

# WINDSHIELD WIPERS

## ALL MODELS

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## DESCRIPTION AND OPERATION

### GENERAL DESCRIPTION

The two-speed wiper consists of a round shaped permanent magnet type motor and speed reduction gear box.

### OPERATION

The wiper motor is controlled through a dash mounted switch on all cars. The Rallye and GT, in addition to the dash mounted switch, also have a switch mounted in conjunction with the windshield washer foot pump. Depressing the washer pump will allow the wipers to operate while the pump is depressed.

## DIAGNOSIS

### PRELIMINARY INSPECTION

1. Make certain of firm wire connections at wiper motor fuse block and wiper switch.

2. Check to see that the fuse is not blown.

3. Be sure wiper motor is not loose on fire wall.

4. With the yellow wire disconnected from terminal No. 53 on the wiper motor, turn the ignition switch and wiper switch to the on position and check voltage available to the wiper motor. There should be 12 volts available at the purple wire with a properly charged battery.

### Checking Wiper Operation

1. Turn ignition switch on and engage wiper switch to see if wiper motor will operate.

2. If wiper action is slow or inoperative, turn switches off and detach wiper control arm from crank arm.

3. Operate wiper manually checking for excessive bind in linkage. Correct if necessary.

4. Turn switch on to see if wiper motor will function with wiper linkage detached. If wiper motor will not run, disconnect connector at wiper motor and connect hot lead from battery to terminal No. 53 on wiper motor. If wiper motor runs, the wiper switch is faulty or there is a break in the lead wire. If wiper motor still will not run, remove and bench test.

## MAJOR REPAIR

### WIPER TRANSMISSIONS

#### Removal (1900 and Manta)

1. Remove wiper blade (2).
2. Remove the wiper transmission retaining nut, washer, and rubber seal ring. See Figure 1E-1.

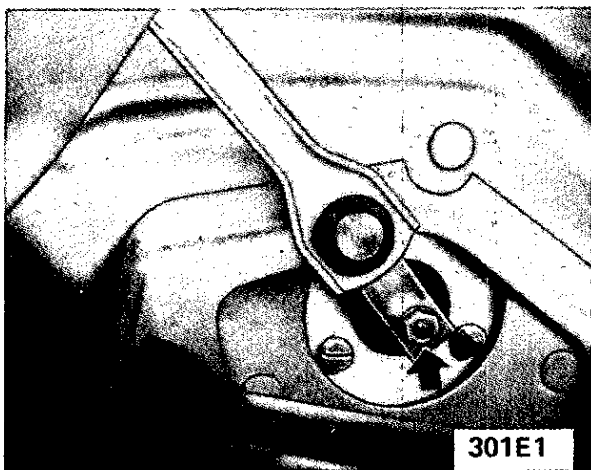


Figure 1E-1 Crank Arm Retaining Nut

3. Remove instrument cluster housing.

If only left wiper transmission is to be serviced, it can be done without removing any other instrument panel components. If the right side, or both, transmissions are to be serviced, then it will be necessary for complete instrument panel removal. On the Rallye models, the gauge carrier must also be removed. On all 1900 and Manta Models the defroster ducts are secured to the instrument panel cover, by two (2) spring clips, and should not be removed from dash cover. Remove cover and duct as a unit.

4. Remove retaining clips from transmission connecting rod pins. Pull connecting rods off pins. See Item "A", Figure 1E-2.

5. Remove the screws securing the wiper transmission to the inner side of the cowl (Items "B", Figure 13), and remove the transmission assemblies.

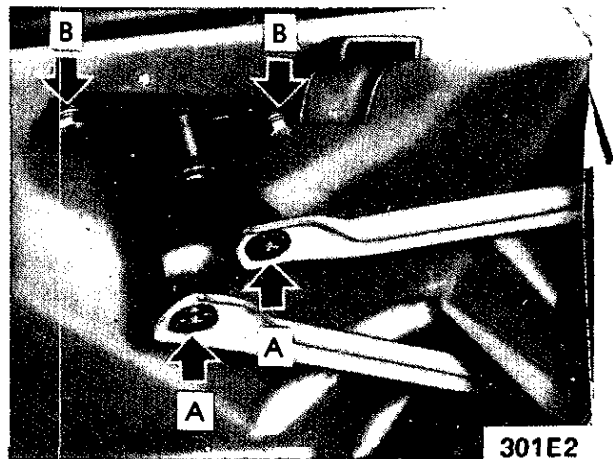


Figure 1E-2 Connecting Rod Retaining Clips

#### Installation

1. Place wiper transmissions into position at cowl and install holding screws.
2. Push connecting rods onto transmission cranking arm pins and install retaining clips. See Figure 1E-2, Item "A".
3. Reinstall dash and instrument cluster parts.
4. Install the rubber seal ring, washer, and transmission retaining nut. See Figure 1E-1.
5. Install wiper blades and check the position of the blades in the park position. See Figure 1E-3.

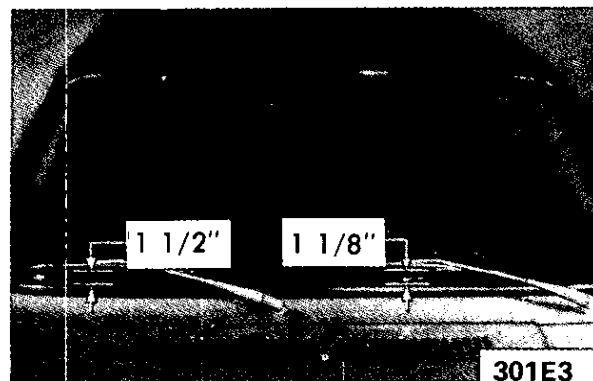


Figure 1E-3 Wiper Blades in Park Position

#### Removal and Installation of GT Wiper Transmission

1. Remove nuts and remove both wiper arms. See Figure 1E-4.
2. Remove three (3) bolts from each windshield

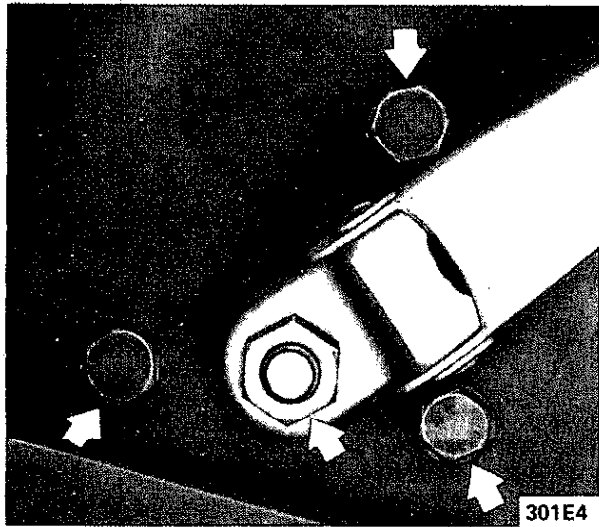


Figure 1 E-4 Removing Wiper Arms-GT

wiper transmission and drop wiper transmissions from deflector panels. See Figure 1E-4.

3. Remove screws from left and center deflector panels. See Figures 1E-5 and 6.

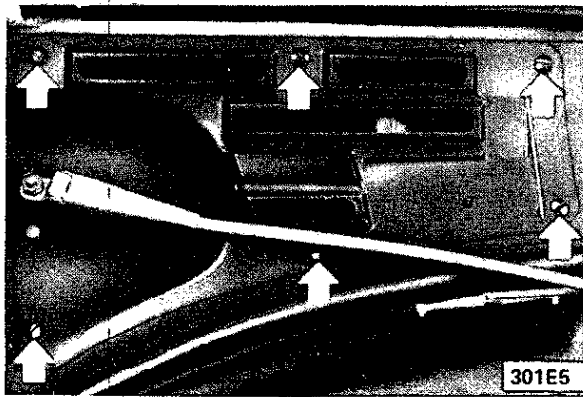


Figure 1E-5 Removing Screws from Left Deflector Panel

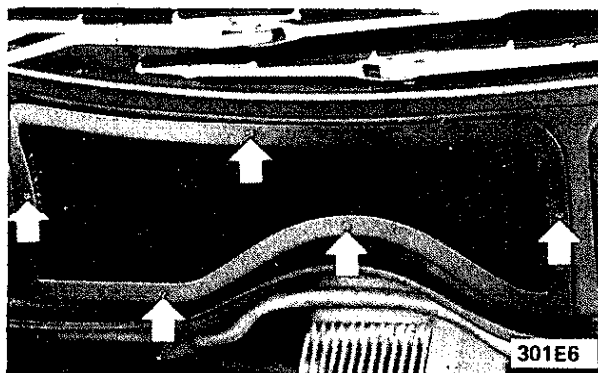


Figure 1E-6 Removing Screws from Center Deflector Panel

4. Remove center deflector panel. Remove left deflector panel together with wiper motor and complete wiper linkage. See Figure 1E-7.



Figure 1E-7 Removing Left Panel, Motor and Linkage

5. Remove nut and lockwasher from wiper motor shaft and remove complete wiper linkage.

6. Install in reverse sequence, checking all parts for wear. Replace any worn parts.

## WIPER MOTOR OVERHAUL

### Removal of Wiper Motor

1. Remove the wiper motor to crank arm attaching nut, this is done from the inside of vehicle. The nut is located on inner side of cowl, just above the steering column. See Figure 1E-1.

2. Pull crank arm off motor drive shaft.

3. Remove three (3) wiper motor attaching screws. See Figure 1E-8.

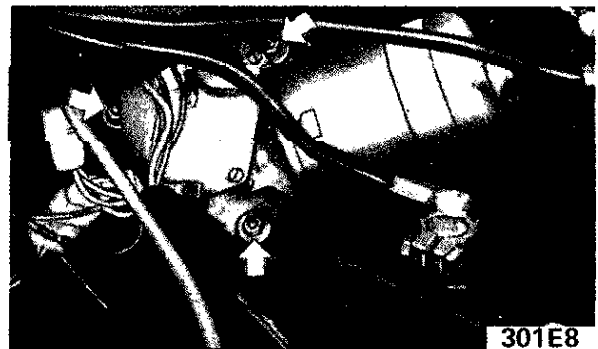


Figure 1 E-8 Wiper Motor Attaching Screws

4. Remove motor from cowl.

5. Remove wiper motor electrical connector from motor.

**Disassembly**

1. Remove two (2) motor housing attaching screws (Item No. 4) and two (2) angle brackets (Item No. 3). See Figure 1E-9.

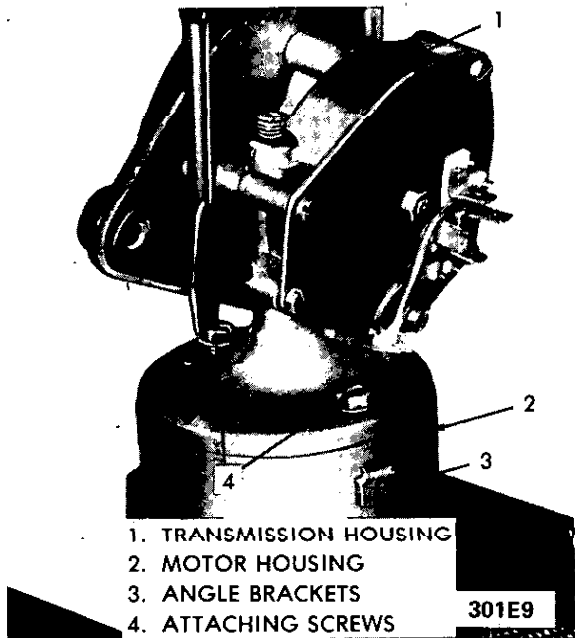


Figure 1 E-9 Removing Motor Housing Attaching Screws

2. Remove transmission housing together with armature from motor housing. See Figure 1E-10. It may be necessary to hold armature in transmission housing with a screw driver.

3. Remove armature from transmission housing.

4. Remove five (5) transmission housing cover screws. See Figure 1E-11.

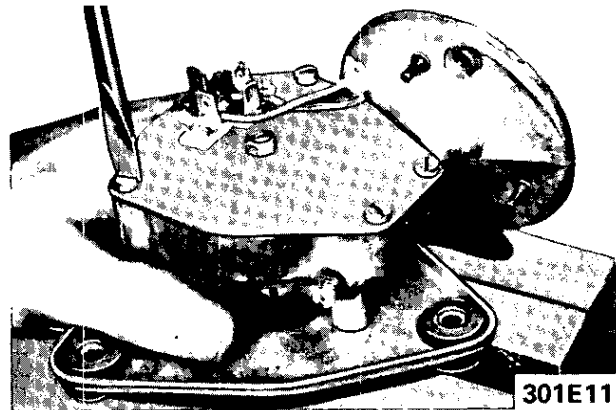


Figure 1 E-11 Remove Transmission Housing Cover Screws

5. Remove cover, gasket and driven gear from transmission housing. See Figure 1E-12. Remove pivot ball from driven gear. See Figure 1E-15.

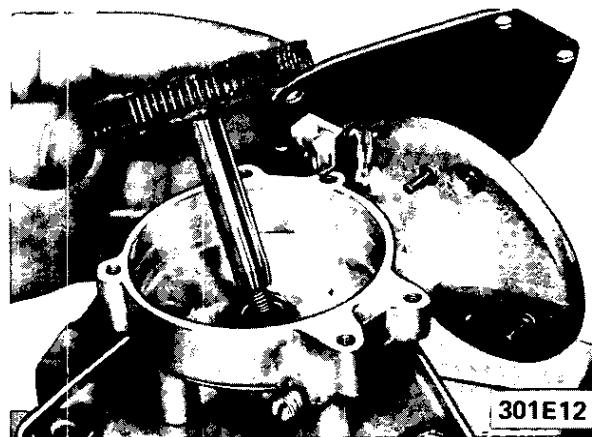


Figure 1 E-12 Remove Driven Gear

6. If required, remove brushes.

- a. To remove positive brushes, cut brush leads off at brush holder. See Figure 1E-13.

- b. To remove negative brush, remove brush retaining screw from commutator end frame. See Figure 1E-14.

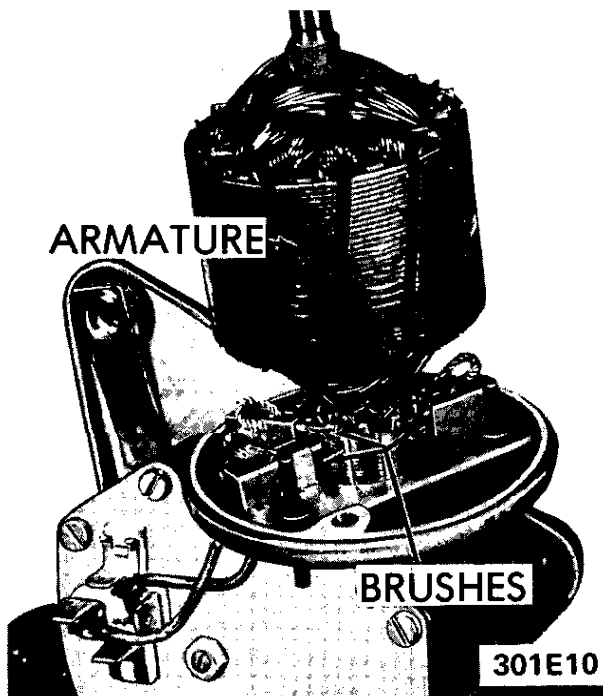


Figure 1 E-10 Transmission and Armature Removed from Motor Housing

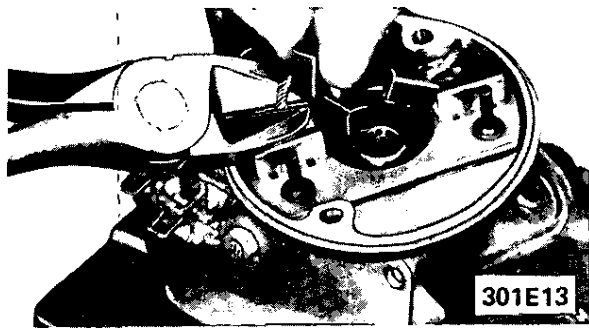


Figure 1 E-I 3 Cut Off Positive Brush Leads

3. Apply a small amount of grease to ball cavity of driven gear and insert ball. See Figure 1E-15.

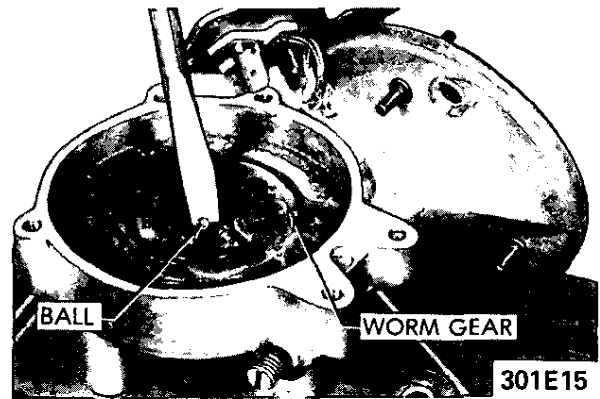


Figure 1E-15 Insert Ball into Driven Gear

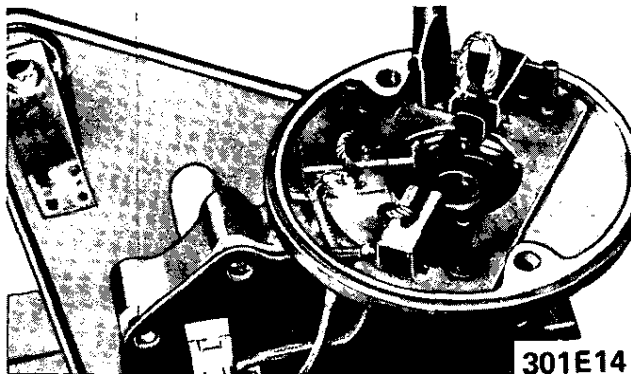


Figure 1E-14 Remove Negative Brush Retaining Screw

4. Install transmission housing cover. See Figure 1E-16.

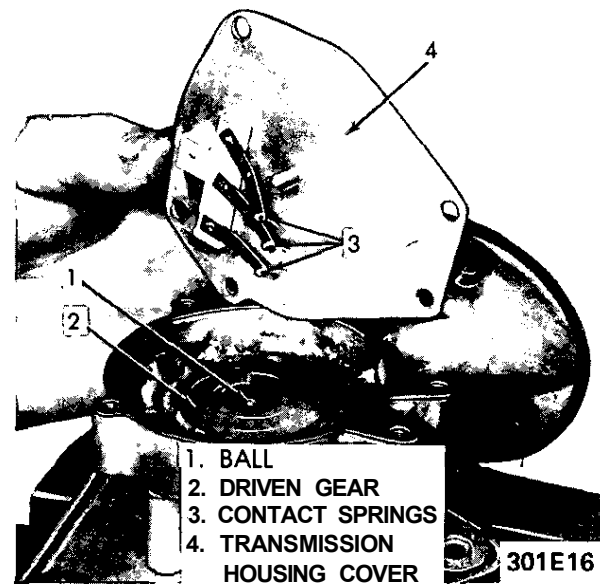


Figure 1 E-I 6 Install Transmission Housing Cover

**Cleaning and Inspection of Parts**

With the exception of electrical parts and bushings, clean all components in a cleaning solvent.

1. Check armature windings for ground, or open circuit. If a ground or open circuit is evident, the armature must be replaced. If the armature checks out, the commutator can be undercut.

2. Check brush springs. Spring pressure of new brushes should be 6.35 to 8.47 ounces. Spring pressure of worn brushes should be at least 3.5 ounces. In case of lower spring pressure, replace springs.

3. Check brushes for wear and replace, if necessary. Minimum brush length should be .24 inch.

4. Check driven gear for wear and replace if necessary.

5. Solder positive brush lead(s) to brush holder(s). Hold brush lead with needle nose pliers to prevent solder from running up wire strands. See Figure 1E-17.

6. Install negative brush

7. Apply a small amount of grease to end of armature shaft. Lightly oil armature shaft.

8. Insert brush springs and brushes into brush holders. Slide armature into housing, taking care not to damage brushes.

**Assembly of Wiper Motor**

1. Fill transmission (driven gear) housing with 1/8 inch layer of grease meeting GM Specification 02383.

2. Install driven gear into housing

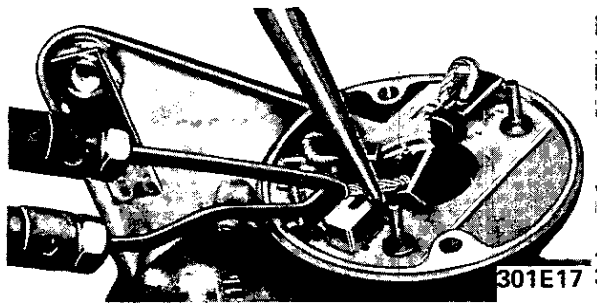


Figure 1 E-1 7 Solder Positive Brush Lead to Brush Holder

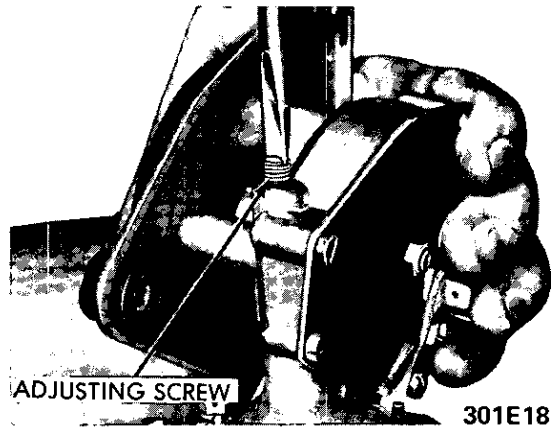


Figure 1 E-1 8 Adjusting Armature End Play

9. Install motor housing over armature so that large drain hole on housing is facing downward when motor assembly is installed in car. Insert angle brackets into motor housing and tighten attaching screws. Be sure to reseal angle brackets to motor housing after retaining screws are tightened.

10. Connect assembled motor with an ammeter and adjust end play of armature shaft and drive gear. To do so, turn in the respective adjusting screw until the current consumption increases. Then back off adjusting screw 1/2 turn. Secure driven gear adjusting screw with lock nut and armature adjusting screw with paint. See Figures 1E-18 and 1E-19.

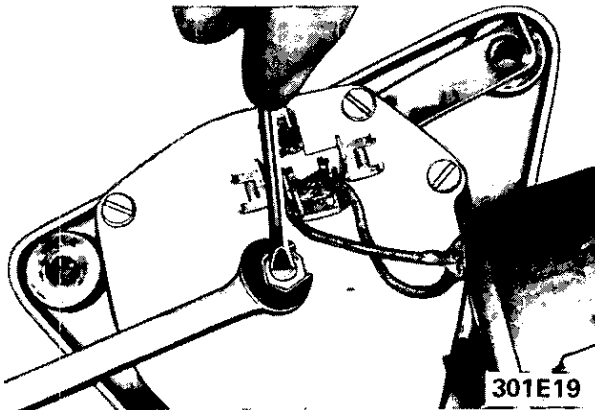


Figure 1E-19 Adjusting Driven Gear End Play

### Installation

1. Connect wiper motor electrical connector to motor.
2. Place wiper motor in position on cowl and secure. Torque attaching nuts 14 to 17 in.lbs.
3. Place crank arm on motor drive shaft and torque nut as follows: Bosch and SWF, 70 to 87 in.lbs. and Siemens, 122 to 139 in.lbs.

4. Check the position of the windshield wiper blades for proper position after the crank arm is attached. See Figure 1E-3 for the proper distance the blades should be from the windshield molding in the park position.

**SPECIFICATIONS**

**GENERAL SPECIFICATIONS**

Rated Voltage .....	12 VDC
Test Voltage .....	13 VDC
Current Draw (Amps)	
No Load	
Low Speed .....	1.5
High Speed .....	2.2
Locked	
Low Speed .....	16
High Speed .....	17
Minimum Commutator Diameter .....	.86 in.
Brush Spring Pressure	
New Brush .....	6.35 to 8.47 oz.
Used Brush .....	3.5 oz. minimum
Minimum Brush Length .....	24 in.

The windshield wiper motor instead of field coils has a permanent magnet (oxide magnet). This motor design is sturdier and consumes less current.

**TORQUE SPECIFICATIONS**

Crank Arm to Motor Drive Shaft .....	70 to 87 in.lbs.
per Motor to Cowl .....	14 to 17 in.lbs.