

MODEL 645-E STEWART-WARNER ELECTRIC WINDSHIELD WIPER SERVICE INSTRUCTIONS

General Operation

The Model 645-E Stewart-Warner Electric Windshield Wiper has two speeds. The first "on" position of wiper switch is high speed, and the second "on" position is low speed. The low speed is intended for use in light rain or snow, when car is being driven at low or medium speed. The car ignition must be turned on before the wiper will operate, as the wiper is connected through the ignition switch. Power is transmitted from the electric motor to the wiper arms by means of a worm gear, fibre driven gear, crank, linkage and the transmissions to which the wiper arms are attached.

When the wiper switch is turned off, the motor continues to operate until the blades are parked at the bottom of their stroke. When turned off, the wiper automatically goes into high speed to finish the stroke to the parked position. Parking is accomplished by the automatic parking mechanism inside the drive unit, which conducts current to the motor until the blades are parked. The parking mechanism declutches from the motor simultaneously with cutting off current from motor, allowing motor to coast to a stop.

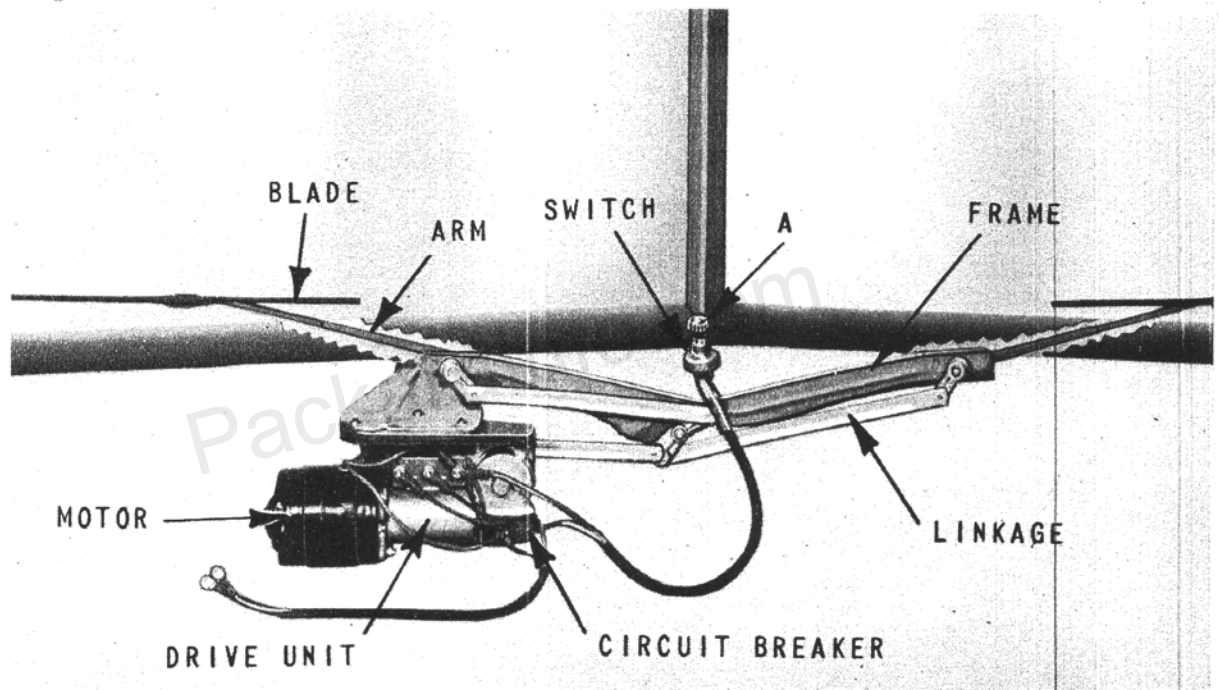


Figure 1 Complete Windshield Wiper

HOW TO SERVICE ELECTRICAL SYSTEM

A. What To Do If Wiper Does Not Change Speeds When Switch Is Turned From First "ON" Position (High) To Second "ON" Position (Low), Or If Wiper Runs Excessively Fast.

1. Check for loose or broken connections of resistor (See Figure 13). These connections can usually be checked without removing wiper from car.
2. If resistor connections are O.K., disconnect four wires leading to on and off switch and connect *new* switch and cable assembly to wiper (See Wiring Diagram, Figure 17). Then test to see if wiper changes from "high" to "low" speed when *new* switch is turned from first to second "on" position.
3. If trouble is not found in switch, then resistor is burned out and must be replaced. Entire wiper assembly must be removed from car to replace the resistor. (See instructions for removing wiper and replacing resistor on following pages.)

HOW TO SERVICE ELECTRICAL SYSTEM (Continued)**B. What To Do If Wiper Motor Runs When Switch Is On, But Wiper Crank ("D", Figure 5) Does Not Operate.**

1. Remove entire wiper from car, disconnect motor from drive unit housing, and remove all parts inside drive unit. (See instructions for removing wiper and replacing motor, etc., on following pages.)
2. Examine motor drive shaft, springs, and drive clutch for defects, and replace defective parts. Make sure that arm ("D", Figure 10) on drive clutch is not worn and swings freely on its pivot. Also examine ears of clutch member ("A", Figure 2) attached to coil assembly.
3. Test coil by connecting one terminal of regular 6-volt storage battery to case of coil ("B", Figure 2) and other battery terminal to coil terminal onto which wire is soldered ("C", Figure 2). Clutch member ("A", Figure 2) of coil should be drawn down to position shown by dotted lines Figure 2 when this is done. Hold coil assembly in position shown in Figure 2, with cross pin of clutch member in slot "D", when making this test. If clutch member does not move, replace entire coil, shaft and contacts assembly.

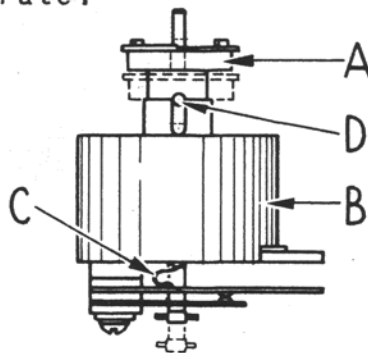


Figure 2 Coil, Shaft and Contacts Assembly

4. If above test reveals no trouble, see that contacts inside drive unit housing are clean, and that terminals of connecting leaf springs on end of coil are clean and are not bent out of position. These springs are normally parallel with coil face (See Figure 2).
5. After steps 1 to 4 above have been taken and trouble is still not located, check for stripped drive or driven gear. If drive gear is stripped, the housing, drive gear, resistor and breaker assembly must be replaced. If driven gear is defective, the bracket, driven gear and crank assembly must be replaced. (See instructions for replacing these assemblies on following pages.)

C. What To Do If Wiper Motor Does Not Run At All When Switch Is On.

1. Turn on both car ignition switch and wiper switch.
2. Check all wire terminals to make sure that connections are tight.
3. Check circuit breaker by shorting across terminals "B" and "C", Figure 6. If wiper operates when this is done, the trouble is in the circuit breaker and it must be replaced. (See "How to Replace Circuit Breaker", Page 3.)
4. Connect new switch and cable assembly to wiper (See Wiring Diagram, Figure 17) and test. If wiper operates, switch and cable assembly originally on car must be replaced.
5. If motor still does not operate, test motor by connecting both red and green motor lead wires to one terminal of 6-volt storage battery, and brown lead to other battery terminal. If motor does not run, replace with new unit (See "How to Replace Motor, etc.", Page 4).
If motor operates, check for dead spots in motor. To do this, detach motor from housing. Place screwdriver in slot in motor drive shaft and, while motor is connected to battery, allow drive shaft to revolve very slowly until it has made at least one complete revolution. If a dead spot is found, a new motor must be installed.

HOW TO MAKE REPLACEMENTS

In order to replace any of the wiper parts located under the cowl (except wiring), it is advisable to remove the entire wiper from car. This is done as explained below.

How To Remove Entire Wiper From Car

1. Pull off control switch knob on panel of car ("A", Figure 1) and remove switch mounting nut.
2. Disconnect two wires "A" and "B", Figure 17.
3. Remove wiper arms by taking out slotted head nuts (See Figure 16).
4. Remove octagon nut (See Figure 3) and lift off fibre washer, spacer and rubber gasket.

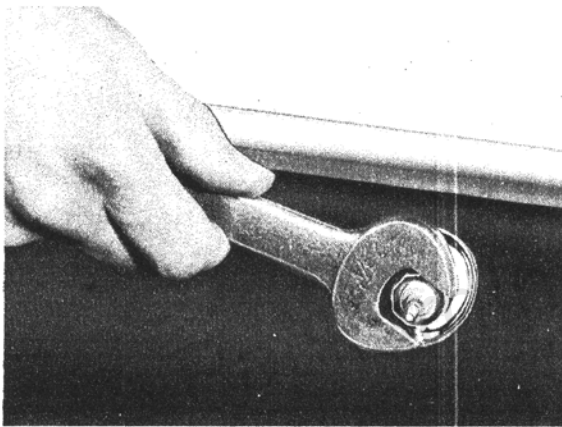


Figure 3 Removing Octagon Nut on Top of Cowl

5. Remove nut holding unit to mounting stud underneath cowl (See Figure 4). This allows all of wiper parts underneath cowl to be removed from car as an assembly, providing nothing else, such as glove compartment, radio or heater, is in the way.

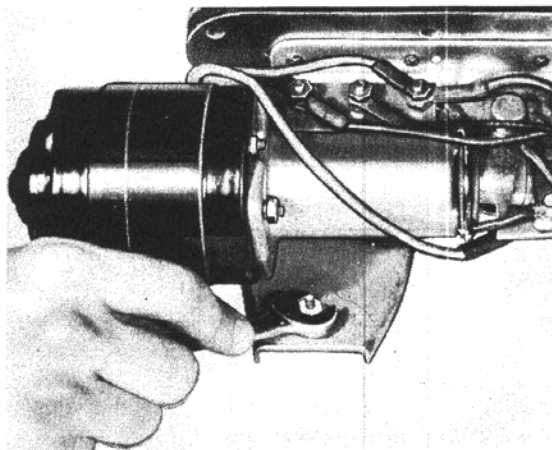


Figure 4 Removing Mounting Nut Underneath Cowl

How To Replace Linkage And Wiper Arm Shafts Assembly

(GUIDE NO. 13 - PARTS LIST FORM 18-12-BV)

1. Remove the small retaining rings and washers at A, B, C and D, Figure 5. This allows entire linkage and wiper arm shafts to be removed from frame.
2. To replace, slip assembly into position and install washers and retaining rings. CAUTION: Be sure small oilless bushing is pressed into link at "D", Figure 5.

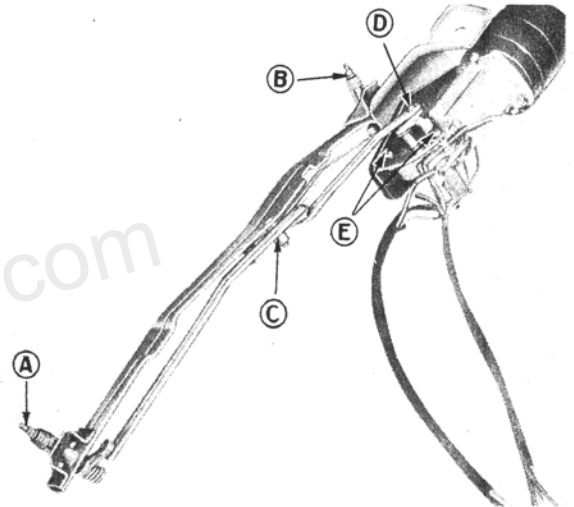


Figure 5 Wiper Parts Used Underneath Cowl (Assembled)

How To Replace Circuit Breaker

(GUIDE NO. 44 - PARTS LIST FORM 18-12-BV)

1. Disconnect wires at C, D and E, Fig. 17.
2. Unsolder short wire ("A", Figure 6) from circuit breaker at "B", Figure 6.
3. Remove nut as shown in Figure 6.

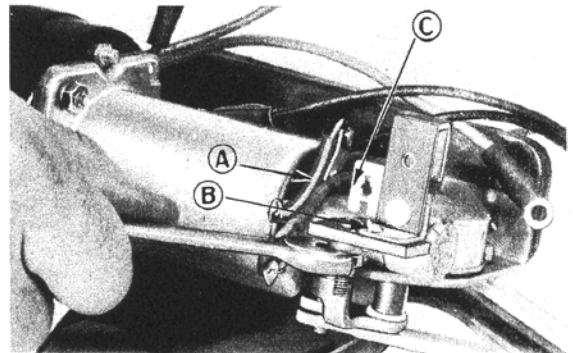


Figure 6 Removing Circuit Breaker

4. Install new circuit breaker by reversing procedure described above.

HOW TO MAKE REPLACEMENTS (Continued)

How To Replace Motor Or Any Parts Inside Drive Unit Assembly

(GUIDE NO. 31 - PARTS LIST FORM 18-12-BV)

1. Disconnect three motor wires.
2. Remove two nuts and washers holding motor to housing (See Figure 7). This allows all parts inside housing to be removed. Coil may fit rather tight in housing, but can readily be removed by pulling on shaft (See Figure 9).

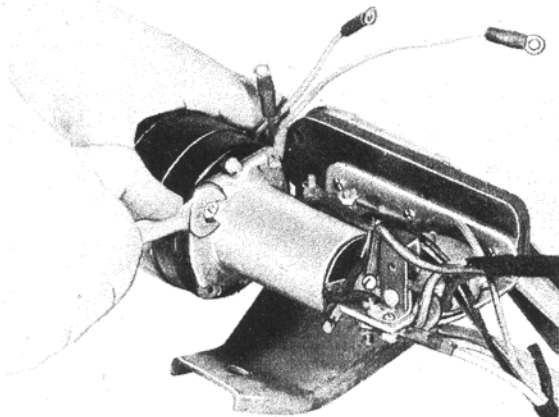


Figure 7 Removing Motor

TO ASSEMBLE

3. Place housing in upright position. Hold steady with vise.
4. Place fibre contact pin in hole in bottom of housing. Use long nosed pliers as shown in Figure 8.

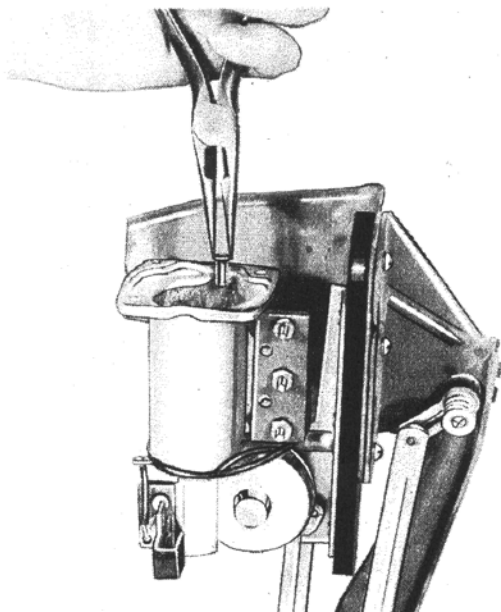


Figure 8 Installing Fibre Contact Pin

5. Place coil, shaft and contacts assembly in housing (See Figure 9).

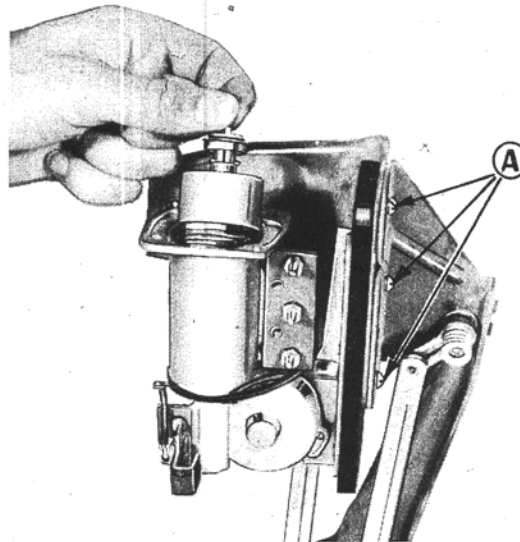


Figure 9 Installing Coil, Shaft and Contacts Assembly

6. Place gasket ("A", Figure 10) on housing.
7. Place bearing and drive clutch assembly over shaft with ears ("B", Figure 10) in line with holes in housing ("C", Figure 10) for motor mounting studs.

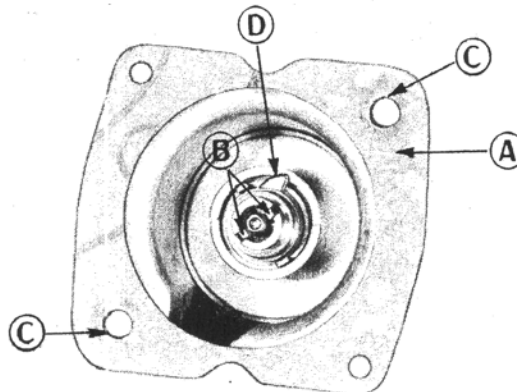


Figure 10 Top View of Housing with Small Drive Clutch in Place

8. Place small spring ("A", Figure 12) on drive clutch.
9. Place large spring ("B", Figure 12) inside housing.
10. Place cup ("A", Figure 11) over motor drive shaft and fasten in place with small retaining ring.
11. Turn motor drive shaft until slots in shaft ("B", Figure 11) line up with mounting studs ("C", Figure 11).

HOW TO MAKE REPLACEMENTS (Continued)

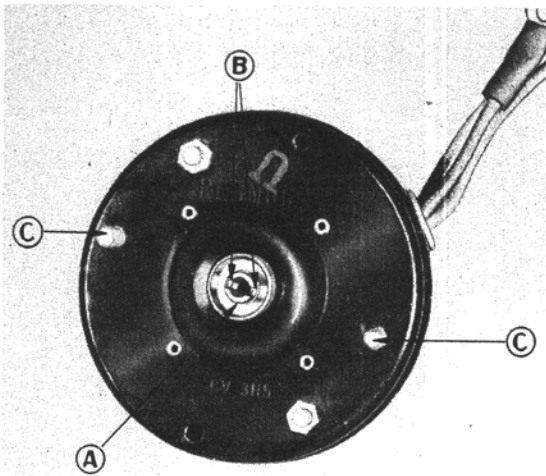


Figure 11 End View of Motor with Cup Installed on Drive Shaft

12. Place motor (with wires in position shown in Figure 12) carefully on housing with studs through holes. Be sure that slots in drive shaft mesh properly with ears on drive clutch, and motor seats snugly against gasket. Fasten with two lock washers and nuts and tighten securely.

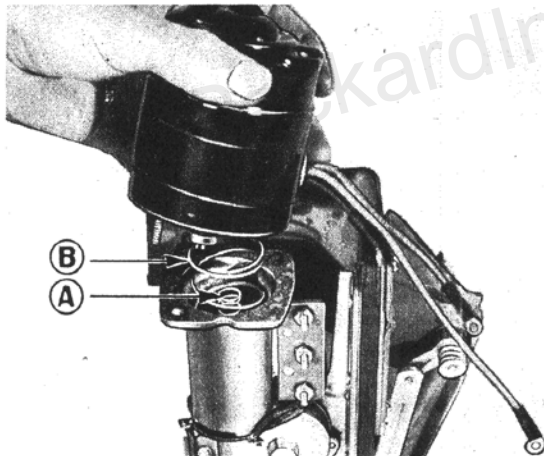


Figure 12 Placing Motor on Housing (Note Position of Motor Wires)

How To Replace Resistor

(GUIDE NO. 43 - PARTS LIST FORM 18-12-BV)

1. Remove entire drive unit from bracket by taking out two screws ("E", Figure 5).
2. Unsolder resistor lead wires at "A" and "B", Figure 13.
3. Solder new resistor into place.
4. Attach drive unit to bracket with two screws and lock washers ("E", Figure 5). Be sure small washer ("C", Figure 13) is over driven gear shaft and gasket ("D", Figure 13) is in place.

How To Replace Housing, Drive Gear, Resistor & Breaker Assembly

(GUIDE NO. 41 - PARTS LIST FORM 18-12-BV)

1. Disconnect wiring.
2. Remove motor and drive unit inside parts (See "How to Replace Motor, etc." on page 4).
3. Remove two screws and lock washers ("E", Figure 5).
4. Attach new housing, drive gear, resistor and breaker assembly to bracket and driven gear assembly with two screws and lock washers ("E", Figure 5). Be sure small washer ("C", Figure 13) is over driven gear shaft and gasket ("D", Figure 13) is in place.
5. Assemble motor and drive unit inside parts to housing (See "How to Replace Motor, etc." on page 4).

How To Replace Bracket, Driven Gear and Crank Assembly

(GUIDE NO. 30 - PARTS LIST FORM 18-12-BV)

1. Remove small retaining ring and washer ("D", Figure 5).
2. Remove three screws and lock washers ("A", Figure 9), allowing entire drive unit and bracket to be removed from frame.
3. Remove two screws and lock washers ("E", Figure 5).
4. Install new driven gear and bracket assembly by reversing procedure described above.

Be sure small washer ("C", Figure 13) is over driven gear shaft and gasket ("D", Figure 13) is in place.

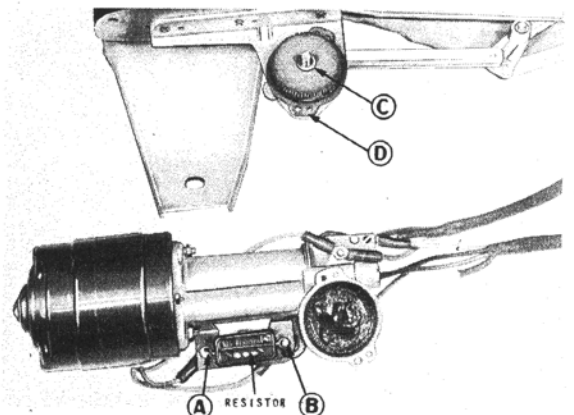


Figure 13 Drive Unit Disconnected from Bracket

WIPER SERVICE

HOW TO MAKE REPLACEMENTS (Continued)

How To Replace Blades

1. Remove blade by holding the wiper arm away from the glass with one hand and pulling end of the blade, with the other hand (See Figure 14). Care should be used not to hold arm any further away from glass than absolutely necessary so that the spring inside the wiper arm is not stretched out of shape.

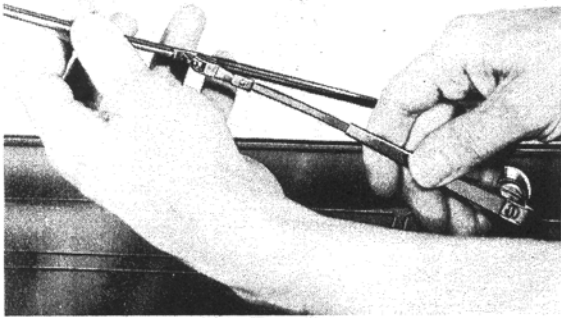


Figure 14 Removing Wiper Blade

2. To install wiper blade, hook onto arm as shown in Figure 15.

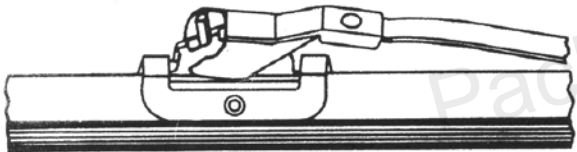


Figure 15 Correct Method of Hooking Wiper Arm to Blade

How To Install Entire Wiper Assembly On Car

1. Place wiper assembly under cowl, allowing wiper arm shafts to go through holes in cowl. Fasten to mounting stud as shown in Figure 4.
2. Replace rubber gaskets, spacers, fibre washers and octagon nuts on top of cowl (See Figure 3).
3. Connect electric wiring leading to car ignition system (See Figure 17) and install wiper switch on instrument panel.
4. Turn on both car ignition switch and wiper switch to make sure wiper operates. Be sure wiper is connected to dead side of car ignition switch.
5. Install wiper arms and blades (See Figures 15 and 16). Adjust blade parking (See "How to Make Blade Parking Adjustment" at right above).

How To Make Blade Parking Adjustment

1. Turn on car ignition and wiper switch. Then turn off wiper switch only, allowing blades to park before turning off car ignition.
2. Loosen wiper arm nut several turns (See Figure 16) and loosen arm on shaft.

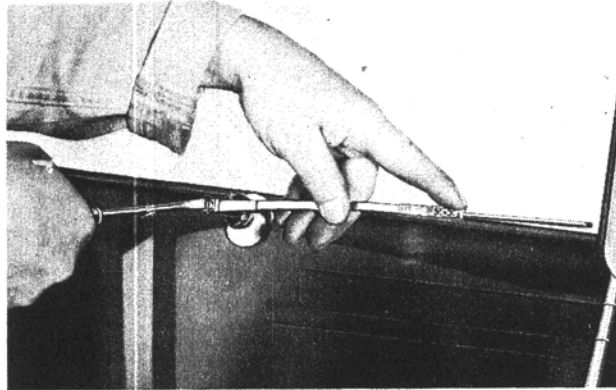


Figure 16 Holding Blade in Correct Parked Position while Tightening Slotted Head Nut

3. Move wiper blade to proper parking position and tighten slotted head nut securely.

When not in use, the wiper blades should be parked near the base of the windshield toward outside where they do not conflict with clear vision. However, blades should have some clearance at the bottom of the stroke to prevent pounding.

Lubrication

The Stewart-Warner Electric Windshield Wiper requires no periodic lubrication, as oilless bearings are used in the motor and transmissions; and the drive and driven gears are lubricated for life before leaving the factory.

However, after a year or more of use, a few drops of oil should be put on the felt washers at the various linkage bearings.

When replacing the Bracket, Driven Gear and Crank Assembly, place a small amount of 5% Graphite Grease on the fibre driven gear. Do not over-lubricate, causing grease to run out on passengers.

MODEL 645-E - WIRING DIAGRAM

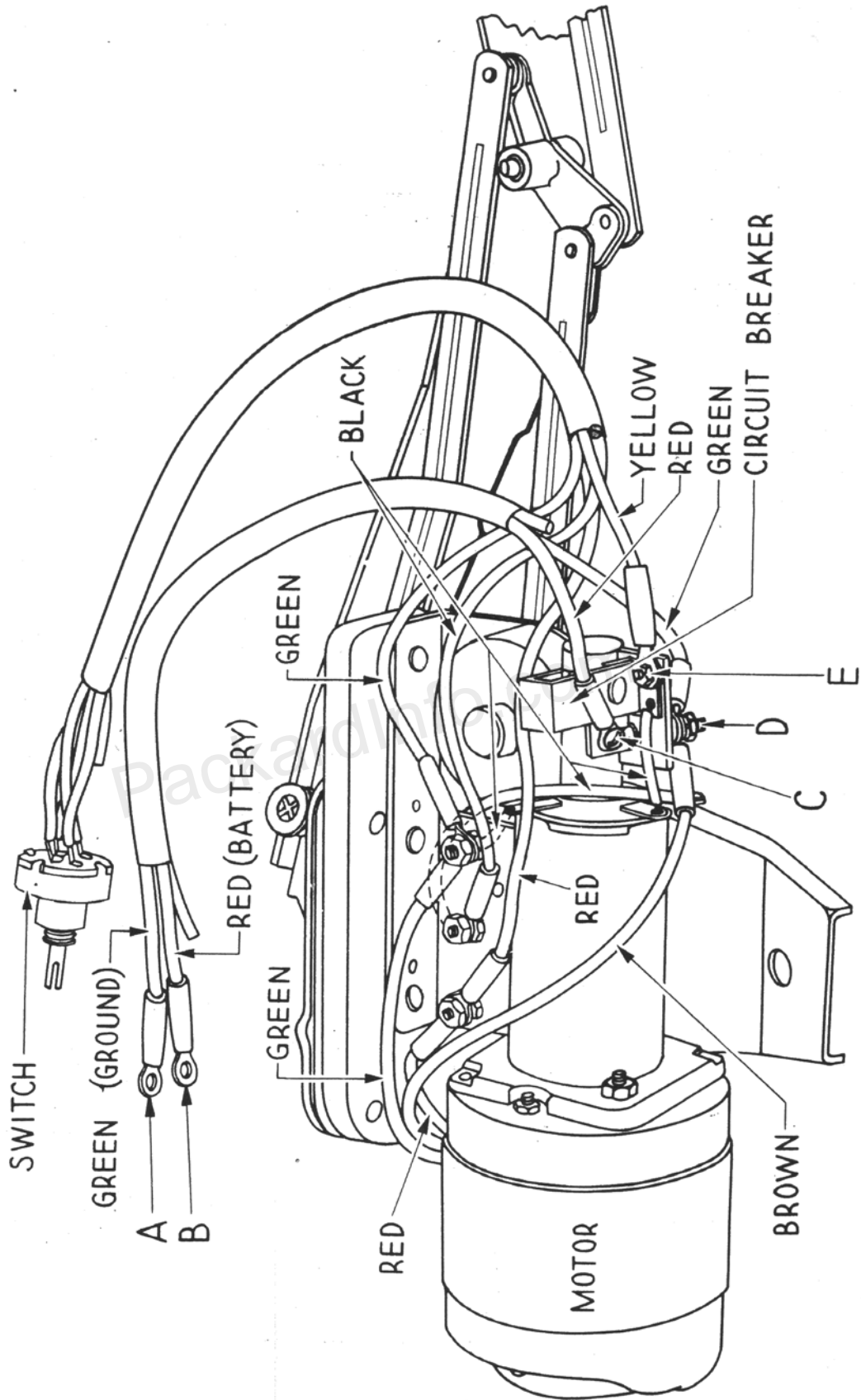


Figure 17 Wiring Diagram for Model 645-E Windshield Wiper

STEWART-WARNER CORPORATION, 1826 DIVERSEY PARKWAY, CHICAGO, ILLINOIS, U.S.A.

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