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# ADJUSTMENT OF BRAKES

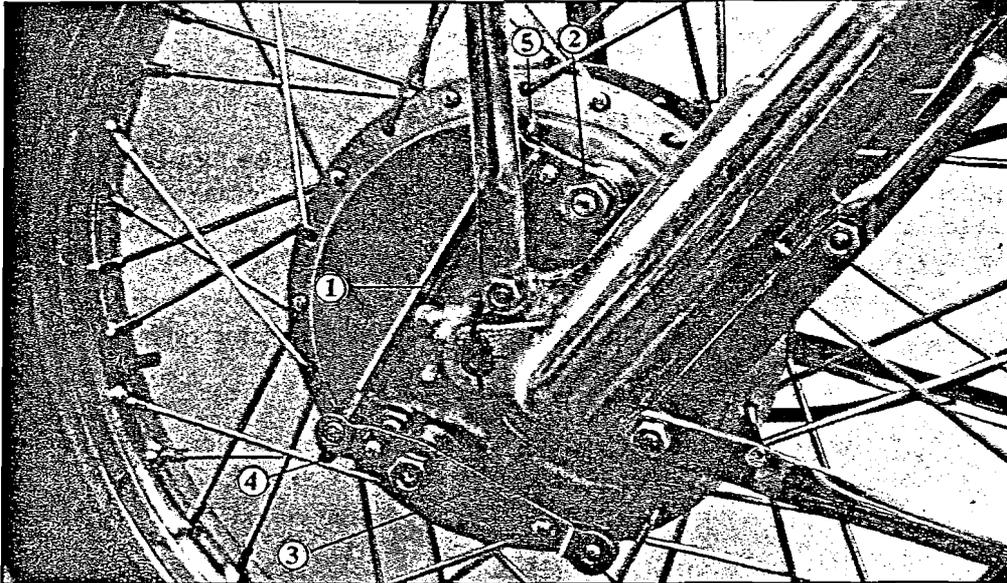
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## 1. Front Brake Twinleading Arrangement - Bullet 350/500 CC

All Bullet 350 & 500 cc models are fitted with twinleading front brakes for effective braking. These are with bonded type brake shoes of 7" diameter.

Where brake judder or sponginess is experienced and the cause is narrowed down to uneven braking of the front wheel, the procedure to adjust the same is as follows:

TWIN LEADING BRAKE ARRANGEMENT



1. Link rod
2. F/B Operating Lever (Short)
3. F/B Operating Lever (Long)
4. L/Rod Turning Nut (RH)
5. L/Rod Trunion Nut (LH)

## 2. Procedure For Adjustment of Brakes

### 2.1 Front wheel removed from the vehicle

Hold the front wheel spindle in a benchvice with soft jaws to avoid damage to spindle. Remove the brake cover plate by loosening the nut and clean the brake drum and brake shoe assembly.

Mark four or five lines with a chalk across the shoe lining surfaces and assemble the cover plate to the wheel and clamp it firmly with the nut. Hold the brake cam levers so that the brake shoes are binding lightly on to the drum and rotate the wheel in the normal direction of rotation (anti-clock wise direction looking from brake drum end). Remove the Brake cover plate and observe the marks on the brake shoe surfaces. If the contacts are uniform, the marks on the shoes would have been erased uniformly. If the mark on one side is not erased, it indicates that the brake shoe has to be moved towards the drum through adjustment provided. For example: if the shoe bearing on the cam connected to the short lever has the chalk marks intact then the shoe should be moved outwards towards the drum. For this adjustment, refit the cover plate assembly, hold the longer brake lever pulled fully in the operating direction so that the brake shoe is binding on the drum and proceed as follows:

**NOTE:** Check the locknuts for threading - RH or LH.

Loosen the locknuts provided at both the ends of link rod and rotate the link rod clockwise so as to move the short lever more towards the normal direction of the operation i.e. towards the longer lever.

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Stop adjusting when the shoe has moved and touches the brake drum which can be felt while making the adjustment through the link rod. Then lock the two lock nuts provided at the end of link rod. If the marks on the shoe operated by the longer lever are not erased, carry out above adjustments in the reverse manner (anticlockwise) ensuring that both the brake shoes are in contact with the drum uniformly.

**CAUTION:** Do not attempt to rotate the link rod without loosening the locknuts and do not overtighten the lock nuts on the link rod. The link rod threads might snap if either of the above is done.

## **2.2. Without Removing Front Wheel From Vehicle**

Increase cable play by threading in the adjuster either at handle bar end or at fork bottom tube end.

Loosen the link rod lock nuts sufficiently at the top and bottom (L & R threads).

Apply front brake and hold the lever (Do not release the brake till the adjustment is complete). This would ensure that the brake shoe nearest to the drum would be in contact with the brake drum.

Turn the link rod right to left (clockwise) or in the opposite direction simultaneously checking whether the short lever moves towards the long lever or vice versa.

Turning the link rod would be easy till the other shoe also comes in contact with the brake drum and thereafter resistance would be felt and would be difficult to rotate further.

Release the hand lever and check for free rotation of the front wheel (No brake binding should be felt and wheel should rotate free).

Hold link rod in position and tighten lock nuts just sufficiently. Adjust the brake cable adjusters such that brake lever travel is 20 to 30 mm from its resting position.

**NOTE:** 1. The Link rod is provided with the LH and RH thread for the above adjustments. Hence the correct trunions and Lock nuts are to be used at the respective threaded ends. (Refer Diagram)

2. Link rod adjustment can be made to compensate for the lining wear in the normal service life which avoids repositioning of the levers.

3. Any excessive play in the Brake cable can be corrected by using the adjuster provided in the Front Brake Lever end at the handle bar and through the adjuster provided on the left hand fork bottom tube assembly.

**CAUTION:** 1. If you are in doubt, please contact the authorised Dealer/Distributor for their guidance and for correct adjustment of the front brakes.

2. Any mal-adjustment of the brake system will render the brakes ineffective and will affect the safety of the rider.

## **2.3. Rear Brake**

Set brake pedal resting position with respect to the foot rest by adjusting the stop bolt provided on the left side on the main frame.

Turn the adjusting nut on the brake rod, clock wise to reduce pedal travel and vice versa to increase pedal travel.

The recommended travel is 20 to 30 mm. Rotate rear wheel and check for free rotation and ensure no brake binding occurs.

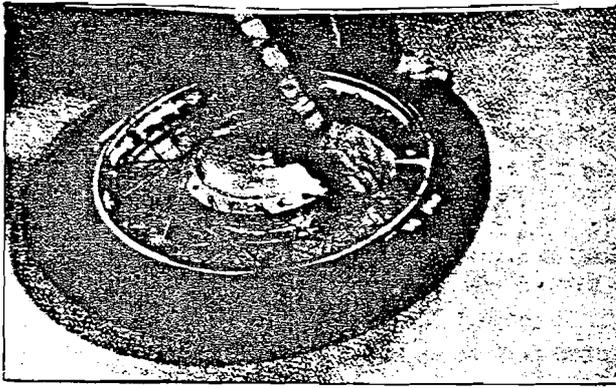
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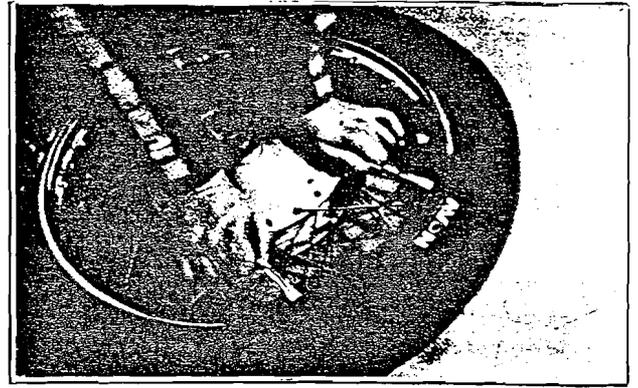
## **TYRES - REMOVAL AND REPLACEMENT**

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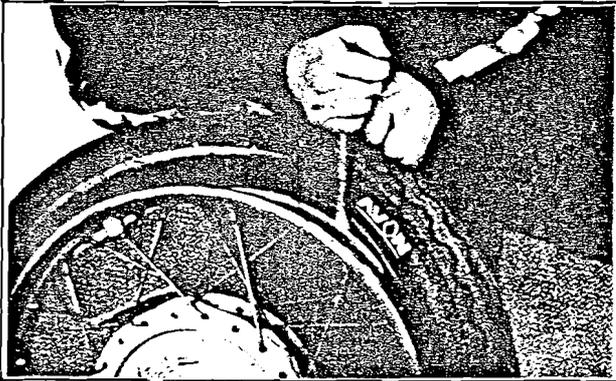
1. At some time or other the need will arise to remove and replace the tyres, either as a result of a puncture or because renewal is required to offset wear. To the inexperienced, tyre changing represents a formidable task, yet if a few simple rules are observed and the technique learned the whole operation is surprisingly simple.
2. To remove the tyre from either wheel, first detach the wheel from the machine. Deflate the tyre by removing the valve insert and when it is fully deflated push the beading of the tyre away from the wheel rim on both sides so that the beading enters the centre well of the rim. Remove the locking cap and push the tyre valve into the tyre.
3. Insert two tyre levers close to the valve, on either side of the valves and lever the edge of the tyre over the outside of the wheel rim. Very little force should be necessary; if resistance is encountered it is probably due to the fact that the tyre beading have not come off the wheel rim all around the tyre.
4. Once the tyre has been edged over the wheel rim, it is easy to work around the wheel rim so that the tyre is completely free on one side. At this stage, the inner tube can be removed.
5. Working from the other side of the wheel, ease the other edge of the tyre over the wheel rim. Continue to work around the rim until tyre is free completely from the rim.
6. If a puncture has necessitated the removal of the tyre, reinflate the inner tube and immerse it in water to trace the source of the leak. Mark its position and deflate the tube. Dry the tube and clean the area around the puncture with a petrol soaked rag. When the surface has dried, apply rubber solution and allow this to dry before removing the protective sticker from a patch and applying the patch to the surface.
7. It is best to use a patch of the self-vulcanising type, which will form a very permanent repair. Note that it may be necessary to remove another protective covering from the top surface of the patch, after it has sealed in position. Inner tubes made from synthetic rubber may require a special type of patch and adhesive if a satisfactory bond is to be achieved.
8. Before replacing the tyre, check the inside of it to remove the foreign particle which caused the puncture. Check the outside of the tyre, particularly the tread area, to make sure nothing is trapped that may cause a further puncture.
9. If the inner tube has been patched on a number of past occasions, or if there is tear or large hole, it is preferable to discard it and fit a new tube.
10. To replace the tyre, inflate the inner tube just sufficiently for it to assume a circular shape. Then push it into the tyre so that it is enclosed completely. Lay the tyre on the wheel at an angle and insert the valve through the rim tape and the hole in the wheel rim. Attach the locking cap on the first few threads, sufficient to hold the valve captive in its correct location.
11. Starting at the point furthest away from the valve, push the tyre beading over the edge of the wheel rim until it is located in the central well. Continue to work around the tyre in the fashion until the whole of one side of the tyre is on the rim. It may be necessary to use a tyre lever during the final stages.



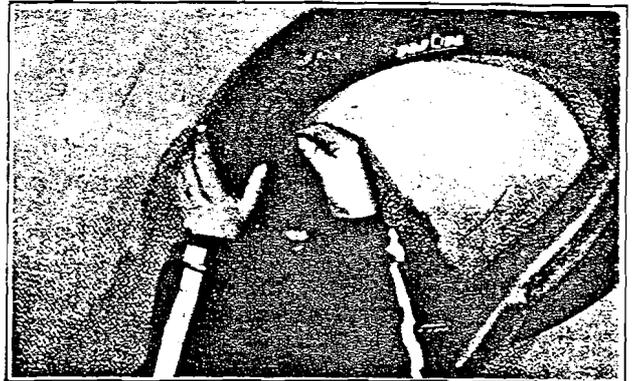
**Tyre removal:** Deflate inner tube and insert lever in close proximity to tyre valve.



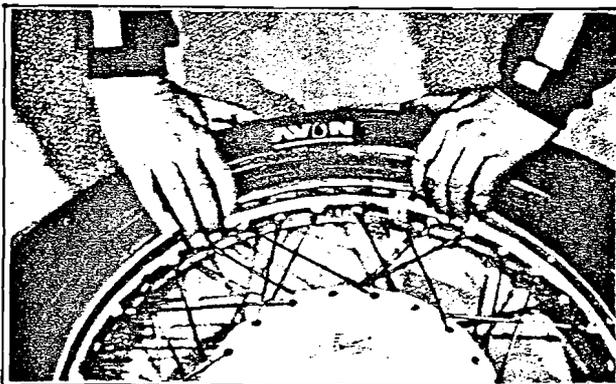
Use two levers to work bead over the edge of rim.



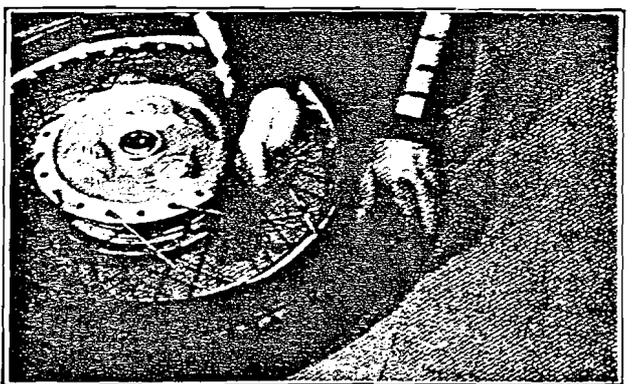
When first bead is clear, remove tyre as shown.



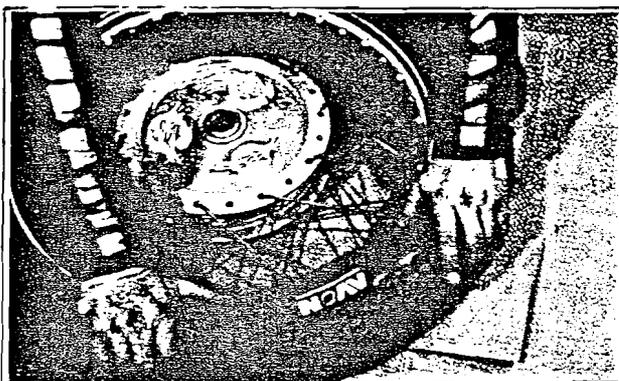
**Tyre fitting:** Inflate inner tube and insert in tyre.



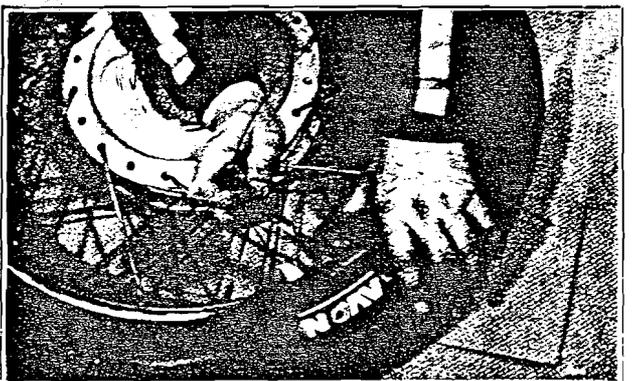
Lay tyre on rim and feed through hole in rim.



Work first bead over rim. Using lever in final section.



Use similar technique for second bead, finish at tyre valve position.



Push valve and tube up into tyre when fitting final section, to avoid trapping.

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12. Make sure that there is no pull on the tyre valve and again commencing with the area furthest from the valve, ease the other beading of the tyre over the edge of the rim. Finish with the area close to the valve, pushing the valve up into the tyre until the locking cap touches the rim. This will ensure the inner tube is not trapped, when the last section of the beading is edged over the rim with a tyre lever.

13. Check that the inner tube is not trapped at any point. Reinflate the inner tube, and check that the tyre is seated correctly around the wall of the tyre on both sides, which should be equidistant from the wheel rim at all points. If the tyre is unevenly located on the rim, try bouncing the wheel when the tyre is at the recommended pressure. It is probable that one of the beading has not pulled clear of the centre well.

14. Always run the tyres at the recommended pressures and never under or over-inflate. See specifications for recommended pressures.

15. Tyre replacement is aided by dusting the side walls, particularly in the vicinity of the beading with a liberal coating of French chalk.

16. Never replace the inner tube and tyre without the rim tape in position. If this precaution is overlooked there is a good chance of the ends of the spoke nipples chafing the inner tube and causing a series of punctures.

17. Never fit a tyre which has a damaged tread or side walls. Apart from the legal aspects there is a very great risk of a blow-out, which can have serious consequences on any two wheel vehicle.

18. Tyre valves rarely give trouble but it is always advisable to check whether the valve itself is leaking before removing the tyre. Do not forget to fit the dust cap which forms an effective second seal. This is especially important on a high performance machine, where centrifugal force can cause the valve insert to retract and the tyre to deflate without warning.

**CAUTION:** Sudden deflation may cause an accident, particularly if it occurs in the front wheel.

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# IGNITION AND LIGHTING SYSTEM

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## 1. General

The A.C., Lighting and Ignition system comprises of seven main components:

(i) Alternator (stator & rotor). (ii) Regulator and Rectifier (RR Unit) (iii) Ignition coil, (iv) Contact breaker unit with automatic timing control, (v) Lighting switch, (vi) Ignition switch, (vii) 12V. Battery.

When the engine is started, the alternator generates AC energy which passes through the rectified as DC energy. This rectified DC gets regulated by the regulator and charges the battery depending on battery and load conditions.

## 2. Alternator

The alternator comprises of two main components, a stator and a rotor. The stator carries three pairs of series-connected coils. The rotor is a permanent magnet. The stator and rotor can be separated without the need to fit magnetic keepers to the rotor poles.

As the rotor turns, paid and repeated reversals of flux take place in the coil cores. These lines cut through the turns of the coil and induce alternating voltages in that coil. External connections are taken from these coils to a regulator rectifier.

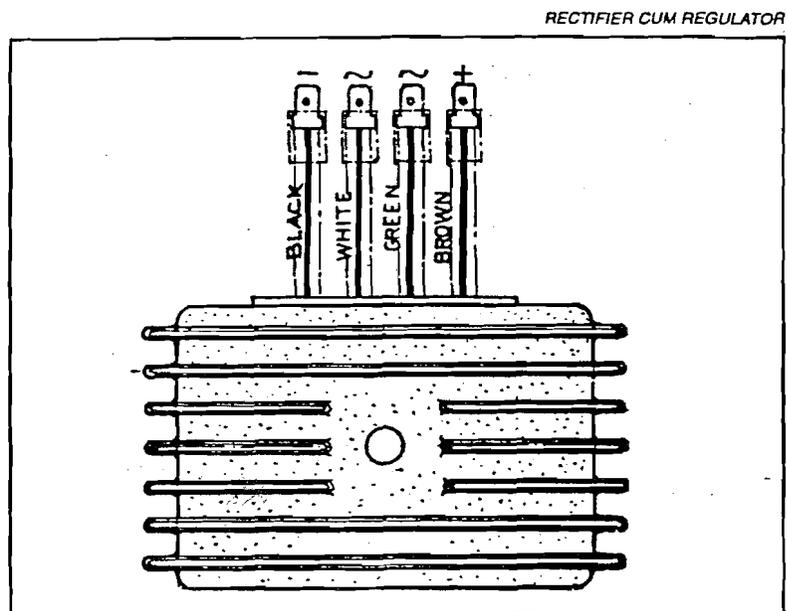
## 3. Regulator-Rectifier unit

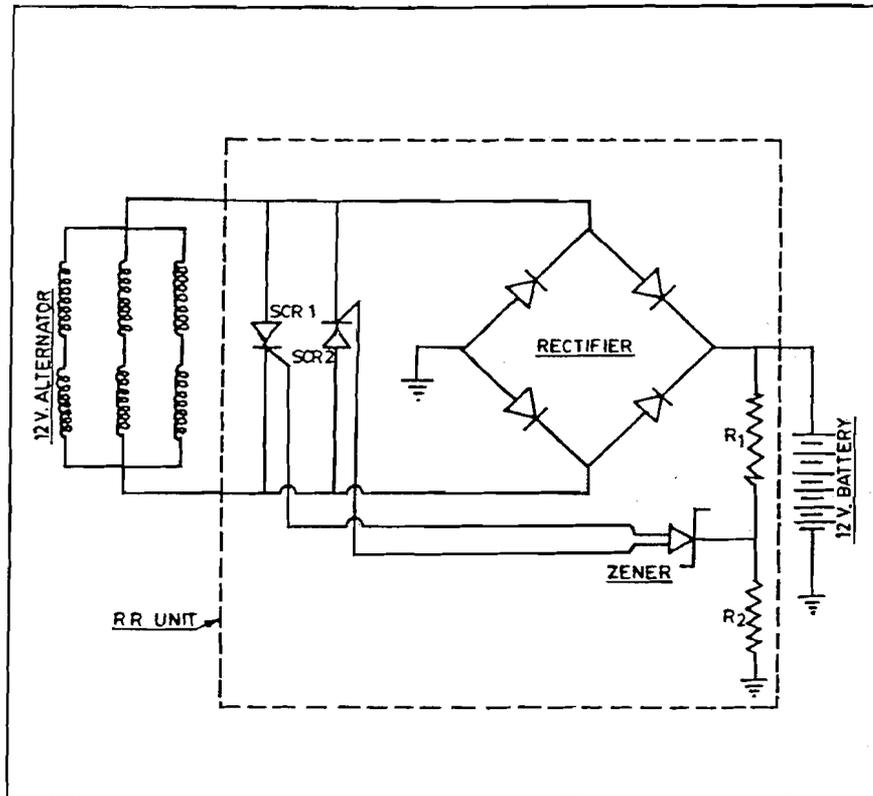
The alternator which consists of stator and rotor has three pairs of series connected coils. The alternator output is directly connected to regulator rectifier AC input terminals.

The control circuit of regulator rectifier unit monitors the battery voltage and regulates the charging current to the battery according to pre-set regulating range (Range: old:13.8 volts to 14.6 volts. New: maximum of 15.5 volts)

During the day running period ie: ignition load alone, the battery voltage rises rapidly and the regulator starts regulating the charging current to the battery.

When the head light is switched 'ON' more current is drawn from the battery and the regulator in turn allows higher current to flow into the battery for charging.





#### 4. New type Regulator - Rectifier. (on Vehicles produced after July 1995)

This is an improved version of the previous regulator cum rectifier.

It is mounted under the seat dual.

The input and output connections are the same as in the old unit.

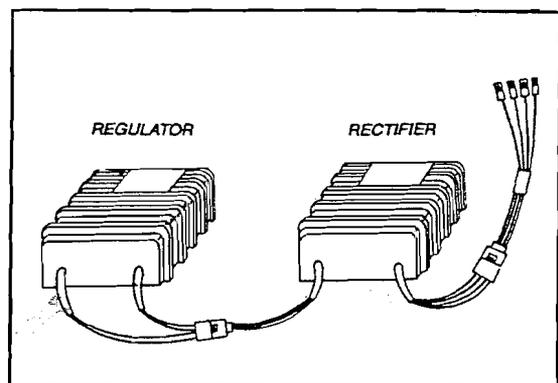
##### **Salient feature:**

The modified regulator, rectifier has the advantage that in the event of the regulator failing and the ammeter not indicating charge, the regulator can be disconnected from the circuit and charging will take place without any regulation of current.

Also the regulator or the rectifier can be replaced individually in the event of a failure.

**CAUTION:** In case the regulator is faulty and has been disconnected from the circuit, it should be replaced through the nearest authorised Enfield dealer to prevent over charging of the battery and subsequent damage to the battery and other electrical systems.

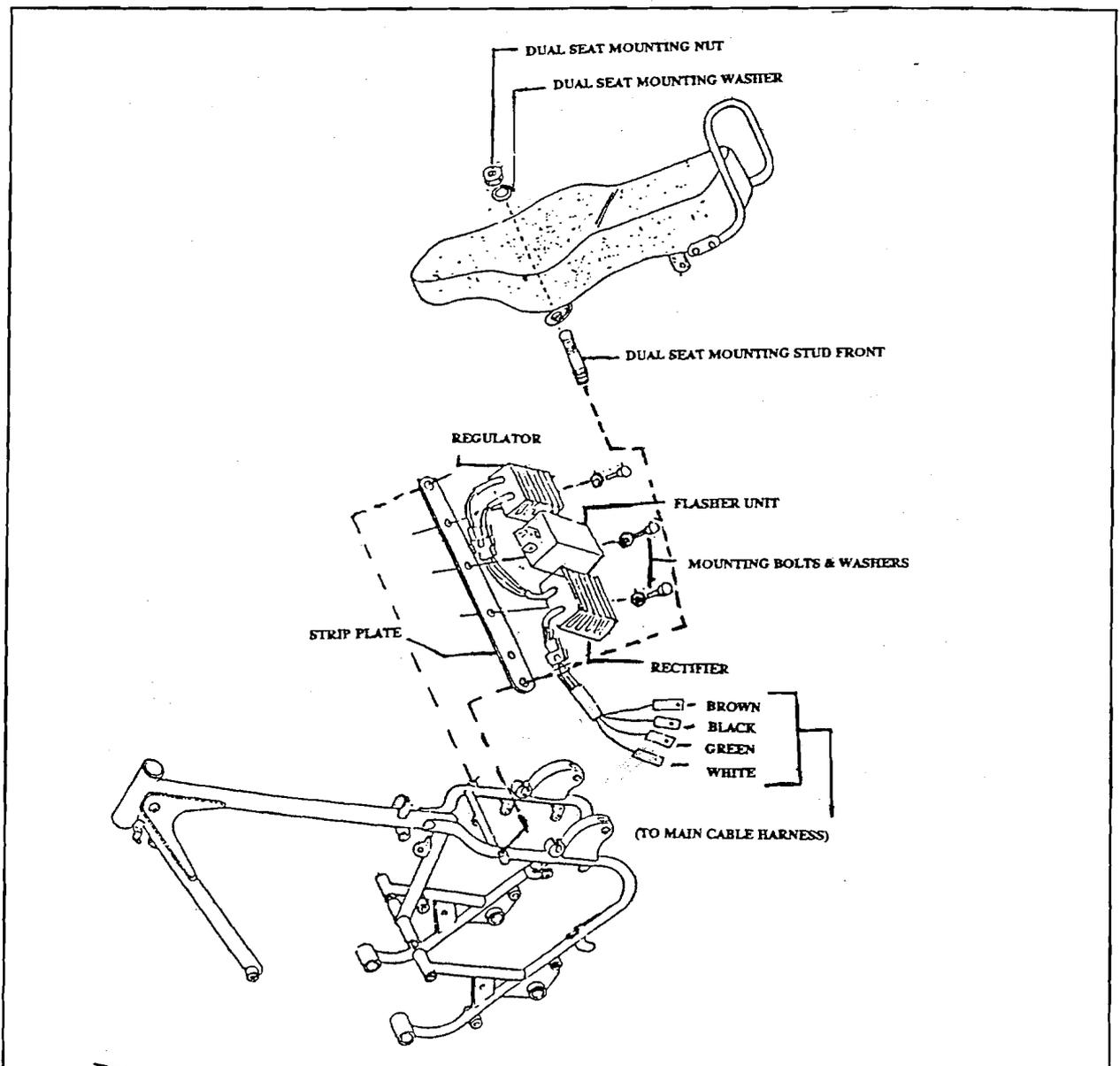
NEW REGULATOR AND RECTIFIER



## 5. Mounting arrangement of new regulator - rectifier Unit.

1. Remove 4 wire connections from regulator cum rectifier which is mounted on the fixed mudguard of the vehicle (just, below the ignition coil)
2. Remove the dual seat mounting and dual seat.
3. Fix the new strip plate (assembled with rectifier/regulator / flasher unit) on to the front mounting studs of the seat.
4. Connect the rectifier wires to the main cable harness. Connect like colour wires together.
5. Connect the flasher unit wire.
6. Reassemble the deal seat over the strip and tighten.

MOUNTING ARRANGEMENT OF NEW REGULATOR - RECTIFIER



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## 6. Routine Maintenance

The alternator and regulator rectifier requires no maintenance apart from ensuring that all connections are clean and tight.

If the rotor, stator, engine crankshaft or rear half of the chaincase have been disturbed, the airgap between the rotor and stator should be checked for a minimum of 0.006" gap.

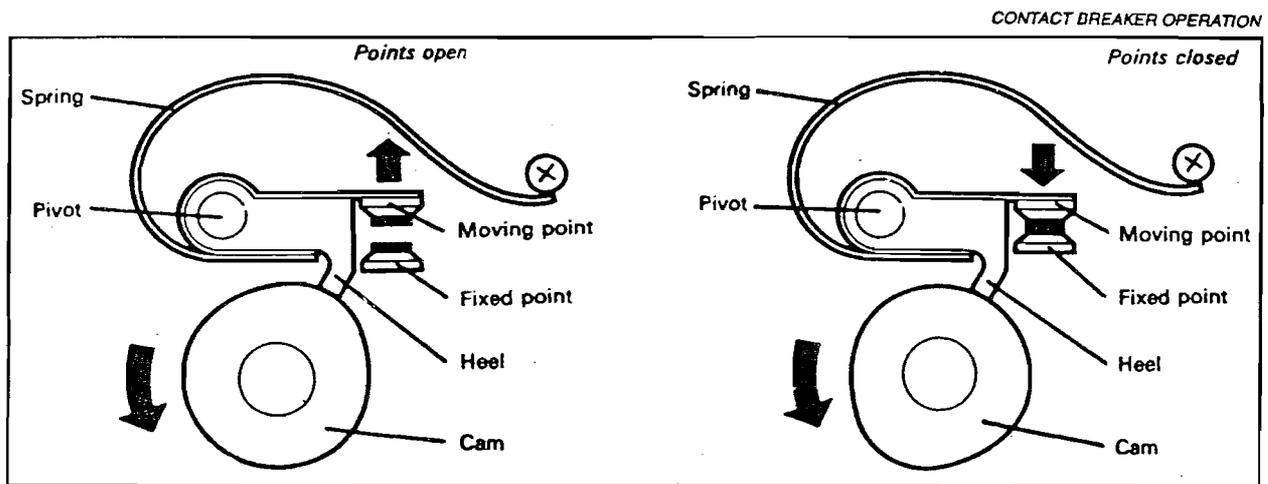
The ignition coil is located beneath the seat. It should be kept clean and the terminals kept tight. When the high tension cable shows signs of perishing or cracking it must be renewed.

## 7. Contact Breaker Unit/Contact Set

The contact breaker setting should be checked after the first 800 Kms. running and subsequently every 5,000 Kms. (3000 miles)

### Cleaning contact breaker points

Remove the contact breaker cover and examine the contacts. If they are dirty or pitted, they must be cleaned by polishing with a fine carborandum stone or very fine emery cloth. Afterwards wipe away any dirt or metal dust with a petrol moistened cloth.



### Setting contact breaker gap.

To check or reset the gap, turn the engine over slowly until the piston is at TDC on compression stroke and the contacts are seen to be fully open. Insert 0.35 to 0.40 mm (0.014" - 0.16") feeler gauge between the contacts. Slacken the screw 'A' securing the fixed contact plate and adjust the position of the plate until the gap is the thickness of the feeler gauge and tighten. If the gap is correct, the gauge will be a sliding fit.

### Setting ignition timing.

To check or reset the ignition timing, rotate the crankshaft in the normal direction until the piston is just before TDC and the contact breaker points just commence to open. (The best way to check the opening of points is to switch on the ignition and crank the engine slowly until the ammeter needle just returns to its central position. The points should just commence to open at this position. Check the position of the piston which should now be 0.8mm before TDC on the compression stroke. At this position slacken the two screws B. Swing the base plate to the left to advance or to the right to retard the ignition. Retighten the two screws such

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that the CB points gap just commences to open. To check whether the adjustment is correct, insert a thin strip of tissue paper between the points and gently pull out the paper which should not get damaged and should be sliding fit.

The most accurate method of setting timing is by using a dial gauge. Remove spark plug and fix a dial gauge on the spark plug hole using a suitable adaptor. Crank engine gently so that piston is at TDC on compression stroke. With the piston at TDC rotate the dial such that the needle aligns with zero on the dial gauge.

Set the C.B. point gap at 0.35 to 0.4mm and rotate the crank shaft in the opposite direction such that the piston will be 0.8mm before TDC (This can be measured on the dial gauge). Now reset the base plate so that the points just commences to open. This can be checked by connecting a 12v bulb and the CB point in series with a battery. When the points are in contact the bulb will glow and when they just open the bulb will not glow

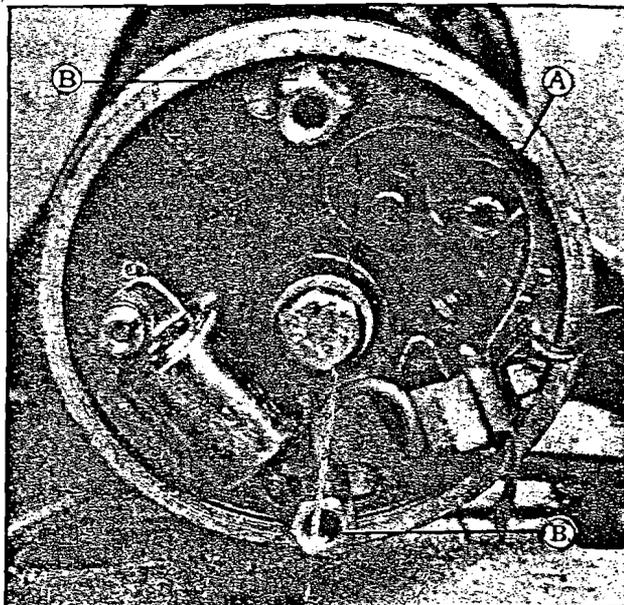
#### **Lubrication (every 5,000 Kms.)**

Smear the surface of the cam very tightly with mobile grease No.2, non creep oil or clean engine oil. Apply a drop of clean engine oil on the contact breaker pivot. Make sure no grease or oil gets in between the contact points.

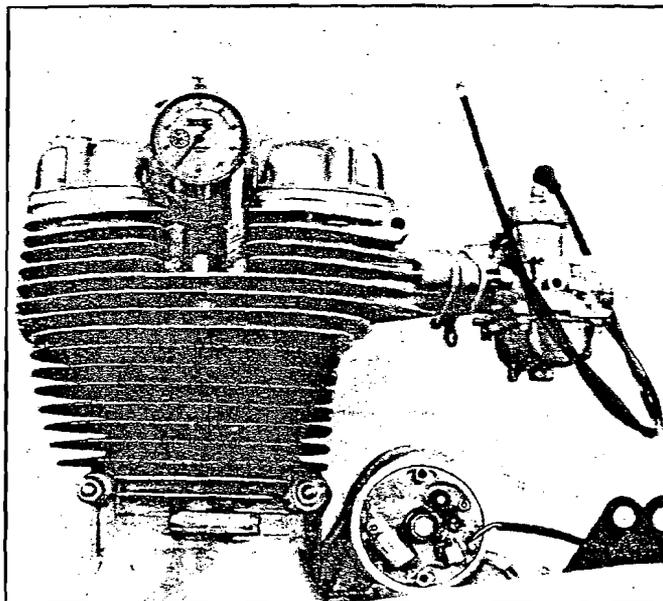
#### **8. Automatic Timing Control**

The automatic timing mechanism provided in the contact breaker housing helps in automatically advancing the ignition timing with relation to engine speed at higher RPM.

CONTACT POINTS



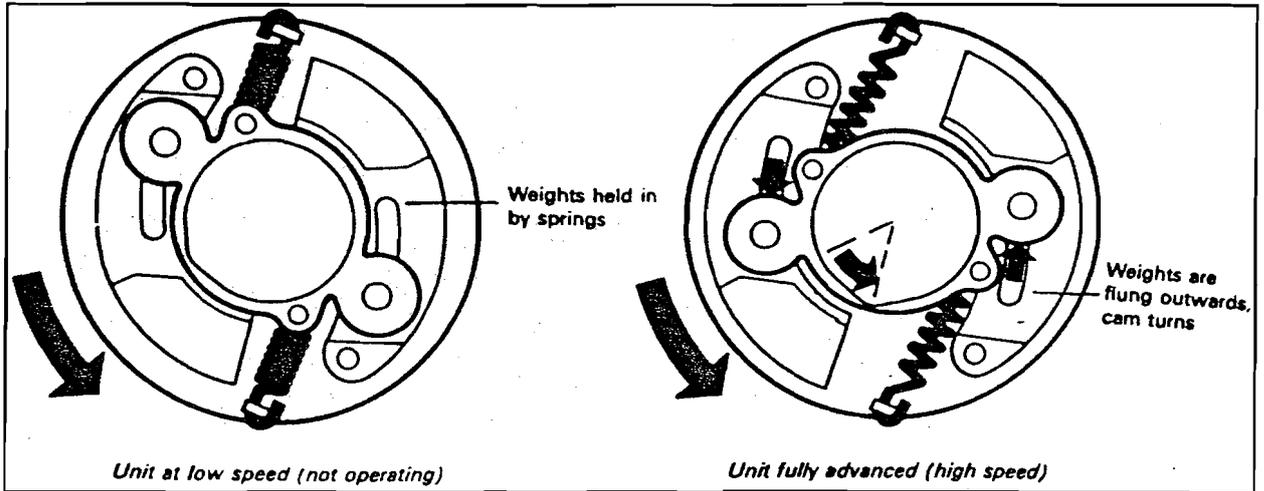
TIMING - USING DIAL GAUGE



When servicing the CB points the cam should be checked for free movement in the clockwise direction and that it is not stuck.

To obtain access to the unit, remove contact breaker cover and the base plate assembly. Apply a drop of clean engine oil on the fly weight pivots and the spring eyelets.

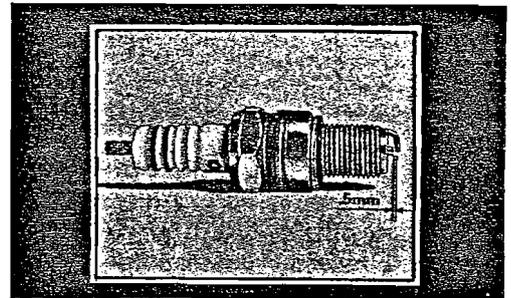
AUTOMATIC TIMING UNIT (ATU) OPERATION



## 9. Spark Plug

Owing to electrode burning, the electrode gap widens in operation and may impair the performance and economy of the motorcycle. Therefore, the electrodes should be cleaned and adjusted to its specified gap - i.e. 0.46 to 0.50 mm. Check the electrode gap every 5,000 Km. and clean and adjust if necessary

SPARK PLUG



Spark Plug	Type	Ref. No.
350cc	- NKG	B7HS
500cc	- NGK	BR8ES

## 10. Battery

The battery is a 12 Volt, 5 or 5.5 Amp. hour capacity battery. Every week the filler cap of each cell should be unscrewed so that distilled water can be added to bring the acid level above the top of the separators if found low. (For US/ Canada battery used is 12V 7 AH)

DO NOT add tap water as this contains impurities. Acid should not be added unless this is accidentally spilled out of the battery. In case of spillage, it should be replaced by dilute sulphuric acid of the same specific gravity as in the cells. Keep the battery terminals clean, and free from corrosion by coating with pure vaseline (not grease). Many lighting troubles can be traced to unseen corrosion between the battery leads and the terminals in the battery. The corrosion takes place much more frequently at the battery terminals than at other electrical contacts.

The state of charge of the battery is indicated by the specific gravity of its electrolyte. If specific gravity falls to 1.110, the battery must be recharged using an external D.C. supply at the normal recharge rate of 0.5 Amp.

**NOTE:** If the battery is subjected to long periods of night parking with the lights on, it may be necessary to recharge the battery before using the motorcycle.

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## 11. Head Lamp

### A) Regular and UK Models

The unit consists of a reflector and front lens assembly which are permanently stuck together to prevent water and dust from entering inside and spoiling the reflector.

A prefocus bulb is used, hence no focusing device is required to be fitted. The bulb has a large flange and cap. A slot in the flange helps in correctly positioning the bulb in the reflector. A spring loaded bulb holder, when assembled on the reflector ensures the bulb is held in position.

The bulb is connected to the wiring harness with the help of lucar connectors. The bulb is 12 V 40/45 watts.

To replace the bulb in the light unit, loosen the top screw on the fixing rim and remove the front rim and light assembly taking care to disengage the lug at the bottom of the front rim from the fixing rim. Disconnect the lucar connectors from the bulb terminals. Gently press and twist the bulb holder in the anticlockwise direction to remove the bulb holder. Remove the bulb out of the reflector.

Reassembly of the headlight bulb is the reverse order of the procedure mentioned above but care should be taken to locate the bulb and holder correctly in the reflector.

In the event of damage to either the lens or the reflector, a new light unit must be fixed.

To remove the light unit from the front rim, remove the securing spring clips holding the light unit to the rim and remove the light unit from the rim.

While reassembling the light unit ensure the word 'top' on the lens is towards the top of the rim and secure the spring clips in the fixing rim ensuring that they are equally spaced around the rim.

### B) US/ Canada Models

These models are fitted with an aiming device to meet the regulations in US and Canada.

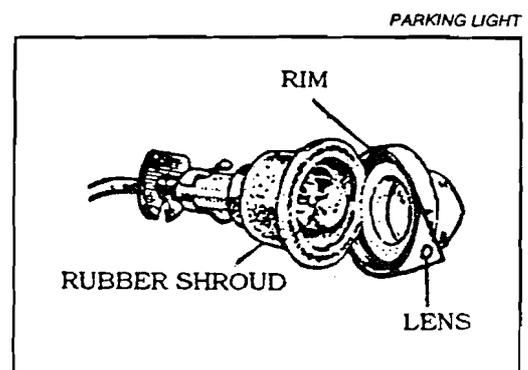
The light unit is a sealed beam. In the event of the head light bulb fusing the complete sealed beam needs to be replaced.

The dismantling of the head light assembly is the same except that the sealed beam is located in the aiming device housing. The sealed beam is located on a spring loaded screw on one side and by means of 2 springs connected to the housing.

## 12. Parking Lights

Access to the parking bulbs is obtained by removing the parking lamp rim (see fig). This forces over the edge of the rubber lamp body and is additionally secured by means of a small fixing screw. After removal of the lamp rim the parking lamp lens can be pulled out of the rubber body, after which the bulb will be accessible.

Bulb - Parking Lamp - 12V - 2W



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### 13. Stop and Tail Lamp

The rear lamp is a combined stop and tail light and also incorporates a reflector.

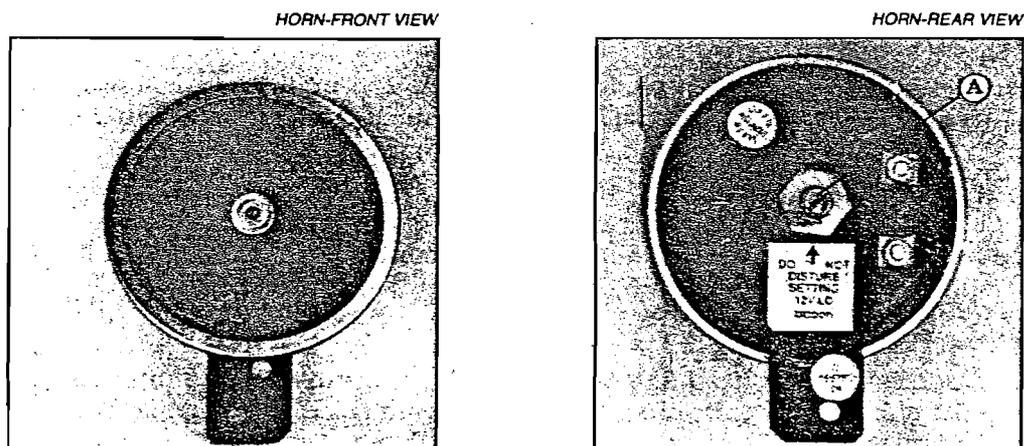
Access to the bulb is obtained by removing the two screws which secure the plastic cover.

The correct bulb is 12 volt 6/18 Watt or 5/21 Watt. The 6 Watt filament provides the normal tail light, while the 18 Watt filament is illuminated by movement of the brake pedal and while operating front brake lever.

Care must be taken while replacing a new tail light assy so that the leads to the stop tail lamp are correctly connected, as the use of the 18 Watt filament on the normal tail light will not only discharge the battery but could cause excessive heat affecting the plastic cover. At the same time, the 6 Watt filament, if used as stop light, will be ineffective in bright sunlight or at night when the tail light filament is illuminated.

### 14) Horn

The machine is fitted with a 12V x 3 Amps D.C. Horn. This is a sealed unit and should never be tampered with. A screw is provided with a locking nut at the back of the horn for tone adjustment. Do not meddle with it unless it requires adjustment. If the horn gives only a choking sound, or does not vibrate, it does not mean that the horn has broken down. The trouble may be due to a discharged battery, a loose connection, or short-circuit in the wiring of the horn. It is also possible that the performance of the horn may deteriorate due to its mounting becoming loose.



A - TONE ADJUSTING SCREW

However a setting screw is provided which is covered by a protective rubber cap. "B"

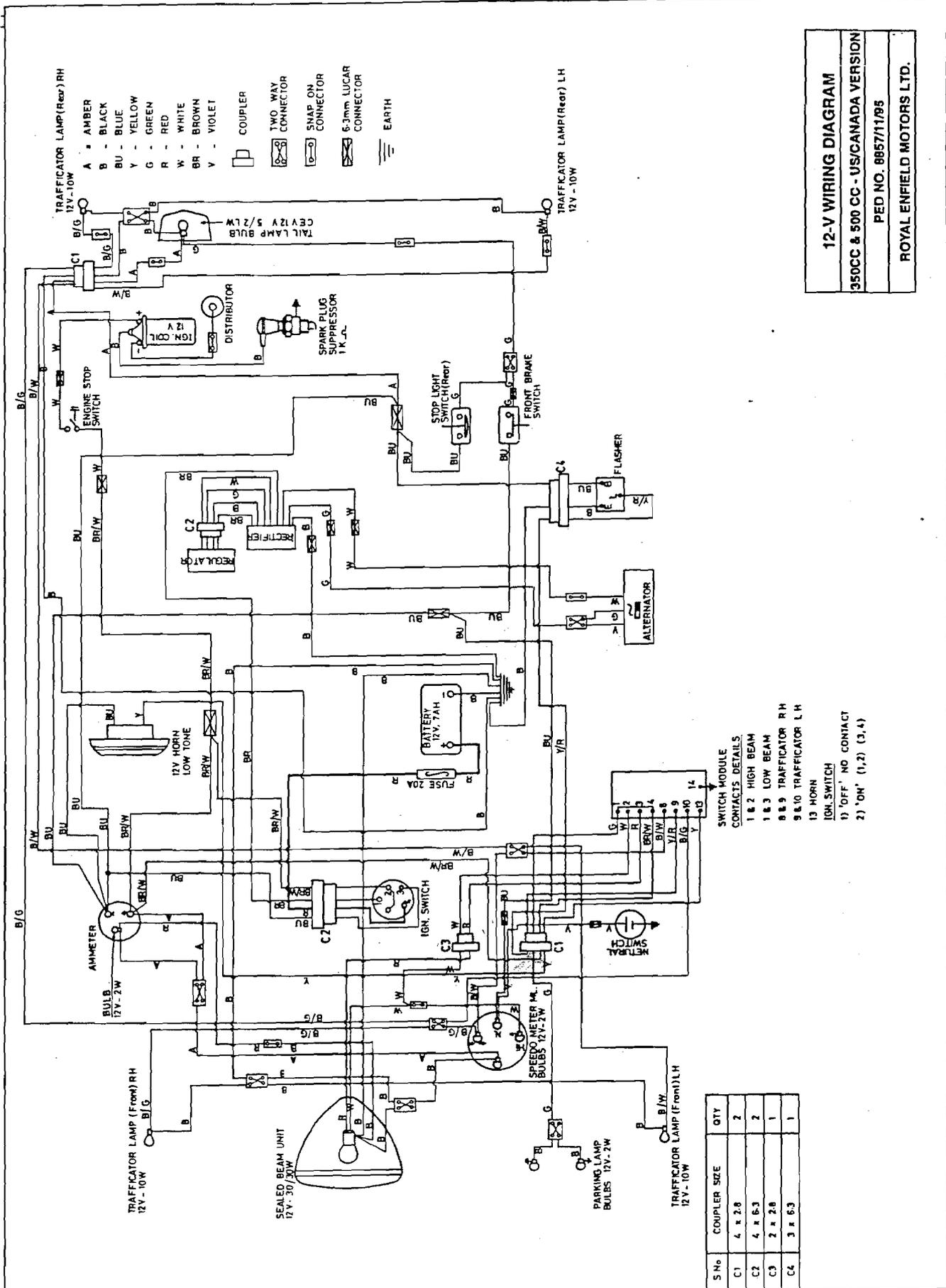
If the horn sound is feeble then minor corrections are possible by means of this setting screw.

To carry out adjustments please proceed as follows:

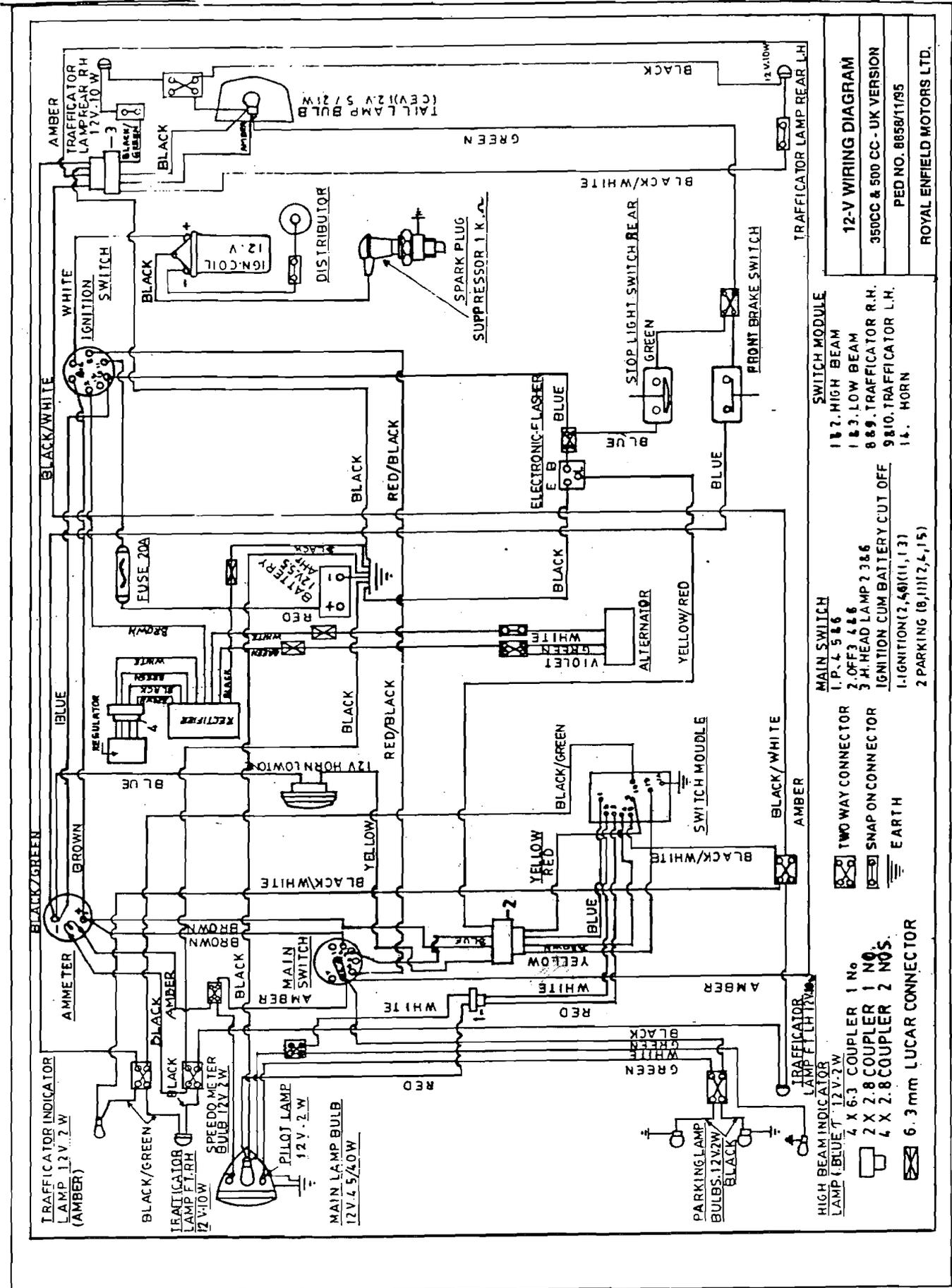
- Remove protective rubber cap
- Turn in the small screw very carefully at the same time check for functioning of the horn
- Stop adjusting when the desired sound level is obtained.
- Refit the protective rubber cap over screw when adjustment is complete.

**NOTE:** IF the adjusting screw is turned in too much the horn would only give a choking sound or if it is turned out too much the sound would be very feeble.

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**12-V WIRING DIAGRAM**  
**350CC & 500 CC - US/CANADA VERSION**  
**PED NO. 8857/11/95**  
**ROYAL ENFIELD MOTORS LTD.**



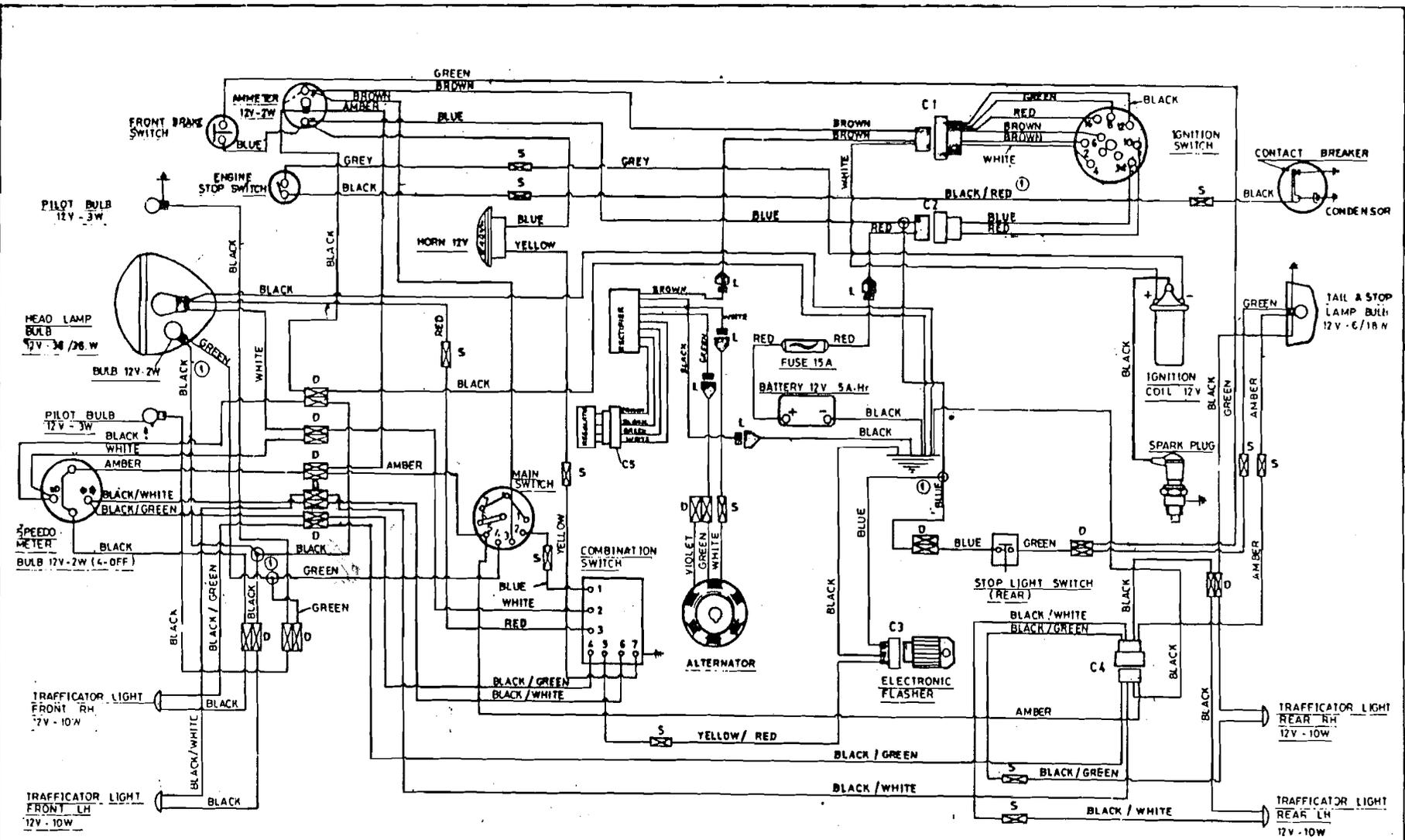
12-V WIRING DIAGRAM  
 350CC & 500 CC - UK VERSION  
 PED NO. 8658/11/95  
 ROYAL ENFIELD MOTORS LTD.

- SWITCH MODULE
- 1 2. HIGH BEAM
  - 1 3. LOW BEAM
  - 8 8 9. TRAFFICATOR R.H.
  - 9 8 10. TRAFFICATOR L.H.
  - 14. HORN
- MAIN SWITCH
- 1. P. 4. 5 & 6
  - 2. OFF 3 & 4 & 6
  - 3. HI HEAD LAMP 2 3 & 6
- IGNITION CUM BATTERY CUT OFF
- 1. IGNITION (2, 4, 6) (11, 13)
  - 2. PARKING (8, 11) (2, 4, 15)

- TWO WAY CONNECTOR
- SNAP ON CONNECTOR
- EARTH

- 4 X 6.3 COUPLER 1 NO.
  - 2 X 2.8 COUPLER 1 NO.
  - 4 X 2.8 COUPLER 2 NOS.
  - 6.3 mm LUCAR CONNECTOR
- TRAFFICATOR LAMP REAR L.H. 12V 10W
- TRAFFICATOR LAMP FRONT R.H. 12V 10W
- TRAFFICATOR LAMP FRONT L.H. 12V 10W
- TRAFFICATOR LAMP REAR R.H. 12V 10W
- TRAFFICATOR LAMP REAR L.H. 12V 10W

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DETAILS OF COUPLERS				CONTACTS			
CODE	PLACE	QTY	SIZE	IGNITION SWITCH	SWITCH MODULE	COUPLER	(C)
C1	IGNITION SWITCH	1	6 x 2.8	OFF - NO CONTACTS	HORN - 7	Two Way Connectors (C)	4
C2	IGNITION SWITCH	1	2 x 6.3	IGN - (2,4,6) (10,14)	H1-BEAM - 18.2	Snap On Connectors (S)	12
C3	FLASHER	1	3 x 6.3	EMG - (2,4,16) (8,12)	LOW BEAM - 18.3	6.3 Lucas Connectors (L)	5
C4	TAIL END HARNESS	1	4 x 2.8		FLASHER LH - (6x7)	Earth	
C5	COUPLER	1	4 x 6.3		RM - (3x8)	Internal Joint	4
				H/L SWITCH			
				OFF - (4,5)			
				P - (3,4,5) (R,7)			
				M - (2,3,8) (R,1)			

**12-V WIRING DIAGRAM**  
**350CC & 500 CC - REGULAR VERSION**  
 PED NO. 8859/11/95  
 ROYAL ENFIELD MOTORS LTD.

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# ELECTRICAL CONNECTION DETAILS

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## 1. Alternator assembly

The three output wires from the alternator should be connected to the main cable harness through snap on connectors.

Connect the wires as follows:

		<i>Wiring Harness</i>		
<i>Alternator</i>		UK	US/Canada	Regular
White	to	white	white *	white
Violet & green	to	green	green	green

\* In certain Vehicles the wire colour is violet

**CAUTION:** Do not interchange the above connections to prevent overcharging of the battery.

## 2. Regulator cum Rectifier

The connections are as follows:

<i>regulator</i>		<i>Wiring Harness</i>		
		UK	US/Canada	Regular
Brown		Brown(+ve)	Brown (+ve)	Brown(+ve)
Black		Black(-ve)	Black(-ve)	Black(-ve)
Green		Green(AC)	Green(AC)	Green(AC)
White		White(AC)	White(AC)	White(AC)

## 3. Ignition Coil

(LT connections) Uk Version: connect white wire from terminal no.6 of ignition switch to +ve terminal of coil and black/white wire from CB point assembly to -ve terminal of coil.

US/Canada: Connect white wire from engine stop switch at the handle bar to +ve terminal of the coil and black wire from CB point assembly to -ve terminal of the coil.

Regular version: Connect whitewire from terminal no.4 of ignition switch +ve terminal of coil and grey wire from engine stop switch to -ve of the coil

HT connections: Connect HT lead to the centre of the coil and the spark plug cap

## 4. Stop - Run switch on handle bar

**Only for US/Canada and Regular versions**

US/Canada: Connect brown/white wire from switch to -ve terminal of ammeter

Regular: Connect black wire from switch to CB Point.

## 5. Battery

Connect the earth wire (black) from harness to - ve terminal of the battery and the main wire (red) from the fuse carrier to the +ve terminal of the battery.

**Caution:** Do not connect the battery to the main cable harness without the fuse carrier and never interchange the battery terminal connections.

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## 6. Ignition Switch

The ignition switch has basically 3 positions. The functions and connections are given below. The wire connections are through non interchangeable couplers.

### UK Version

Key position (rider seated)	Control Contacts
Centre	Ignition off, battery circuit off, key can be removed
Clockwise	Ignition and battery Circuits ON Terminals(2,4,6) (11 & 13) are connected. Key cannot be removed
Anticlockwise	Ignition off, battery circuit ON. Pilot and tail lamp glows. Key can be removed to facilitate night time parking with pilot lights ON

Terminal Connections	
Terminal Number	Wire Colour
11 (+ve from battery)	Red
13	Blue
2 (+ve from RR unit)	Brown
4	Brown
6	white

### Regular version:

The ignition switch is the same as UK version switch except that the switch has no function in the anticlockwise position and the terminal connections are different as follows:

Terminal Connections	
Number	Wire colour
2 (+ve from RR unit)	Brown
4	White
6	Brown
10 (+ve from battery)	Red
14	Blue

### US/Canada Version

The ignition switch is located on the head lamp casing in place of the head light switch.

Position 1 Ignition and battery circuits off.

Position 2 & 3: All circuits ON and headlight illuminates moment switch is ON.

## 7. Main Light Switch

This switch is applicable only to UK and regular versions. The main light switch is located on the head lamp casing and has 3 positions.

In the UK version the centre position is off and in the Regular version the extreme left is of position.

P	pilot lamps on
Off	all lights off
H	Pilot and head light ON.

The wiring connections are as follows:

UK Version		Regular Version	
Wire Colour	Terminal No.	Wire Colour	Terminal No.
Brown	2	Blue	2
Blue	3	Brown	3
Red	5	Green	4
Green & Amber	6	Amber	5

## 8. Handle Bar Switch

The handle bar switch provided on the left side of the handle bar consists of head lamp high & low switch (head lamp day flash only in UK & US/canada versions) trafficator switch and horn push button. The wires are presoldered to the terminals and connections are through couplers and snap on connectors. The colour of the wiring connections are given for reference purposes.

Terminal No	Wires colour			Connections for
	Uk	US/Canada	Regular	
1	Blue	green	Blue	H-lamp supply
2	Red	Red	White	H-lamp Hi beam
3	White	White	Red	H-lamp Lo beam
4	Brown	Brown	-	H-lamp day flash
4	-	-	Black/green	Trafficators Lamps
5	-	-	Yellow/red	Trafficator supply
6	-	-	Black/white	Trafficator lamps
7	-	-	Yellow	Horn
8	Yellow/red	Yellow/red	-	Trafficator supply
9	Black/white	Black/white	-	Trafficator lamps
10	Black/green	Black/green	-	Trfficator lamps
13	Yellow	Yellow	-	Horn

## 9. Horn

Connect the lucar terminals blue and yellow to the horn and ensure the protective sleeve is in position over the connections.

## 10 Brake light switches

There are 2 switches provided, one near the front brake lever and the other inside the LH tool box.

The connections are blue and green wires

The front brake light switch connects inside the head lamp casing, using lucar connectors, and the rear brake wire connections are through snap on connectors

**NOTE:** Ensure all earth connections are clean and firm and the wires are fully inserted into the snap on connectors lucar terminals and couplers.

Check and correct any electrical faults before replacing blown fuse links.

Do Not interchange battery terminal connections and regulator cum rectifier connections.

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# CARBURETTOR

Bullet Motorcycles are fitted with MIKCARB Carburettors

350cc	-	VM-24 Type
500cc	-	VM-28 Type

## Function

The function of the carburettor is to provide combustible Air- fuel mixture by breaking the fuel into tiny particles - in the form of vapour and mixing the fuel vapour with air in a proper ratio and deliver it into the engine combustion chamber.

In general, all carburettors are designed to provide the engine with the designed ratio of atomised fuel-air mixture at the required quantity levels to cater to both load and road speed of engines.

In the Mikcarb carburettors fitted to 350cc and 500cc Bullet Motorcycles, the atomisation and mixing of fuel and air is carried out by THREE systems, viz.:-

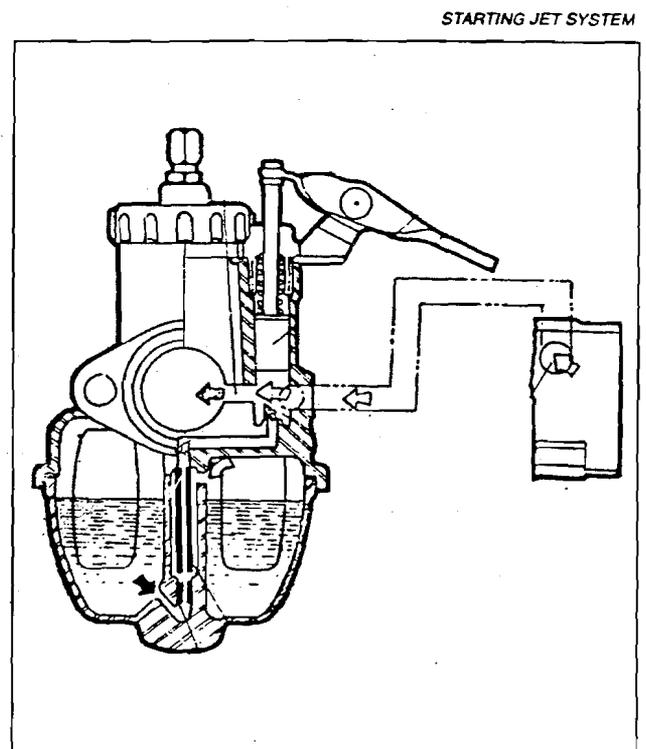
- STARTING JET SYSTEM or CHOKE SYSTEM
- PILOT JET SYSTEM
- MAIN JET SYSTEM

### 1. Starting Jet System

The starting jet system provided in this carburettor is to aid starting, under adverse condition such as that experienced during cold winter mornings.

The starting jet system comes into operation, when the choke lever is pushed down and thereby lifting the choke plunger from its seat. This enables an additional quantity of fuel to be supplied to the engine in addition to that of pilot jet system.

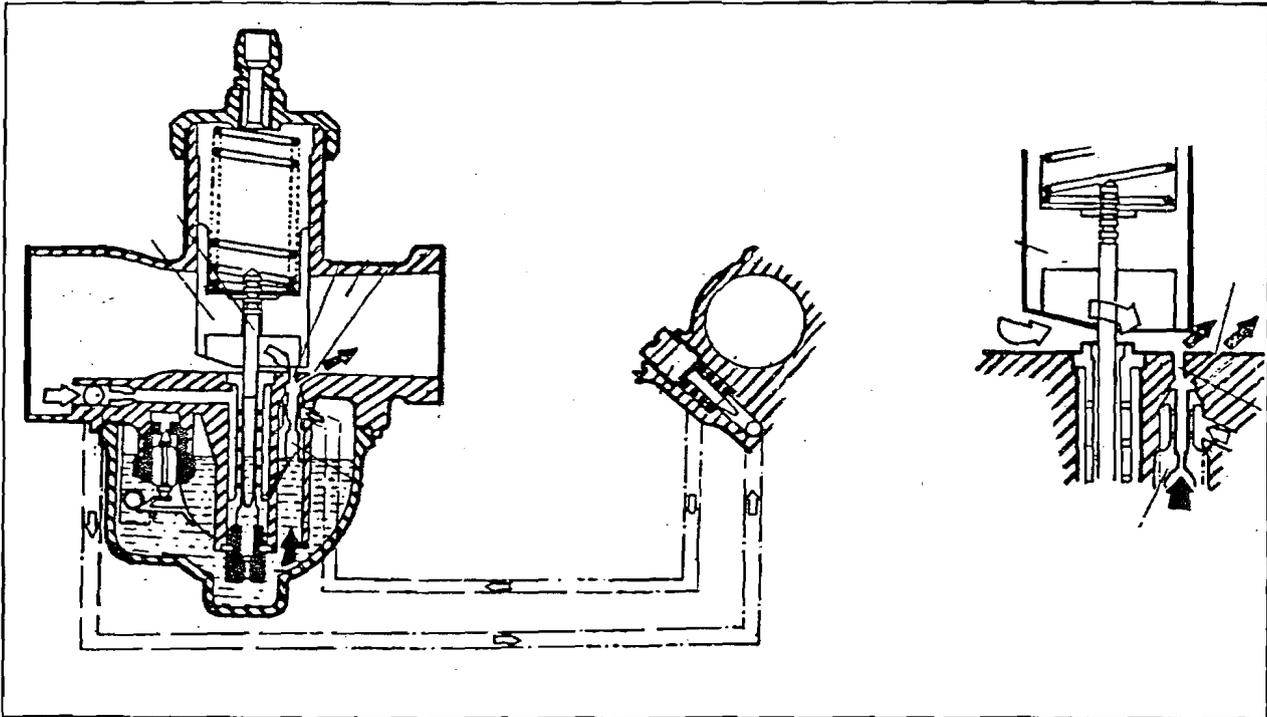
This action makes the fuel air mixture to become richer for better startability.



## 2. Pilot Jet System

The pilot jet system supplies the engine requirements at lower engine speeds only, i.e. during idling rpm. This function is carried out by the pilot jet and pilot air screw. The pilot air screw governs the air fuel mixture ratio. Adjusting the screw by screwing in beyond the specified limits would make the mixture rich and vice versa.

PILOT JET SYSTEM



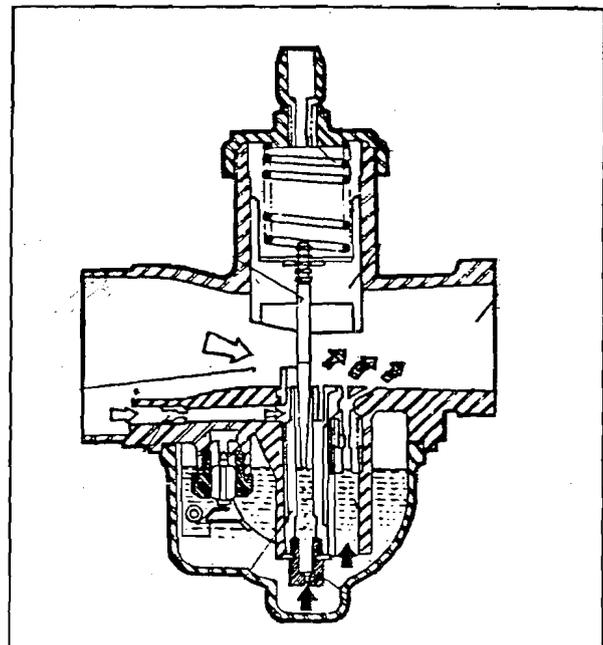
## 3. Main Jet System

The main jet system comes into operation at speeds above idling, i.e. the moment throttle slide is lifted. When once the main jet system becomes functional, it provides to the by-pas circuit for the pilot jet system. As such, the pilot jet system becomes totally inoperative during main jet system operation.

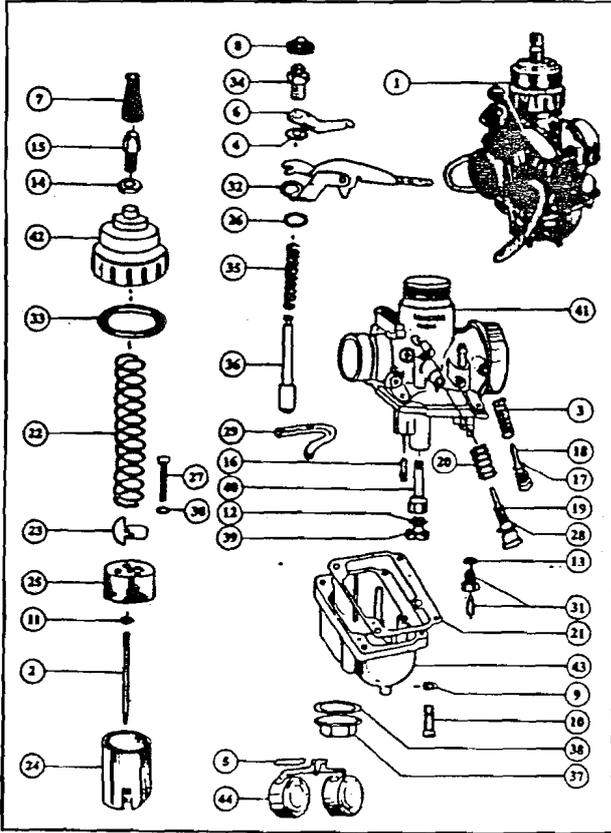
This main jet system comprises of the main jet, the needle jet and the taper needle. The fuel flows through the main jet (also known as metering jet) during the main jet operation.

The taper needle, which is mounted on the throttle slide, while operated up and down increases or reduces the cross sectional area between the needle jet bore and the needle. This in turn monitors the quantity of atomised fuel supplied with respect to engine speed & load.

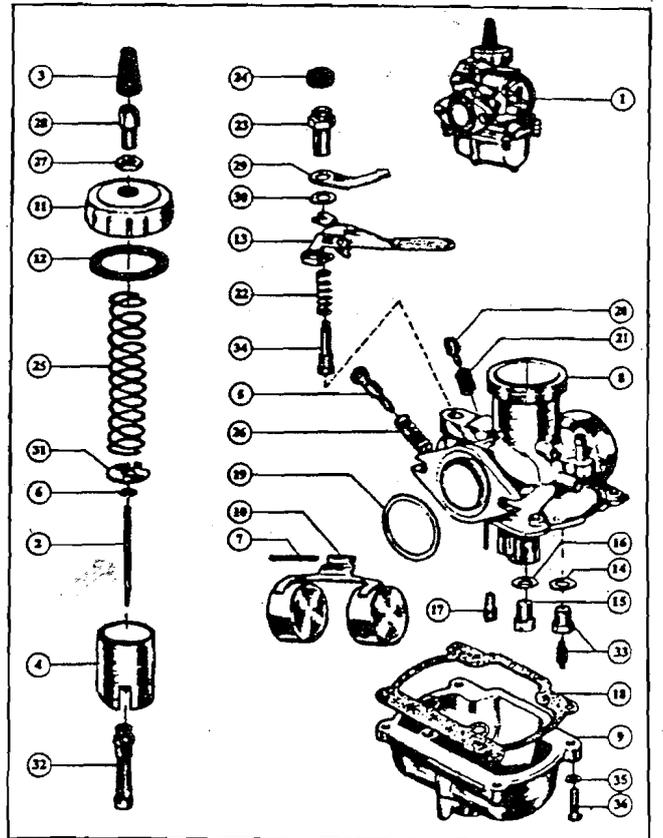
MAIN JET SYSTEM



MIKCARB CARBURETTOR VM28 (500 C.C.)



MIKCARB CARBURETTOR (VM 24 - 350 CC)



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The taper needle shank has five grooves in it, so that, it can be set in relation to the throttle slide. If the needle is set higher on the throttle slide, the quantity of fuel that is being supplied would become much more, than if it would have been set at a lower position. However, it is to be noted thatt the fuel supplied is governed by the above mechanism only on part throttle condition. With the throttle fully opened, the fuel supplied is monitored by the main jet only. The recommended position for the Needle Lock is the 2nd or 3rd groove from bottom.

#### **4. Servicing**

The carburettor should be cleaned thoroughly with petrol only. Ensure that all parts are in serviceable condition. Before mounting the carburettor, always ensure that the slide is free to move up and down by operating the throttle twist grip. Also ensure that the starter piston (choke plunger) is properly set in position.

**CAUTION:** Never user a sharp instrument or wire to clean the carburettor parts especially jets and passages. If the passages are blocked, use only pressurised air to clear the passages. Handle all parts gently and with great care. Run down all threaded attachments gently. Never use force.

#### **5. Mounting**

Special care must be exercised while mounting the carburettor. Ensure positioning of carburettor is vertical and the gasket, 'O' Ring is serviceable, to prevent any air/gas leak.

In 500cc models, Rubberised Inlet Manifold is fitted. To check the condition for any crack, or otherwise a cracked manifold will result in starting trouble and erratic idling speed.

#### **6. Setting Idling**

It is always recommended to set idling speed of the engine while the engine is still warm, i.e. after a short run.

The procedure for setting idling speed is:

- a) Start the engine and warm up for 2 to 3 minutes.
- b) Turn the pilot air screw down to the bottom and reduce the engine RPM to the slowest rate, using the idle adjusting screw.
- c) Open out the air screw slowly and keep watch on engine speed. At a point, engine speed will increase. Find the position where the engine RPM is maximum and the engine firing uniform. This is normally between 2 to 3 half turns of the air screw ( $360^\circ + 180^\circ$  Turns) from its fully closed position.
- d) Now adjust the idling RPM once more with the idling screw.

**NOTE:** 1. Take out any excessive play in the throttle cable.  
2. Turn the handle bar to left side & right side to ensure that the throttle cable is free and does not foul with anyother part in the routing of the cable.

Besides the above two settings, no other settings to the carburettor is required for normal operating conditions.

SERVICE LIMITS					
SL No	COMPONENT	350 cc		500 cc	
		mm	Inches	mm	Inches
1.	Small end (Gudgeon pin)	19.11	0.752	19.11	0.752
2.	Crankshaft big end-axial play	0.55	0.021	0.55	0.021
3.	Crankshaft Runout	0.08	0.003	0.08	0.003
4.	Connecting rod twist	0.075	0.002	0.075	0.002
5.	Crankshaft axial play in crank case	2.80	0.11	2.80	0.11
6.	Cylinder Barrel wear (To be measured approx 20mm from top)	70.078	2.759	84.125	3.312
7.	Piston Wear (To be measured approx 015mm from bottom (skirt))	69.636	2.741	83.725	3.296
8.	Bore to Piston Clearance (bore - piston diameter)	0.715	0.007	0.175	0.007
9.	Piston ring end Gap in bore	0.75	0.030	1.00	0.039
10.	Ring to Groove clearance - Compression rings - Oil ring (Scraper ring)	0.150 0.187	0.006 0.007	0.178 0.229	0.007 0.009
11.	Valve stem to Valve guide clearance. - Inlet - Exhaust.	0.075 0.10	0.003 0.004	0.075 0.10	0.003 0.004
12.	Valve spring free length - Inner - Outer	48.20 50.04	1.897 1.970	48.20 50.04	1.897 1.970
13.	Clutch Steel Plate Distortion	0.15	0.006	0.15	0.006
14.	Clutch Friction Plates Thickness -Bonded -with Insets	4.00 4.30	0.157 0.169	4.00 4.30	0.157 0.169
15.	Clutch Plate lug width	6.00	0.236	6.00	0.236
16.	Clutch spring free length	25.5	1.004	25.5	1.004
17.	Wheel axle shaft run out	0.2	0.008	0.2	0.008
18.	Wheel rim run out	2.0	0.078	2.0	0.078
19.	Brake lining thickness	2.0	0.078	2.0	0.078
20.	Brake drum internal diameter	153.50	6.043	153.50	6.043
21.	Front fork main tube run out	0.05	0.002	0.05	0.002
22.	Front fork spring free length	527	20.75	527	20.75

## TROUBLE SHOOTING : BULLET MOTOR CYCLES

### COMPLAINT : ENGINE DIFFICULT / DOES NOT START

CHECK	OBSERVATION	CAUSES	REMEDIES
1. Crank the engine several times. How is the cranking pressure?	Kick starter pedal moves freely.	1) Clutch slippage : <ul style="list-style-type: none"> <li>● No clutch cable free play</li> <li>● Stuck clutch cable</li> <li>● Weak clutch springs</li> <li>● Worn out clutch plates</li> </ul>	<input type="checkbox"/> Adjust clutch cable play <input type="checkbox"/> Clean and free the cable <input type="checkbox"/> Change the clutch springs <input type="checkbox"/> Replace the clutch plates
		2) Compression weak: <ul style="list-style-type: none"> <li>● Loose spark plug</li> <li>● Tight tappet adjustment</li> <li>● Blown cylinder head gasket</li> <li>● Leaky valves</li> <li>● Worn out/scored cylinder</li> <li>● Worn out piston rings</li> <li>● Jammed piston rings</li> <li>● Glazed cylinder</li> <li>● Leaky decompressor</li> <li>● Loose cylinder head nuts</li> </ul>	<input type="checkbox"/> Tighten the spark plug <input type="checkbox"/> Adjust the tappet correctly <input type="checkbox"/> Change the gasket <input type="checkbox"/> Lap the valves <input type="checkbox"/> Rebore to next over size <input type="checkbox"/> Replace piston rings <input type="checkbox"/> Clean and fit <input type="checkbox"/> Rebore the cylinder to next o.s. <input type="checkbox"/> Check and change the gaskets <input type="checkbox"/> Lap the decompressor valve <input type="checkbox"/> Tighten the nuts
		3) Kick starter pawl slipping	Change the pawl / spring
	Cranking pressure OK		
2. Remove the fuel hose from the carburetor. Turn the fuel tap to ON/Reserve. Does fuel flow to carburetor?	No, it doesn't	<ul style="list-style-type: none"> <li>● No fuel in the tank</li> <li>● Blocked fuel tank cap vent</li> <li>● Chocked fuel tap</li> </ul>	<input type="checkbox"/> Fill up the tank <input type="checkbox"/> Clear the vent <input type="checkbox"/> Clean fuel tap
	Yes, it flows		
3. Check fuel. How is it?	It is stale, gives an offensive odour	● Vehicle not used for long periods	<input type="checkbox"/> Clean petrol tank and carburetor and fill the tank with fresh petrol
	It is adulterated	● Kerosene/Diesel in Petrol	<input type="checkbox"/> Select a reliable pump
	Petrol is OK		

**TROUBLE SHOOTING : ENGINE DIFFICULT / DOES NOT START**

CHECK	OBSERVATION	CAUSES	REMEDIES
4. Switch 'on' ignition and crank engine. Does the amp. meter needle deflect?	a) No, it doesn't	<ul style="list-style-type: none"> <li>● Kill switch circuit open</li> <li>● Defective ignition switch</li> <li>● Snapped battery connection</li> <li>● Snapped LT lead</li> <li>● CB points not closing</li> <li>● Open primary circuit</li> <li>● Fully discharged battery</li> </ul>	<ul style="list-style-type: none"> <li>▣ Check and correct</li> <li>▣ Replace ignition switch</li> <li>▣ Check and correct</li> <li>▣ Check and correct</li> <li>▣ Adjust the points</li> <li>▣ Check and correct</li> <li>▣ Charge the battery</li> </ul>
	b) Yes, it always remains in discharged position	<ul style="list-style-type: none"> <li>● Shorted kill switch</li> <li>● Shorted ignition switch</li> <li>● C.B. points not opening</li> <li>● Shorting at CB points</li> </ul>	<ul style="list-style-type: none"> <li>▣ Replace the kill switch</li> <li>▣ Replace ignition switch</li> <li>▣ Adjust CB points</li> <li>▣ Check and correct</li> </ul>
	c) It is OK		
5. Remove spark plug. Cover the spark plug hole with thumb. Crank engine several times. How is the petrol smell? Is there petrol stain on thumb?	a) No petrol smell. No fresh petrol stain on thumb.	<ul style="list-style-type: none"> <li>● Stuck open slide valve</li> </ul> <p>Less petrol flow to the bowl</p> <ul style="list-style-type: none"> <li>● Blocked carburetor fuel inlet</li> <li>● Stuck closed, float needle</li> <li>● Float height too high</li> <li>● Blocked pilot jet/pilot discharge orifice</li> <li>● Warped inlet flange</li> <li>● Loose inlet fasteners</li> </ul>	<ul style="list-style-type: none"> <li>▣ Free the slide valves</li> <li>▣ Clean the passage</li> <li>▣ Clean and free float needle</li> <li>▣ Adjust float height</li> <li>▣ Clear the jet/discharge orifice</li> <li>▣ Face the flange</li> <li>▣ Tighten fasteners</li> </ul>
	b) Heavy petrol smell. Petrol wets thumb.	<p>Too rich air petrol mixture from carburetor:</p> <ul style="list-style-type: none"> <li>● Dirt on float needle seat</li> <li>● Damaged float needle valve</li> <li>● Punctured float assembly</li> <li>● Float height adjusted too low</li> <li>● Loose/Worn out pilot jet</li> <li>● Blocked pilot jet bleed holes</li> <li>● Stuck open choke</li> <li>● Choke on hot engine</li> <li>● Air screw too far in</li> </ul>	<ul style="list-style-type: none"> <li>▣ Clean the needle seat</li> <li>▣ Replace the needle valve</li> <li>▣ Repair/Replace the float</li> <li>▣ Adjust float to right height</li> <li>▣ Tighten/Replace pilot jet</li> <li>▣ Clean the jet bleed holes</li> <li>▣ Check, clean and fit the choke</li> <li>▣ Pull choke to 'off' position</li> <li>▣ Adjust the air screw</li> </ul>
	c) Too much oil on thumb	For causes and remedies refer to high lub oil consumption	
	d) It is normal		

6. Clean spark plug electrode tips. Set gap. Connect it to HT lead. Earth its body. Turn ignition switch 'on'. Ensure 'kill switch' is in Run position. Crank the engine. How is the spark?	a) No spark	<ul style="list-style-type: none"> <li>● Defective spark plug</li> <li>● Defective plug cap</li> <li>● Open primary circuit</li> <li>● Defective H.T. coil</li> </ul>	<ul style="list-style-type: none"> <li>☐ Change the plug</li> <li>☐ Change the cap</li> <li>☐ Check and correct</li> <li>☐ Change the HT coil</li> </ul>
	b) Red/Yellow spark	<ul style="list-style-type: none"> <li>● Defective HT lead</li> <li>● Excessive electrode gap</li> <li>● Loose connections</li> <li>● Dirty, pitted CB points</li> <li>● Discharged battery</li> <li>● Defective HT coil</li> </ul>	<ul style="list-style-type: none"> <li>☐ Replace HT lead</li> <li>☐ Adjust the gap</li> <li>☐ Tighten all connections</li> <li>☐ Clean and adjust CB points</li> <li>☐ Re-charge the battery</li> <li>☐ Change HT coil</li> </ul>
	c) Side spark or Intermittent spark	<ul style="list-style-type: none"> <li>● Cracked spark plug insulator</li> <li>● Loose connections</li> <li>● Fouled spark plug</li> <li>● Cracked HT lead</li> </ul>	<ul style="list-style-type: none"> <li>☐ Change the spark plug</li> <li>☐ Tighten connections</li> <li>☐ Clean and adjust the gap</li> <li>☐ Change the HT lead</li> </ul>
	d) Light blue solid spark		
7. Is the spark plug of right specification	No	<ul style="list-style-type: none"> <li>● Shorter reach spark plug</li> </ul>	☐ Replace with right plug
	Yes		
8. Is the ignition timing correct?	No	<ul style="list-style-type: none"> <li>● Too far advanced / retarded ignition timing</li> </ul>	☐ Adjust ignition timing
	Yes, it is correct		
Then, now, engine should start easily			

- NOTE:**
1. Combustion elements : Fuel, Air and Heat.
  2. Right compression heats up the air petrol mixture. Light blue spark at the right time ignites it and engine starts.
  3. Right compression pressure for bullet -  $6.5 \text{ kg/cm}^2$  to  $8.5 \text{ kg/cm}^2$ .
  4. Check ignition coil as follows : Remove spark plug cap from H.T. lead. Turn ignition switch 'on'. Hold the H.T. lead end about 8 m.m. away from cylinder head. Crank the engine. Continuous light blue spark jumping from the lead indicates the primary circuit and the HT coil are OK.

**COMPLAINT : LOW IDLING PROBLEM**

CHECK	OBSERVATION	CAUSES	REMEDIES
1. Does the engine cut off suddenly when the throttle is closed but remain running as long as throttle remain partly open?	a) Yes, it cuts off.	<ul style="list-style-type: none"> <li>● Throttle stop screw too far out</li> <li>● Air screw too far in</li> <li>● Pilot jet blocked</li> <li>● Pilot discharge orifice blocked</li> <li>● Weak compression</li> <li>● Too far advanced ignition</li> <li>● Too far open CB points</li> <li>● Stuck open auto adv. Ign. unit</li> </ul>	<ul style="list-style-type: none"> <li>▣ Adjust throttle stop screw</li> <li>▣ Adjust air screw</li> <li>▣ Clean pilot jet</li> <li>▣ Clean the pilot orifice</li> <li>▣ Check and correct</li> <li>▣ Check and adjust</li> <li>▣ Check and adjust</li> <li>▣ Check and correct</li> </ul>
	b) No, it does not cut off		
2. How is the engine running in throttle fully closed position?	a) It gradually cuts off without excessive smoke	<ul style="list-style-type: none"> <li>● Loose carburator mounting</li> <li>● Warped carburator flange</li> <li>● Air screw too far out</li> <li>● Loose LT connection</li> </ul>	<ul style="list-style-type: none"> <li>▣ Tighten the mounting</li> <li>▣ Check and correct</li> <li>▣ Adjust the air screw</li> <li>▣ Tighten the connections</li> </ul>
	b) It cuts off gradually with smoke and heavier exhaust sound	<p>Excessive fuel flow to the engine :</p> <ul style="list-style-type: none"> <li>● Air screw too far in</li> <li>● Dirt between float needle valve and seat</li> <li>● Damaged float needle valve</li> <li>● Punctured float</li> <li>● Faulty float height adjustment</li> </ul>	<ul style="list-style-type: none"> <li>▣ Adjust air screw</li> <li>▣ Clean needle valve and seat</li> <li>▣ Replace float needle valve</li> <li>▣ Replace float</li> <li>▣ Correct float height</li> </ul>
	c) OK		
3. Is the engine low idle rpm higher?	a) Yes, it is higher	<ul style="list-style-type: none"> <li>● No throttle cable free play</li> <li>● Throttle stop screw fully in</li> <li>● Stuck throttle inner cable</li> <li>● Partly stuck open slide valve</li> <li>● Restricted fuel flow to float chamber</li> <li>● Aux air screw move out</li> <li>● Air screw too far out</li> </ul>	<ul style="list-style-type: none"> <li>▣ Adjust throttle cable play</li> <li>▣ Adjust as required</li> <li>▣ Clean/Replace cable</li> <li>▣ Clean and free the slide valve</li> <li>▣ Check and correct</li> <li>▣ Check and adjust</li> <li>▣ Adjust the air screw</li> </ul>
	b) No, it is not		
4. Does the engine low idle erratically?	a) Yes, it does	<ul style="list-style-type: none"> <li>● Air screw too far out</li> <li>● Auxiliary air screw too far out</li> <li>● Suction leakage</li> <li>● Worn out slide valve</li> </ul>	<ul style="list-style-type: none"> <li>▣ Adjust the air screw</li> <li>▣ Adjust auxiliary air screw</li> <li>▣ Check and correct</li> <li>▣ Replace slide valve</li> </ul>
	b) No, it doesn't		
5. Does the engine misfire and cut off?	a) Yes, it does	<ul style="list-style-type: none"> <li>● Excessive spark plug gap</li> <li>● Fouled spark plug</li> <li>● Faulty HT coil/cord</li> <li>● Dirty CB points</li> <li>● Water in petrol</li> <li>● Low level of petrol in float chamber</li> </ul>	<ul style="list-style-type: none"> <li>▣ Adjust gap to 0.5 mm</li> <li>▣ Clean and adjust spark plug</li> <li>▣ Replace the HT coil/cord</li> <li>▣ Clean and readjust</li> <li>▣ Replace petrol</li> <li>▣ Adjust the float height to <math>29 \pm 1</math>mm</li> </ul>
	b) No, it doesn't		

**COMPLAINT : LOW IDLING PROBLEM**

CHECK	OBSERVATION	CAUSES	REMEDIES
6. With ignition on, kick the engine. Is there a severe kick back?	Yes	<ul style="list-style-type: none"> <li>● Too far advanced ignition timing</li> <li>● High compression pressure</li> </ul>	<ul style="list-style-type: none"> <li>▣ Adjust ignition timing</li> <li>▣ Check and correct</li> </ul>
	No		
Engine would now low idle smoothly			

**NOTE** : Find out induction leakage by :

**METHOD 1** : Pour some petrol at the suspected joint. If engine cuts off, there is suction leakage at that joint.

**METHOD 2** : Pour some lube oil or apply grease at the suspected joint. If the slow running improves, there is leakage at that joint.

**COMPLAINT : LOSS OF POWER**

CHECK	OBSERVATION	CAUSES	REMEDIES
1. Is the load on engine O.K?	a) No, it is over loaded.	<ul style="list-style-type: none"> <li>● Excessive pay load</li> <li>● Low tyre presure</li> <li>● Tight chain - Primary and Rear</li> <li>● Brake binding</li> <li>● Too much oil in gear box or primary chain case.</li> <li>● Sticky wheel bearing</li> </ul>	<ul style="list-style-type: none"> <li>☐ Reduce pay load</li> <li>☐ Inflate the tyre to right pressure</li> <li>☐ Adjust chain tension</li> <li>☐ Adjust brake</li> <li>☐ Drain and correct</li> <li>☐ Clean and lubriacte the bearings</li> </ul>
	b) Yes		
2. Does the road speed increase in proportion with engine rpm?	a) No	Clutch slippage : Causes & remedies as given for 'clutch slippage' complaint (Page 14).	
	b) Yes		
3. How is the smoke?	a) Excessive smoke	<ul style="list-style-type: none"> <li>● Adulterated petrol</li> <li>● Carburator flooding</li> <li>● Blocked air bleed holes</li> <li>● Blocked air jet</li> <li>● Stuck open choke plunger</li> <li>● Chocked air filter</li> <li>● Weak spark</li> <li>● Too far retarded ignition timing</li> <li>● Poor compression : Causes &amp; remedies as given for weak compression in check 1 in 'engine difficult to start'.</li> </ul>	<ul style="list-style-type: none"> <li>☐ Replace Petrol</li> <li>☐ Check and correct</li> <li>☐ Clean the bleed holes</li> <li>☐ Clean the air jet</li> <li>☐ Check and correct</li> <li>☐ Clean air filter</li> <li>☐ Check and correct</li> <li>☐ Adjust ignition timing</li> </ul>
	b) No smoke	<ul style="list-style-type: none"> <li>● Blocked petrol jets</li> <li>● Too less petrol in float chamber</li> </ul>	<ul style="list-style-type: none"> <li>☐ Clean them</li> <li>☐ Check and correct</li> </ul>
	c) Normal		
4. Does the engine over heat?	a) Yes	Causes and remedies as given for the complaint 'engine over heting' (Page 14).	
	b) No		
Then, the engine will have full power.			

**COMPLAINT : HIGH LUB OIL CONSUMPTION**

CHECK	OBSERVATION	CAUSES	REMEDIES
1. Check the parked place. any oil spot on the ground?	Yes, External oil leaks	<ul style="list-style-type: none"> <li>● Loose drain plugs</li> <li>● Loose joints</li> <li>● Damaged gaskets</li> <li>● Damaged sealing surface</li> </ul>	<ul style="list-style-type: none"> <li>☐ Tighten the plugs</li> <li>☐ Tighten fasteners</li> <li>☐ Replace the gaskets</li> <li>☐ Face / Replace the parts</li> </ul>
	No		
2. Start the engine. How is the oil throw from the breather pipe?	Excessive oil throw from breather for few minutes when the engine is started first time in the day	<ul style="list-style-type: none"> <li>● Excessive oil in oil tank</li> <li>● Timing shafthole in crankcase worn out</li> <li>● Excessive run out of timing shaft</li> <li>● Crankcase mounting nuts loose</li> <li>● Gasket between oil tank and crankcase housing damaged</li> <li>● Porocity / Blow hole in crankcase</li> </ul>	<ul style="list-style-type: none"> <li>☐ Drain and correct the level</li> <li>☐ Turn it and fit a bush</li> <li>☐ Replace the crank shaft</li> <li>☐ Tighten them in sequence after loosening them by 1/4 turn</li> <li>☐ Replace the gasket</li> <li>☐ Chang the crankcase</li> </ul>
	Excessive oil throw from breather through out the engine operation	<ul style="list-style-type: none"> <li>● Air vent in lus. oil dip stick cover blocked</li> <li>● Return pump not operating</li> <li>● Blocked return pump passages</li> <li>● Excessive blow by</li> </ul>	<ul style="list-style-type: none"> <li>☐ Clean the vent hole</li> <li>☐ Check and correct it</li> <li>☐ Clean the blockages</li> <li>☐ Check and correct</li> </ul>
	No oil throw from breather		
3. Start the engine and accelerate. How is the smoke?	Excessive white smoke	<ul style="list-style-type: none"> <li>● Wrong grade or recycled lub oil</li> <li>● Worn out valve guide or valve stem</li> <li>● Piston, piston rings or cylinder wall worn out</li> <li>● Connecting rod bent</li> <li>● Wrong piston ring fitment</li> </ul>	<ul style="list-style-type: none"> <li>☐ Use SAE 20w - 50 oil</li> <li>☐ Replace valve guide and valve</li> <li>☐ Replace the worn out parts</li> <li>☐ Replace the connecting rod</li> <li>☐ Fit the ring correctly</li> </ul>
	No white smoke		
The oil consumption will then be OK.			

**NOTES :**

a) Oil seepage into crank case when engine is at rest, results in the flywheel dipping through the accumulated oil. When engine is started the resultant excessive oil splash causes oil escape through breather during the first few minutes of engine operation.

b) Failure of return pump causes excessive oil accumulation in crank case throughout engine operation. The fly wheels dip through it. Excessive splash thus caused ends up with continuous oil through from the breather.

c) Excessive blow-by results in excessive gas flow through the crank case to the breather. The flowing gas picks up the splashed oil at the crank case. This ends up with continuous oil throw from the breather.

## COMPLAINT : HIGH LUB OIL CONSUMPTION

### d) Method of checking oil circulation :

- 1 : Remove the tappet inspection door. Continuous oil flow through the push rod while the engine is in operation indicates proper oil circulation.
- 2 : Loosen the banjo union at the cylinder head. Engine in idling, oil flow from this joint indicates proper oil circulation upto this point.
- 3 : While engine is idling, loosen the feed plug. Solid oil flow from here indicates proper functioning of feed pump.

### e) Method of finding oil leaks to crankcase from cork seal, crank shaft timing end bush & joint between crank case and oil tank :

- 1 : Keep the motor cycle on a level ground.
- 2 : Remove the return pump filter plug and drain the oil completely from crank case chamber / flywheel chamber.
- 3 : Check and top up oil in tank to 'H' mark on dip stick.
- 4 : Refit the return pump filter plug.
- 5 : Keep the motor cycle in this way for 24 Hrs. During this period do not crank or start the motor cycle.
- 6 : Now, remove the return pump filter plug and collect the oil that may drain from the crank case in a bowl. If no oil is draining, there is no leakage from oil tank and timing chest to crank case.
- 7 : If oil get collected and oil level in sump is unchanged then leakage is from T chest.

### f) Method of checking return pump operation :

- 1 : Ride the vehicle for one or two kms or start and run the engine for 10 mts.
- 2 : Keep the motor cycle on stand and switch off the engine.
- 3 : Remove the return pump filter plug and collect the draining oil in a bowl.
- 4 : About 50 to 75 ml oil will normally be there to drain. If oil drained measure more than 100 ml, operation of return pump can be suspected.

**COMPLAINT : LOW MILEAGE**

CHECK	OBSERVATION	CAUSES	REMEDIES
1. Does the customer report any other performance problem?	No, he doesn't	<ul style="list-style-type: none"> <li>External petrol leakage</li> <li>Poor driving techniques :                             <ul style="list-style-type: none"> <li>● Clutch and brake riding</li> <li>● Racing starts</li> <li>● Too many revving</li> <li>● Sudden accelerations</li> <li>● Over loading</li> <li>● Frequent brake application</li> <li>● Under / over speeding</li> <li>● Continuous low gear operation</li> <li>● Lugging the vehicle</li> </ul> </li> <li>● Too few kms running per day</li> <li>● Continuous riding oil connects office</li> <li>● Under filling of fuel</li> <li>● Parking the vehicle in sun</li> <li>● Fault odometer / odo drive</li> <li>● Bald Tyres</li> <li>● Under inflated tyres</li> </ul>	<ul style="list-style-type: none"> <li>☒ Check and stop leakage</li> <li>☒ Educate the customer</li> <li>☒ Educate the user</li> <li>☒ Take mileage test and satisfy customer</li> <li>☒ Avoid congested traffic</li> <li>☒ Select reliable fuel pump</li> <li>☒ Park it in shade</li> <li>☒ Check and correct</li> <li>☒ Replace tyres</li> <li>☒ Inflate tyres</li> </ul>
	Yes, he does		
2. Is the engine over loaded?	Yes, it is over loaded	<ul style="list-style-type: none"> <li>● Excessive pay load</li> <li>● Tight primary / secondary chain</li> <li>● Too much thick oil in clutch or gear box</li> <li>● Sticky wheel bearing</li> <li>● Under inflated tyres</li> <li>● Birdling brakes</li> <li>● Wheel misalignment</li> </ul>	<ul style="list-style-type: none"> <li>☒ Carry correct pay load</li> <li>☒ Adjust chain tension</li> <li>☒ Drain and maintain level</li> <li>☒ Clean and lubricate</li> <li>☒ Inflate to right pressure</li> <li>☒ Adjust the brakes</li> <li>☒ Adjust the belts</li> </ul>
3. Does the engine cold start easily without putting choke 'ON'?	Yes, it does	<ul style="list-style-type: none"> <li>● Higher petrol level in float chamber</li> <li>● Partially open choke</li> <li>● Chocked air filter element</li> </ul>	<ul style="list-style-type: none"> <li>☒ Adjust the float height</li> <li>☒ Check and correct</li> <li>☒ Clean and fit the element</li> </ul>
	No, starting is normal		

**COMPLAINT : LOW MILEAGE**

CHECK	OBSERVATION	CAUSES	REMEDIES
4. Does the road speed increase with engine rpm?	No, it doesn't	Clutch slippage : Causes and remedies as given for 'clutch slippage' problem (Page 15)	
	Yes, it does		
5. Is there excessive white smoke?	Yes	Causes and remedies as given against white smoke in high lub. oil consumption (Page 7)	
	No		
6. Does the engine misfire?	Yes, it does	<ul style="list-style-type: none"> <li>● Fouled spark plug</li> <li>● Too much spark plug electrode gap</li> <li>● Cracked spark plug insulator</li> <li>● Defective condenser</li> <li>● Dirty/pitted C.B. points</li> <li>● Defective HT coil</li> <li>● Too rich air petrol mixture</li> </ul>	<ul style="list-style-type: none"> <li>▣ Clean the spark plug</li> <li>▣ Adjust the gap</li> <li>▣ Change the spark plug</li> <li>▣ Replace the condenser</li> <li>▣ Clean and adjust the points</li> <li>▣ Replace them</li> <li>▣ Check and correct</li> </ul>
	No, it doesn't		
7. Is there starting problem, poor pickup and more smoke?	Yes	<ul style="list-style-type: none"> <li>● Weak spark</li> <li>● Too far retarded ignition timing</li> <li>● Low compression</li> <li>● Too much oil entry into combustion chamber</li> </ul>	<ul style="list-style-type: none"> <li>▣ Check and correct</li> <li>▣ Check and adjust ignition timing</li> <li>▣ Check and correct</li> <li>▣ Check and correct</li> </ul>
	No		
8. Does the engine over heat?	Yes, it overheats	For causes and remedies refer to engine over heating complaint (Page 11)	
	No, it doesn't		
Now the vehicle mileage will be good.			

## ENGINE OVER HEATING

CAUSES	REMEDIES
<ul style="list-style-type: none"> <li>● Too lean air petrol mixture (characterised by loss of power)</li> <li>● Too far advance ignition timing (characterised by kick back while starting and combustion knocks)</li> <li>● Excessive carbon deposit in cylinder (Characterised by post ignition)</li> <li>● Dirty / Blocked cooling fins</li> <li>● Lub oil starvation</li> <li>● Wrong grade lub oil</li> <li>● Engine over loaded</li> <li>● Wrong spark plug</li> <li>● Less working clearances between moving parts</li> </ul>	<ul style="list-style-type: none"> <li>▣ Check and correct</li> <li>▣ Adjust the timing</li> <li>▣ Decarbonise the engine</li> <li>▣ Clear and clean the fins</li> <li>▣ Check and correct</li> <li>▣ Change the oil</li> <li>▣ Reduce the load</li> <li>▣ Replace it with correct plug</li> <li>▣ Check and correct</li> </ul>

**COMPLAINT : ENGINE NOISY IN OPERATION**

CHECK	OBSERVATION	CAUSES	REMEDIES
1. Start and accelerate the engine. Any high intensity continual, gas leakage sound?	Yes	<ul style="list-style-type: none"> <li>● External compression leakage</li> <li>● Exhaust gas leakage</li> </ul>	<ul style="list-style-type: none"> <li>☐ Check and correct</li> <li>☐ Check and correct</li> </ul>
	No		
2. Start and run the engine. Any continuous air flow sound?	Yes	<ul style="list-style-type: none"> <li>● Cracked / damaged air below</li> <li>● Torn / damaged air filter</li> </ul>	<ul style="list-style-type: none"> <li>☐ Change it</li> <li>☐ Change it</li> </ul>
	No		
3. Is there humming / howling noise	Yes	<ul style="list-style-type: none"> <li>● Tight gears</li> </ul>	<ul style="list-style-type: none"> <li>☐ Check and correct the back lash</li> </ul>
	No		
4. Is there a continuous metallic tapping noise?	Yes	<ul style="list-style-type: none"> <li>● Excessive tappet clearance</li> <li>● Excessive small end clearance</li> <li>● Dry auto adv. ign. unit</li> <li>● Loose valve stem cap</li> <li>● Damaged cams</li> <li>● Loose rocker in bush</li> </ul>	<ul style="list-style-type: none"> <li>☐ Adjust the tappets</li> <li>☐ Check and change the worn part</li> <li>☐ Check and lubricate</li> <li>☐ Change the cap</li> <li>☐ Change the cam wheels</li> <li>☐ Change the bush</li> </ul>
	No		
5. Is there a continuous grinding like noise	Yes	<ul style="list-style-type: none"> <li>● Worn out ball bearing</li> </ul>	<ul style="list-style-type: none"> <li>☐ Replace them</li> </ul>
	No		
6. Does the knock reduce with increasing engine temperature?	Yes	<ul style="list-style-type: none"> <li>● Too much clearance between piston and cylinder</li> </ul>	<ul style="list-style-type: none"> <li>☐ Change the worn out part</li> </ul>
	No		
7. Does the noise increase with temperature	Yes	<ul style="list-style-type: none"> <li>● Engine over heating</li> <li>● Excessive compression ratio</li> <li>● Too far advanced ignition</li> </ul>	<ul style="list-style-type: none"> <li>☐ Check and correct</li> <li>☐ Check and correct</li> <li>☐ Check and adjust</li> </ul>
	No		
8. Does the knock increase with the load?	Yes	<ul style="list-style-type: none"> <li>● Worn out floating bush</li> <li>● Loose chain adjuster</li> <li>● Loose engine sprocket</li> </ul>	<ul style="list-style-type: none"> <li>☐ Change the floating bush</li> <li>☐ Check and correct</li> <li>☐ Replace the sprocket</li> </ul>
	No		
Then, the engine would run smoothly.			

**COMPLAINT : PREMATURE WEAR OF ENGINE COMPONENTS**

CHECK	OBSERVATION	CAUSES	REMEDIES
1. Is there any suction leakage or air filter damage?	Yes	<ul style="list-style-type: none"> <li>● Cracked or improperly fitted air filter</li> <li>● Induction system joint leakages</li> </ul>	<ul style="list-style-type: none"> <li>☐ Replace the air filter or properly fit it</li> <li>☐ Check and correct</li> </ul>
	No		
2. Is the petrol dirty adulterated?	Yes	<ul style="list-style-type: none"> <li>● Rusted tank</li> <li>● Water contaminants in petrol</li> <li>● Torn fuel tap filter</li> <li>● Adulterated petrol</li> </ul>	<ul style="list-style-type: none"> <li>☐ Clean the tank</li> <li>☐ Replace the petrol</li> <li>☐ Replace the filter</li> <li>☐ Change the petrol</li> </ul>
	No		
3. Is engine oil dirty	Yes	<ul style="list-style-type: none"> <li>● Neglected maintenance</li> <li>● Use of recycled oil</li> </ul>	<ul style="list-style-type: none"> <li>☐ Replace oil at regular intervals</li> <li>☐ Use specified oil</li> </ul>
	No		
4. Does the engine over heat?	Yes	For causes and remedies refer to Engine over heating complaint.	
	No		
5. Does the engine produce unusual sounds / knocks?	Yes	<ul style="list-style-type: none"> <li>● Excessive clearance loose adjustments</li> <li>● Worn out bearings / component surfaces</li> </ul>	<ul style="list-style-type: none"> <li>☐ Check and correct</li> <li>☐ Check and correct</li> </ul>
	No		
Keep the causes of premature wear away to ensure long life for engine components.			

Note : Use of non-genuine parts causes premature wear.

**COMPLAINT : FLAME AT THE CARBURATOR (BACK FIRE)**

CAUSES	REMEDIES
<ul style="list-style-type: none"> <li>● Too lean air petrol mixture</li> <li>● Use of smaller size jets</li> <li>● Over heated engine</li> <li>● Leaky in take valve</li> </ul>	<ul style="list-style-type: none"> <li>☐ Check carburettor setting and adjust</li> <li>☐ Change the jets</li> <li>☐ Check and correct</li> <li>☐ Check and adjust tappet</li> <li>☐ Lap the valve on its seat</li> </ul>

**COMPLAINT : FLAME AT THE SILENCER (AFTER FIRE)**

CAUSES	REMEDIES
<ul style="list-style-type: none"> <li>● Defective spark plug</li> <li>● Too rich air fuel mixture</li> <li>● Retarded ignition timing</li> <li>● Leaky Exhaust valve</li> </ul>	<ul style="list-style-type: none"> <li>☐ Clean &amp; adjust or replace</li> <li>☐ Adjust carburettor</li> <li>☐ Check and adjust ignition timing</li> <li>☐ Adjust tappet</li> <li>☐ Lap the valve</li> </ul>

**COMPLAINT : CLUTCH SLIPPAGE**

CHECK	OBSERVATION	CAUSES	REMEDIES
1. Does the road speed increase with engine rpm?	No	Clutch slippage : <ul style="list-style-type: none"> <li>● No clutch lever free play</li> <li>● Worn out clutch plates</li> <li>● Weak pressure springs</li> <li>● Glazed steel plate / clutch plates</li> <li>● Distorted pressure plates</li> </ul>	<ul style="list-style-type: none"> <li>☐ Adjust clutch cable free play</li> <li>☐ Replace clutch plates</li> <li>☐ Replace springs</li> <li>☐ Replace the glazed plates</li> <li>☐ Replace the distorted plates</li> </ul>
	Yes		
Then there is no clutch slippage			

**COMPLAINT : CLUTCH DRAGGING**

CHECK	OBSERVATION	CAUSES	REMEDIES
1. Does the vehicle tend to move on engaging gear though clutch lever is fully depressed?	Yes	<ul style="list-style-type: none"> <li>● Excessive clutch lever free play</li> <li>● Distorted steel plates</li> <li>● Dirty/high viscous oil</li> <li>● Broken friction plates</li> <li>● Damaged clutch rod and ball adjuster</li> </ul>	<ul style="list-style-type: none"> <li>▣ Check and adjust</li> <li>▣ Replace steel plates</li> <li>▣ Replace with SAE 10w-30 oil</li> <li>▣ Replace the broken plates</li> <li>▣ Replace the damaged part</li> </ul>
	No		
Then there is no clutch dragging			

**COMPLAINT : GEARS DIFFICULT TO ENGAGE**

CAUSES	REMEDIES
<ul style="list-style-type: none"> <li>● Clutch drag</li> </ul>	<ul style="list-style-type: none"> <li>▣ Check and correct</li> </ul>
<ul style="list-style-type: none"> <li>● Tight gears</li> </ul>	<ul style="list-style-type: none"> <li>▣ Check and correct</li> </ul>
<ul style="list-style-type: none"> <li>● Faulty selector mechanism adjuster plate adjustment</li> </ul>	<ul style="list-style-type: none"> <li>▣ Check and adjust</li> </ul>
<ul style="list-style-type: none"> <li>● Too tight gear operator selector assy. adjustment</li> </ul>	<ul style="list-style-type: none"> <li>▣ Check and adjust</li> </ul>

**COMPLAINT : PREMATURE WEAR OF DRIVE CHAIN AND SPROCKET**

CAUSES	REMEDIES
<ul style="list-style-type: none"> <li>● Too tight chain adjustment</li> </ul>	<ul style="list-style-type: none"> <li>▣ Adjust the chain to its normal slackness</li> </ul>
<ul style="list-style-type: none"> <li>● Too loose chain adjustment</li> </ul>	<ul style="list-style-type: none"> <li>▣ Adjust the chain to its normal slackness</li> </ul>
<ul style="list-style-type: none"> <li>● Over loading of motorcycle</li> </ul>	<ul style="list-style-type: none"> <li>▣ Reduce the load</li> </ul>
<ul style="list-style-type: none"> <li>● Misalignment of F.D sprocket with rear wheel sprocket due to faulty chain adjustment</li> </ul>	<ul style="list-style-type: none"> <li>▣ Adjust the chain tension properly</li> </ul>
<ul style="list-style-type: none"> <li>● Too much dirt on chain</li> </ul>	<ul style="list-style-type: none"> <li>▣ Clean and lubricate</li> </ul>
<ul style="list-style-type: none"> <li>● Chains roller and pin runs dry</li> </ul>	<ul style="list-style-type: none"> <li>▣ Clean and lubricate</li> </ul>
<ul style="list-style-type: none"> <li>● Faulty cush drive</li> </ul>	<ul style="list-style-type: none"> <li>▣ Replace cush drive</li> </ul>

**COMPLAINT : TYRE / TUBE DAMAGES PREMATURELY**

INDICATIONS	CAUSES	REMEDIES
Excessive wear at the tread edges	<ul style="list-style-type: none"> <li>● Low tyre inflation pressure</li> </ul>	<ul style="list-style-type: none"> <li>▣ Inflate the tyres to the right pressure</li> </ul>
Tyre side wall cracks	<ul style="list-style-type: none"> <li>● Low tyre inflation pressure</li> </ul>	<ul style="list-style-type: none"> <li>▣ Inflate the tyres to the right pressure</li> </ul>
Tube inner nozzle snaps	<ul style="list-style-type: none"> <li>● Low tyre inflation pressure</li> </ul>	<ul style="list-style-type: none"> <li>▣ Inflate the tyres to the right pressure</li> </ul>
Excessive wear at tread centre	<ul style="list-style-type: none"> <li>● Excessive tyre inflation pressure</li> </ul>	<ul style="list-style-type: none"> <li>▣ Inflate the tyre to the right pressure</li> </ul>
Tyre wears in batches	<ul style="list-style-type: none"> <li>● Defective tyre</li> <li>● Frequent sudden braking</li> <li>● Defective suspension</li> </ul>	<ul style="list-style-type: none"> <li>▣ Change the tyre</li> <li>▣ Avoid sudden braking</li> <li>▣ Check and rectify</li> </ul>

**COMPLAINT : BRAKE LESS EFFECTIVE**

CAUSES	REMEDIES
<ul style="list-style-type: none"><li>● Excessive clearance between brake shoe and drum</li><li>● Oily shoes</li><li>● Glazed shoes and drum</li><li>● Worn out brake shoes</li><li>● Wornout drum</li><li>● Bend back plate</li><li>● Misaligned brake shoe in drum</li><li>● Struck brake cam</li></ul>	<ul style="list-style-type: none"><li>▣ Adjust the brake</li><li>▣ Replace shoes</li><li>▣ Remove the glaze with emery paper</li><li>▣ Replace brake shoes</li><li>▣ Replace the drum</li><li>▣ Replace back plate</li></ul>

**COMPLAINT : BRAKE BINDING**

CAUSES	REMEDIES
<ul style="list-style-type: none"><li>● Brake shoe return spring broken/weak</li><li>● Too tight brake adjustment</li><li>● Jammed cams</li><li>● Brake pedal jam</li><li>● Bend brake rod</li></ul>	<ul style="list-style-type: none"><li>▣ Replace the spring</li><li>▣ Adjust the brakes correctly</li><li>▣ Lubricate the cams</li><li>▣ Lubricate</li><li>▣ Straighten the brake rod</li></ul>

**COMPLAINT : BRAKE SQUEAKING**

CAUSES	REMEDIES
<ul style="list-style-type: none"><li>● Dust in brake drum</li><li>● Glazed brake shoes / drum</li><li>● Bent back plate</li><li>● Water on brake shoes</li><li>● Misaligned wheel</li><li>● Hard brake shoe linings</li><li>● Totally wornout shoes</li></ul>	<ul style="list-style-type: none"><li>▣ Clean the brake drum</li><li>▣ Roughen the shoe face/drum face</li><li>▣ Change the plate</li><li>▣ Apply the brake several times</li><li>▣ Align the wheel</li><li>▣ Replace the shoe linings</li><li>▣ Replace the shoes</li></ul>

**COMPLAINT : FRONT FORK HITTING NOISE**

CAUSES	REMEDIES
<ul style="list-style-type: none"><li>● Too less oil in the fork (hits at the end of the compression stroke)</li><li>● Weak coil springs (hits at the end of compression stroke)</li><li>● Worn out spring stud (hits at the end of expansion stroke)</li><li>● Loose main tube fitment</li></ul>	<ul style="list-style-type: none"><li>☒ Top up the oil level</li><li>☒ Replace springs with new ones</li><li>☒ Replace it with new</li><li>☒ Tighten the main tubes</li></ul>

**COMPLAINT : WHEEL WOBBLING**

CAUSES	REMEDIES
<ul style="list-style-type: none"><li>● Loose wheel axle nut</li><li>● Loose spokes</li><li>● Bend wheel rim</li><li>● Retreaded tyre</li><li>● Loose steering adjustments</li><li>● Worn out chain stay pivot bushes</li><li>● Loose wheel bearing</li></ul>	<ul style="list-style-type: none"><li>☒ Tighten the nuts</li><li>☒ True the wheels</li><li>☒ Replace the wheel rim</li><li>☒ Replace with new tyre</li><li>☒ Adjust steering properly</li><li>☒ Change the bushes</li><li>☒ Change the wheel bearing</li></ul>





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## BULLET 350 CC/500 CC - TORQUE VALUES

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### ENGINE

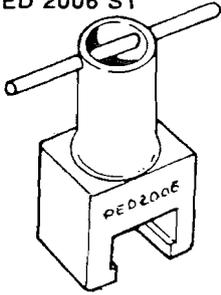
ITEM	Kg-m	LB-inch
Rocker Bearing Stud Nut (3/16")	1.30	112.0
Crank Pin Nut (7/8")	13.80	1200.0
Timing Shaft Nut (3/4")	9.20	800.0
Cylinder Head Nut (5/6")	3.30	285.0
Crankcase Joint Nut (M6 1/4")	0.90	78.0
Crankcase Joint Nut (M8 5/16")	1.10	95.0
Gearbox Endcover Bolt (1/4")	1.00	85.0
F.D. Sprocket Lock Nut (1 3/16")		
Alternator Nut (Rotor) (9/16")	5.50	475.0
Clutch Mounting Nut (9/16")	5.50	475.0
Main Shaft Nut in Gear Box (5/8")	6.50	565.0
Rocker Box Studnut	1.45	125.0
Oilfeed and Return Filter Assy.	3.00	260.0
Rocker Oil Pipe Banjo Union	1.00	85.0
Rocker Oil Screwed Bush	1.60	138.0
Oil Feed Plug	1.60	138.0
Oil Cleaner Cap Nut	1.40	120.0
Chaincase Front att. nut	1.40	120.0

### CHASSIS

Frame Stud Nut-Gear Box (1/2")	3.20	277.0
Front Engine Plate Stud Nut (1/2")	3.20	277.0
Rear Engine Plate Stud Nut (Bot.) (3/8")	2.00	175.0
Rear Brake Cam Lever Nut (7/15")	2.00	175.0
Chainstay Stud Nut (1/2")	3.50	300.0
Front Fork End Cap Nut (5/16")	1.30	112.0
Rear Wheel Lock Nut (M22)	7.50	650.0
Rear Wheel Spindle Castle Nut (M16)	6.50	565.0
Rear Shock Absorber Upper (3/8")/Lower Nut (3/8")	2.50	215.0
Front Mudguard Stay Screw Nut (1/4")	0.30	25.0
Front Engine Plate Stud Nut (M8)	1.50	130.0
Front Mudguard Stay Stud Nuts (5/16")	1.20	104.0
Handle Bar Clip Bolt (5/16")	3.30	286.0
Handle Bar Clip & Seat Stud Nuts (5/16")	2.40	208.0
Main Footrest Nuts (3/8")	1.20	104.0
Coil Fixing Bolt and Nuts (M6)	0.45	40.0
Regulator Fixing Nut (M6)	0.45	40.0
Rear Mudguard Carrier Stud Nut (Top) (3/8")	2.00	175.0
Rear Mudguard Carrier Stud Nut (Bottom) (7/16")	2.50	216.0
Rear Engine Plate Stud Nut (M8)	1.50	130.0
Eye Bolt Stud Nut (5/16")	1.50	130.0
Tank Fixing Nut (3/8")	1.60	140.0

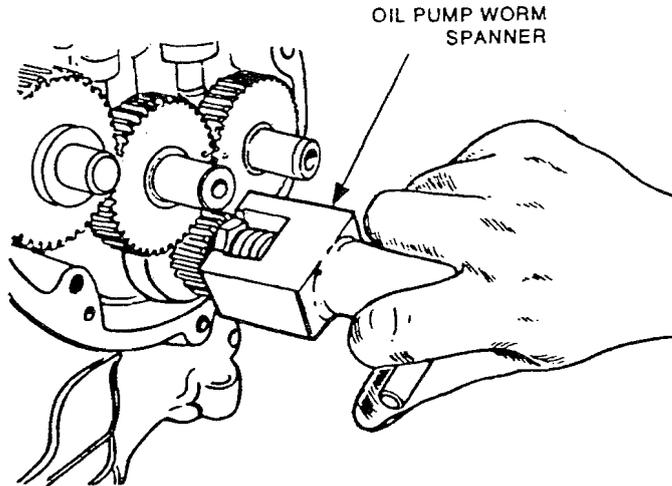


PED 2006 ST



### OIL PUMP WORM SPANNER

APPLICATION :  
REMOVAL AND  
FITMENT OF OIL  
WORM NUT

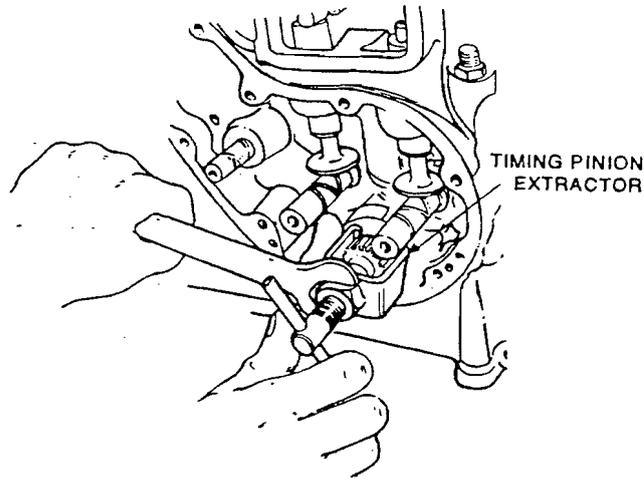


PED 2013 ST

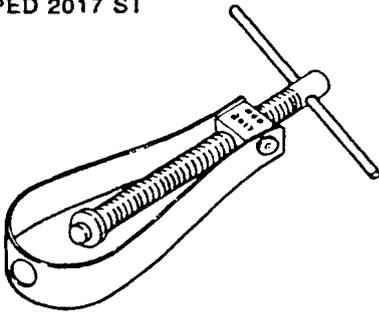


### TIMING PINION EXTRACTOR

APPLICATION :  
REMOVAL OF TIMING  
PINION

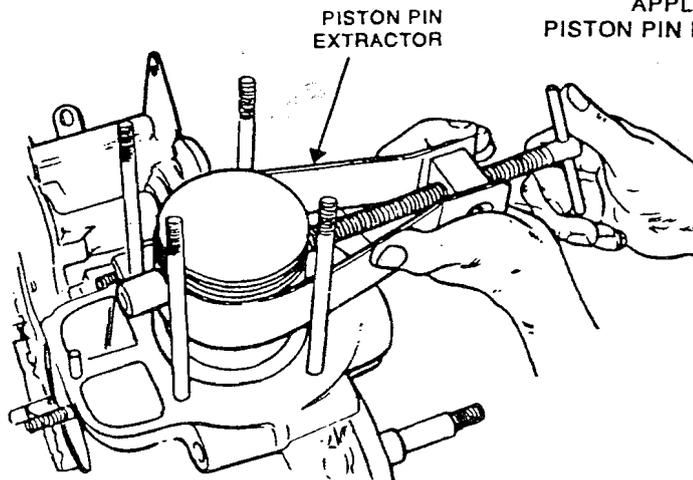


PED 2017 ST

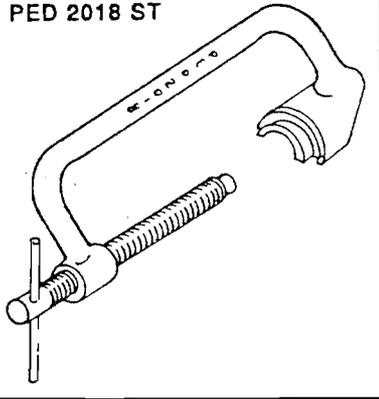


### PISTON PIN EXTRACTOR

APPLICATION :  
PISTON PIN REMOVAL

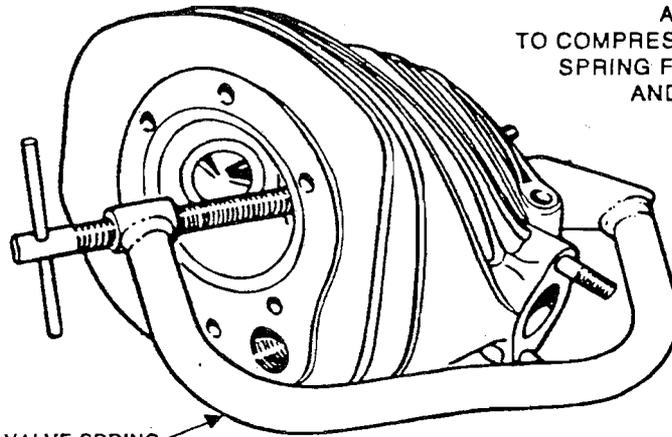


PED 2018 ST



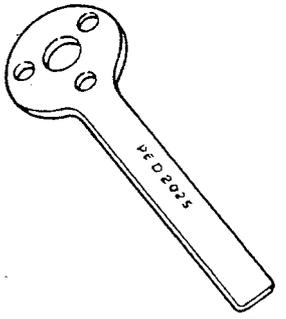
### VALVE SPRING COMPRESSOR

APPLICATION :  
TO COMPRESS THE VALVE  
SPRING FOR REMOVAL  
AND FITMENT OF  
VALVE



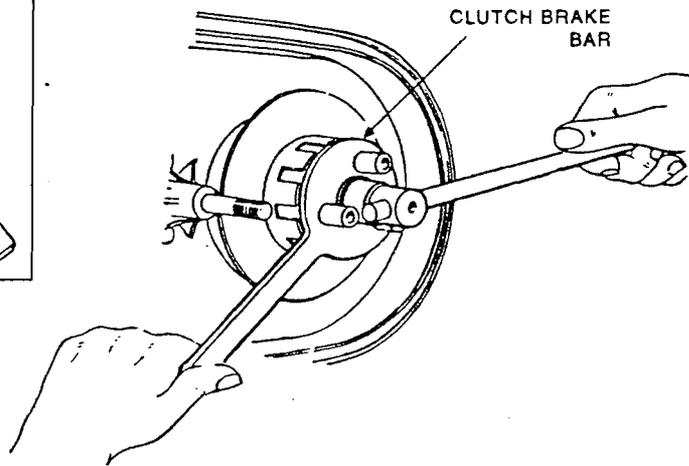
VALVE SPRING  
COMPRESSOR

PED 2025 ST



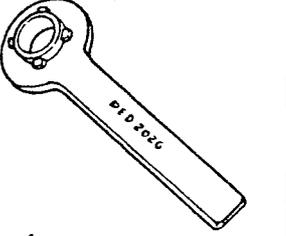
### CLUTCH BRAKE BAR

APPLICATION :  
HOLDING THE CLUTCH  
CENTRE AND BACK  
PLATE ASSY.



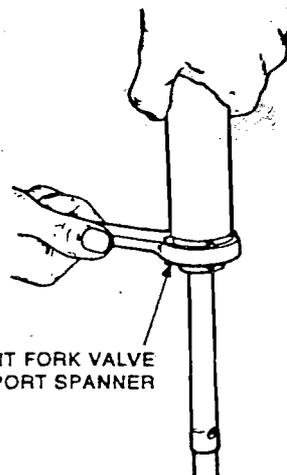
CLUTCH BRAKE  
BAR

PED 2026 ST



### FRONT FORK VALVE PORT SPANNER

APPLICATION :  
REMOVAL AND FITMENT  
OF VALVE PORT

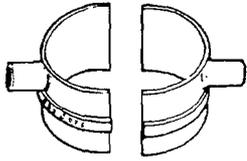


FRONT FORK VALVE  
PORT SPANNER

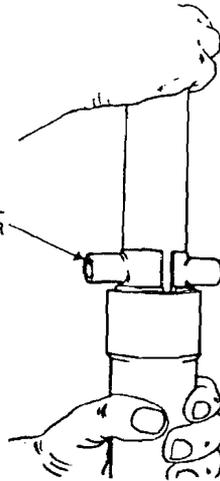




PED 2076 ST



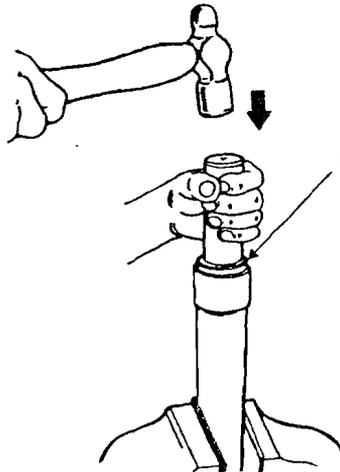
FRONT FORK OIL SEAL EXPANDER



### FRONT FORK OIL SEAL EXPANDER

APPLICATION :  
FOR EXPANDING OIL SEAL  
WHILE INSERTING  
MAIN TUBE INTO  
BOTTOM TUBE OF FRONT  
FORM

PED 2077 ST

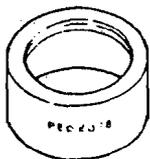


MANDREL FOR OIL SEAL

### MANDREL FOR OIL SEAL

APPLICATION :  
FITMENT OF OIL SEAL  
IN FRONT FORK  
BOTTOM TUBE

PED 2078 ST



SLEEVE FOR REMOVING FRONT FORK OIL SEAL



### SLEEVE FOR REMOVING FRONT FORK OIL SEAL

APPLICATION :  
REMOVAL OF OIL SEAL  
FROM FRONT FORK  
BOTTOM TUBE

## Metric conversion tables

Inches	Decimals	Millimetres	Millimetres to Inches		Inches to Millimetres	
			mm	Inches	Inches	mm
1/64	0.0156265	0.3969	0.01	0.00039	0.001	0.0254
1/32	0.03125	0.7937	0.02	0.00079	0.002	0.0508
3/64	0.046875	1.1906	0.03	0.00118	0.003	0.0762
1/16	0.0625	1.5875	0.04	0.00157	0.004	0.1016
5/64	0.78125	1.9844	0.05	0.00197	0.005	0.1270
3/32	0.09375	2.3812	0.06	0.00236	0.006	0.1524
7/64	0.109375	2.7781	0.07	0.00276	0.007	0.1778
1/8	0.125	3.1750	0.08	0.00315	0.008	0.2032
9/64	0.140625	3.5719	0.09	0.00394	0.009	0.2286
5/32	0.15625	3.9687	0.1	0.00394	0.01	0.254
11/64	0.171875	4.3656	0.2	0.00787	0.02	0.508
3/16	0.1875	4.7625	0.3	0.01181	0.03	0.762
13/64	0.203125	5.1594	0.4	0.01575	0.04	1.016
7/32	0.21875	5.5562	0.5	0.01969	0.05	1.270
15/64	0.234375	5.9531	0.6	0.02362	0.06	1.524
1/4	0.25	6.3500	0.7	0.02756	0.07	1.778
17/64	0.265625	6.7469	0.8	0.3150	0.08	2.032
9/32	0.28125	7.1437	0.9	0.3543	0.09	2.286
19/64	0.296875	7.5406	1	0.03937	0.1	2.54
5/16	0.3125	7.9375	2	0.07874	0.2	5.08
21/64	0.328125	8.3344	3	0.11811	0.3	7.62
11/32	0.34375	8.7312	4	0.15748	0.4	10.16
23/64	0.359375	9.1281	5	0.19685	0.5	12.70
3/8	0.375	9.5250	6	0.23622	0.6	15.24
25/64	0.390625	9.9219	7	0.27559	0.7	17.78
13/32	0.40625	10.3187	8	0.31496	0.8	20.32
27/64	0.421875	10.7156	9	0.35433	0.9	22.86
7/16	0.4375	11.1125	10	0.39370	1	25.4
29/64	0.453125	11.5094	11	0.43307	2	50.8
15/32	0.46875	11.9062	12	0.47244	3	76.2
31/64	0.48375	12.3031	13	0.51181	4	101.6
1/2	0.5	12.7000	14	0.55118	5	127.0
33/64	0.515625	13.0969	15	0.59055	6	152.4
17/32	0.53125	13.4937	16	0.62992	7	177.8
35/64	0.546875	13.8906	17	0.66929	8	203.2
9/16	0.5625	14.2875	18	0.70866	9	228.6
37/64	0.578125	14.6844	19	0.74803	10	254.0
19/32	0.59375	15.0812	20	0.78740	11	279.4
39/64	0.609375	15.4781	21	0.82677	12	304.8
5/8	0.625	15.8750	22	0.86614	13	330.2
41/64	0.640625	16.2719	23	0.90551	14	355.6
21/32	0.65625	16.6687	24	0.94488	15	381.0
43/64	0.671875	17.0656	25	0.98425	16	406.4
11/16	0.6875	17.4625	26	1.02362	17	431.8
45/64	0.703125	17.8594	27	1.06299	18	457.2
23/32	0.71875	18.2562	28	1.10236	19	482.6
47/64	0.734375	18.6531	29	1.14173	20	508.0
3/4	0.75	19.0500	30	1.18110	21	533.4
49/64	0.765625	19.4469	31	1.22047	22	558.8
25/32	0.78125	19.8437	32	1.25984	23	584.2
51/64	0.796875	20.2406	33	1.29921	24	609.6
13/16	0.8125	20.6375	34	1.33858	25	635.0
53/64	0.828125	21.0344	35	1.37795	26	660.4
27/32	0.84375	21.4312	36	1.41732	27	685.8
55/64	0.859375	21.8281	37	1.4567	28	711.2
7/8	0.875	22.2250	38	1.4961	29	736.6
57/64	0.890625	22.6219	39	1.5354	30	762.0
29/32	0.90625	23.0187	40	1.5748	31	787.4
59/64	0.921875	23.4156	41	1.6142	32	812.8
15/16	0.9375	23.8125	42	1.6535	33	838.2
61/64	0.953125	24.2094	43	1.6929	34	863.6
31/32	0.96875	24.6062	44	1.7323	35	889.0
63/64	0.984375	25.0031	45	1.7717	36	914.4

USE ALWAYS GENUINE "ENFIELD" SPARES

REML / EXP / 500 / 11-95.