13 Cut-out and voltage regulator contacts – maintenance

1 Every 12 000 miles (20 000 km) check the cut-out and regulator contacts. If they are dirty or rough or burnt, place a piece of fine glasspaper (do not use emery paper or carborundum paper) between the cut-out contacts, close them manually, and draw the glasspaper through several times.
2 Clean the regulator contacts in exactly the same way, but use emery or carborundum paper *and not glasspaper.* Carefully clean both sets of contacts from all traces of dust with a rag moistened in methylated spirit.

14 Voltage regulator – adjustment

1 If the battery and dynamo are in sound condition but the operation of the charging circuit is still suspect, then the voltage regulator and cut-out in the control box should be checked, and if necessary adjusted.
2 Check the regulator settings by removing the leads A and A1 from the control box and joining them together using a short length of wire. Connect the positive clip of a 0 to 20 volt voltmeter to the D terminal of the control box, and the negative clip to a good earth.
3 Start the engine and slowly increase its speed until the voltmeter needle flicks and then steadies. This should occur at about 2000 rpm.
4 If the voltage at which the needle steadies is outside the limits listed in the table, switch off the engine, remove the control box cover and turn the regulator adjusting screw a fraction of a turn at a time, clockwise to increase the setting and anti-clockwise to decrease it. Recheck the voltage reading after each adjustment.

Air temperature	Open circuit voltage
10°C or 50°F	*16.1 to 16.7*
20°C or 68°F	*16.0 to 16.6*
30°C or 86°F	*15.9 to 16.5*
40°C or 104°F	*15.8 to 16.4*

It is essential that the adjustments be completed within 30 seconds of starting the engine otherwise the heat from the shunt coil will affect the readings.

15 Cutout – adjustment

1 With the control box A and A1 leads joined together, and the voltmeter connected as described in the previous Section, the cut-in voltage can be checked, and if necessary adjusted, as follows.
2 Switch on the headlights to provide an electrical load, start the engine and slowly increase its speed. The voltage reading will rise steadily, drop back and then rise again. The point reached just before the drop back should be between 12.7 and 13.3 volts.
3 If the reading obtained is outside these limits, switch off the engine and turn the cut-out adjusting screw a fraction of a turn at a time clockwise to raise the voltage and anti-clockwise to lower it. Recheck the voltage reading after each adjustment. As with the voltage regulator, it is essential that the adjustments be completed within 30 seconds of starting the engine, otherwise the heat from the shunt coil will affect the readings.
4 After completing the adjustments remove the voltmeter, disconnect the control box leads and refit the cover.

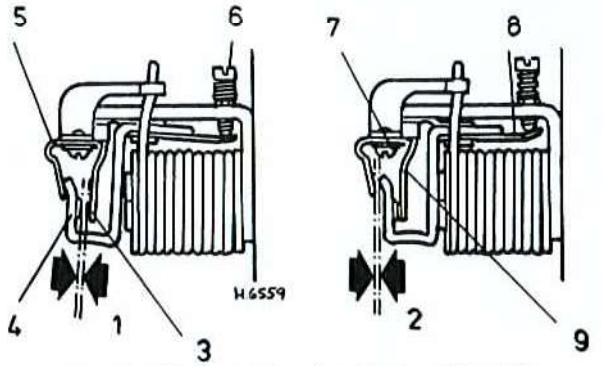

Fig. 10.5 Mechanical setting of cut-out (Sec 15)

1 0.01 to 0.02 in (0.25 to 0.51 mm)
2 0.030 in (0.76 mm)
3 Follow through – 0.01 to 0.02 in (0.25 to 0.51 mm)
4 Armature tongue and moving contact
5 Stop arm
6 Output adjusting screw
7 Armature securing screw
8 Armature tension spring
9 Fixed contact blade

16 Alternator – general description

Later Mini models are equipped with an alternator in place of the dynamo and control box. The Lucas 11AC alternator and separate 4TR control unit was used initially, but this has now been superseded by the 16ACR alternator with control unit incorporated.

Both types of alternator are similar in construction, comprising basically an aluminium casing, housing a three-phase star connected stator. A rotor carrying the field windings rotates within the stator and is driven by the fanbelt. The alternator output is controlled by a voltage regulator located in the separate control unit on the 11AC alternator and contained within the end housing on the 16ACR machine.

As its name implies, the alternator generates alternating current (ac) as opposed to direct current (dc) generated by the dynamo. The alternating current is rectified by diodes, located in the alternator end housing, into direct current, which is the current required for battery charging.

The main advantage of the alternator over its predecessor, the dynamo, lies in its ability to provide a high charge at low revolutions. Driving slowly in heavy traffic with a dynamo invariably means no charge is reaching the battery. In similar conditions, even with the wiper, heater, lights and perhaps radio switched on the alternator will ensure a charge reaches the battery.

17 Alternator – special procedures

In order to protect the sensitive electronic components in the alternator, the following precautions must always be observed when working on this unit or any other part of the car electrical system.

a) All alternator systems covered by this manual use a negative earth. Even the simplest mistake of connecting a battery the wrong way round could burn out the alternator diodes in a matter of seconds
(b) Never disconnect the battery when the engine is running
(c) Before disconnecting any wiring in the system, the engine ignition should be switched off. This will minimise accidental short circuits.
(d) The alternator must never be run with the output wire disconnected
(e) Always disconnect the battery from the car's electrical system if an external charging source is being used
(f) Do not use test wire connections that could move accidentally and short circuit against nearby terminals. Short circuits will not blow fuses – they will blow diodes or transistors
(g) Always disconnect the battery cables and alternator output lead before carrying out any electric welding work on the car

18 Alternator – maintenance

1 The alternator has been designed for the minimum amount of maintenance in service, the only item requiring regular attention being the fanbelt. The fanbelt should be carefully inspected every 3000 miles (5000 km) and its tension checked and, if necessary, adjusted as follows.
2 The fanbelt should be tight enough to ensure that there is no slip between the belt and alternator pulley. If a shrieking noise is heard from the engine when accelerated rapidly, then it is likely that the belt is slipping. On the other hand the belt must not be too tight, otherwise the bearings will wear rapidly. Ideally 0.5 in (12 mm) of fanbelt deflection should be felt using light finger pressure at a point midway