

HINTS FROM AUSTIN'S MORRIS GARAGE ©

Hi, everybody. This time we're covering the maintenance and repair of the Lucas Windtone horn. This horn is installed on the late MG TC, TDs, TFs, MGAs, and many other British cars. It has also been very seldom discussed.

1 General Description

Windtone horn operation depends on the vibration of an air column, which is excited at its resonant frequency, or an harmonic of it, by an electrically energized diaphragm.

The horns are usually installed in pairs, one horn having a higher note than the other. The high- and low-note WT614 (early Bentley/Rolls Royce) and WT618 (most other models, including MGs from the late TCs through the Magnette Mark IV but not the MGBs or MGCs) differ in note by a major third (A to C on the piano, for instance). There are extra-loud 12-volt Windtone horns (WT28/WT29) that we will not discuss here, because of their rare use. The horn shape determines the horn model (see Figures 1 and 2). High- and low-note horns may be distinguished by the letters "H" and "L" marked inside the trumpet flares. The horns use sprung mounting brackets.

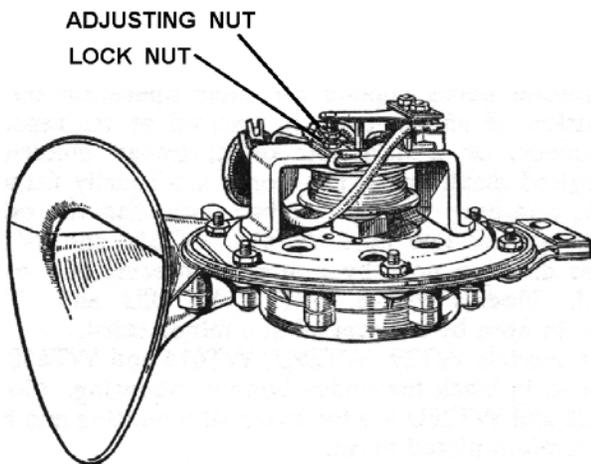


Figure 1. WT614 Horn, with Cover Removed

Horns on the MG cars are generally connected directly to a 12-volt source, thus are "hot" all the time (see schematic HORNS (A) in Figure 3).

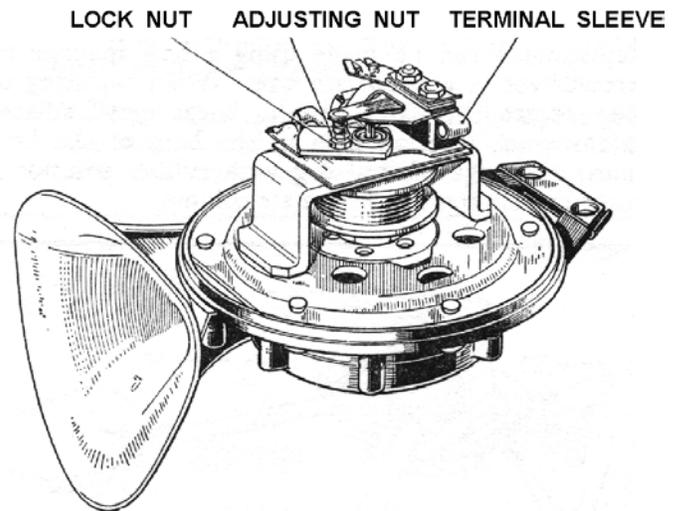


Figure 2. WT618 Horn, with Cover Removed

Note that earlier models have the base plate attached to the horn body with screws and nuts.

On other cars, a relay is used to minimize the current carried by the horn contacts and to reduce the voltage drop in the horn wiring (see schematic HORNS (B) in Figure 3). If desired, the direct-connected horns may be wired this way, too.

2 Servicing

Before making any adjustments to a horn, make sure the battery is in a good state of charge (*I recommend it be fully charged*).

Do not dismantle a horn until all external checks in Table 1 are completed.

a. Horn Loose on Mounting

Check that the bolts fixing the horn bracket to both the horn and the car are tight and that the horn flare does not contact other devices or the body. Also make sure items mounted near the horn are rigidly mounted so they cannot vibrate when the horn is sounded.

Horns with coiled trumpets must be mounted with their bases horizontal and covers at the top. Under no circumstances should they be mounted in the reverse or sideways, as that may result in water entering and collecting in the bends of the air column, which would make the horn perform poorly or even not at all.

Table 1. Servicing Summary

Symptom	Possible Causes	Reference
Note unsatisfactory	Horn loose on mounting Horn out of adjustment Internal fault(s)	Paragraph 2 (a) " 2 (e) (i) " 2 (e) (ii-vi)
Horn does not operate	Faulty wiring Blown fuse Faulty relay Internal fault(s)	Paragraph 2 (b) " 2 (c) " 2 (d) " 2 (e) (ii-vi)

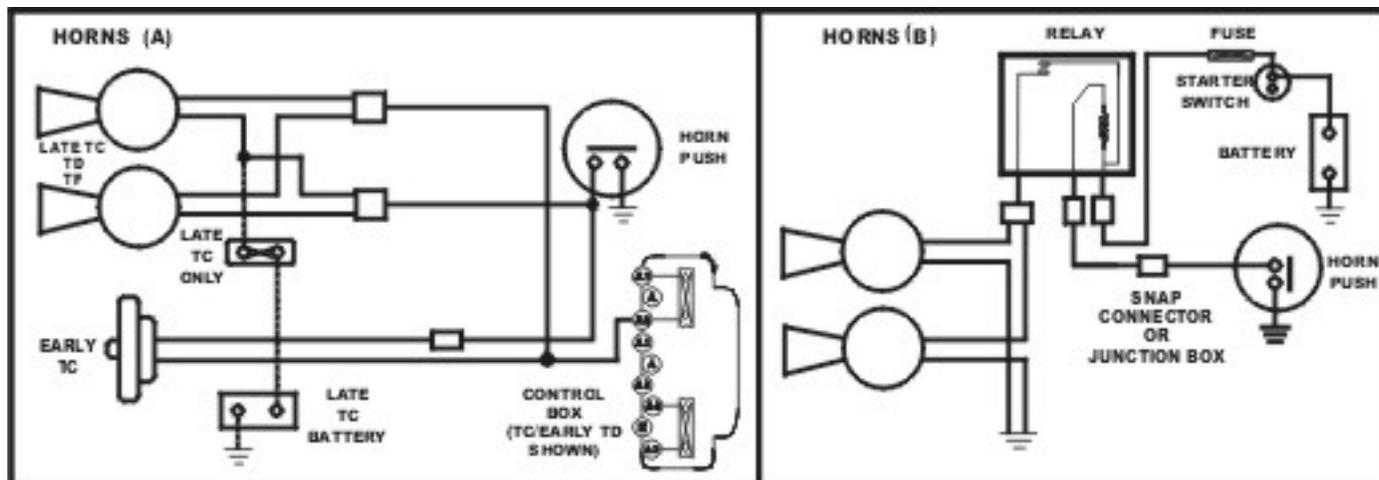


Figure 3. Typical Horn Circuit Wiring

b. Faulty Connection

Examine the horn circuit wiring, replacing any that are badly worn or chafed. Make sure all connections are clean and tight, and that the connecting eyelets or connector nipples are firmly soldered to the wires.

On certain model WT614 horns, the contact clips in the terminal block may have been distorted as a result of allowing insufficient slack in the wiring. They can be bent back into shape with a pair of pliers.

c. Blown Fuse

If a separate fuse is installed to protect the horn circuit, it may have blown. Before replacing the fuse, however, examine the wiring for evidence of a short that may have caused the fuse to blow. Use an ohmmeter to verify the wires are not common to ground. A blown fuse may also indicate a horn is badly out of adjustment.

d. Faulty Relay

When equipped so, check the relay by connecting terminals C1 and C2 (H and B on some relays) with a short piece of heavy-gauge cable. If the horns operate properly, remove the cable and connect it between the remaining relay terminal W (or P) and ground. Persistence of the fault means there is an internal defect in the relay, which will have to be replaced. If the horn does sound, check the horn push circuit.

e. Internal Faults

(i) Contact breaker out of adjustment

Make sure that poor performance is not due to one of the causes in paragraphs a–d before attempting any horn adjustment. Adjustment does not change the pitch of the note but takes up wear of the moving parts, which, if not corrected, would result in the loss of power and note roughness.

The horn should not be used repeatedly when out of adjustment, as the resulting increase in current draw will be excessive. The maximum current for each model is given in Table 2.

Table 2. Current Consumption for One Horn

Model	6-Volt (amps)	12-Volt (amps)
WT614	11.5–13	5.5
WT618	13–14	2.5–3

The total current consumption for a pair of horns will, naturally, be twice the figure quoted in the table.

To check the current consumption, break the circuit at a convenient point, and connect a 0–30 amp (0–50 amp for 6-volt horns) in series. If the reading is in excess of the specification, it will be necessary to adjust the horns, even if they are apparently operating correctly. The horns should be tested with the car stationary and the battery fully charged.

Adjustment

Remove the cover securing screw, and remove the cover and supporting strap. Disconnect the supply cable from one horn, making sure it does not touch any part of the car and cause a short circuit (remember, the horn supply is almost always “hot.”) The horns must always be securely bolted down when carrying out any adjustment and, if it is necessary to remove the horn from the car for testing, it should be firmly clamped by its securing bracket for the test. As with the HF horns, when testing or adjusting, use a pure DC supply—not rectified AC.

Slacken the lock nut on the fixed contact, and rotate the adjusting nut a few degrees at a time clockwise (CW) to reduce the current, or counterclockwise (CCW) to increase the current. Remember, the adjustment is a very critical one. Tighten the lock nut before testing the horn after each trial adjustment. The contact spring on a correctly set horn should be more or less parallel with the surface of the magnet bridge for the contacts to be in line. A clear, steady note should be obtained over a voltage range of 5 to 7 volts for 6-volt and 10 to 14 volts for 12-volt horns.

(ii) *Badly worn contacts*

If the contacts are so badly worn that correct adjustment is not possible, a new set of contacts, i.e., moving contact and spring, and fixed contact must be fitted, and adjusted as described in paragraphs (e) and (i), above.

(iii) *Faulty resistance*

To prevent excess sparking as the horn contacts separate, a carbon resistance is connected across the horn coil. The resistance values vary according to the horn voltage. If the resistance becomes open circuited, the horn note becomes rough, and heavy sparking will occur as the horn contacts separate. The correct resistance values for each horn are:

6-volt horns — 0.054 ohms
12-volt horns — 8 ohms

On WT618 horns, the contact breaker terminal block is made of a resistive material. This serves as the spark-suppressing resistance.

(iv) *Open-circuited or burned out coil*

The horn coil can be easily checked for continuity by connecting an ohmmeter between the two coil supply wires. The resistance values of the coil windings vary according to voltage.

6-volt horns — 0.54 ohms
12-volt horns — 0.28 ohms

(v) *Incorrect armature setting*

Armature setting can be checked by measuring the amount of push rod movement. To do this, see Figure 4, and screw back the contact breaker adjustable contact until the contacts are parted. Position

a dial indicator on the moving contact spring directly above the push rod. Temporarily energize the coil, arranging the supply wires in such a way as to bypass the contact breaker, and note the reading on the dial indicator. Do not energize the coil longer than it takes to read the gauge.

Because of differences in diaphragm stiffness, the amount of movement compatible with satisfactory horn performance can differ with individual horns of the same model and voltage. The armature movements listed in Table 3 are therefore nominal—the essential conditions being that an armature does not impact against the pole piece (indicated by a sharp metallic click) or otherwise contact any part of the horn body.

Figure 5 shows two special tools required for making armature adjustments on WT614 (top) and WT618 horns.

Adjust the armature as follows:

1. Slacken the armature lock nut.
2. Reset the armature, using the tools, as in Figure 6.

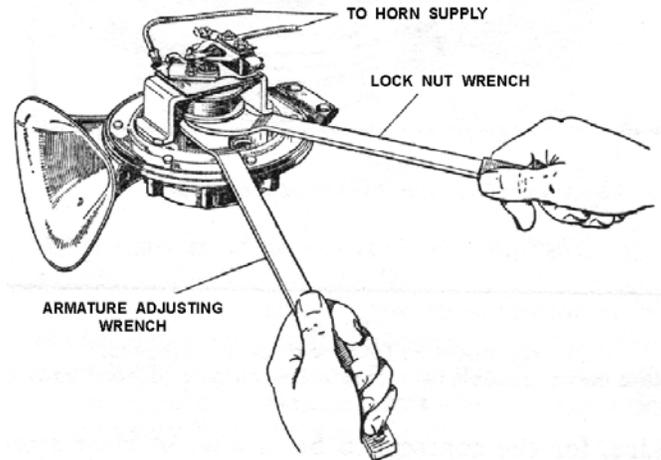


Figure 6. Adjusting the Armature

Table 3. Armature Clearances

Model	High Note Settings	Low Note Settings
WT614	6-volt: 0.045"	6-volt: 0.050"
	12-volt: 0.055"	12-volt: 0.060"
WT618	6-volt: 0.050"	6-volt: 0.050"
	12-volt: 0.055"	12-volt: 0.055"

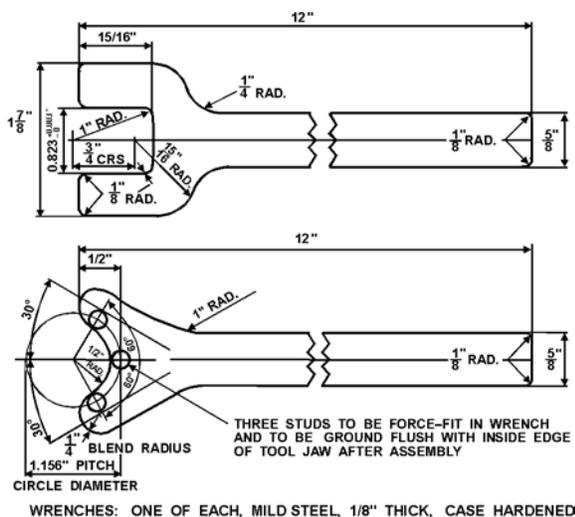


Figure 5. Adjusting Tool Dimensional Drawings

3. Tighten the armature lock not.
4. Reset the contact breaker as in paragraph (e) (i).

(vi) *Push rod sticking*

Remove the contact breaker spring, and work the push rod up and down in its bushing so it moves freely.

If necessary, clean the rod and bushing with gasoline to remove any accumulation of dirt or grease. After cleaning, lightly smear the rod with a light grease. Make sure grease does not get onto the contacts.

Dismantling

Unless a major fault occurs, such as a broken diaphragm or a burned out coil (both of which are very rare faults), dismantling of the movement itself is not advisable. If however, dismantling is necessary, refer to Figure 7, and follow the order of disassembly in Figure 8. When a horn coil housing and base plate is affixed to the die cast body with rivets, the rivets must be drilled out. To reassemble, reverse the order in Figure 8. Upon reassembly, the holes must be drilled out to 7/32 in., and the rivets replaced by appropriate machine screws and nuts.

Reassembly

Reassembly is done by reversing the dismantling sequence, and the following points must be observed when the horn is being reassembled:

1. Make sure a fiber packing washer is assembled between the diaphragm and the body die casting.
2. Note that high note horns have thinner armature plates than low note horns.
3. The diaphragm clamping nuts must be tightened to a torque of not less than 30 in. lb.
4. Reset the armature with its upper surface approximately even with the surface of the horn base plate.
5. Lightly smear the push rod with a light grease.
6. After long service, the spring locking plate on a WT618 terminal block assembly loses its spring tension, and a new plate must be installed.
7. The terminal block assembly nuts on WT618 horns must be tightened to a torque of 30 in. lb, to obtain consistent horn performance.
8. Carry out an insulation test before connecting power to the horn. Test between each terminal and the horn body with a 500 volt insulation tester.
9. Reset the armature and contact breaker with the instructions given above.

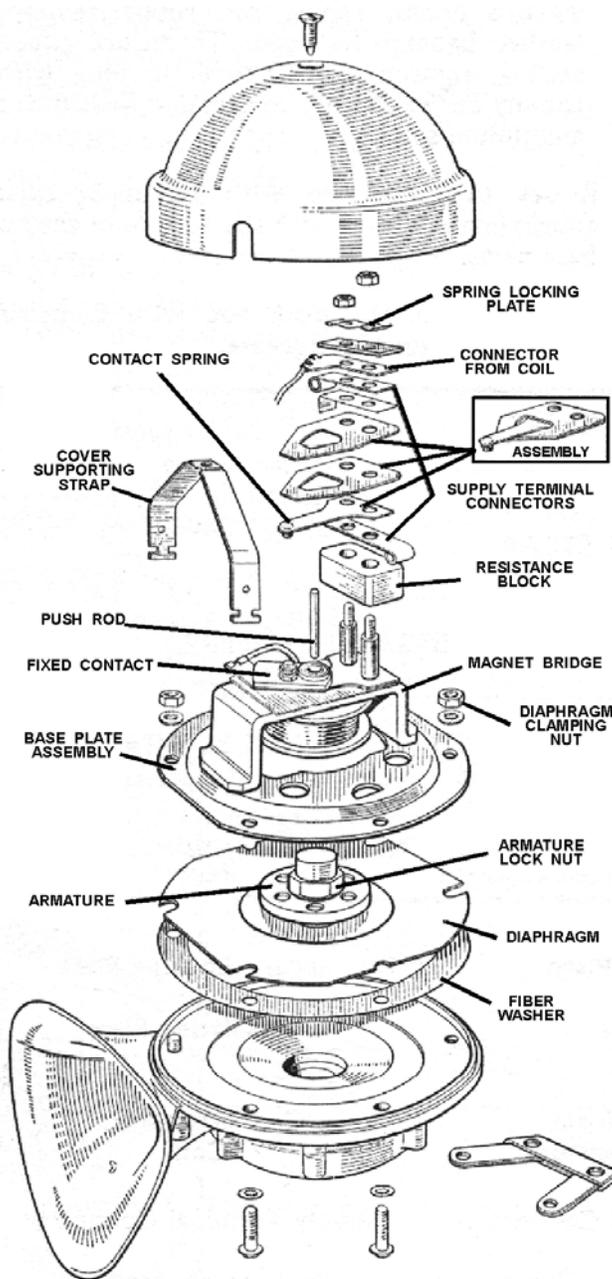


Figure 7. WT618 Shown Disassembled

All MG car clubs, who focus on pre-1956 MG cars, and all vintage MG owners are encouraged to join our club to enjoy the many benefits of membership. Please write for an application or visit our Web site at vintagemg.com to view, print, fill one out, and mail it in with your payment. There are many other very interesting things at the site, too.

That's all for this time. Regards to all, Jerry.

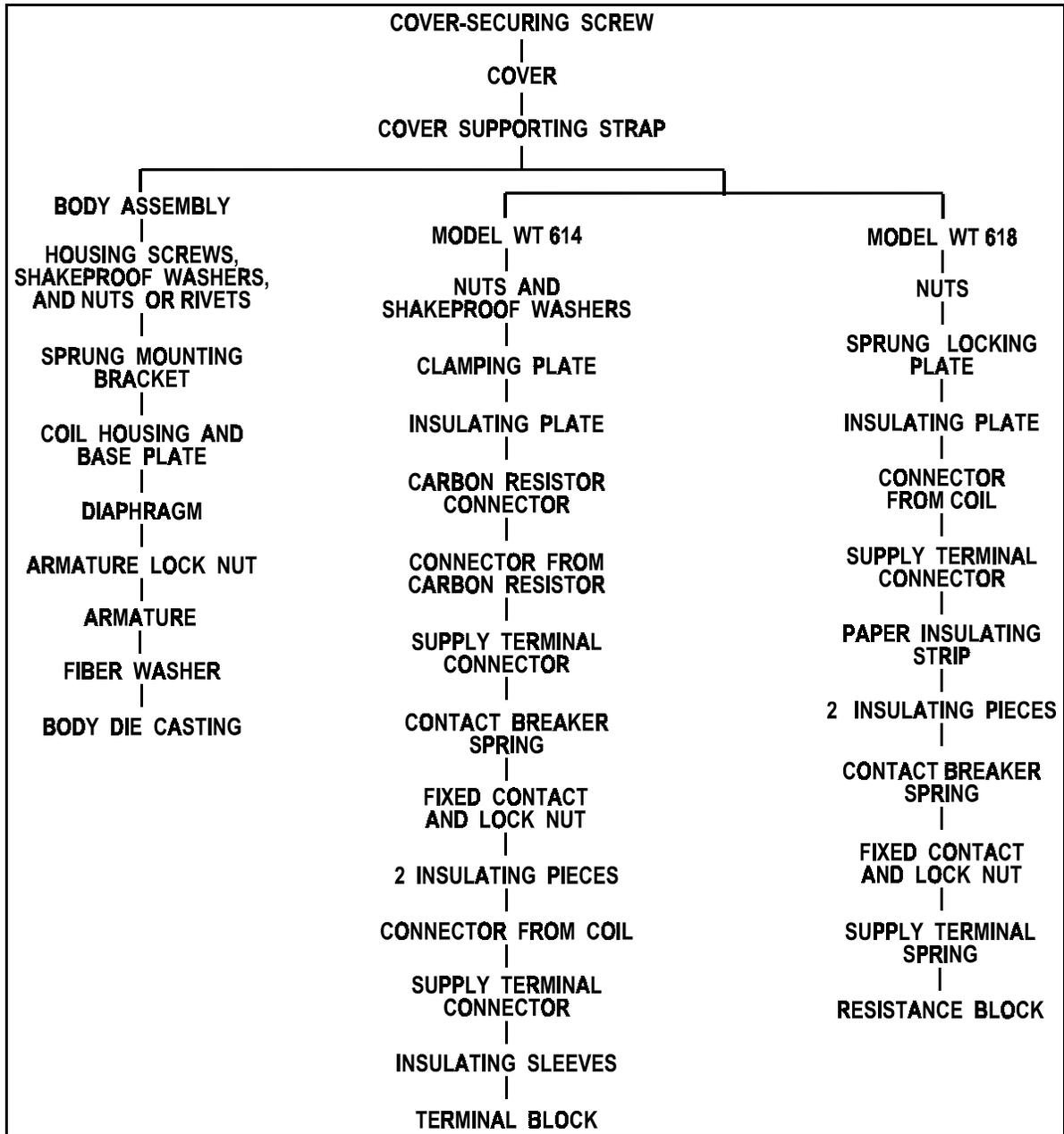


Figure 8. *Dismantling and Reassembly Sequence*

