## Windshield Wipers

### General

The wiper motor, located under the instrument panel on the frame, drives the wiper arms by way of connecting rods which link the central crankshaft to the wiper arm cranks. The motor is controlled by a pull switch located above the ignition switch and is turned on in the pulled position.

### Maintenance

The connecting rod sockets on BOSCH wipers require no service. The connecting rods and wiper cranks on SWF wipers must be oiled at regular intervals. The wiper blades should be adjusted so that they both sweep the same pattern and turn freely.

## Removing and Installing Wiper Motor

38 LI

### Removal

1. Remove connecting rods from the motor crank.
2. Loosen the set screw on the crank and remove the crank.
3. Disconnect cables.
4. Remove three mounting screws and remove the motor.

### Installation

The installation is accomplished in the reverse order of removal observing the correct cable connections.

## Horn

### General

The horns are located under the front fenders behind the upper grill slots. The horns are two tone with a high tone horn on the left and the low tone horn on the right.
The horns are the standard diaphragm, magnet, and contact type known as the "Wagnerian Hammer". The electromagnet attracts the diaphragm which in turn opens contacts that interrupt the current to the electromagnet. The resulting vibration gives the frequency of the horn. A condenser connected in parallel with the contacts suppresses the arc which would normally occur and cause rapid damage. The horns are operated by the horn button in the center of the steering wheel. The contact is transmitted through a carbon brush and collector ring to ground on the steering column. This ground connection activates the horn relay which makes the connection to the horns. The relay is located on the right wall under the instrument panel and can be identified by its black cover.

### Maintenance

The spring leaf mounts of the individual horns should be carefully installed so that the horns are supported free to vibrate. The usual horn failures are electrode wear, rust clogged diphragms, moisture entering the housing, or condenser failure.

39 LI

## Removing and Installing Horns

1. Remove bolt from the spring mount under the fender.
2. Remove the cables from the two screw contacts on the horn and remove the horn.

When installing the horn it is important that the horn does not contact the body work but is supported freely on the spring mount.

40 LI

## Tuning Horns

### General

The horns may become weak or irregular from contact wear or diaphragm distortion. A screw on the back of each horn for tuning has therefore been designed to correct such changes.

### Adjustment

1. Remove the horn in question (39 LI).
2. Secure the base of the spring mount in a vise (Fig. 69).
3. Connect the horn to a 6 V battery through a control switch or simple door bell button.
4. Adjust the tuning screw in or out until a clear loud tone is obtained which has no irregular sounds or overtones.

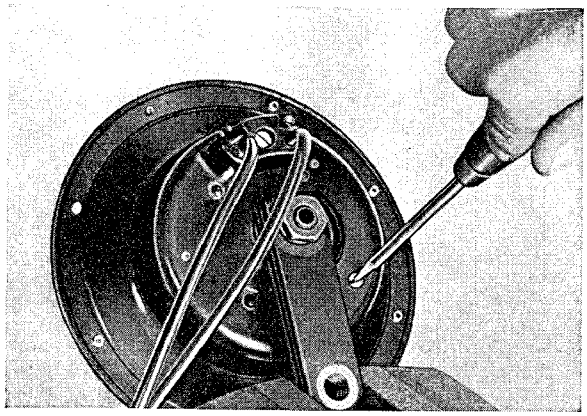

Fig. 69

If a clear loud signal cannot be obtained by this adjustment, a new horn must be installed.

## Horn Button

The horn button section in the center of the steering wheel can be removed by unscrewing or turning it counter-clockwise by grasping the knobs on its outer circumference. It is advisable to disconnect the ground cable from the battery before-hand to avoid excessive noise.

## Headlight Signal

The headlight signal is operated by the lever of the BAL switch on the steering column. The headlight relay is located near the horn relay on the right-hand wall under the instrument panel and can be identified by its grey cover. The relay provides a quick and efficient contact to prevent the BAL switch contacts from being burned. For repair of this switch, refer to page L 64.

## Replacing Fuses



The fuse box is centrally located under the instrument panel and contains all the fuses for the electrical equipment.
Fuses may be removed by pushing downward and pulling out.
In the event that a fuse burns out it is of primary importance to locate the cause before installing a new fuse. The fuses serve to prevent serious damage to the wiring and accessories and can therefore indicate possibly dangerous damage which must be corrected before replacing the fuse. Never use fuses of greater capacity, pieces of metal foil, or wires. It is advisable to carry a few spare 8/15 ampere and 25/40 ampere fuses.

## Service Diagnosis for Windshield Wiper Motor

| Failure | Cause | Repair |
|---|---|---|
| Wipers operate very slowly, jerkey, or stop. | a. Dirty or worn brushes. | a. Install new brushes. |
| | b. Brush pressure too weak. | b. Install new springs. |
| | c. Brush holders have tight hinges. | c. Free brush holder hinges. |
| | d. Dirty commutator. | d. Clean commutator. |
| Squeaking noises. | a. Crank pin and linkage dry. | a. Lubricate crank pin and linkage with high temperature grease. |
| | b. Armature dragging on field core. | b. Adjust field core and test armature movement. |
| Wipers do not start. | a. Poor cable connection or burned fuse. | a. Test for current supply with meter or replace fuse. |
| | b. Field core displaced or fouling armature. | b. Test movement of armature and adjust field core if necessary. |
| | c. Burned out armature due to an internal short or internal ground; may be traced to field core fouling the armature. | c. Install new motor or armature. |