC / 450°	540° BDC / 630° / 720° TDC
Crankshaft revolutions	← (1)	→	(2) →	

TECHNICAL SPECIFICATION

Sl. No	Item Description	Bullet 350	Bullet 500	Lightning 535	Bullet Mac 350
A	**DIMENSIONS AND WEIGHTS**				
1	Length	2120mm			
2	Width	750mm			
3	Height	1080mm			
4	Wheel base	1372mm			
5	Saddle height	850 mm	760mm		
6	Ground clearance	140mm			
7	Vehicle Dry weight	163kg	168kg		163kg
8	Max.pay load	175kg	185kg		175kg
B	**ENGINE AND ENGINE SYSTEMS**				
1	Engine Type	4 Stroke, spark ignition, air cooled, single cylinder			
2	Fuel used	Unleaded petrol			
3	Catalytic converter	Nil	Hot tube type		Nil
4	Bore	70mm	84mm	87mm	70mm
5	Stroke	90mm			
6	Swep volume	346cc	499cc	535cc	346cc
7	Compression ratio	6.5:1		7.2:1	8.5:1
8	Max Power @ rpm	18 BHP @ 5625	22 BHP @ 5400	25 BHP @ 5500	18 BHP @ 5500
9	Specific H.P.	52.02	44.08	46.72	52.02
10	Max Torque @ rpm	27.6 Nm @ 2875	35.9 Nm @ 3000	38 Nm @ 4000	27.6 Nm @ 2875
11	Low Idle rpm	900 to 1000			
12	Starting	Kick Start			
13	Cr. Shaft LH bearing	6305 & Nu 305			
14	Cr. Shaft RH bearing	Nu 205 R	Nu 205 EC 4 NA		
15	Air filter	Cotton Gauze			Polyurathane
16	Carburettor	Micarb VM - 24	Micarb VM - 28		PHBH 28
17	Main Jet	90	110	117.5	105
18	Pilot jet	25			38
19	Starting jet	40			70
20	Jet block	0-8			
21	Needle	4DH7-3	4DH7-4	5 DHW	264 T
22	Needle lock groove from top	III	III	III	II
23	Air screw turns out (initial)	1.5			1
24	Float height	28 to 30mm			23.5 to 24.5mm
25	Intake system	Over head valve			
26	Lubrication	Dry sump pressure feed			
27	Cooling	Natural air flow			

TECHNICAL SPECIFICATION

Sl. No	Item Description	Bullet 350	Bullet 500	Lightning 535	Bullet Mac 350
C	**PERFORMANCE**				
1	Cruising speed	← 40-50 →			
2	Max.Speed	100	125	130	120
3	Mileage under normal riding conditions	35-40	30-35	34 - 36	40-45
D	**TRANSMISSION**				
1	Primary Drive	← 3/8" Duplex chain & sprocket →			
2	Engine/ Clutch Drum Sprkt Teeth	← 25/56 →			
3	Primary Reduction	← 2.24:1 →			
4	Clutch	← Wet multiplate →			
5	Gear Box	← Constant Mesh 4 Speed →			
6	Gear ratios:	← I - 2.778:1 →			
		← II - 1.842:1 →			
		← III - 1.364:1 →			
		← IV - 1:1 →			
7	Secondary drive	← Chain and sprocket 5/8" pitch →			
8	Wheel/FD.Spkt teeth	38/16	38/17	38/18	38/16
9	Secondary Ratio	2.375 : 1	2.235 : 1	2.11 : 1	2.375 : 1
10	Drive Chain links	94	← 95 →		94
11	Overall ratio - Max	14.779 : 1	13.907 : 1	13.13 : 1	14.779 : 1
12	Overall ratio - Min	5.32 : 1	5.006 : 1	4.726 : 1	5.32 : 1
13	Main shaft RH bearing	← 6303 →			
14	Main shaft LH bearing	← 6206 →			
E	**CHASSIS**				
1	Frame	← Tubular, welded →			
2	Front suspension	← Telescopic, Hydraulic damped →			
3	Rear suspension	← Swing arm with hydraulic shock absorbers →			
4	Front brake	← 178 mm X 38 mm Twin lead, internal expanding →			
5	Rear brake	← 153 mm X 25 mm, internal expanding →			
6	Rear brake pedal	← LH side →			
7	Wheel bearing Fr & Rr	← 6203 →			
8	Rr. Sprocket bearing	← 6005 →			
9	Front tyre	← 3.25 X 19 - 6 PR →			
10	Rear Tyre	3.25 X 19 - 6 PR	← 3.50 X 19 - 6 PR →		
11	Front tyre Pressure -Solo	← 18 PSI (1.27 Kg/cm²) →			
12	Front tyre Pressure -Dual	← 20 PSI (1.41 Kg/cm²) →			
13	Rear tyre Pressure -Solo	← 28 PSI (2.00 Kg/cm²) →			
14	Rear tyre Pressure -Dual	← 30 PSI (2.11 Kg/cm²) →			
15	Steering lock	← Inbuilt →			

FE80RS

ISKRA

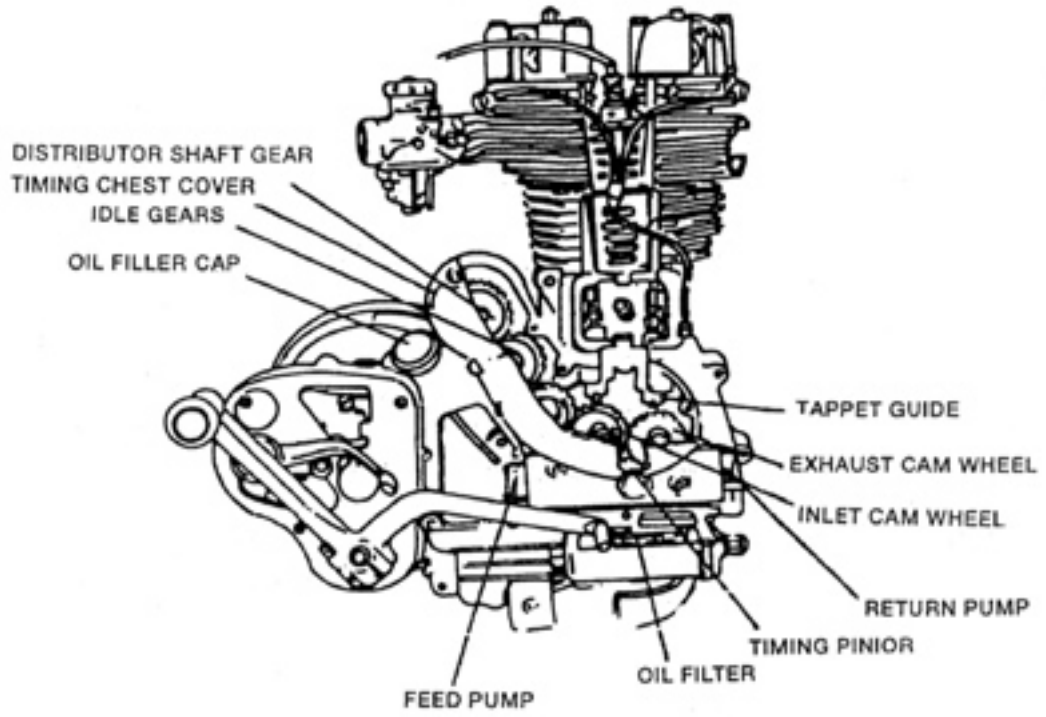
TECHNICAL SPECIFICATION

Sl. No	Item Description	Bullet 350	Bullet 500	Lightning 535	Bullet Mac 350
F	**CONTROLS**				
1	Steering	← Handle Bar →			
2	Accelerator	← Twist grip on right hand side of handle bar →			
3	Clutch	← Hand lever on LH side of handle bar →			
4	Gears	← Foot lever on RH side →			
5	Front brake	← Hand lever on RH side of handle bar →			
6	Rear brake	← Foot lever on LH side →			
7	Decompressor	← Thumb lever on LH side of handle bar →			
G	**ELECTRICITY AND IGNITION**				
1	Generation	← Alternator 12V 80W →			
2	System	← 12V - AC/DC →			
3	Ignition	← Contact breaker →			CDI System
4	Ignition timing	← 0.8mm BTDC →			1.8mm BTDC
5	Spark plug type	MICO W 145Z1	MICO W5DC NGK BR8ES	NGK BR 8 ES	MICO W5DC
6	Spark plug gap	← 0.50mm →			0.70mm
7	Rotor to stator gap	← 0.15 to 0.25mm →			0.25 to 0.5 mm
8	Battery	← 12V 5AH →			
9	Head lamp	← 12V 45/40W →			
10	Pilot Lamp	←12V 2W 2 nos→		12V, 3.4W	12V 2W 2 nos
11	Tail Lamp	← 12V 5W →			
12	Brake lamp	← 12V, 21W →			
13	Turn signal	← 12V 10W →			
14	Speedometer lamp	← 12 X 3.4W →			
15	Ammeter Light	← 12 X 3.4W →			
16	Turn signal Indica	← 12 X 3.4W →			
17	Hi Beam Indicator	← 12 X 3.4W →			
18	Horn	← 12V 3A DC →			12V 3A DC - 2 nos
H	**OIL AND PETROL**				
1	Engine oil	← SAE 20W-50 →			SAE 20W-40
2	Performance rating	← API-SE/SF →			API-SF
3	Tank capacity	← 2.25 Litres →			1.65 Litres
4	Front fork oil	← 10W-30 →			
5	Fr. Fork oil capacity	← 200ml per leg →			
6	Clutch oil	← SAE 10W-30 →			20W-40
7	Clutch oil Capacity	← 420ml →			
8	Gear Box Grease (Initial filling)	← Veedol'00' Grade grease →			
9	Gear Box capacity	← 700 Gms →			
10	Fuel tank capacity	← 14.5Litres →			
11	Reserve	← 1.25Litres →			

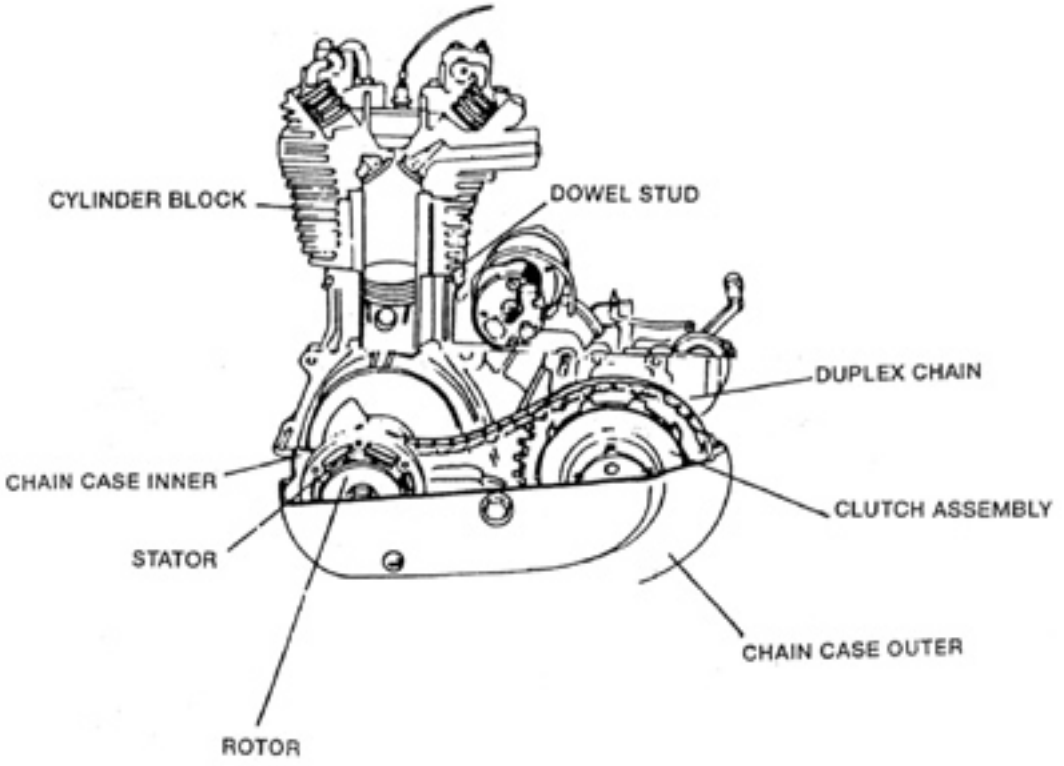
MAJOR AGGREGATES

ENGINE
346 CC, AIR COOLED, 4 STROKE, SPARK IGNITION ENGINE

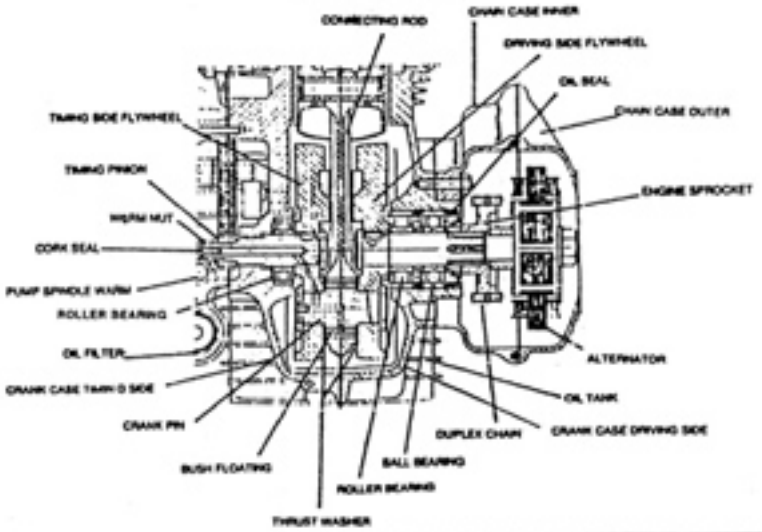
TIMING SIDE



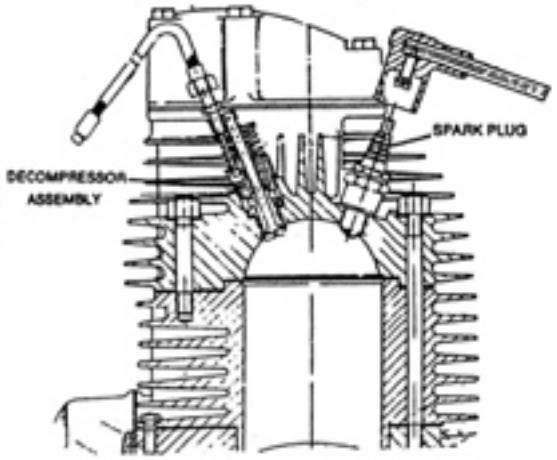
DRIVING SIDE

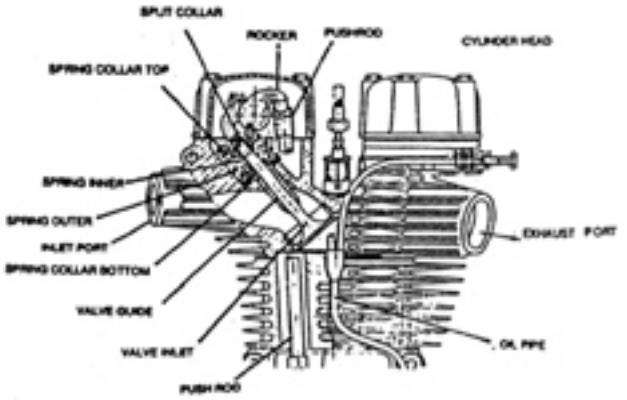


INSIDE VIEW

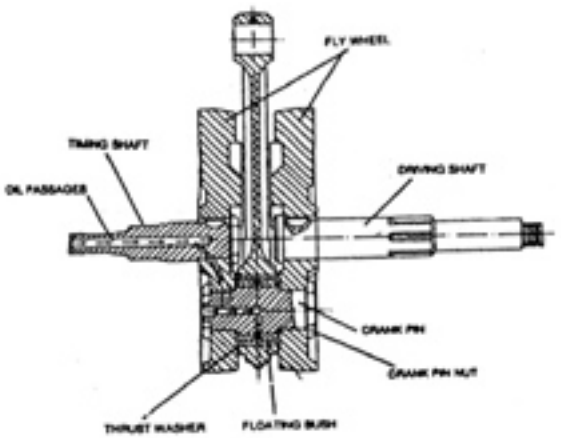


CYLINDER BLOCK AND CYLINDER HEAD

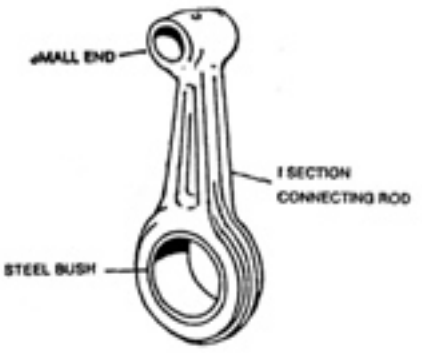




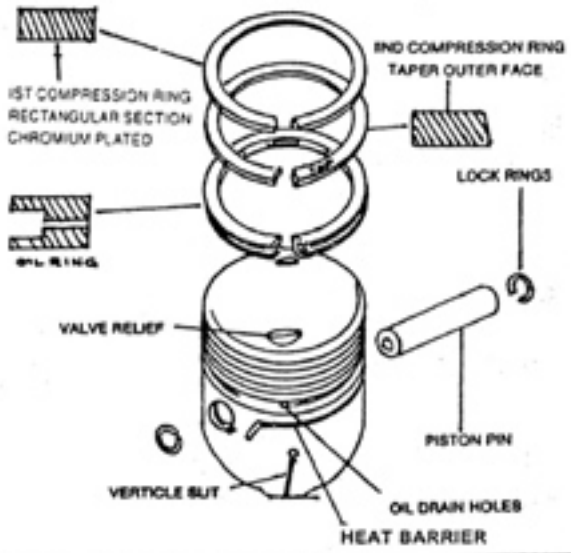
CRANK SHAFT ASSEMBLY



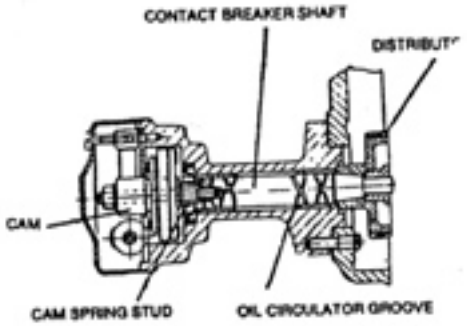
CONNECTING ROD

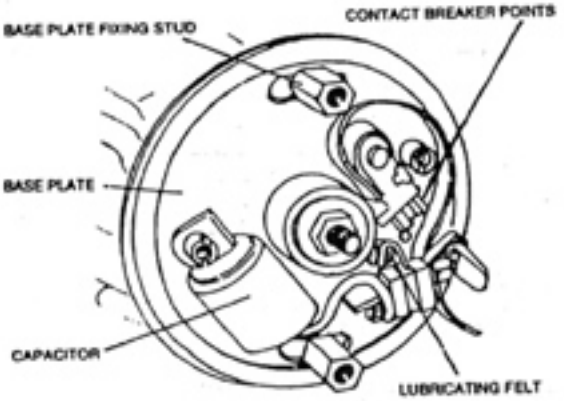


PISTON ASSEMBLY

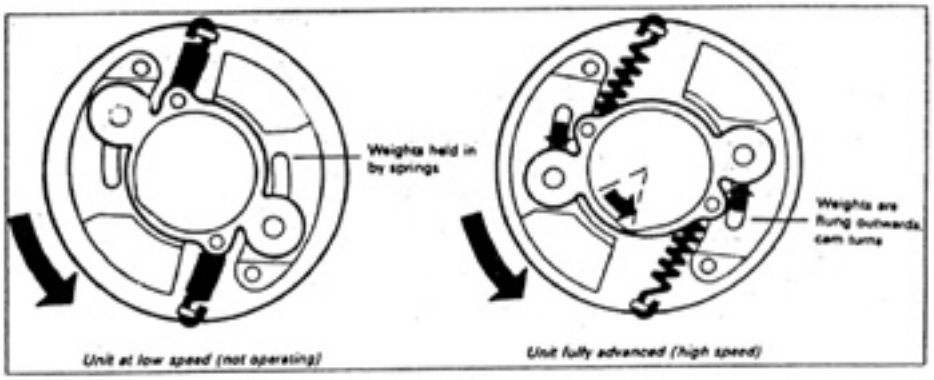


DISTRIBUTOR

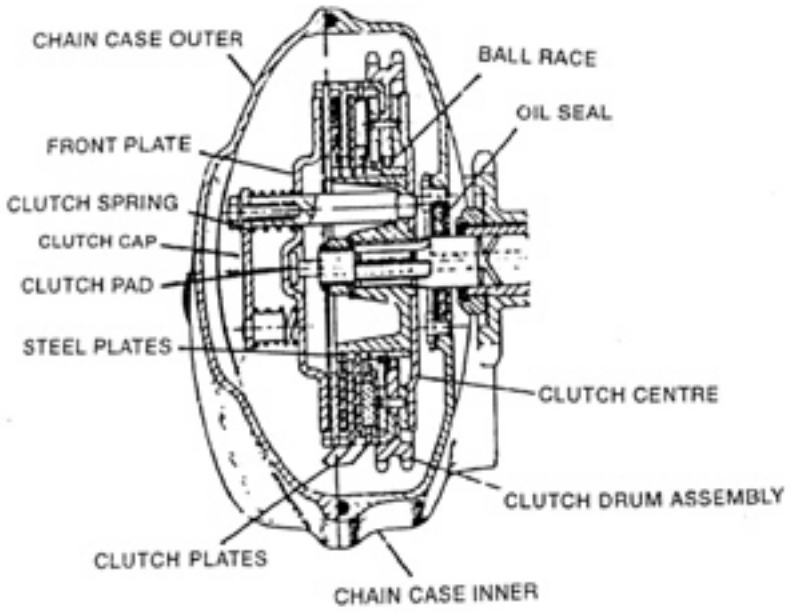




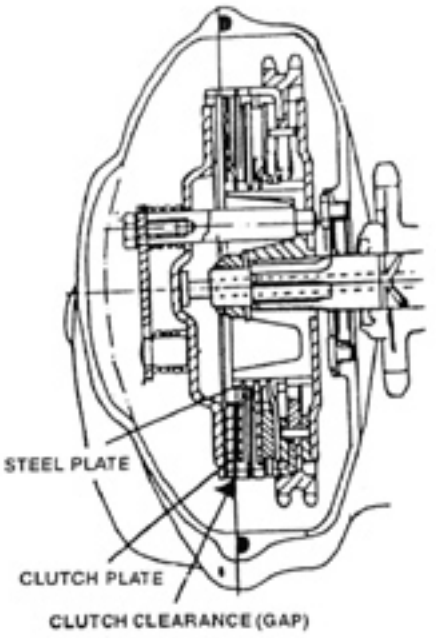
AUTOMATIC ADVANCE MECHANISM



CLUTCH

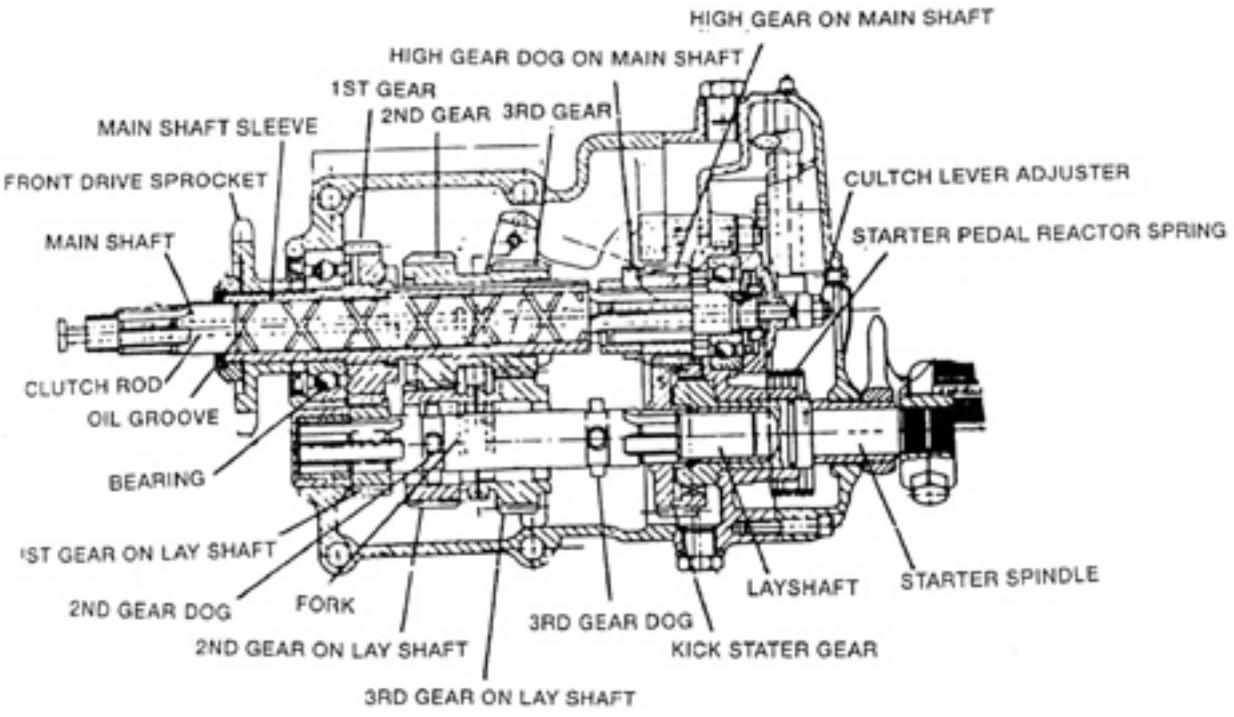


Engaged

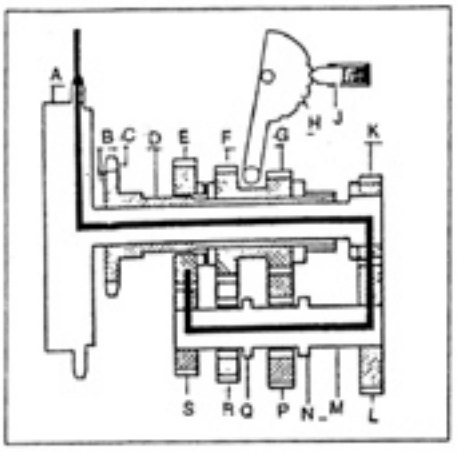


Disengaged

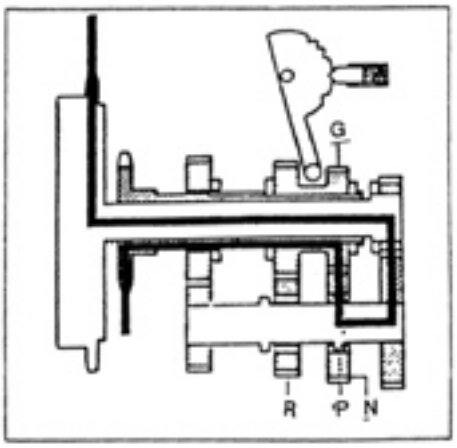
GEAR BOX



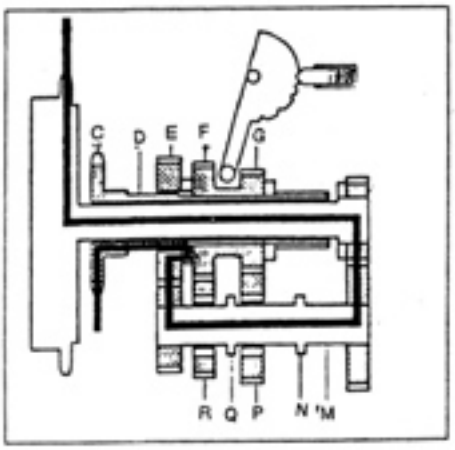
GEAR BOX OPERATION



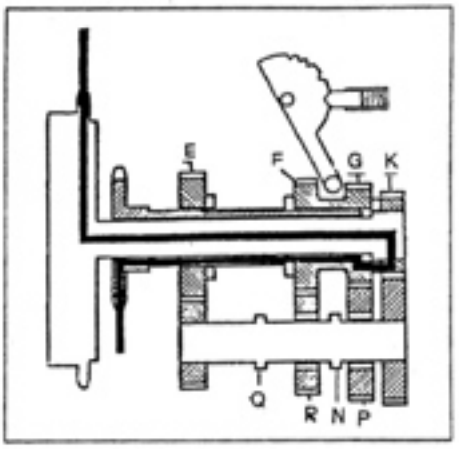
Neutral



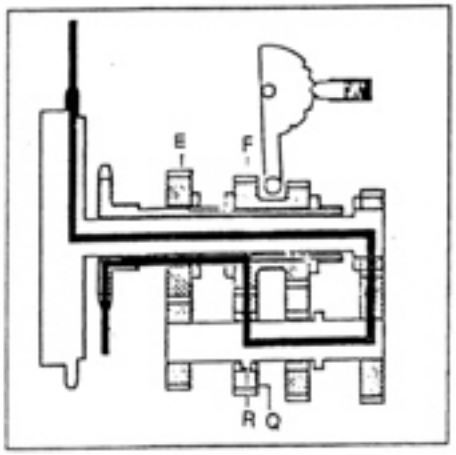
Third gear



First gear



Top gear



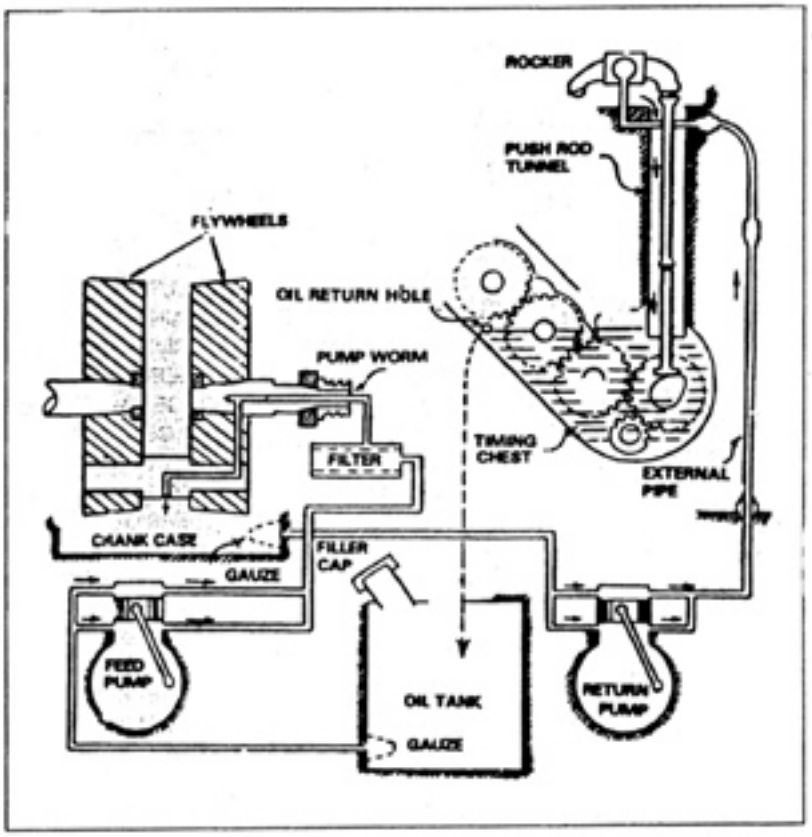
Second gear

A – CLUTCH ASSEMBLY
B – MAIN SHAFT
C – DRIVE SPROCKET
D – SLEEVE
E – Ist GEAR ON SLEEVE
F – IInd GEAR ON SLEEVE
G – IIIrd GEAR ON SLEEVE
H – GEAR OPERATOR-INSIDE
J – GEAR OPERATOR SELECTOR ASSEMBLY
K – HIGH GEAR
L – KICK STARTER GEAR
M – LAY SHAFT
N – IIIrd GEAR DOG
P – IIIrd GEAR
Q – IInd GEAR DOG
R – IInd GEAR
S – Ist GEAR

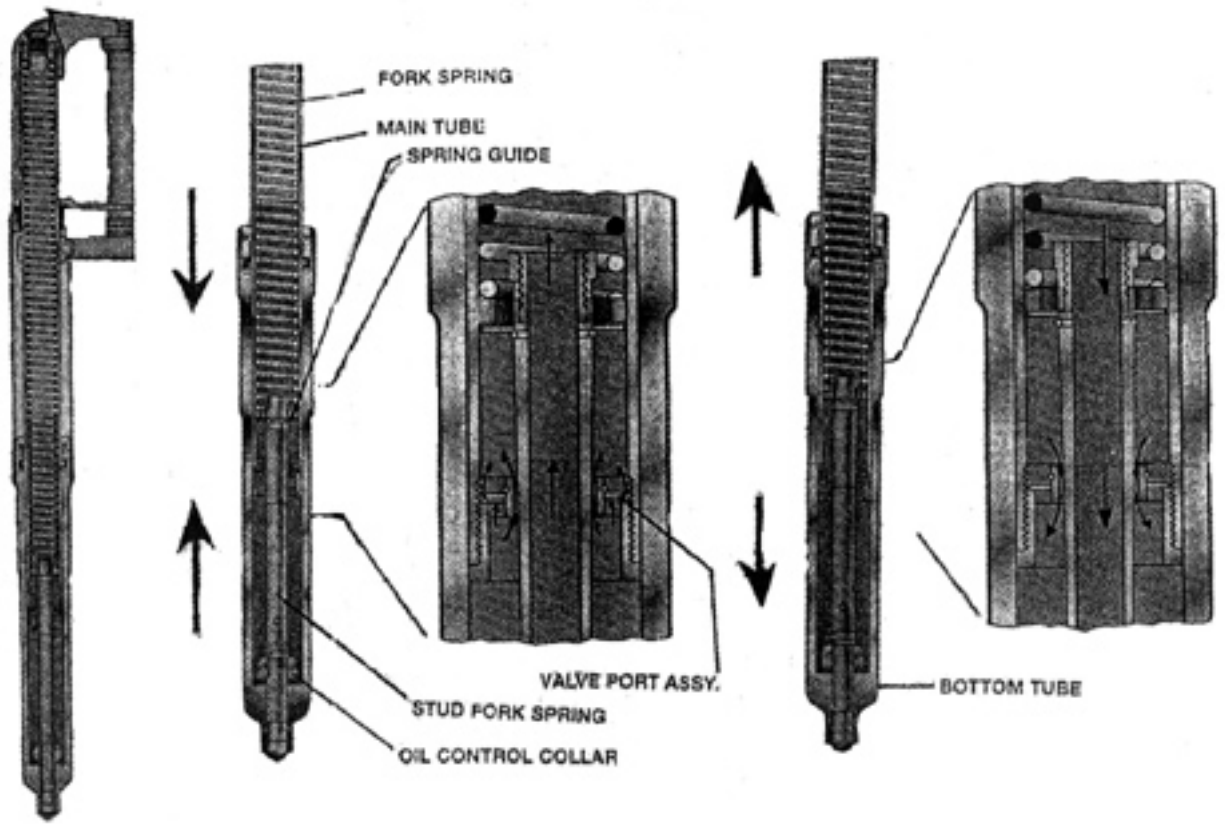
LUBRICATION SYSTEM

DRY SUMP PRESSURE FEED SYSTEM

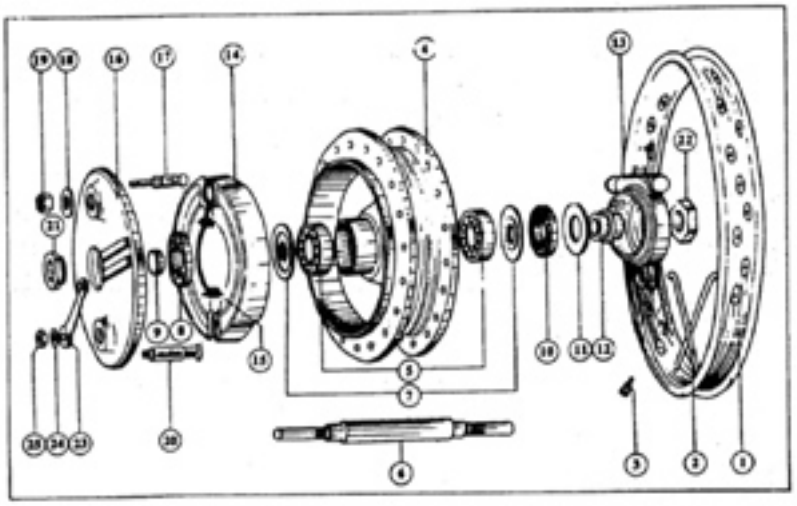
1. Oil is stored in a oil tank of 2.25 litre capacity. Dipstick with filler cap is provided to check the level and top up as needed.
2. There are two pumps in this system : A. Feed Pump and
   B. Return Pump
3. Feed pump flow circuit
   - ★ Oil tank ---> Drilled passage ---> Primary gauze filter ---> Feed Pump ---> Oil filter assembly ---> Feed plug on crank shaft ---> Drilled passages on crank shaft ---> Big end bearing ---> Drains to crank case.
   - ★ The oil that drains from big end is thrown around in crank case by the rotating crank shaft to lubircate cylinder walls, piston rings, and the main bearings.
   - ★ Bulk of the oil thrown on cylinder wall is scrapped down by oil scrapper ring.
   - ★ The drained oil gets accumulated in crank case.
4. Return pump flow circuit
   - ★ Crank case ---> Drilled passage ---> Gauze filter ---> Return pump ---> External pipeline ---> Rocker shaft bush
   - ★ From rocker shaft, oil flows to valve assembly ---> push rod tunnel ---> Timing chest.
   - ★ The rotating gears in the timing chest carry oil to lubricate all gears.
   - ★ Then the oil flows to oil tank through the oil return hole on the crank case.



FRONT FORK ASSEMBLY

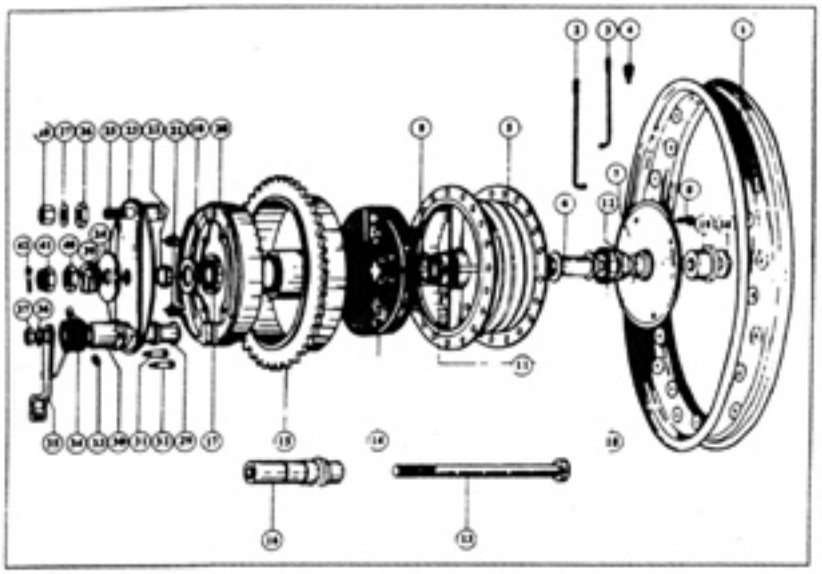


WHEEL AND HUB ASSEMBLY - FRONT



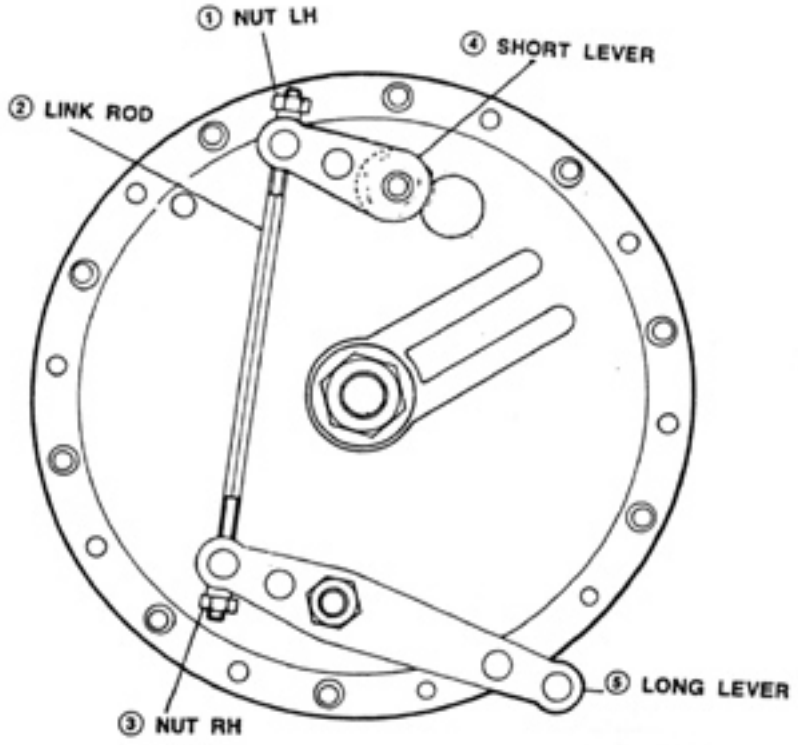
1. Front Wheel rim (WM 2-19)
2. Front Wheel spokes
3. Front Wheel spokes nipples
4. Front hub assembly
5. Front hub journal bearing (6203)
6. Front hub spindle
7. Front hub felt retainer
8. Front hub felt washer (drum side)
9. Front hub cover plate distance collar
10. Front hub felt washer (speedo side)
11. Front hub felt washer retainer (speedo side)
12. Front hub speedo drive spacing collar
13. Speedo drive complete
14. Front brake shoe c/w lining
15. Front brake shoe spring
16. Front brake cover plate
17. Front brake shoe pin
18. Washer front brake shoe pin
19. Nut front brake shoe pin
20. Front brake operating cam
21. Nut front hub cover plate
22. Front hub spindle nut (speedo side)
23. Front brake operating cam lever
24. Washer front brake operating cam lever
25. Nut front brake operating cam lever S/L

WHEEL AND HUB ASSEMBLY - REAR



1. Rear wheel rim Wm 2-19
2. Rear wheel spokes (dust cover side-outer)
3. Rear wheel spokes (dust cover side-inner)
4. Rear wheel spokes nipples
5. Centre hub with barrel
6. Rear hub bearing spacer assy.
7. Rear hub dust cover
8. Rear hub dust cover screw
9. Rear hub barred 'O' ring
10. Rear hub grease seal (small
11. Rear hub journal bearing
12. Rear hub grease seal (small)
13. Rear hub spindle (long)
14. Rear hub sprocket cush rubber
15. Rear hub sprocket 38T
16. Rear hub spindle (short)
17. Rear hub bearing (large)
18. Distance collar (dust cover inner side)
19. Rear hub distance collar (dust cover outerside)
20. Rear brake shoe c/w lining (bounded)
21. Rear brake shoe spring
22. Rear brake cover plate distance collar
23. Rear brake cover plate assembly
24. Rear hub distance collar (drum side)
25. Rear brake shoe pin
26. Nut rear brake shoe pin
27. Washer rear brake shoe pin (plain)
28. Shoe pin nut rear brake anchor
29. Rear brake operating cam
30. Rear brake cam bush
31. Rear brake operating cam bush pin (long)
32. Rear brake operating cam bush pin (short)
33. Rear brake operating cam bush pin lock nut
34. Rear brake return spring
35. Rear brake operating Cam Lever Assy.
36. Washer rear brake lever
37. Nut rear brake lever
38. Rear hub adjuster (RH)
39. Rear hub adjuster (LH)
40. Locknut (Rear hub spidle)
41. Nut rear hub spindle
42. Rear hub spindle split pin

TWIN LEAD BRAKE



PERIODICAL MAINTENANCE

The maintenance schedule detailed here will help you maintain your Bullet motorcycle meticulously and to get a long trouble free service. The schedule provided herein is based upon average riding conditions and indicates the Kms at which regular inspections, adjustments, replacements and lubrications are to be carried out. The frequency of the maintenance must be shortened depending upon the severity of the driving conditions or if the motorcycle is used in a very dusty environment. Contact the nearest Royal Enfield Authorised service centre for expert advice and to carry out the required maintenance.

S. No.	DESCRIPTION	FREE SERVICE Which ever is earlier				PAID SERVICE						
	Kms (x 1000)	0.5	3	6	9	12	15	18	21	24	27	30
	Months	1.5	3	6	9							
1	Engine Oil (Bullet 350 / Electra / 500)	R	R	R	R	R	R	R	R	R	R	R
		Check level every 500 Kms or earlier as required										
2	Engine Oil (Bullet Machismo)	R		R		R		R		R		R
		Check level every 500 Kms or earlier as required										
3	Engine oil filter (Bullet 350 / Electra / 500)	R	C	C	C	R	C	C	C	R	C	C
	Engine oil filter (Bullet Machismo)	C	C	R	C	R	C	R	C	R	C	R
4	Engine oil strainer (Bullet 350 / Electra / 500)	C	C	C	C	C	C	C	C	C	C	C
	Engine oil strainer (Bullet Machismo)	C		C		C		C		C		C
5	Tappets	A	A	A	A	A	A	A	A	A	A	A
6	CB points (350 / 500 CC)	A	A	A	A	R	A	A	A	R	A	A
7	Ignition timing (350 / 500 CC)	A	A	A	A	A	A	A	A	A	A	A
8	Automatic advance system (350 / 500 CC)	L		L		L		L		L		L
9	Spark plug	A	A	A	A	A	R	A	A	A	A	R
10	HT lead for crack	I	I	I	I	I	I	I	I	I	I	I
11	Air filter element	C	C	C	C	R	C	C	C	R	C	C
12	Carburetor	Clean Inspect and Tune										
13	Fuel filter (350 / Electra / Bullet Machismo)	C	C	R	C	R	C	R	C	R	C	R
14	Fuel tank			C		C		C		C		C
15	Breather Box (Bullet Machismo)	Drain Every 3000 Kms										
16	Fuel hose	I	I	I	I	R	I	I	I	R	I	I
17	Accelerator cable play	A	A	A	A	A	A	A	A	A	A	A
18	Rubber hose, Air filter to Carberetor	I	I	I	I	R	I	I	I	R	I	I
19	Auxiliary air regulatin pipe (Bullet 350 / Electra)	I	I	I	I	R	I	I	I	R	I	I
20	Braided Hose (500 CC) crack / leaks	I	I	I	I	I	I	I	I	I	I	I
21	Hose PAV to Inlet manifold (500 CC) crack/leaks	I	I	I	I	R	I	I	I	R	I	I
22	L' metallic pipe in Inlet Flange (500 CC) crack/leaks	I	I	I	I	I	I	I	I	I	I	I

A : Adjust C : Clean D : De-carbonise F : Face / Run out I : Inspect L : Lubricate R : Replace
Note : For maintenance after 30,000 Kms pls repeat the same frequency levels specified above, in consultation with a Royal Enfield Authorised service centre.

S. No.	DESCRIPTION	FREE SERVICE Which ever is earlier				PAID SERVICE						
	Kms (x 1000)	0.5	3	6	9	12	15	18	21	24	27	30
	Months	1.5	3	6	9							
23	Rubber Inlet manifold (Bullet Machismo / 500 CC) crack/leaks	I	I	I	R	I	I	I	R	I	I	I
24	Decompressor cable play	Adjust every 1000 Kms or earlier as required										
25	Inlet / Exhaust valve seating						A					A
26	Cylinder head						D					D
27	Exhaust system						D					D
28	Primary Chain tension	A		A		A		A		A		A
29	Clutch oil	R	R	R	R	R	R	R	R	R	R	R
		Check level every 500 Kms or earlier as required										
30	Clutch free play	Adjust every 1000 Kms or earlier as required										
31	Gear box grease / oil					R			R			
		Check level every 1000 Kms or earlier as required										
32	Clutch actuating arm	L	L	L	L	L	L	L	L	L	L	L
33	Rear brake pedal pivot	L	L	L	L	L	L	L	L	L	L	L
34	Battery terminals (apply petroleum jelly)	C	C	C	C	C	C	C	C	C	C	C
35	Battery Electrolyte level	I	I	I	I	I	I	I	I	I	I	I
36	Earth wire eyelet (behind battery carrier)					I						I
37	Rear Chain	A	A	A	A	A	A	A	R	A	A	A
		Lubricate every 3000 Kms or earlier as required										
38	Fork oil					R			R			
		Check level every 1000 Kms or earlier as required										
39	Front brake play	Adjust every 1000 Kms or earlier as required										
40	Rear brake play	Adjust every 1000 Kms or earlier as required										
41	Front / Rear brake cams			L		L		L		L		L
42	Steering ball races					L				L		
43	Spokes tightness	I		I		I		I		I		I
44	Wheel rim runout			I		I		I		I		I
45	Tyre wear		I	I	I	I	I	I	I	I	I	I
46	Hand levers & kick starter pivot	Lubricate every 1000 Kms or earlier as required										

A : Adjust **C : Clean** **D : De-carbonise** **F : Face / Run out**
I : Inspect **L : Lubricate** **R : Replace**

Note :

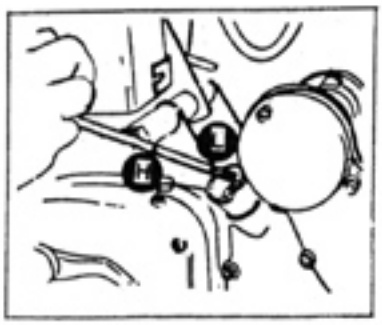
For maintenance after 30,000 Kms pls repeat the same frequency levels specified above, in consultation with a Royal Enfield Authorised service centre.

PERIODICAL MAINTENANCE

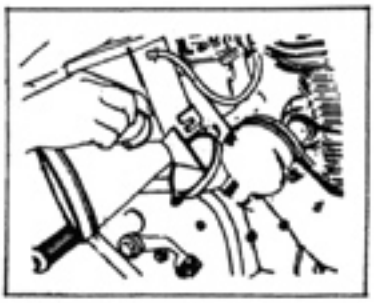
ENGINE OIL

Viscosity	-	SAE 20W-50
API rating	-	SE or above

LEVEL CHECK



✓ Right Level :
Between 'H' and 'L' of dipstick



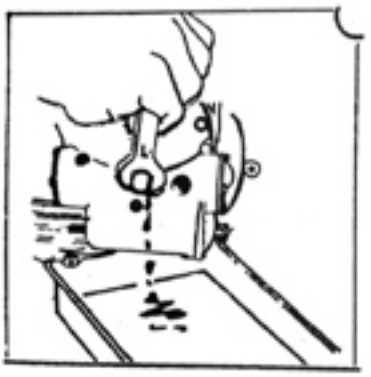
✓ Top up, if required upto 'H' mark on dipstick

OIL CHANGE : (EVERY 3000 KMS)

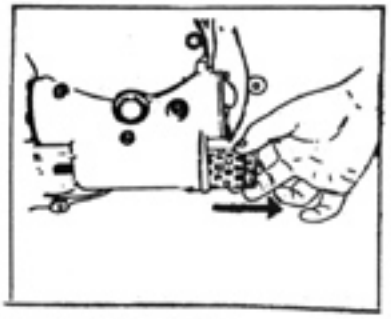
✓ Keep vehicle on level ground

✓ Start the engine and warm up before draining.

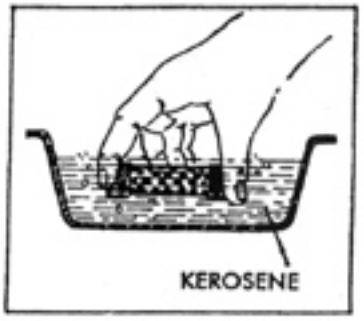
✓ Drain the oil from oil tank and sump



✓ Drain the oil from timing chest

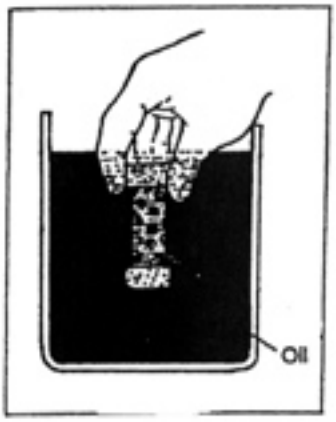


✓ Remove the filter

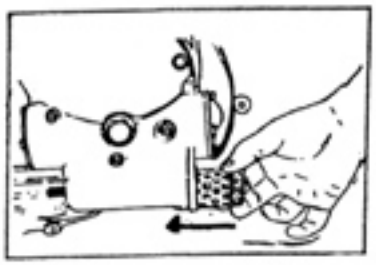


✓ Clean the filter

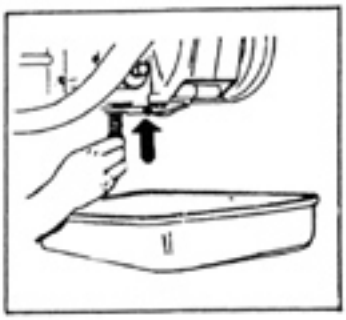
Note : Replace oil filter element every 12000 Kms.



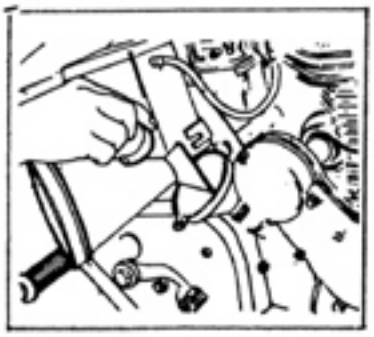
✓ Soak the filter in oil for 15 mts.



✓ Rifit the filter

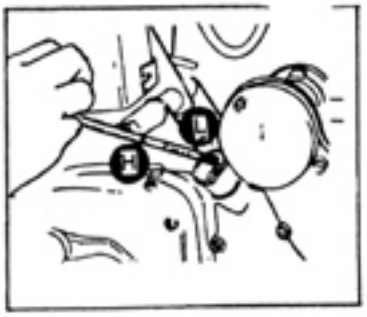


✓ Tighten the drain plugs and feed plug



✓ Fill up with SAE 20W-50 oil

✓ Capacity : 2.25 Lits



✓ Check level

✓ Oil level should be upto 'H' mark

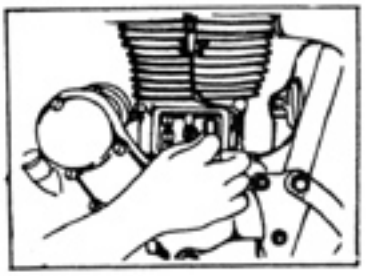
TAPPETS ADJUS™ENT

(EVERY 3000 KMS)

✓ Ensure engine is cold

✓ Bring piston to compression stroke TDC

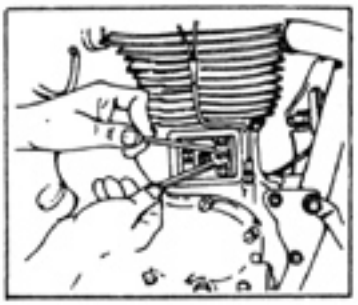
Set by noting the ammeter needle deflection from negative to zero.



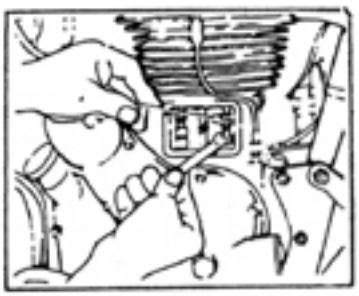
✓ Remove tappet cover and check push rods.

✓ Push rods to be thumb free without up & down play.

✓ If incorrect, adjust as follows :



✓ Loosen the lock nut

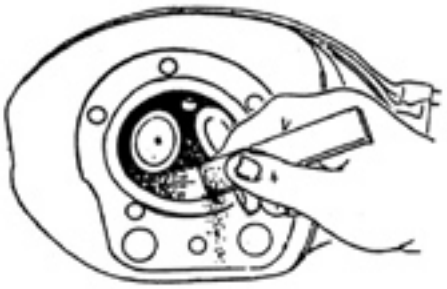


✓ Adjust the screw for zero clearance and thumb push rotation

✓ Tighten lock nut and check

DECARBONISING (EVERY 12,000 KMS)

Cylinder head

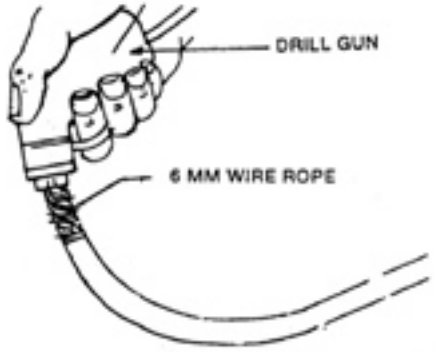


- ✓ Scrub out carbon with a scraper
- ✓ Similarly, decarbonise piston and barrel also

EXHAUST BEND PIPE

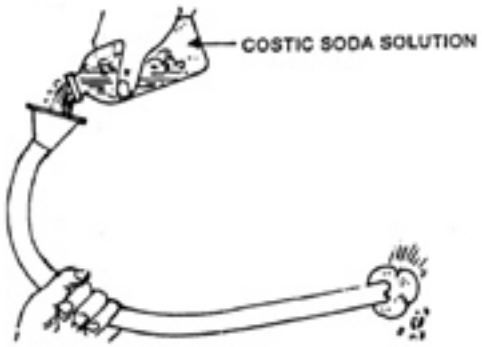
MECHANICAL METHOD

- ✓ Take 6 mm wire rope of 70cm length
- ✓ Loosen out splines at one end.
- ✓ Fit the other end to a drill gun



- ✓ Insert it into the pipe and operate the drill.
- ✓ The loose splines of the wire rope will cut and remove the carbon

Chemical method



- ✓ With a potato, close the tube at one end.
- ✓ Prepare a solution by mixing 1 kg. Caustic soda with 8 ltrs. of water.

> Note : Prepare the solution in plastic container. Do not allow caustic soda or the solution to come in contact with skin or cloth.

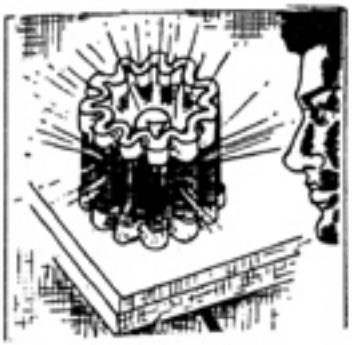
- ✓ Fill the pipe with the solution
- ✓ Keep for 45 to 60 minutes
- ✓ Remove the solution
- ✓ Clean the pipe thoroughly in running water.

AIR FILTER CLEANING

(EVERY 3,000 KMS)

- ✓ Tap - off the dirt

- ✓ Blow compressed air (15 PSI) from inside out



- ✓ Use light to check for cracks / holes / clogging
- ✓ If defective, replace with new.

CARBURETTOR

CLEANING (EVERY 3,000 KMS)

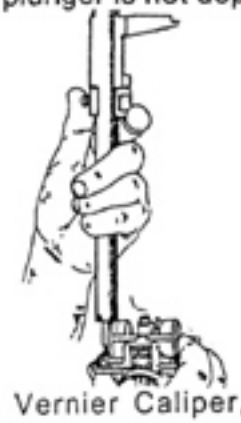
- ✓ Remove the main and pilot jets.
- ✓ Clean with compressed air

FLOAT HEIGHT ADJUSTMENT

(EVERY 3,000 KMS)

Float Height : 28 to 30 mm

- ✓ Remove the float chamber body and gasket
- ✓ Hold the mixing chamber body in inverted position
- ✓ Hold the float so that its tongue just contacts the spring loaded plunger of the float needle valve. Ensure that the spring loaded plunger is not depressed.

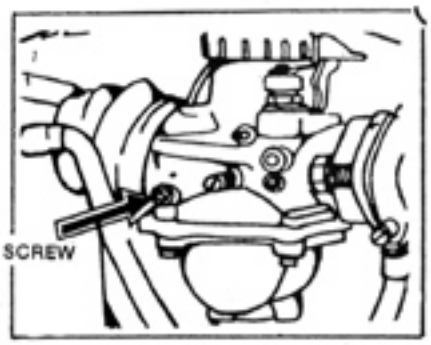


- ✓ With a Vernier Caliper, measure the height from the mixing chamber body face to top of the float.
- ✓ If, the float height is incorrect, correct it by bending the float assembly tongue.
- ✓ Check the float height again.

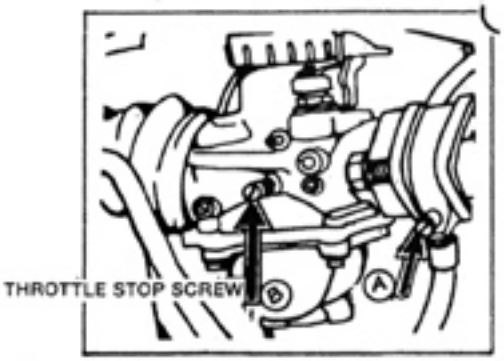
LOW IDLE ADJUSTMENT

(EVERY 3,000 KMS)

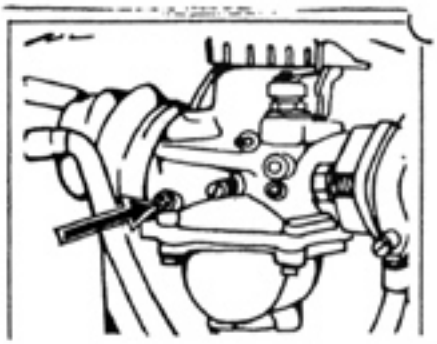
Note : Warm up engine before tuning



- ✓ Tighten the air screw fully and loosen it out by one and half turn.
- ✓ Tighten Auxiliary air screw fully.
- ✓ Start and warm up the engine.

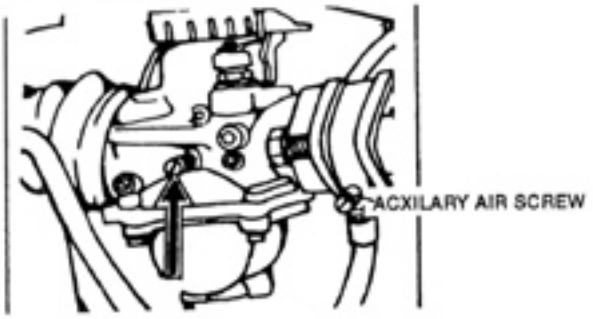


- ✓ Set engine speed to 1300 RPM by screwing in throttle stop screw.



- ✓ Loosen the air screw to get highest engine speed

- ✓ Loosen the stop screw and set low idle speed to 900 to 1000 RPM

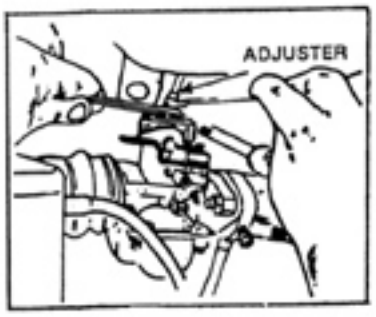


- ✓ Loosen the auxiliary air screw by half turn. Engine RPM increases.
- ✓ Loosen the throttle stop screw and set idle speed to 900 to 1000 RPM
- ✓ Repeat the above two steps until turning out auxilary air screw does not increase engine RPM

THROTTLE CABLE FREE PLAY ADJUSTMENT

Free Play : 1 to 2 mm

- ✓ Loosen the lock nut



- ✓ Screw in the cable adjuster to increase the play and screw out the cable adjuster to reduce the play.
- ✓ Tighten the lock nut.

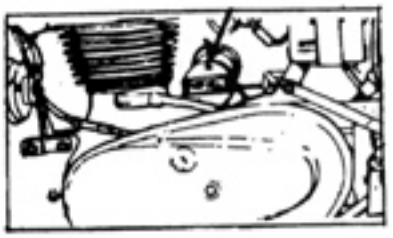
SPARK PLUG

CLEAN AND ADJUST : EVERY 3000 KMS

- ✓ Clean inside with a pointed scraper
- ✓ Measure and adjust the gap to 0.5 mm

GREASING

DISTRIBUTOR SHAFT : (EVERY 3000 KMS)

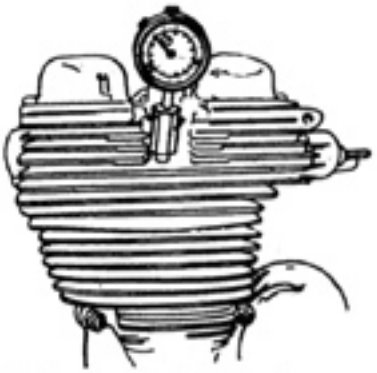


- ✓ Grease with a grease gun

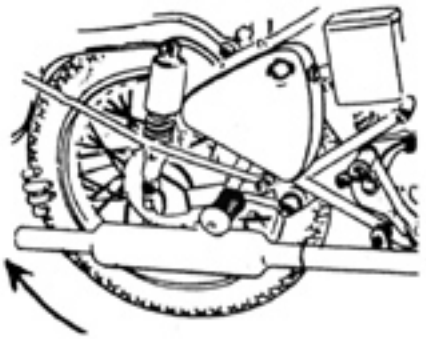
IGNITION TIMING ADJUSTMENT

(EVERY 3000 KMS) Only for BULLET 350, 500, Lightning 535

- ✓ Remove spark plug

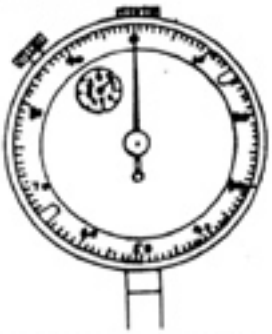


- ✓ Fit dial gauge with adaptor
- ✓ Put a wooden plank under centre stand legs so that rear wheel is lifted from the ground.
- ✓ Engage fourth gear by rotating the rear wheel and shifting the gear lever simultaneously.

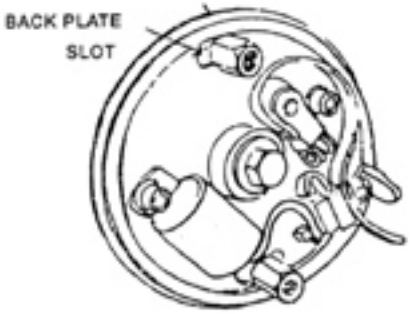


- ✓ Rotate the rear wheel as shown and bring the piston to TDC in compression stroke.

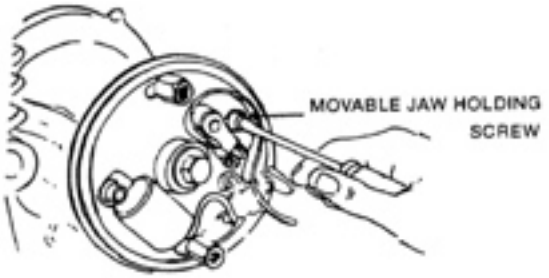
✓ Maximum clockwise reading of dial gauge indicates TDC.



✓ Zero set the dial gauge

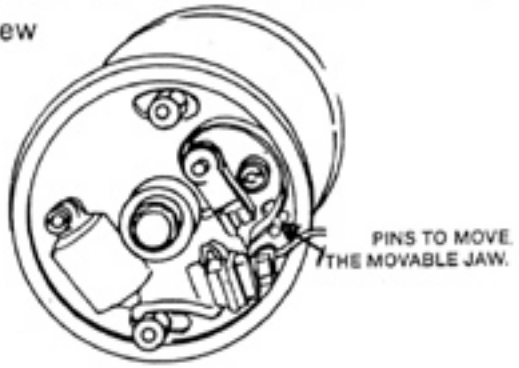


✓ Ensure CB back plate screws are at the centre of back plate slots.



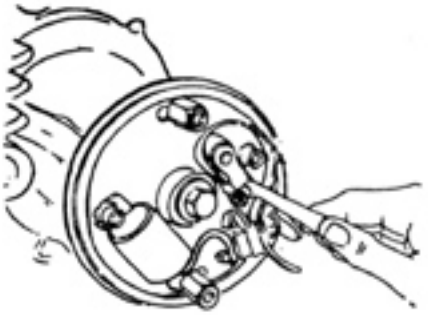
✓ Clean the CB points

✓ Loosen the movable jaw holding screw



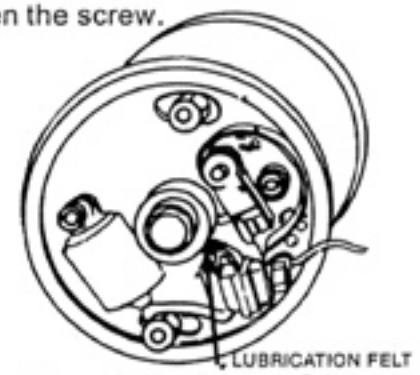
✓ Adjust the gap. Use a screw driver to move the CB point movable Jaw

✓ Set the gap to 0.35 to 0.40 mm

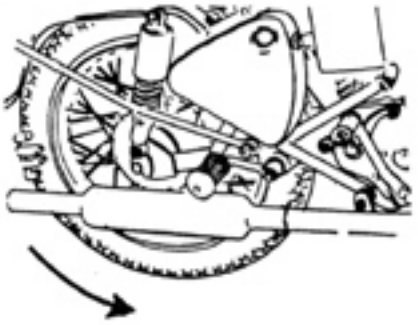


✓ Check with a feeler gauge

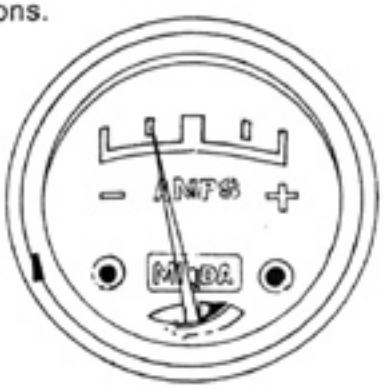
✓ Tighten the screw.



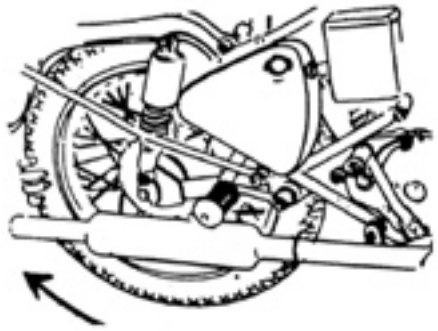
✓ Apply a drop of oil onto cam felt.



✓ Turn the wheel as shown until the dial gauge needle makes 3 full anticlockwise revolutions.



✓ Turn ignition switch 'ON', ammeter will deflect to - ve side.

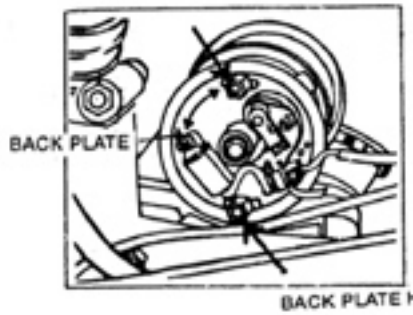


✓ Turn the wheel as shown very slowly...

✓ ... Till the needle makes 2.2 clockwise revolution (i.e. 0.8mm before TDC. Needle position as shown above.)

Note : Take care not to cross '20' reading

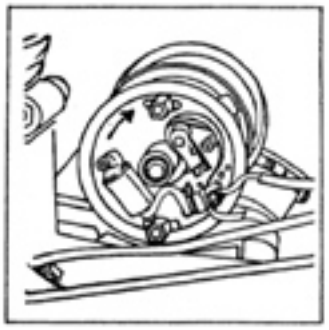
Note : If the needle crosses '20' reading repeat the above four steps to eliminate timing gears backlash effect on ignition timing.



✓ Loosen the backplate holding screws and adjust back plate, such that CB point just opens...

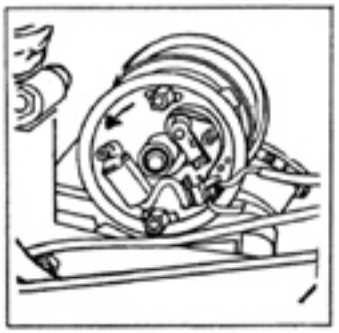
✓ ... As indicated by ammeter just deflecting back to zero

RETARDING & ADVANCING



✓ For retarding.

- Reduce the CB point gap.
- Move base plate in clockwise direction.



✓ For advancing.

- Increase the CB point gap
- Move the base plate in anticlockwise direction.

- ✓ Remove the strips.
- ✓ Rotate the engine to ascertain that the rotor does not come in contact with the stator.

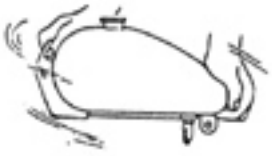
PETROL TANK CLEANING

(EVERY 6.000 KMS)

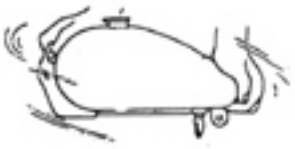
- ✓ Remove the petrol tank
- ✓ Plug the drain hole

- ✓ Pour 500 ml of kerosene

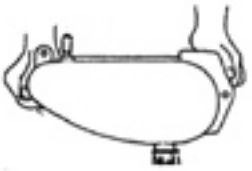
- ✓ Put a handful of carpenter screws in it.



- ✓ Vigorously shake the tank for 2 to 3 minutes.



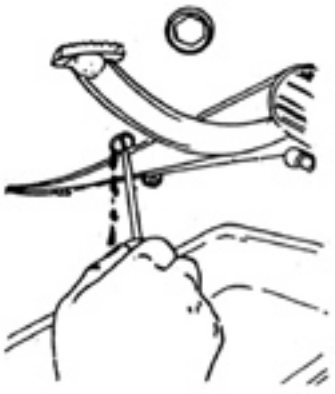
- ✓ Drain and remove kerosene and the screws.



- ✓ Pour 500 ml of fresh kerosene, shake and drain.
- ✓ Blow compressed air to dry the tank.

CLUTCH

OIL LEVEL CHECK (EVERY 1000 KMS)



- ✓ Loosen / remove the level plug.
- ✓ The clutch oil should slowly ooze out
- ✓ If not, top up with SAE 10 W - 30 oil.

- ✓ Remove the strips.
- ✓ Rotate the engine to ascertain that the rotor does not come in contact with the stator.

PETROL TANK CLEANING

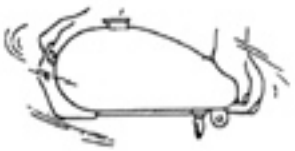
(EVERY 6,000 KMS)

- ✓ Remove the petrol tank
- ✓ Plug the drain hole

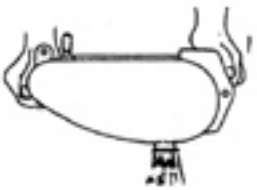
- ✓ Pour 500 ml of kerosene

- ✓ Put a handful of carpenter screws in it.

- ✓ Vigorously shake the tank for 2 to 3 minutes.



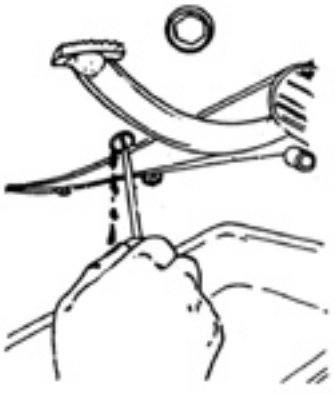
- ✓ Drain and remove kerosene and the screws.



- ✓ Pour 500 ml of fresh kerosene, shake and drain.
- ✓ Blow compressed air to dry the tank.

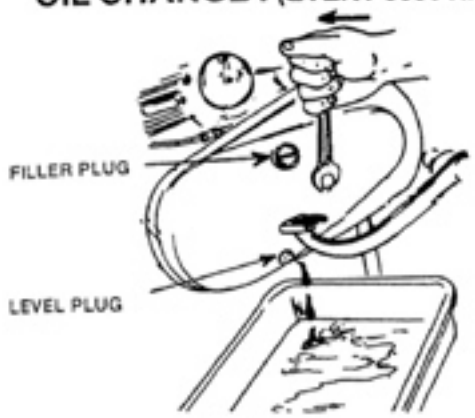
CLUTCH

OIL LEVEL CHECK (EVERY 1000 KMS)

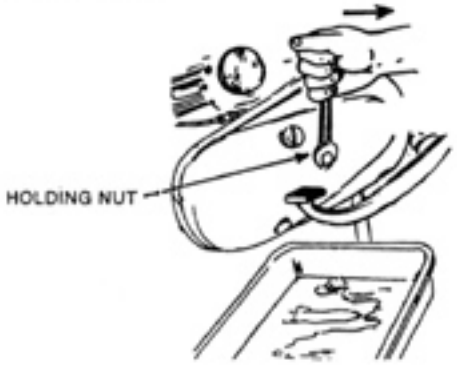


- ✓ Loosen / remove the level plug.
- ✓ The clutch oil should slowly ooze out
- ✓ If not, top up with SAE 10 W - 30 oil.

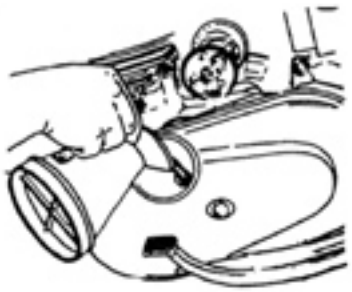
OIL CHANGE : (EVERY 3000 KMS)



- ✓ Keep the vehicle on level ground
- ✓ Drain the oil by loosening the chain case cover outer

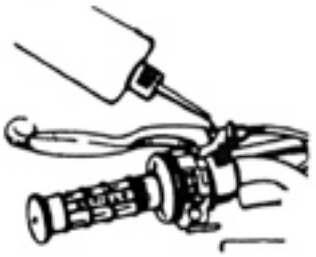


- ✓ Tighten the chain case cover holding nut
- ✓ Remove the level plug
- ✓ Remove the filler plug
- ✓ Pour SAE 10W - 30 oil through the filler plug
- ✓ ... Till the oil oozes out from the level plug hole



- ✓ Tighten filler and level plugs.

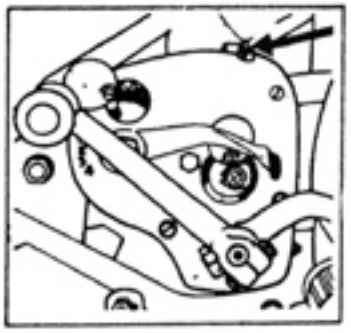
CABLE END OILING : (EVERY 3000 KMS)



- ✓ Lubricate the cable end with a oil can.

GREASING

- ✓ With a grease gun, grease the clutch actuating ARM through the grease nipple

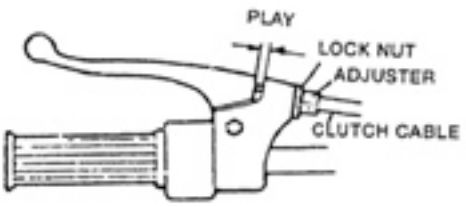


- ✓ Remove the adjuster.
- ✓ Remove the ball and clutch rods from main shaft.
- ✓ Apply grease on then.
- ✓ Refit them.

CLUTCH CABLE FREE PLAY :

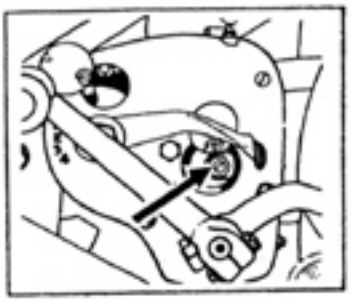
(EVERY 1000 KMS)

Free play : 2-3 mm



WITH ADJUSTER SCREW

✓ Ensure cable adjuster is fully in.



✓ Loosen the lock nut
✓ Tighten the screw till resistance is felt
✓ Now, loosen out by ½ turn
✓ Tighten lock nut

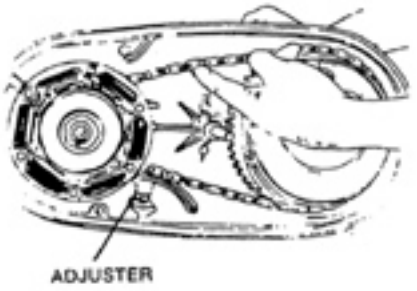
WITH ADJUSTER ON CABLE

✓ Loosen the lock nut

✓ Screw out the adjuster to reduce the play.
✓ Screw in the adjuster to increase the play.
✓ Tighten the locknut.

PRIMARY CHAIN TENSION ADJUSTMENT (EVERY 3000 KMS)

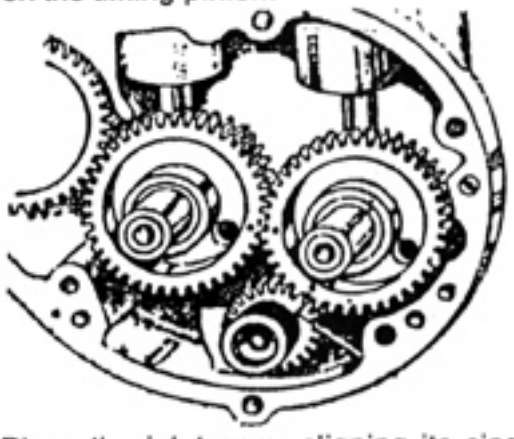
✓ Check the slackness at the centre of the top run.
✓ If more, adjust as follows



✓ Loosen adjuster lock nut
✓ Screw out the adjuster till the right slackness is achieved
✓ Tighten the lock nut.

VALVE TIMING

✓ Punch marks on crank shaft pinion, exhaust cam wheel and inlet cam wheel are to aligh when piston is at TDC.
✓ Bring the Piston to TDC (The Timing pinion key way will be at 12 'O' clock position)
✓ Position the Exhaust cam, aligning its two punch marks with the two punch marks on the timing pinion.



✓ Place the inlet cam, aligning its single punch mark with the single punch mark on the exhaust cam.

GEAR BOX

LUB : LEVEL CHECK : (EVERY 3,000 KMS)

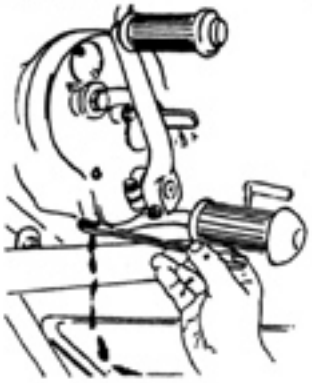
✓ Remove the level plug

✓ The Grease should ooze out.

✓ If not, top up with SAE 20 W-50 oil

LUBRICANT CHANGE : (EVERY 12,000 KMS)

✓ Start and warm up the engine



Drain the lubricant

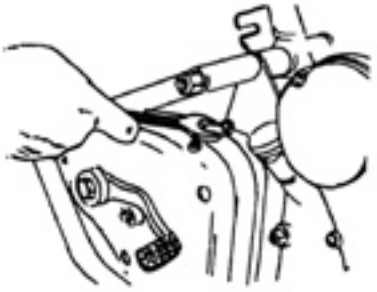
Tighten the drain plug

✓ Remove the filler and level plugs.

✓ Use VEEDOL '00' grease, 700 grams

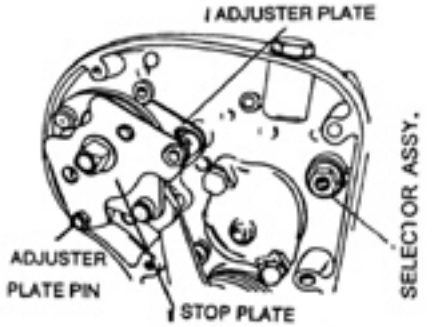
✓ Fill the gear box with veedol '00' grade grease ...

✓ Till the grease starts oozing out from the level plug hole.



✓ Tighten the fil' ·nd level plug

SELECTOR ADJUSTER PLATE ADJUS™ENT



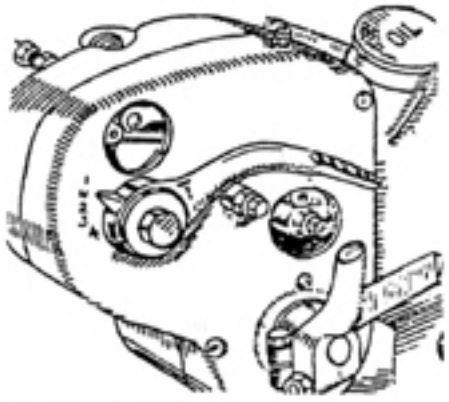
✓ Remove the gear box end cover

- ✓ Remove the nuts and the foot control stop plate.
- ✓ Loosen the adjuster plate pins.
- ✓ Move the adjuster plate as required
- ✓ Move the adjuster plate in :
  - ★ Anticlock wise directon to make 1st gear engagement easier.
  - ★ Clock wise direction to make 2nd, 3rd and 4th gear engagement easier.
- ✓ Tighten the adjuster plate pin.
- ✓ Fit foot control stop plate and nut.
- ✓ Fit the gear box end cover

GEAR OPERATOR SELECTOR ASSEMBLY ADJUSTMENT

- ✓ Loosen the lock nut.
- ✓ Tighten the gear operator selector assembly fully.
- ✓ Loosen the gear operator selector till it clicks two times.
- ✓ Tighten the lock nut.
- ✓ Check gear shifting. If tight, loosen the gear operator by one more click.

NEUTRAL FINDER ADJUSTMENT

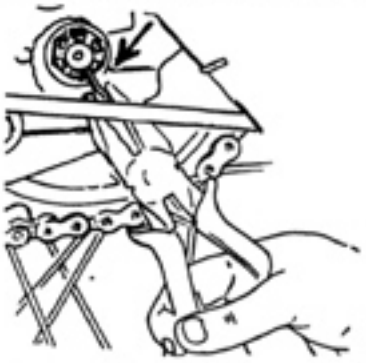


- ✓ Shift Gear to 4th
- ✓ Depress the neutral lever, while gently turning rear wheel, gear from 4th must fall into the neutral.
- ✓ If it does not fall into the neutral, the neutral lever travel is less.
- ✓ If it crosses through neutral to first gear, the neutral lever travel is more.
- ✓ Loosen the screw of neutral stopper eccentric cam and turn the cam to correct the travel of the neutral finder lever.

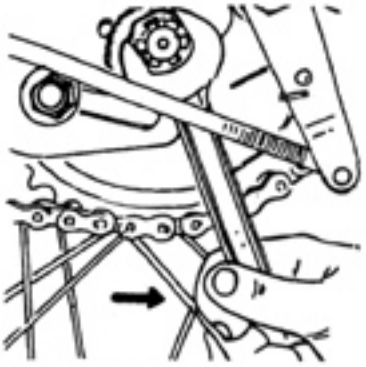
REAR CHAIN

SLACKNESS ADJUSTMENT :

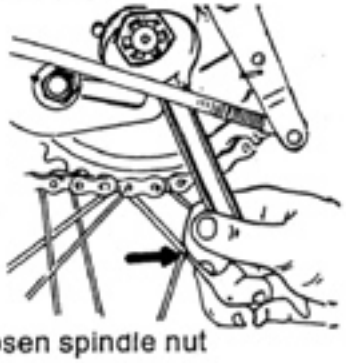
- ✓ Check slackness
- ✓ Slackness to be 25 to 30 mm
- ✓ If more or less, adjust as follows :



- ✓ Remove split pin.



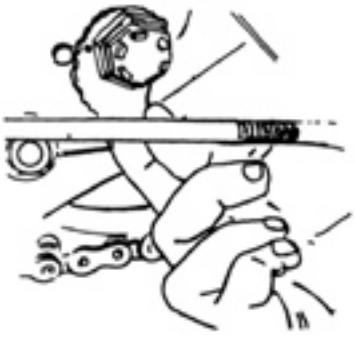
- ✓ Loosen Axle nut



- ✓ Loosen spindle nut

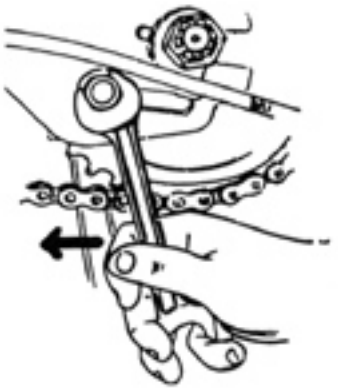
✓ Loosen anchor nut

✓ Loosen the brake rod nut



✓ Turn the adjuster cams on both sides till 25 to 30 mm chain slackness is achieved.

✓ Check and ensure that the number of notches from the punch mark on the cam to the notch resting on the pin are equal on both sides.



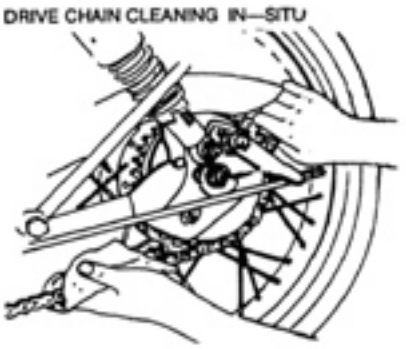
✓ Apply brake and tighten all the nuts.

REAR CHAIN

CLEANING AND LUBRICATION

(EVERY 1000 KMS)

DRIVE CHAIN CLEANING IN—SITU



✓ Clean the chain using a clean piece of cloth.

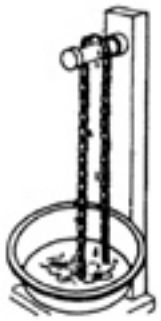
✓ Apply SAE 20W - 50 oil liberally on the chain.

✓ Rotate the wheel to run the chain several times.

✓ Wipe off the excess oil using a clean dry cloth.

AFTER REMOVAL : (EVERY 3000 KMS)

✓ Brush and clean the chain in kerosene



✓ Hang the chain for 5 minutes to allow the kerosene to drain.

✓ Clean with a piece of dry cloth.

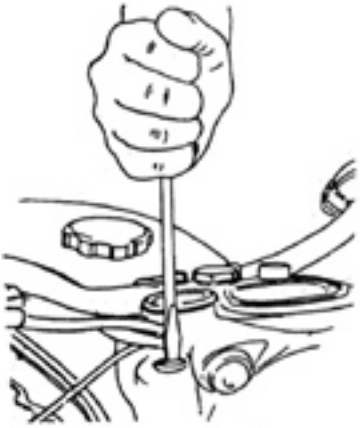
✓ Heat grease (multipurpose) to 120°C (Appx.)
✓ Place the chain in the molten grease.
✓ Allow the grease to cool.
✓ Remove chain fram the grease.

✓ Remove the excess grease and clean the chain with a piece of dry cloth

✓ While refitting, ensure correct direction of lock link.

FRONT FORK

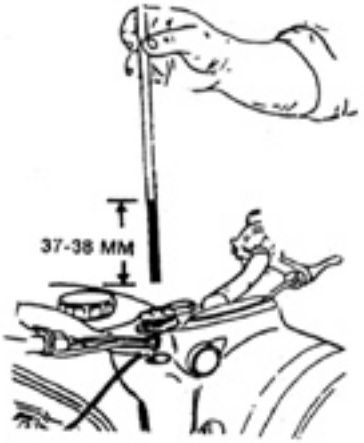
LEVEL CHECK : (EVERY 3000 KMS)



✓ Remove plug screw

✓ Check oil level with a 5 mm dia rod

✓ The level to be 37 to 38 mm

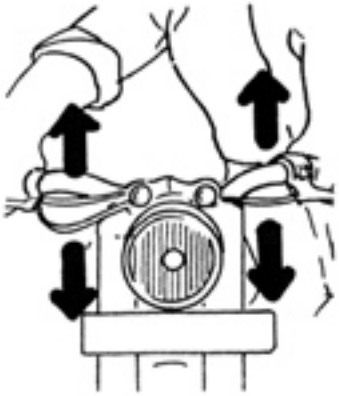


✓ Top up, if required.

OIL CHANGE : (EVERY : 12,000 KMS)

- ✓ Remove spring stud nut and drain oil
- ✓ Tighten the spring stud nut.
- ✓ Pour 200 ml of SAE 10 W - 30 oil in each leg.

- ✓ Fit and tighten the plug screw.



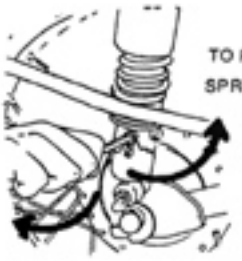
- ✓ Bump front fork several times

- ✓ Remove plug screw and check level.
- ✓ Top up, if required.

- ✓ Tighten plug screw

SHOCK ABSORBER ADJUSTMENT

- ✓ The adjuster at the bottom of the spring has five notches.
- ✓ For normal use, keep the adjuster at 3rd notch.



- ✓ Turn the adjuster as shown in the picture for increasing or reducing the spring tension.

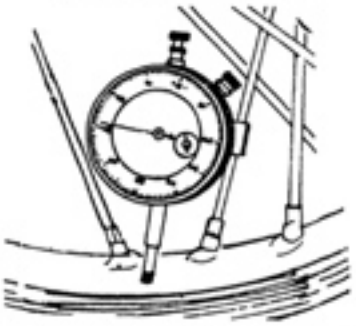
- ✓ Increase the spring tension for heavy load and rough road operation.
- ✓ Reduce the spring tension for smooth road and low load operation.
- ✓ Select the same adjuster position for both LH & RH shock absorbers.

WHEEL RIM

FACE OUT CHECKING

- ✓ Pre load the dial gauge on to the face of the rim
- ✓ Slowly rotate the wheel.
- ✓ The total indicated reading is the face out.
- ✓ Service Limit : 2 mm

RUN OUT CHECKING



- ✓ Pre load the dial guage on to the rim inner face.
- ✓ Slowly rotate the wheel.
- ✓ The total indicated reading is the runout.
- ✓ Service Limit : 2 mm.

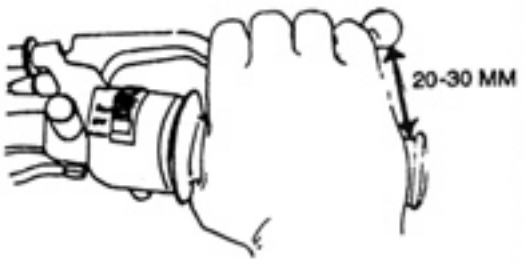
REAR SPROCKET DRUM BEARING

GREASING (EVERY : 12,000 KMS)

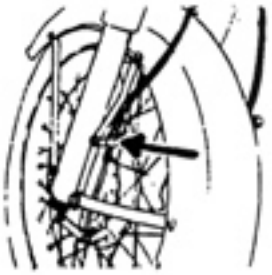
- ✓ Remove the sprocket drum assembly.
- ✓ Pack Grease.
- ✓ Replace grease seal with new.
- ✓ Refit the sprocket assembly.

FRONT BRAKE

ADJUSTMENT



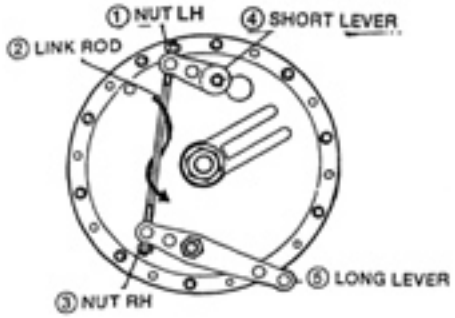
- ✓ Depress front brake lever fully and check if distance between handgrip and lever is 20 - 30 mm. If gap is less adjust as follows.



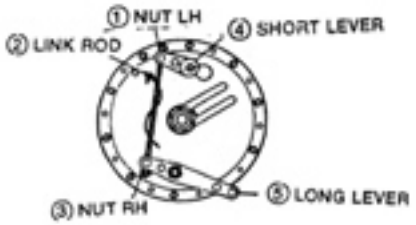
- ✓ Loosen the lock nut at the LH fork end and turn out the adjuster screw till the distance from brake lever to hand grip comes to 20 to 30 mm

TWIN LEAD BRAKE ADJUSTMENT

- ✓ Keep the brake in released condition.



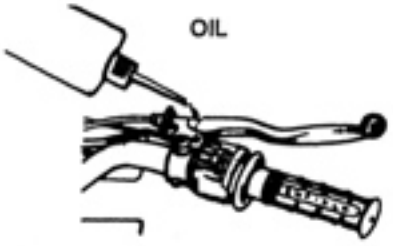
- ✓ Loosen link rod nuts 1 & 3.
- ✓ Turn link rod 2 as shown above 3 times.
- ✓ The short lever 4 moves towards release position.
- ✓ Apply the brake and keep it applied.



- ✓ Turn the link rod 2 as shown above.
- ✓ This would move the short lever 4 towards apply direction.
- ✓ Stop turning link rod 2 when high resistance is felt for turning.
- ✓ Tighten the link rod nuts 1 & 3.

LEVER PIVOT LUBRICATION

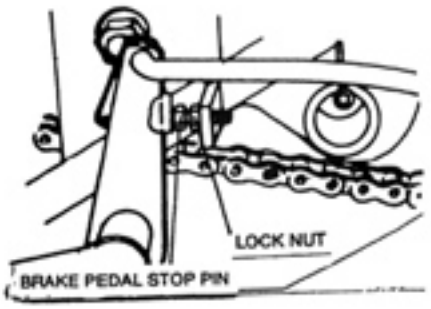
(EVERY 3,000 KMS)



- ✓ Apply few drops of engine oil at the lever pivot.

REAR BRAKE

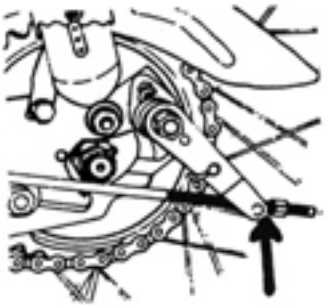
PEDAL HEIGHT ADJUSTMENT



- ✓ Loosen the lock nut.
- ✓ Turn in / out the pedal stop pin till the pedal and foot rest are at the same level.
- ✓ Tighten the lock nut.

PEDAL PLAY ADJUSTMENT

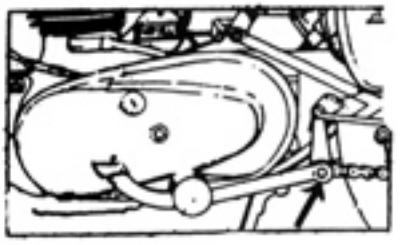
Pedal play - 25 to 35 mm



- ✓ Turn in/out the adjuster nut for correct pedal play.

BRAKE PEDAL BUSH

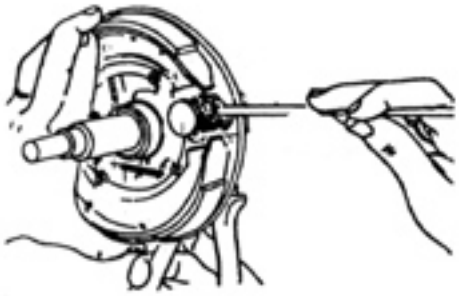
GREASING (EVERY 3,000 KMS)



- ✓ Grease the nipple with a grease gun.

BRAKE CAM GREASING

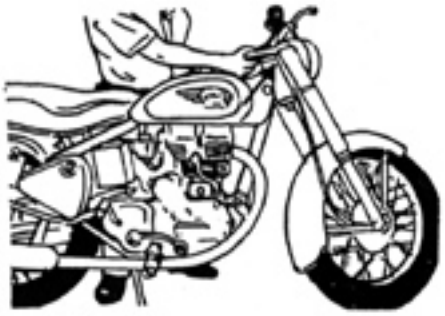
(EVERY 6,000 KMS)



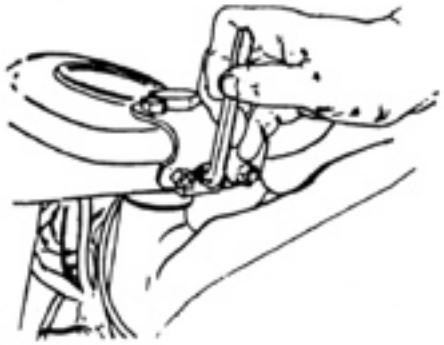
- ✓ Remove the brake cover plate.
- ✓ Clean the brake cam and apply grease.
- ✓ Refit the cover plate.

STEERING PLAY ADJUSTMENT

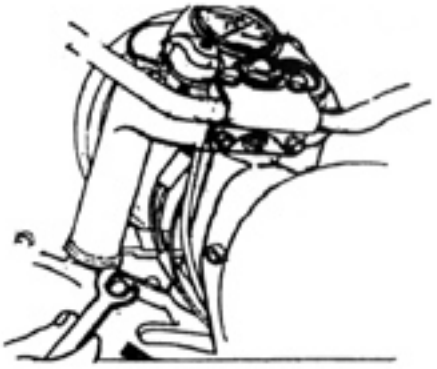
(EVERY 3,000 KMS)



- ✓ Keep a wooden plank under the stand.
- ✓ Rock the front end and feel the play at stem top end.
- ✓ If felt, adjust as follows :



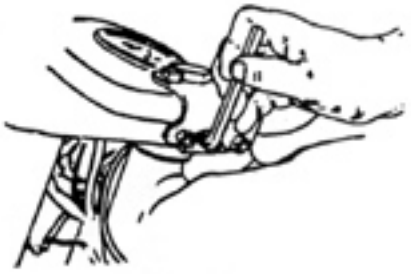
- ✓ Loosen head lamp casing allen screw.



- ✓ Loosen crown plate bolts.

- ✓ Tighten stem lock nut.

- ✓ Check play.
- ✓ Steering to be free with out any play.



- ✓ Tighten headlamp casing allen screw.
- ✓ Tighten crown plate bolts.

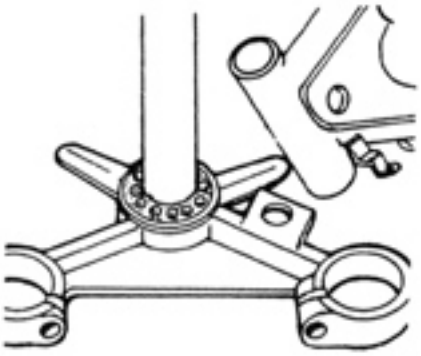
STEERING BALL RACE LUBRICATION

(EVERY 12,000 KMS)

✓ Remove steering stem assembly.

✓ Clean and check the balls and races throughly for damages / pittings / discolouration.

✓ Change if defective.



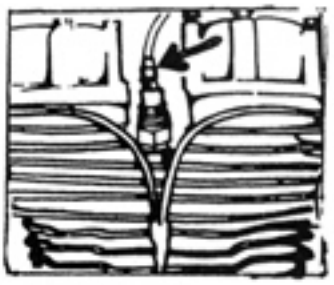
✓ Pack grease on the bottom ball race.

✓ Pack grease on the top ball race.

✓ Assemble the steering stem.

DECOMPRESSOR CABLE

PLAY ADJUSTMENT



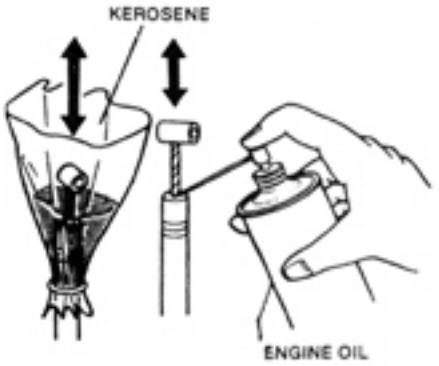
✓ Loosen the lock nut

✓ Adjust with adjuster screw till 4 to 5 mm play at lever is achieved.

✓ Tighten the lock nut.

CABLE CLEANING

✓ Remove the dirt with kerosene as shown.

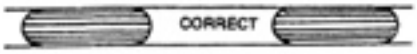


✓ Lubricate with fresh lubricating oil.

WHEEL ALIGNMENT CHECK

✓ Hold the vehicle upright off the stand on a level ground

✓ Stretch a string about 100 mm above the ground along the wheels.



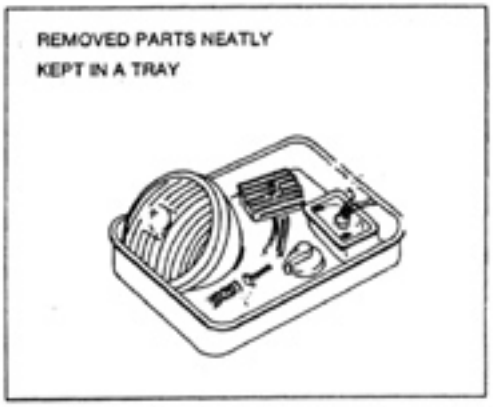
✓ If the string touches two points on the rear wheel and two points on the front wheel (Four point contact) then the wheels are aligned.

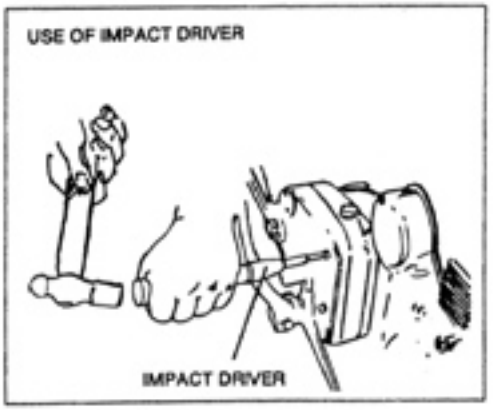
✓ If the string touches only three points on the two wheels, the alignment is incorrect

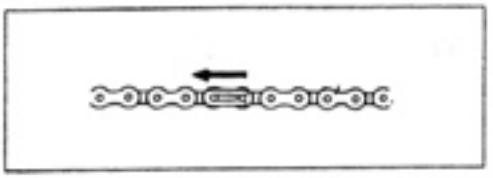
✓ Adjust the rear wheel, with chain adjuster cam till the string touches four points.

CLEANING AND ASSEMBLY PRECAUTIONS

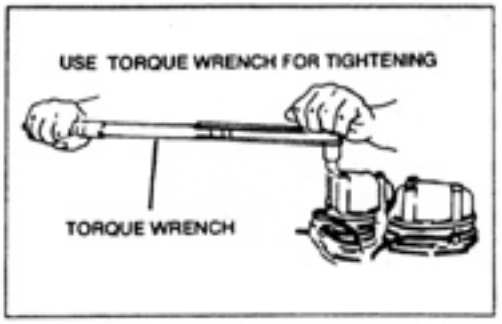
1. Ensure, the vehicle needs the service you contemplate by proper investigation and analysis
2. Keep the vehicle on a ramp so as to stand and work. People work faster this way.
3. Arrange parts removed in trays, neatly.
4. Inspect all parts, decide the parts you need for servicing and procure it. Only then start assembly.
5. Clean all components (except rubber and electrical parts) in clean kerosene oil mixed with 2% Engine oil.
6. Never use petrol for cleaning. It is costlier and hazardous.
7. Apply lubricating oil on piston, piston ring, and cylinder bore before assembly.
9. Apply oil on threads of bolts and nuts.
10. Replace washers, seals, gaskets and circlips while overhauling.
11. Always use right tools while working to make the work faster, safer and dependable.
12. Use impact screw driver for loosening jammed screws.
13. Heat the aluminium bearing bores for removal and assembly of bearings.
14. Ensure sealing surfaces are clean and free from scoring and warpage.
15. When using liquid gasket, ensure it does not flow into the threaded holes.
16. While assembling, ensure
    - ★ Arrow mark on the piston, faces exhaust side.
    - ★ The open end of the chain lock to face opposite to normal direction of chain rotation.
    - ★ The number of notches from the punch marks of the chain adjuster cams to the notch resting on the pin are to be equal at LH & RH sides.







17. Check for correctness of assembly after each stage.
18. Tighten all nuts and bolts to correct torques.
19. Always smear oil or grease on the oil seal lips before installing.
20. Apply specfit on outer surface of seals to achieve better sealing.
21. Use only recommended oils and grease.
22. Wear goggles and gloves while using grinding machine.
23. Use rubber aprons while working on batteries.
24. Keep a bottle of washing soda water solution (Ratio - 50 gms to one litre water) handy at battery charging area to rinse in case of accidental battery acid spillage.



UNIT : mm

COMPONENTS INSPECTION

CLEANING

- ★ Mix 2% engine oil with clean kerosene oil
- ★ Clean all components in the above solution
- ★ Dry them with dry compressed air

INSPECTION

Visually inspect the components for the following :

- ★ Breaks
- ★ Cracks
- ★ Scoring
- ★ Scuffing
- ★ Seizure marks
- ★ Bend
- ★ Twist
- ★ Pitting
- ★ Corrossion
- ★ Discolouration

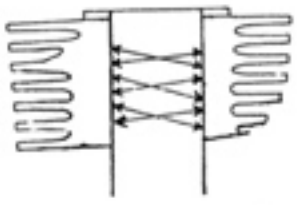
If found ok, check dimensional limits as follows :

Note :
- New components' dimensions to be between new minimum and new maximum
- Replace old parts beyond service limits
- Dimensions are in millimeters (mm)

Pic 1 Cylinder bore

	Bul 350	500	Lightning 535	A 350
New Min.	69.86	83.959	87.0	70.00
New Max.	69.89	83.985	87.03	70.03
Service limit	70.00	84.125	87.15	70.15

Pic 2 Cylinder bore : point of measurement



	Bul 350	500	Lightning 535	A 350
New Min.	Three points as shown			
New Max.				
Service limit				

Pic 3 Piston diameter

	Bul 350	500	Lightning 535	A 350
New Min.	69.786	83.88	86.89	69.94
New Max.	69.836	83.91	86.92	69.97
Service limit	69.636	83.725	86.73	69.85

Pic 4 Piston to bore clearance

	Bul 350	500	Lightning 535	A 350
New Min.	0.075	0.075	0.08	0.03
New Max.	0.100	0.100	0.14	0.09
Service limit	0.175	0.175	0.42	0.30

Pic 5 Ring to groove clearance : comp.rings

	Bul 350	500	Lightning 535	A 350
New Min.	0.025	0.038	0.048	0.025
New Max.	0.076	0.076	0.085	0.076
Service limit	0.15	0.178	0.178	0.15

Pic 6 Ring to groove clearance : comp.rings - Middle

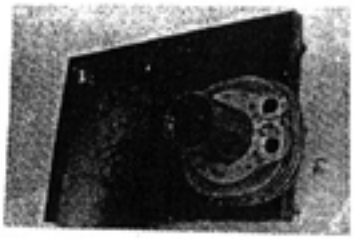
	Bul 350	500	Lightning 535	A 350
New Min.	0.025	0.038	0.02	0.025
New Max.	0.076	0.076	0.057	0.076
Service limit	0.15	0.178	0.178	0.15

UNIT : mm

Pic 7 Ring to groove clearance : Oil ring

	Bul 350	500	Lightning 535	A 350
New Min.	0.05	0.05	0.051	0.05
New Max.	0.10	0.20	0.096	0.10
Service limit	0.18	0.229	0.229	0.18

Pic 8 Piston ring end gap : Compression



	Bul 350	500	Lightning 535	A 350
New Min.	0.20	0.30	0.30	0.26
New Max.	0.33	0.50	0.50	0.50
Service limit	0.75	1.00	0.75	0.80

Pic 9 Piston Ring end gap: Oil ring

	Bul 350	500	Lightning 535	A 350
New Min.	0.20	0.30	0.25	0.30
New Max.	0.33	0.50	0.40	0.50
Service limit	0.75	1.00	1.00	0.75

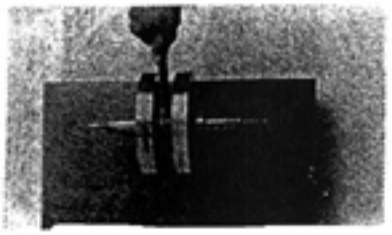
Pic 10 Small end bore

	Bul 350	500	Lightning 535	A 350
New Min.	19.06	19.06	19.06	20.01
New Max.	19.07	19.07	19.07	20.02
Service limit	19.11	19.11	19.11	20.05

Pic 11 Piston Pin diameter

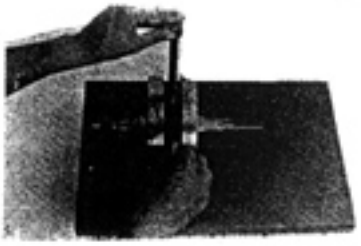
	Bul 350	500	Lightning 535	A 350
New Min.	18.987	18.987	18.987	19.992
New Max.	18.992	18.992	18.992	19.997
Service limit	18.982	18.982	18.982	19.982

Pic 12 Bigend frreeness



	Bul 350	500	Lightning 535	A 350
New Min.	Connecting rod to rotate freely			
New Max.				
Service limit				

Pic 13 Bigend axial play

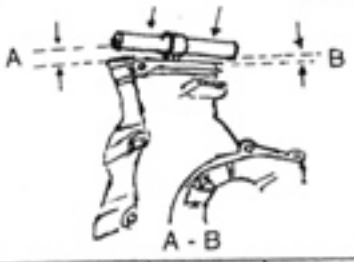


	Bul 350	500	Lightning 535	A 350
New Min.	0.15	0.15	0.15	0.25
New Max.	0.33	0.33	0.33	0.50
Service limit	0.55	0.55	0.55	0.60

Pic 14 Crank shaft : Run out

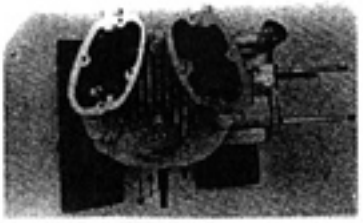
	Bul 350	500	Lightning 535	A 350
New Min.	0.00	0.00	0.00	0.00
New Max.	0.04	0.04	0.04	0.04
Service limit	0.08	0.08	0.08	0.08

Pic 15 — Connecting rod : Bend



	Bul 350	500	Lightning 535	A 350
New Min.	0.00	0.00	0.00	0.00
New Max.	0.05	0.05	0.05	0.05
Service limit	0.075	0.075	0.075	0.08

Pic 16 — Crank shaft : Axial play



	Bul 350	500	Lightning 535	A 350
New Min.	1.73	1.73	1.73	1.73
New Max.	2.30	2.30	2.30	2.30
Service limit	2.80	2.80	2.80	2.80

Pic 17 — Cylinder block & Head warpage

	Bul 350	500	Lightning 535	A 350
New Min.	0.00	0.00	0.00	0.00
New Max.	0.02	0.02	0.02	0.02
Service limit	0.05	0.05	0.05	0.05

Pic 18 — Warpage removal

	Bul 350	500	Lightning 535	A 350

Face the surface as shown on the emery paper, spread on surface plate

Pic 19 — Valve stem to guide (inlet) : clearance

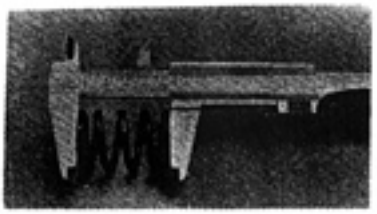
	Bul 350	500	Lightning 535	A 350
New Min.	0.018	0.018	0.02	0.02
New Max.	0.055	0.055	0.04	0.05
Service limit	0.075	0.075	0.06	0.08

UNIT : mm

Pic 20 — Valve stem to guide (Exhaust) : Clearance

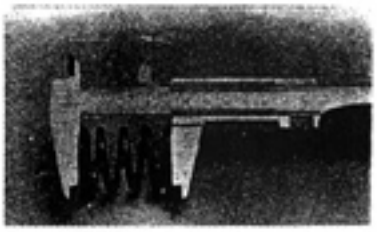
	Bul 350	500	Lightning 535	A 350
New Min.	0.043	0.043	0.04	0.04
New Max.	0.081	0.081	0.07	0.07
Service limit	0.10	0.10	0.09	1.00

Pic 21 — Valve spring (inner) : length



	Bul 350	500	Lightning 535	A 350
New Min.	51.25	51.25	51.25	42.80
New Max.	51.35	51.35	51.38	44.80
Service limit	48.20	48.20	48.20	41.50

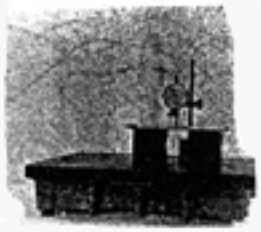
Pic 22 — Valve spring (outer) : length



	Bul 350	500	Lightning 535	A 350
New Min.	53.20	53.20	53.20	42.80
New Max.	53.30	53.30	53.30	44.80
Service limit	50.04	50.04	50.04	41.50

UNIT : mm

Pic 23 — Push tube : Run out

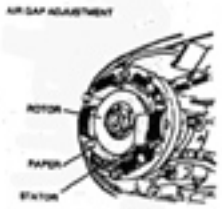


	Bul 350	500	Lightning 535	A 350
New Min.	0.00	0.00	0.00	0.00
New Max.	0.02	0.02	0.02	0.02
Service limit	0.05	0.05	0.05	0.05

Pic 24 — Valve : Clearance

	Bul 350	500	Lightning 535	A 350
New Min.	Thumb free (cold) Push tube			0.10 (cold)
New Max.				
Service limit				

Pic 25 — Rotor to coil : Clearance

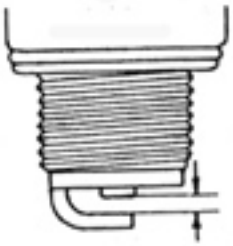


	Bul 350	500	Lightning 535	A 350
New Min.	0.15	0.15	0.15	0.25
New Max.	0.25	0.25	0.25	0.50
Service limit				

Pic 26 — C.B. Point : Gap

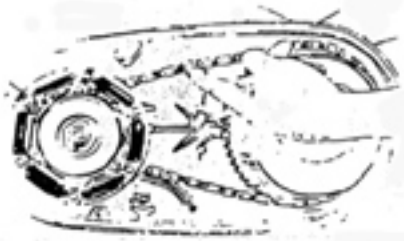
	Bul 350	500	Lightning 535	A 350
New Min.	0.35	0.35	0.35	N.A.
New Max.	0.40	0.40	0.40	N.A.
Service limit				N.A.

Pic 26 — Spark Plug : Electrode gap



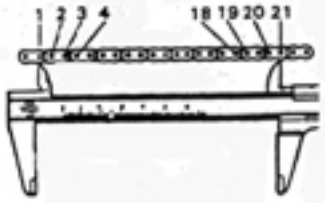
	Bul 350	500	Lightning 535	A 350
New Min.	0.5	0.5	0.5	0.7
New Max.	0.6	0.6	0.6	0.8
Service limit				

Pic 28 — Duplex chain : Slackness



	Bul 350	500	Lightning 535	A 350
New Min.	5.00	5.00	5.00	5.00
New Max.	6.00	6.00	6.00	6.00
Service limit				

Pic 29 — Duplex chain : Length across 21 pins



	Bul 350	500	Lightning 535	A 350
New Min.	191.00	190.00	190.00	190.00
New Max.	191.00	191.00	191.00	191.00
Service limit	195.00	195.00	195.00	195.00

Pic 30 — Friction plate : Thickness

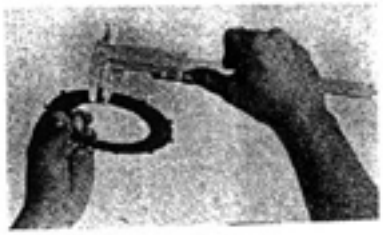
	Bul 350	500	Lightning 535	A 350
New Min.	4.70	4.70	4.70	4.70
New Max.	4.80	4.80	4.80	4.80
Service limit	4.00	4.00	4.00	4.00

UNIT : mm

Pic 31 Friction plate with insert : thickness

	Bul 350	500	Lightning 535	A 350
New Min.	4.80	4.80	4.80	4.80
New Max.	5.10	5.10	5.10	5.10
Service limit	4.30	4.30	4.30	4.30

Pic 32 Clutch plate : Lug width



	Bul 350	500	Lightning 535	A 350
New Min.	6.10	6.10	6.10	6.10
New Max.	6.22	6.22	6.22	6.22
Service limit	6.00	6.00	6.00	6.00

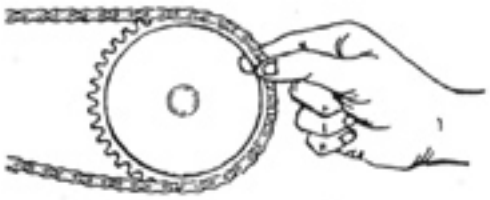
Pic 33 Clutch steel plate : Distortion

	Bul 350	500	Lightning 535	A 350
New Min.	0.00	0.00	0.00	0.00
New Max.	0.05	0.05	0.05	0.05
Service limit	0.15	0.15	0.15	0.15

Pic 34 Clutch spring : Length

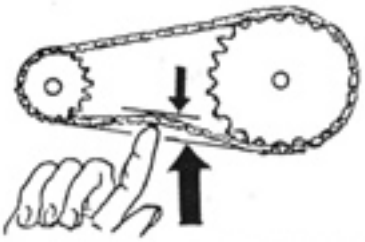
	Bul 350	500	Lightning 535	A 350
New Min.	30.00	30.00	30.00	30.00
New Max.	31.75	31.75	31.75	31.75
Service limit	25.50	25.50	25.50	25.50

Pic 35 Rear sprocket : Chain pull off



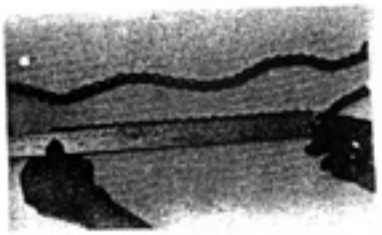
	Bul 350	500	Lightning 535	A 350
New Min.				
New Max.				
Service limit	5.00	5.00	5.00	5.00

Pic 36 Drive chain : Slackness



	Bul 350	500	Lightning 535	A 350
New Min.	20.00	20.00	20.00	20.00
New Max.	30.00	30.00	30.00	30.00
Service limit				

Pic 37 Drive chain length across 21 pins



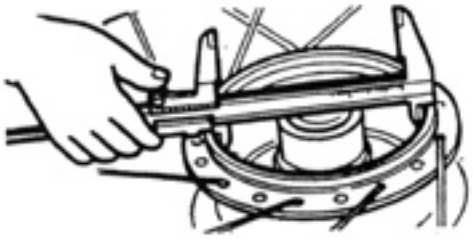
	Bul 350	500	Lightning 535	A 350
New Min.	320	320	320	320
New Max.	322	322	322	322
Service limit	328	328	328	328

Pic 38 Sprocket

	Bul 350	500	Lightning 535	A 350
New Min.	Sharp, Bent, Broken teeth			
New Max.				
Service limit				

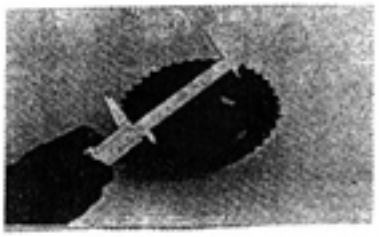
UNIT : mm

Pic 39 Brake drum front : Internal diameter



	Bul 350	500	Lightning 535	A 350
New Min.	177.80	177.80	177.80	177.80
New Max.	177.90	177.90	177.90	177.90
Service limit	178.80	178.80	178.80	178.80

Pic 40 Brake drum rear : Internal diameter

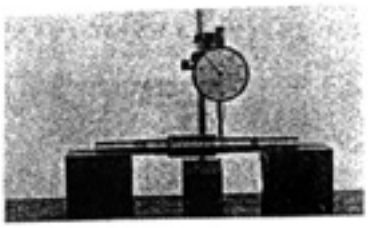


	Bul 350	500	Lightning 535	A 350
New Min.	152.40	152.40	152.40	152.40
New Max.	152.50	152.50	152.50	152.50
Service limit	153.50	153.50	153.50	153.50

Pic 41 Brake lining : Thickness

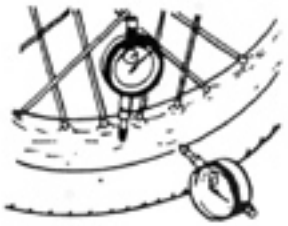
	Bul 350	500	Lightning 535	A 350
New Min.	3.80	3.80	3.80	3.80
New Max.	4.06	4.06	4.06	4.06
Service limit	2.00	2.00	2.00	2.00

Pic 42 Axle Shaft : Run out



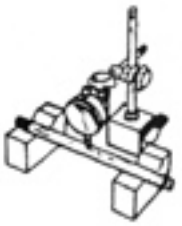
	Bul 350	500	Lightning 535	A 350
New Min.	0.00	0.00	0.00	0.00
New Max.	0.01	0.01	0.01	0.01
Service limit	0.02	0.02	0.02	0.02

Pic 43 Wheel : Face out / Run out



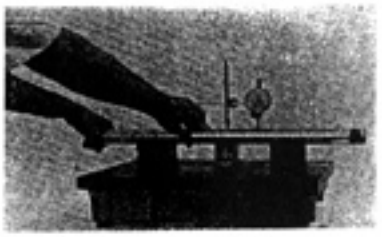
	Bul 350	500	Lightning 535	A 350
New Min.	0.00	0.00	0.00	0.00
New Max.	0.10	0.10	0.10	0.10
Service limit	0.20	0.20	0.20	0.20

Pic 44 Swing arm shaft : Run out



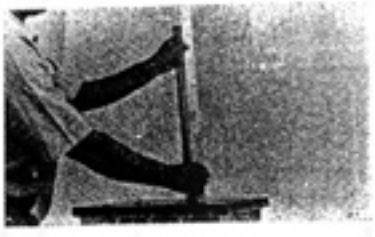
	Bul 350	500	Lightning 535	A 350
New Min.	0.00	0.00	0.00	0.00
New Max.				
Service limit	0.05	0.05	0.05	0.05

Pic 45 Main tube : Run out



	Bul 350	500	Lightning 535	A 350
New Min.	0.00	0.00	0.00	0.00
New Max.				
Service limit	0.05	0.05	0.05	0.05

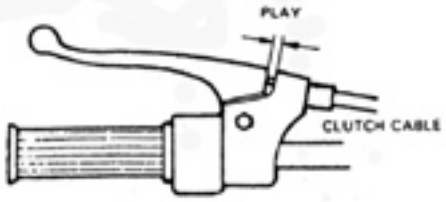
Pic 46 Front fork assembly spring : Length



	Bul 350	500	Lightning 535	A 350
New Min.	538	538	538	538
New Max.	544	544	544	544

UNIT : mm

Pic 47 Clutch cable : Free play



	Bul 350	500	Lightning 535	A 350
New Min.	2	2	2	2
New Max.	4	4	4	4
Service limit				

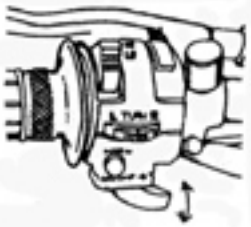
Pic 48 Accelerator cable . Free play

	Bul 350	500	Lightning 535	A 350
New Min.	1	1	1	1
New Max.	2	2	2	2
Service limit				

Pic 49 Tyre tread : Depth

	Bul 350	500	Lightning 535	A 350
New Min.				
New Max.				
Service limit	1.00	1.00	1.00	1.00

Pic 50 Decompressor cable : Free play



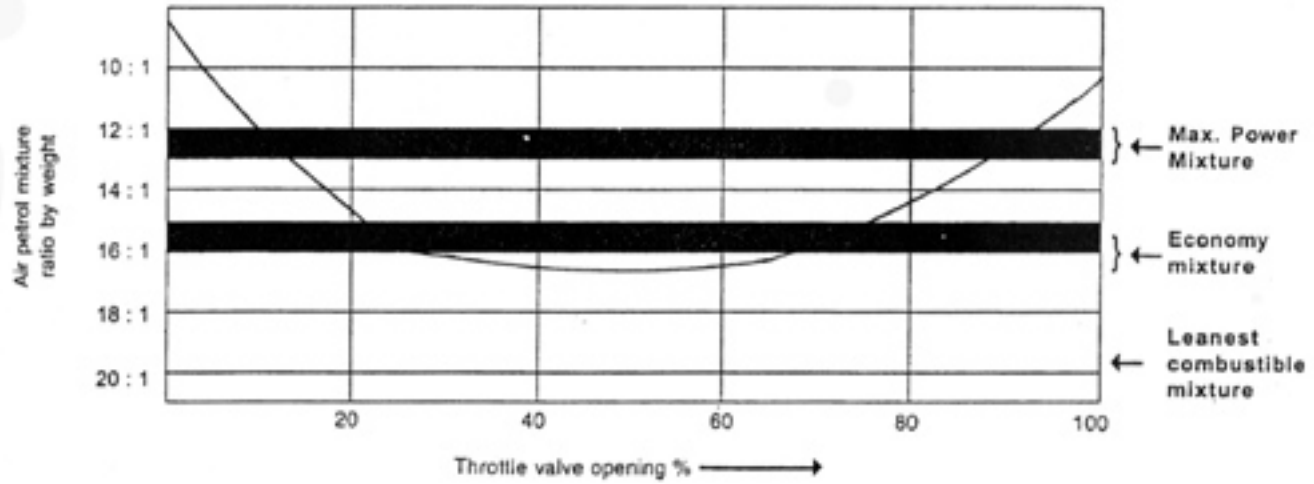
	Bul 350	500	Lightning 535	A 350
New Min.	2	2	2	Nil
New Max.	5	5	5	Nil
Service limit				

CARBURETION

INDICATIONS OF TOO RICH AND TOO LEAN AIR PETROL MIXTURE

TOO RICH	TOO LEAN
1. Engine snatches and revolutions sound heary	1. Engine over heats
2. Engine running becomes worse on warming up	2. Engine runs better after it warms up
3. Black carbon accumulation on spark plug tip	3. Whitish spark plug tip
4. Excessive bluish white smoke	4. Erratic engine running and jerking
5. Performance improves on removal of air filter	5. Engine runs better when choke is 'ON'.

EFFECT OF THROTTLE OPENING ON AIR PETROL MIXTURE RATIOS



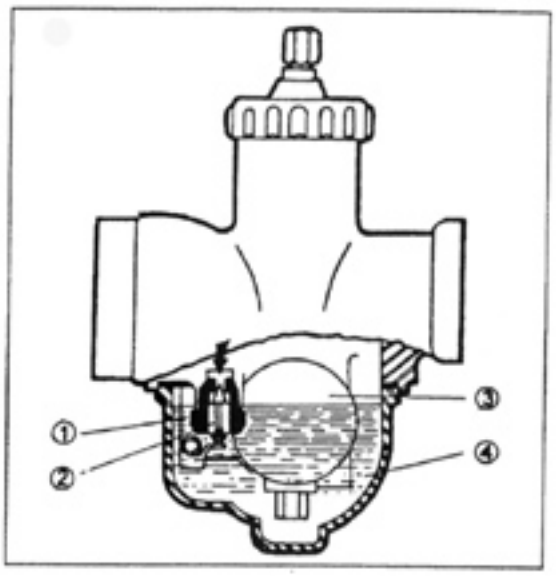
FLOAT SYSTEM

FUNCTION : To maintain a predetermined level of petrol in float chamber.

FUEL FLOW : Petrol tank ----→ Tap ----→ Hose ----→

Carburetor inlet ----→ Float Valve ------

Float chamber ←----------

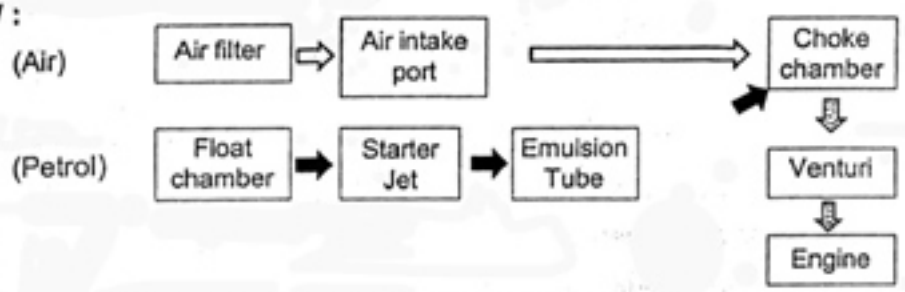


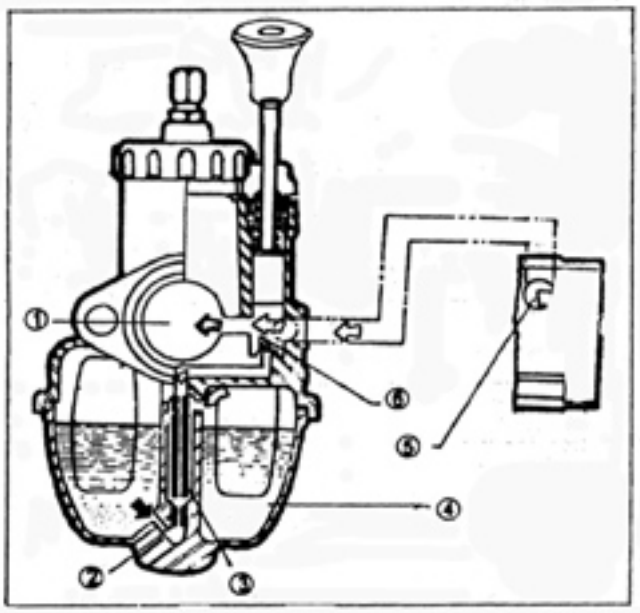
1. Needle valve seat
2. Needle valve
3. Float
4. Float chamber

STARTING SYSTEM

FUNCTION : To supply additional petrol to compensate the condensation of petrol when engine is cold.

FLOW :





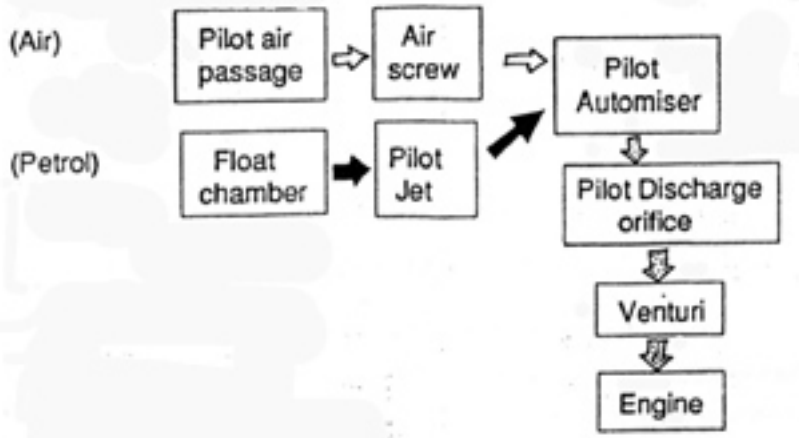
1. Venturi
2. Starterjet
3. Emulsion tube
4. Float chamber
5. Air intake port
6. Choke chamber

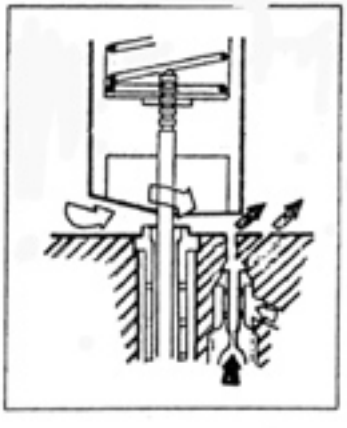
PILOT SYSTEM

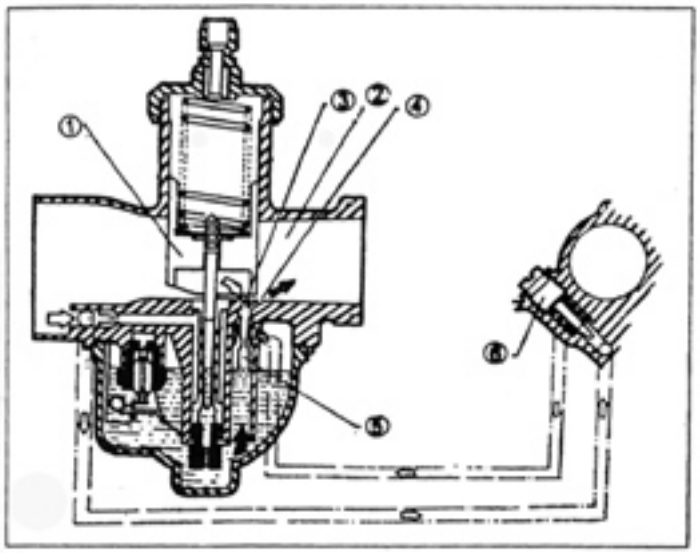
FUNCTION :

To supply Air petrol mixture to the engine from 0 to ½ throttle positior

FLO'







1. Throttle valve
2. Venturi
3. Bypass orifice
4. Pilot discharge orifice
5. Pilot jet
6. Air screw

1. Jet needle
2. Main discharge orifice
3. Main jet
4. Emulsion tube
5. Main air passage
6. Air jet

MAIN SYSTEM

FUNCTION :

To supply air petrol mixture to the engine from ¼ to full throttle open position.

FLOW :

(Air) Main air passage → Air Jet → Emulsion Tube

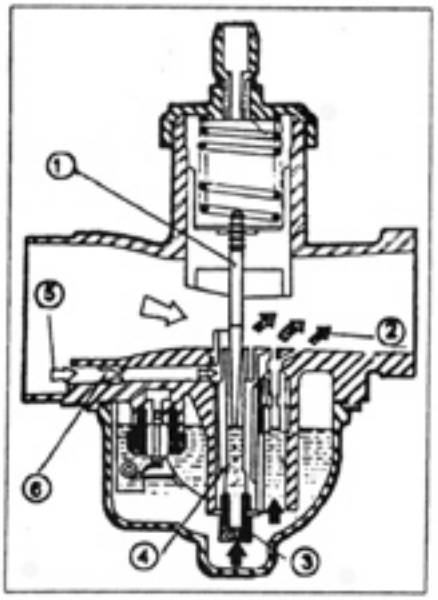
(Petro) Float chamber → Main Jet → Emulsion Tube

Emulsion Tube → Main discharge orifice → Venturi → Engine

⇨ Air

➡ Petrol

⇨ Air Petrol mixture

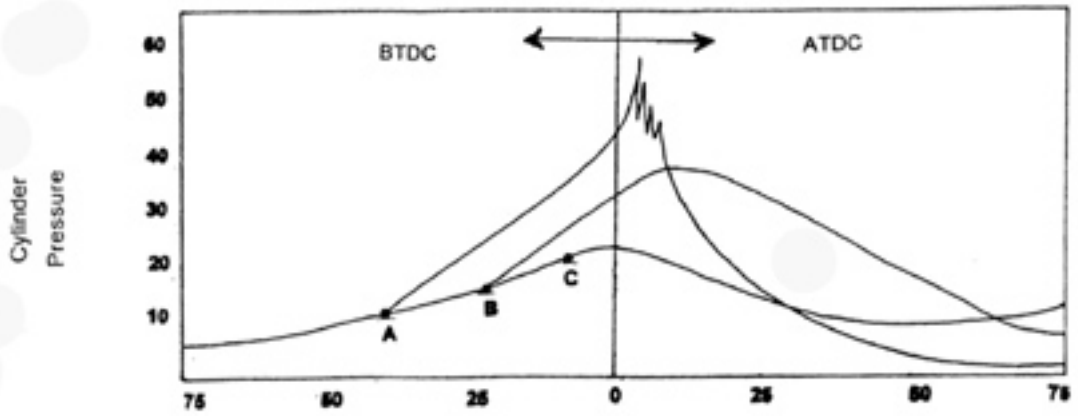


WORKING RANGE OF CARBURETTOR COMPONENTS

ITEMS	THROTTLE POSITION				
	Fully closed	1/4 OPEN	1/2 OPEN	3/4 OPEN	Fully open
1. Air screw and pilot jet					
2. Throttle valve					
3. Jet needle					
4. Main jet					
5. Air jet					
6. Float system					

IGNITION AND ELECTRICALS

EFFECT OF TOO FAR ADVANCED AND RETARDED IGNITION TIMING

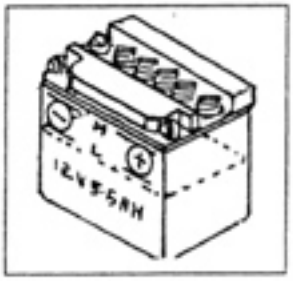


A - Too far advanced timing. Causes detonation, pinking and engine over heating.

B - Normal timing

C - Too far retarded timing. Causes incomplete combustion, black smoke, bend pipe over heating and high fuel consumption

BATTERY AND BATTERY MAINTENANCE



Lead Acid Battery has

Positive plates	-	Lead peroxide
Separator	-	Made of insulating material
Negative plate	-	Sponge lead
Electrolyte	-	Sulphuric acid + Distilled water.

Battery stores electrical energy in the form of chemical energy.

Fully charged battery voltage 2.2 per cell

Fully discharged battery voltage 1.75 per cell

Ampere Hours (AH) indicate the capacity of the battery.

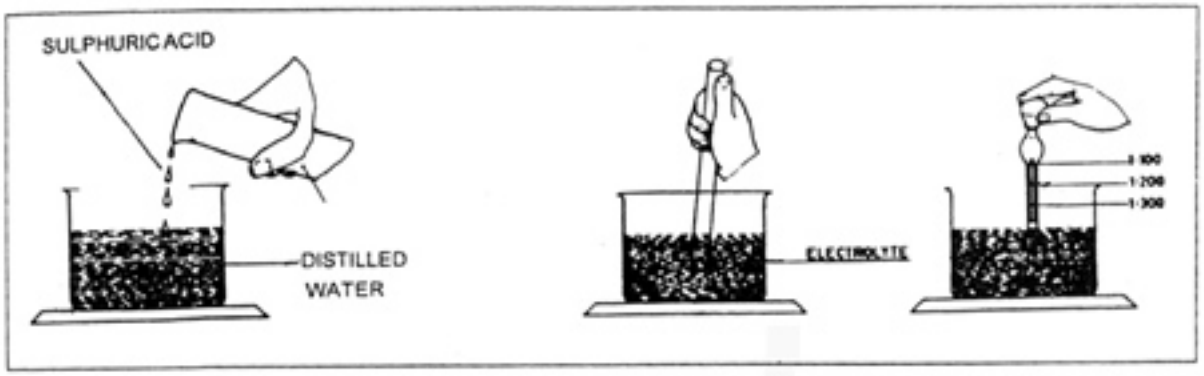
Ampere Hour (AH) = Discharging current (A) x Discharging hours (H)

Eg : 10 AH means that it takes 10 Hrs for a fully charged battery to come to fully discharged condition when discharged continuously at a constant rate of one ampere.

Initial Charging :

Electrolyte : Dilute sulphuric acid with distilled water to a specific gravity of 1.240

Preparation :



NOTE : It is important to ensure that the sulphuric acid is added to the distilled water and not vice versa. Stir and check the specific gravity of electrolyte and add sulphuric acid till the specific gravity becomes 1.240

Temperature of electrolyte :

Cool the electrolyte to about 40 deg. C before filling it in the battery upto the maximum level indicated or 2 to 4mm above the plates.

Soaking period :

keep the battery with electrolyte filled for about half an hour before commencement of charging. Top upthe level with electrolyte if necessary. Then put them on charge.

Battery	Duration	Charging Current
12V 5 Ah	10 hours	0.5 Amps.

charging :

charge a used battery when the specific gravtiy of electrolyte is less than 1.220

Charging Procedure :

1. Top up the electrolyte level with distilled water
2. Connect the positive and negative terminals of battery to the positive and negative terminals of the constant current battery charger.
3. Keep all battery filler caps open.
4. Switch on the power ON/OFF switch and ensure that the charger is operative.
5. Switch on the charging ON/OFF switch
6. Disconnect the battery from the charger when fully charged.

Indication of full charge :

1. Free gassing from electrolyte for more than 90 minutes
2. 3 consecutive reading taken in intervals of 30 minutes each to read constantly 1.240 specific gravity.
3. Voltage : 6V Battery - 6.6 V; 12V Battery - 13.2 V

Precautions :

1. Wear rubber apron while working at battery charging.
2. Use only constant current battery charger of correct charging rate.
3. Never remove the filler cap seals, till you are ready to charge the battery. Hydration may occur when atmospheric air contacts the plates.
4. Keep the filler caps removed while charging.
5. Use only distilled water to top up the level after the initial charging.
6. During charging, the electrolyte temperature should not exceed 45°C If necessary, discontinue the charging to cool the electrolyte.
7. Ensure that the batteries are kept on a non-metallic surface while charging.
8. Keep fire and spark away from battery charging area.
9. Be sure to connect the long vent tube to the battery. While fixing it to the motorcycle route it correctly.
10. Avoid running the motorcycle without connecting the battery.

BATTERY MAINTENANCE

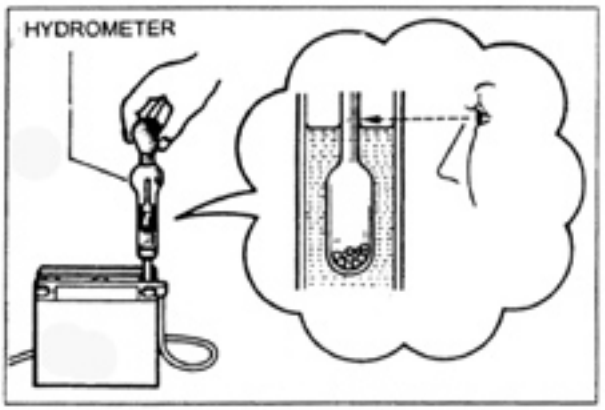
1. Check the electrolyte level and top up, if necessary to the mark or 2 to 4 mm above the separator with distilled water every week.

   Important Note : For topping up, use only distilled water.

2. Keep the battery surface clean and dry.
3. Never over charge the battery - it damages the battery.
4. Remove the battery from the motorcycle and store it separately when the motorcycle is not in operation for more than one month.
5. Recharge stored batteries once a month.
6. Check the terminals and cables for corrosion. Apply petroleum jelly on terminals to prevent corrosion.

HYDROMETER :

Hydrometer is used to check specific gravity of electrolyte. The float graduation in level with the electrolyte in it, is the specific gravity of the electrolyte.



BATTERY PROBLEMS

Sulphation :

The active materials in the plates are converted into lead suphate during discharge. This lead sulphate is reconverted to active materials during recharge. If the battery remains in discharged condition for long periods or excess quantity of acid is used in the electrolyte, the lead sulphate is converted to hard crystalline substance. This is sulphation.

Sulphated batteries do not take normal charging i.e, during charging the lead sulphate will not get reconverted to active materials. Such batteries may show normal voltage with out load, but do not take load.

Hydration :

The positive and negative plates remain submerged in electrolyte. However, when electrolyte level is less than the minimum indicate, the active materials on the plate get exposed to atmospheric air. The active materials, then reacts with water vapour of the atmosphere, forming white spots on the plate. This is hydration.

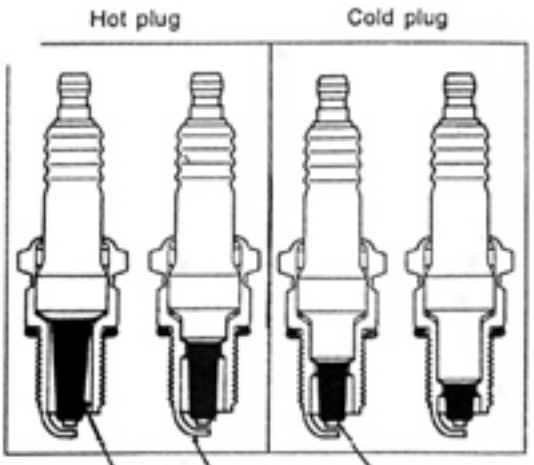
Hydration reduces the active area on the plates for chemical reaction. This reduces battery capacity.

Shedding :

The active material of the plates falling off is shedding. Over charging and rough handling are the main causes for it. Over charging of the battery also may cause buckling of the plates, rendering the battery unserviceable. Over charging means charging of the battery with excessive current.

SPARK PLUG

Spark plug is a vital part of ignition system. They are subjected to high combustion pressure (around 40 times the atmospheric pressure), intense heat (more than 2000 deg.c. temperature) and severe vibrations. Use of specified spark plug is therefore very important for good performance of an engine.



HEAT RANGE

The spark plug is selected such that its elektrodes withstand the operating temperatures of the engine - hot enough to prevent fouling but cold enough to avoid auto ignition.

HOT PLUG

Spark plug with large insulator tip surface area. Central electrode remain hotter.

COLD PLUG

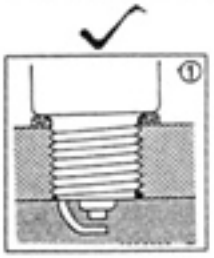
Spark plug with less insulator tip surface area. Central electrode cools faster.

Vehicle Usage	Spark Plug Recommended
1. Normal driving, both in city and highway	Normal recommendation
2. Mostly stop and go city driving	Use hotter plug
3. Mostly heavy loading, sustained high speed	Use colder plug

SPARK PLUG ELECTRODE TEMPERATURE

Below 450 deg.C	-	Rapid spark plug fouling leading to misfiring
Cause	-	Use of spark plug colder than required
450 deg.C	-	Self cleaning temperature.
450 to 850 deg.C	-	Normal. Burns combustion residues that come in contact with electrodes. Remain clean for long periods.
850 deg.C	-	Auto ignition temperature.
Above 850 degg.C	-	Causes pre-ignition, electrode melting and blisters on insulator surface.
Cause	-	Use of spark plug hotter than required.

CYLINDER HEAD AND SPARK PLUG REACH RELATION



ONE GASKET : ①

Correct plug seat

NO GASKET : ②

Carbon deposit on exposed thread. Removal of plug from cylinder head damages cylinder head thread. Earth electrode gets over heated.

TWO GASKET : ③

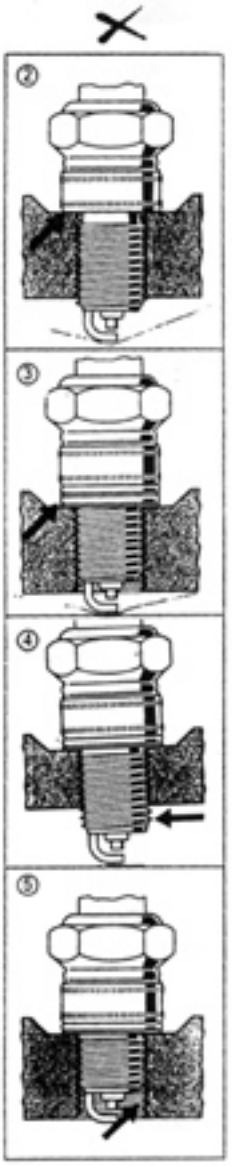
Results in cylinder threads becoming filled with combustion residue.

LONG REACH SPARK PLUG, IN A CYLINDER HEAD DESIGNED FOR SHORT REACH PLUG ④

- ★ Over heating
- ★ Pre-ignition
- ★ Damage to piston
- ★ Spark plug removal difficult

SHORT REACH SPARK PLUG, IN A CYLINDER HEAD DESIGNED FOR LONG REACH PLUG ⑤

- ★ Starting problem
- ★ Mis-firing
- ★ Difficult in fitmet of new spark plug due to residue on cylinder head threads.



Spark plug Tip colour	Indication	Figure
1. Dark Brown Brown Yellow Brown Light Brown Greyish Brown	★ Normal combustion ★ Correct running of engine	
2. Shining black wet carbon deposits	★ Oil fouling ★ Oil leakage to combustion chamber.	
3. Whitsh Brown to Whitish Grey	★ Engine is running in slightly over heated condition	

4. Dull black, velvetty carbon deposits	Incomplete combustion of fuel due to : ★ Too rich air petrol mixture ★ Retarded ignition timing ★ Continuous low speed operation ★ Excessive electrode gap ★ Colder spark plug ★ Low H.T. voltage	
5. Melted electrode and blistered porcelain insulator tip	Over heated engine and overheated spark plug due to : ★ Too lean air petrol mixture ★ Use of hot spark plug ★ Use of longer reach spark plug ★ Excessive carbon deposit in cylinder or exhaust system. ★ Too far advanced ignition timing.	

SPARK PLUG MAINTENANCE

Neglecting the spark plug maintenance eventually leads to difficult starting and poor performance. If the spark plug is used for a long period, the electrode gradually burns away and carbon builds up along the inside part. Once in 3000 Kms or earlier, the plug should be remove for inspection, cleaning and resetting the gap.

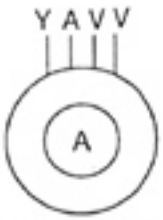
Carbon deposits on the spark plug establishes a 'shunt' between center and earth electrodes, that prevents good sparking and causes misfiring. Clean the deposits off periodically, with a spark plug cleaning tool/machine.

Check spark plug for worn out earth and center electrodes. If the earth electrode has worn off to a knife edge and center electrode has reduced in height, replace it with new.

Spark Plug cleaning	Electrode Gap checking
	

ELECTRICAL COMPONENTS INSPECTION

12V, AC / DC



Stator coil output wire colours

V - Violet
W - White
G - Green
Y - Yellow
A - Amber

CONTINUITY CHECK

V - V → YES
Y - A → YES
YES, YES → OK

If NO, open Circuit. Check & Correct

V - Y → NO → OK

If YES, short circuit. Check & Correct

V - EARTH → NO
Y - EARTH → NO
NO, NO → OK

If YES, short circuit. Check & Correct.

RESISTANCE CHECK

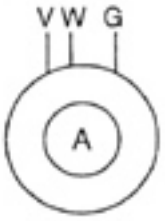
V - V → 0.5 to 0.7 Ohms
Y - A → 0.5 to 0.7 Ohms

VOLTAGE OUTPUT CHECK

Across 'Y' & 'A', with head lights on, at 2000 rpm, minimum out put - 13 volts.

Across'V' & 'V', with Trafficator and stop lamp on at 2000 rpm - minimum output - 13 Volts.

12V, DC



W - G → YES
W - V → YES
G - V → YES
YES, YES, YES → OK

W - G → YES
W - V → YES
G - V → YES
YES, YES, YES → OK

W - G → 0.5 to 1.0 Ohms
W - V → 1.0 to 2.0 Ohms

Connect 'V' with 'G'. Across VG & W, with head lights on, at 2000 rpm, minimum output - 13 volts

IGNITION SWITCH

	2	4	6	8	11	13	15
EMG	•	•					•
OFF				•	•		
ON	•	•	•		•	•	

MAIN SWITCH

	1	2	3	4	5	7	R
OFF				•	•	•	•
P			•	•	•		
H	•	•	•		•		•

LH CONTROL MODULE

	LIGHTS								TRAFICATOR				HORN		
	4 Y	5 YR	6 BU	7 G	3 Gr	2 RW	1 C/B			LH	7	RH		8	
OFF										BW	W	BG	OFF		
PO					o	o	o		LH	o	o		ON	o	o
ON	o	o			o	o			OFF						
R		o	o						RH		o	o			
Lg		o	o	o											
PL			o			o									

IGNITION SWITCH

	R.B.	B	R	R
OFF	•	•		
ON			•	•

CONTINUITY CHECK

Continuity between terminals as shown ——— SWITCH OK
Continuity between terminals not connected ——— SHORTING → SWITCH NOT OK
No continuity between terminals connected ——— OPERN CIRCUIT → SWITCH NOT OK

SPARK PLUG

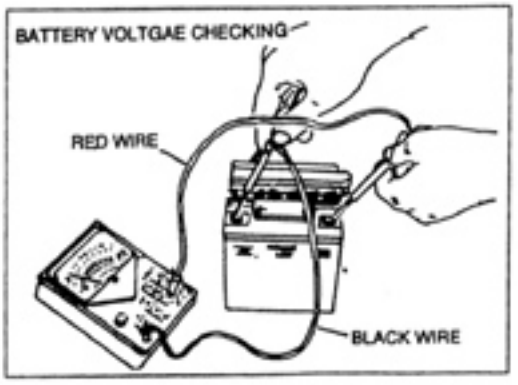
- Clean the electrodes and set gap to 0.5 mm
- Clean the plug in a 'Spark plug cleaner cum Tester'
- Test the plug for proper sparking in the tester

Light blue, solid, continuous spark seen in the mirror of the tester — SPARK PLUG OK

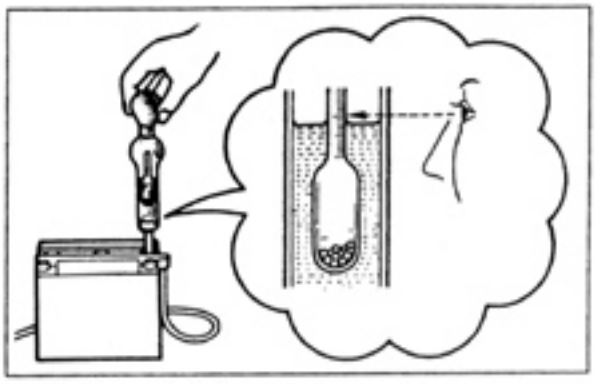
Yellow or red spark; intermittant or no spark; or side spark as seen in the tester mirror — SPARK PLUG NOT OK

BATTERY

VOLTAGE CHECK

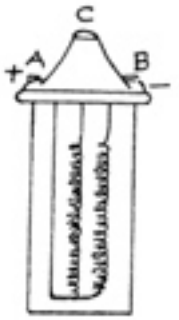


SPECIFIC GRAVITY (SG) CHECK



	VOLTAGE		SPECIFIC GRAVITY	
	Fully charged	Fully discharged	Fully charged	Fully discharged
12V Battery	13.2	10.8	1.24	1.22

H.T. COIL

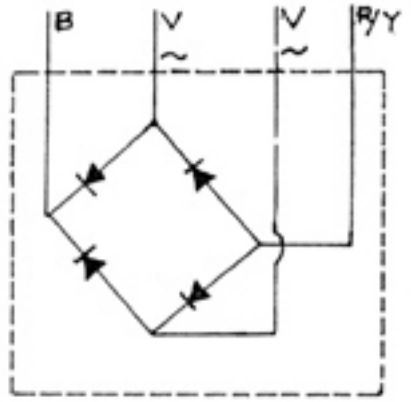


Primary winding resistance (A-B) 3 to 4 Ohms

Secondary winding resistance (A-C) 7 to 8 Kilo Ohms

RECTIFIER

CONTINUITY CHECK



MULTIMETER		
- VE TO TOUCH	+ VE TO TOUCH	INDICATION SHOULD BE
V	B	ON
B	V	OFF
V	B	ON
B	V	OFF
R/Y	V	ON
V	R/Y	OFF
R/Y	G	ON
V	R/Y	OFF

CONDENSER

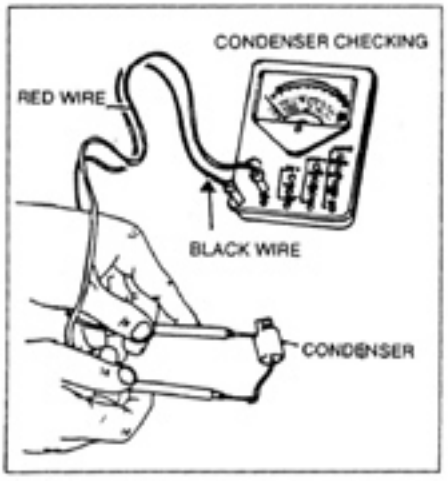
Select OHM meter (Ohm Scale) in multimeter

Discharge the condenser by tounchin its body with its lead

Touch condenser's body with one probe and condenser's lead with the other probe of the multimeter.

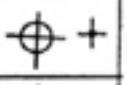
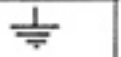
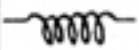
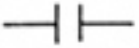
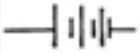
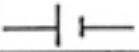
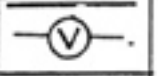
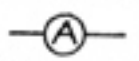
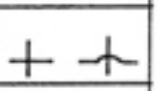
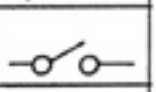
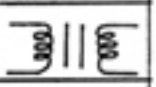
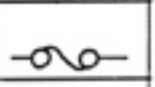
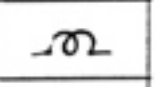
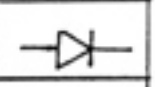
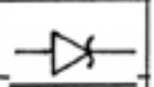
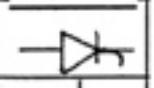
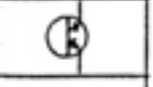
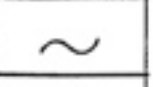
The multimeter needle deflects and returns ⟶ OK

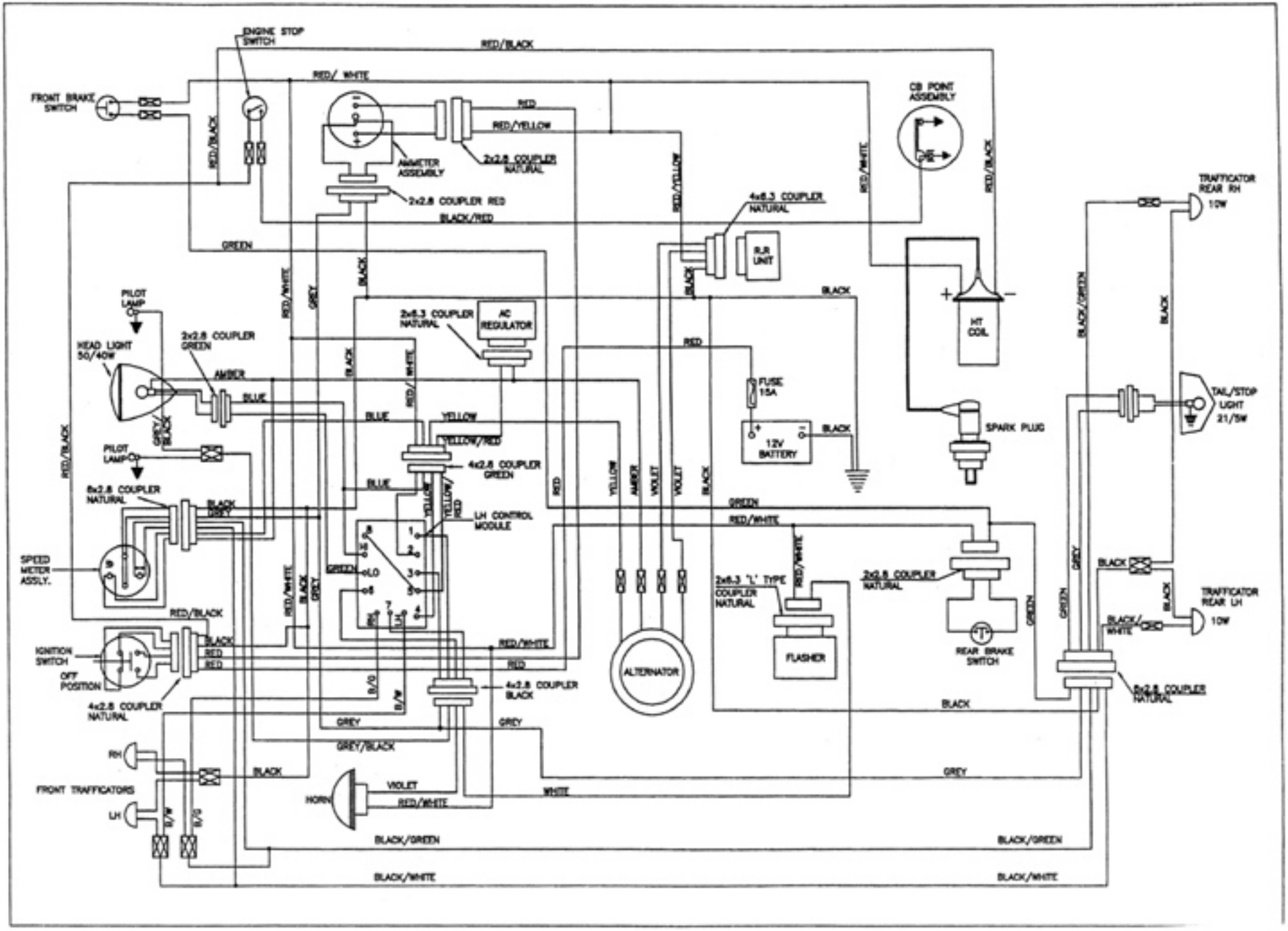
The needle does not move at all } ⟶ NOT OK
The needle moves and remains there }



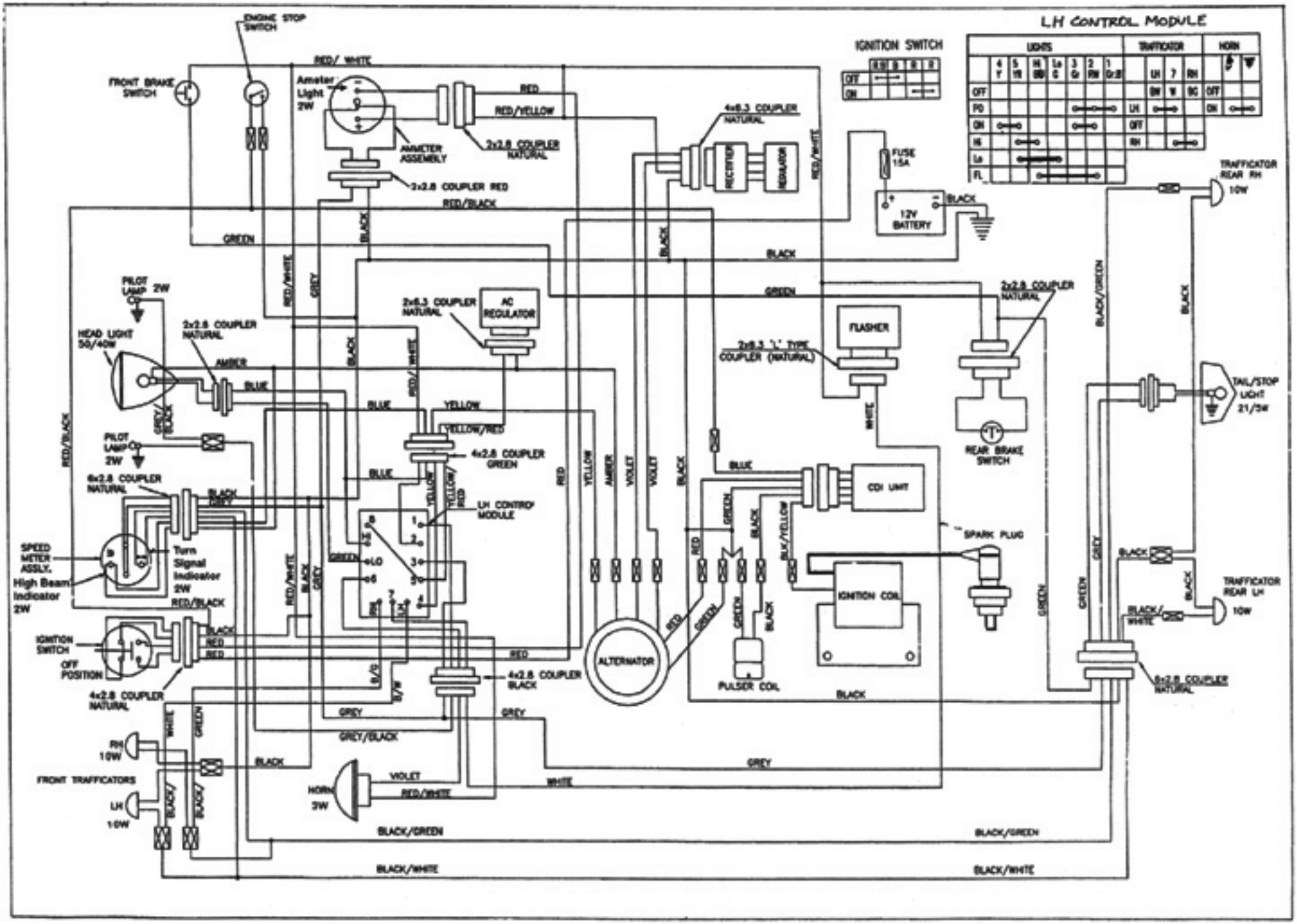
SYMBOLS

ELECTRICAL SYMBOLS

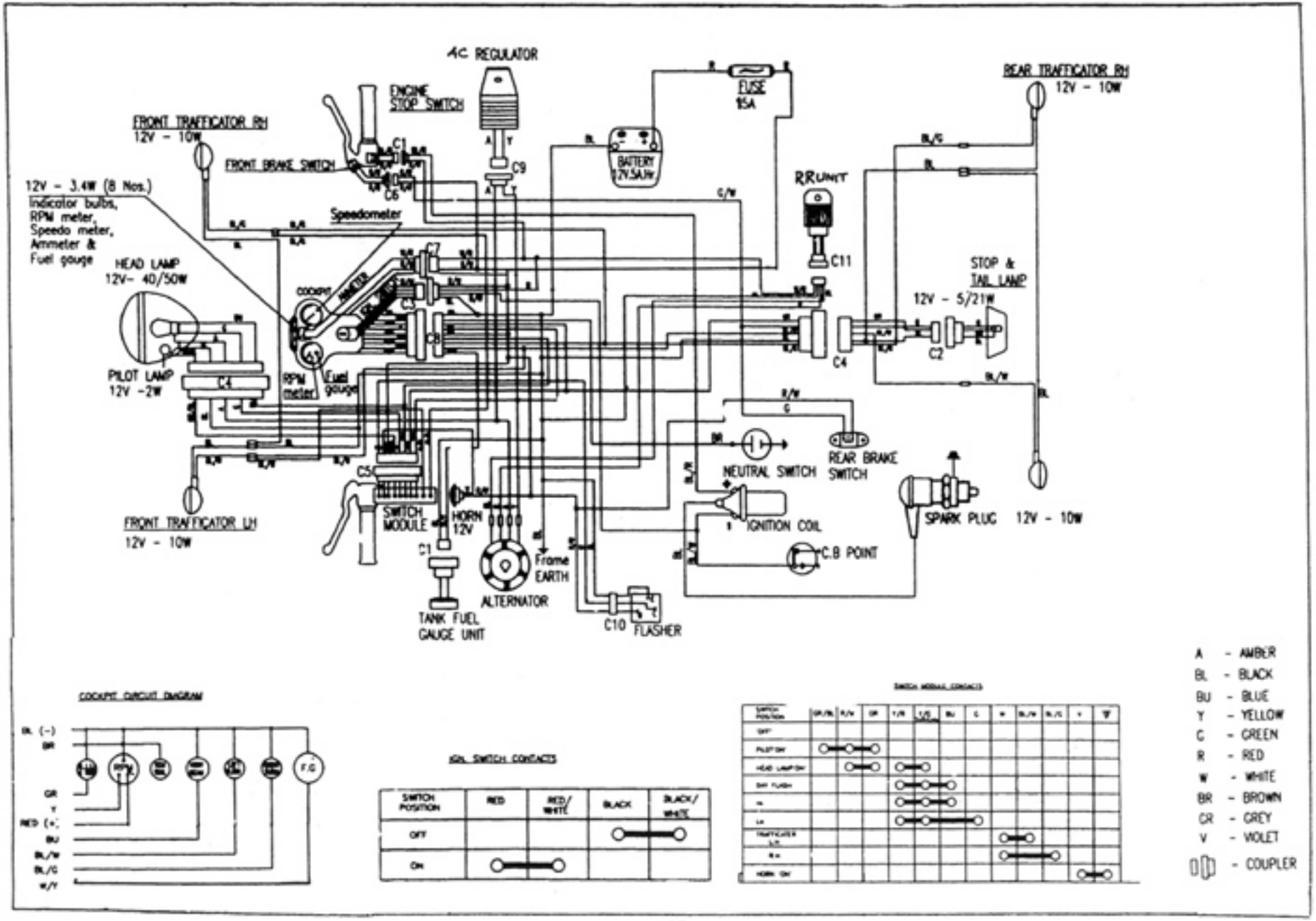
01.	Connection ...	
02.	Ground ...	
03.	Coil ...	
04.	Resistor ...	
05.	Capacitor ...	
06.	Battery ...	
07.	Cell ...	
08.	Armature and brush ...	
09.	Voltmeter ...	
10.	Ammeter ...	
11.	Wired across ...	
12.	Switch ...	
13.	Transformer ...	
14.	Fuse ...	
15.	Bulb ...	
16.	Recitifier ...	
17.	Zener diode ...	
18.	Silicon controlled rectifier ...	
19.	Transistor ...	
20.	Alternating current ...	
21.	Direct current ...	


ENGINE STOP SWITCH
RED/BLACK
RED/ WHITE
FRONT BRAKE SWITCH
RED/BLACK
AMMETER ASSEMBLY
RED
RED/YELLOW
2x2.8 COUPLER NATURAL
2x2.8 COUPLER RED
BLACK/RED
CB POINT ASSEMBLY
RED/YELLOW
RED/WHITE
RED/BLACK
4x6.3 COUPLER NATURAL
RJR UNIT
GREEN
RED/WHITE
GREY
BLACK
BLACK
HT COIL
PILOT LAMP
2x6.3 COUPLER NATURAL
AC REGULATOR
2x2.8 COUPLER GREEN
HEAD LIGHT 50/40W
AMBER
BLUE
BLUE
YELLOW
RED
FUSE 15A
12V BATTERY
BLACK
SPARK PLUG
YELLOW/RED
PILOT LAMP
4x2.8 COUPLER GREEN
RED/BLACK
6x2.8 COUPLER NATURAL
BLUE
LH CONTROL MODULE
GREEN
RED/WHITE
SPEED METER ASSLY.
RED/BLACK
RED/WHITE
BLACK
GREY
GREEN
HI
LO
IGNITION SWITCH
OFF POSITION
RED/WHITE
RED
RED
4x2.8 COUPLER BLACK
4x2.8 COUPLER NATURAL
B/O
B/W
ALTERNATOR
2x6.3 'L' TYPE COUPLER NATURAL
RED/WHITE
FLASHER
2x2.8 COUPLER NATURAL
REAR BRAKE SWITCH
GREEN
BLACK
GREY
GREY/BLACK
BLACK
RH
FRONT TRAFFICATORS
LH
B/W
B/O
VIOLET
RED/WHITE
HORN
WHITE
GREY
BLACK/GREEN
BLACK/GREEN
BLACK/WHITE
BLACK/WHITE
TRAFFICATOR REAR RH 10W
BLACK/GREEN
BLACK
TAIL/STOP LIGHT 21/5W
BLACK
BLACK/WHITE
TRAFFICATOR REAR LH 10W
GREEN
GREY
BLACK
BLACK
2x2.8 COUPLER NATURAL

12V, AC, DC (with CDI)



12V, AC, DC, (Lightning)



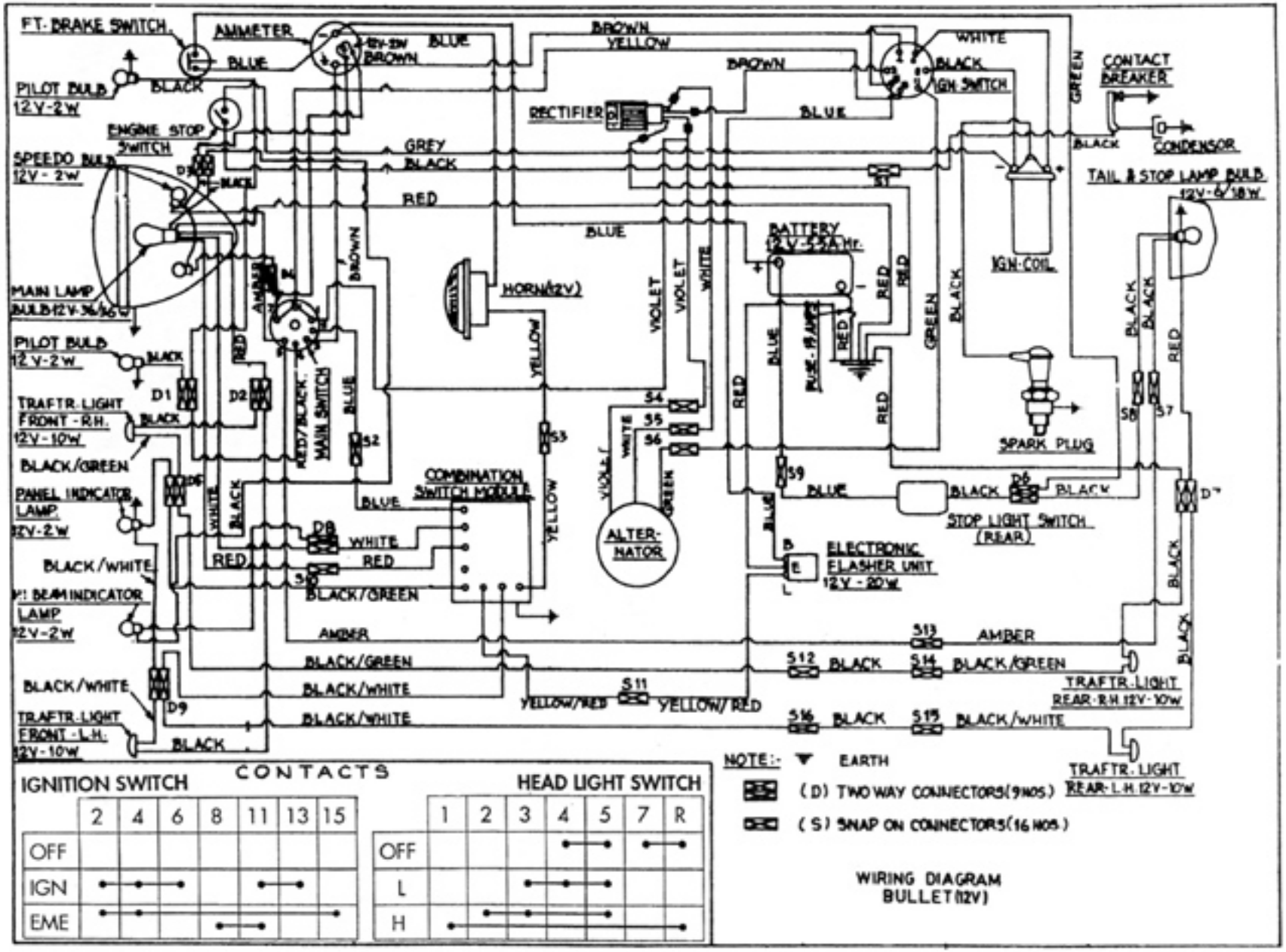
COCKPIT CIRCUIT DIAGRAM

IGN. SWITCH CONTACTS

SWITCH POSITION	RED	RED/WHITE	BLACK	BLACK/WHITE
OFF			○—○	
ON	○—○			

SWITCH MODULE CONTACTS

12V, DC (350 STD)



IGNITION SWITCH — CONTACTS

	2	4	6	8	11	13	15
OFF							
IGN	•	•	•		•		
EME	•	•		•			•

HEAD LIGHT SWITCH

	1	2	3	4	5	7	R
OFF				•	•	•	
L			•	•	•		
H	•		•	•	•		•

COMPRESSION TEST

Leakage of compressed air petrol mixture reduces the compression pressure. The leakages can take place either downwards to crank case or upwards through cylinder head.

Down ward leaks (Blow-by) occurs due to :

* Worn out/scored piston rings, cylinder bore.
* Excessive clearance between piston and cylinder
* Scored ring groove land on piston.

Upward leaks occurs due to :

* Loose cylinder head nuts
* Blown cylinder head gasket
* Leaky valve seating
* Leaky decompressor valve

Compression test enables us to understand :

* Whether any excessive leak is present.
* If yes, is it towards the bottom or top.

PROCEDURE

1. Clean and fit the air filter.
2. Ensure clutch operates well.
3. Start and warm up the engine.
4. Switch off the engine.
5. Remove the spark plug.
6. Hold the compression gauge pressed on to the spark plug hole.

7. Hold throttle on full open position.
8. Smartly kick the kick starter pedal two or three times.
9. Remove gauge and check the compression pressure in the gauge.

COMPRESSION PRESSURE :

Bullet : 90 To 115 PSI

Lightning 535 : 110 to 130 PSI

Causes for excessive compression pressure :

Carbon deposit in the cylinder.

Use of thinner cylinder head gasket

Facing of cylinder head / block.

Lower compression pressure indicates compression leakage. To determine whether the leakage occurs towards the bottom or to the top, a **'wet'** compression test is to be taken.

PROCEDURE

1. Introduce some lub. oil to the engine (two strokes with an oil can will do)
2. Press the decompressor and crank the engine two or three times.
3. Then take the compression reading as explained earlier.

In wet test, if the compression pressure is higher only upto 5 PSI from that of dry test, the leakage is from : Valves, decompressor plunger and / or cylinder head gasket. If the wet reading pressure is higher by more than 5 PSI, the leakage occurs towards the bottom.

Unit : Nm

Sl. No.	Item Description	Torque	
		350 & 500	A350
ENGINE			
1.	Crank pin nut 7/8"	138	--
2.	Crank shaft pinion nut (Worm nut)	92	92
3.	Crank case stud nuts ¼"	9	9
4.	Crank case stud nuts 5/16	11	11
5.	Cylinder base stud	5	5
6.	Cylinder base stud nut	9	9
7.	Crank case drain plugs	30	11
8.	Cylinder head mounting studs	12	12
9.	Cylinder head nuts	33	24
10.	Tappet guide	--	50
11.	Tappet cover nuts	--	8
12.	Timing cover screws	10	10
13.	Oil filter stud	8	8
14.	Oil filter cover nut	14	12
15.	Oil pipe banjo bolts	17	17
16.	Rocker cover screws/nuts	14.5	7
17.	Spark Plug	20	20
18.	Front drive sprocket nut	55	55
19.	Alternator rotor nut	55	54
20.	Exhaust pipe mounting studs	--	12
21.	Exhaust pipe mounting nuts	--	6
CLUTCH & GEAR BOX			
1.	Clutch centre mounting nut	55	55
2.	Gear box end cover bolts ¼"	10	10
3.	Gear main shaft nut	65	65
CHASSIS			
1.	Chain stay stud nuts	35	35
2.	Head lamp clip bolt	13	13
3.	Rear hub short spindle nut	75	75
4.	Wheel axle nuts Fr. & Rr.	65	65
5.	Brake cam nuts	20	20
6.	Shock absorber nuts	25	25
7.	Handle bar bolts	33	33