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1993-2005 GM Wiper Motor Crank Arm Calibration

Application:

GM Front Wiper Motors with hidden park, 1995 to 2005 on 40-1010, 1012, 1019, 1025 & 85-1012, 1025.

Problem:

Wipers stop in the wrong position.

Cause:

Improper installation and adjustment of the wiper motor crank arm.

Solution:

The parked position of the motor is very important. As shipped, the wiper motor is in the correct position. If the motor is run before installation, the motor must be placed in the inter-wipe position. The steps below describe how to do that and then how to install and correctly adjust the crank arm.

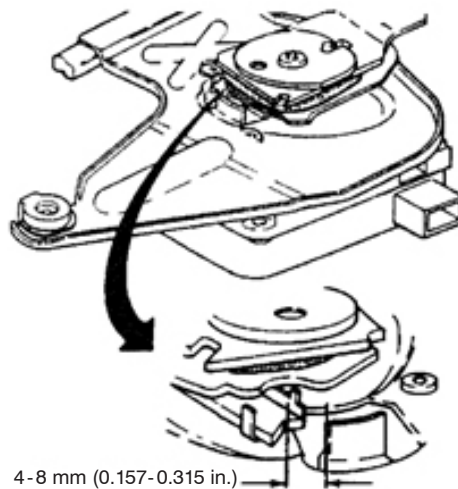
Removal Procedure

1. Disconnect the motor harness.
2. Remove the drive link from the wiper motor crank arm ball stud by loosening two screws or unsnapping plastic socket.
3. Remove wiper crank arm cover and seal (if applicable), save all hardware, cover and seal for reuse.
4. Loosen the wiper motor crank arm screw. While holding the crank arm, tap on the crank arm with a suitable tool until the arm loosens from the motor.
5. When the arm is loose remove the screw and crank arm from the motor shaft.
6. Remove the old motor.
7. Remove mounting bracket screws (3), remove mounting bracket.

Installation Procedure

1. Install mounting bracket onto the wiper motor. Tighten 3 mounting screws to 6-8 Nm (53-70 lb. in.).
2. Connect harness to replacement motor.
3. Turn the ignition switch to the ACCY position (do not start the vehicle).
4. Turn the wiper control switch to maximum PULSE or DELAY position. The motor should run.
5. Wait for the wiper motor to cycle (run) once and then stop.
6. When the wiper motor is stopped (in the inner-wipe position), turn **ignition switch** to OFF.

7. Gently place the crank arm assembly on the wiper motor shaft. Do not apply any downward pressure. **IMPORTANT:** The crank arm assembly must rotate freely on the “stationary” wiper motor shaft during the next step.
8. Rotate the crank arm assembly on the stationary wiper motor shaft until the depressed park actuator arm is 4-8 mm (0.157 – 0.315 in) away from the metal tab on the wiper motor bracket (see graphic below). **NOTE:** Hold motor shaft firmly in position, DO NOT allow the motor shaft to rotate during installation of the crank arm.
9. Install the wiper motor crank arm screw and tighten to 14–17 Nm. (124-150 lb. in.).
10. Check the gap between the wiper arm and tab, if the gap is not 4-8 mm (0.157-0.315 in) remove the crank arm and repeat the crank arm installation procedure.
11. When the gap is correct, install motor assembly, then install the drive link onto the crank arm.
12. Install drive link (refer to removal above). If retaining screws are used, tighten to 5 Nm. (44 lb. in.).
13. Complete installation per service manual.



Note:

This instruction is supplied for installation information and is not an authorization for repair.

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40-1032L: Determining GM Vehicles with Moisture Sensitive Wipers

Application:

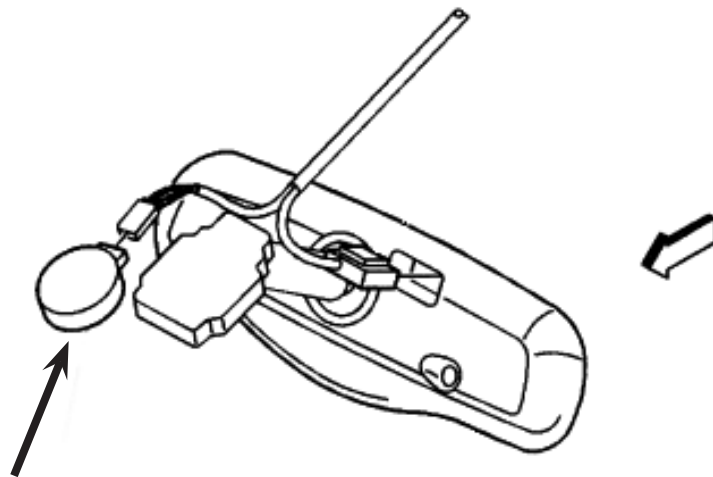
2002-2003 Chevy S10 Trailblazer, GMC S15 Envoy, Oldsmobile Bravada
2003-2004 Isuzu Ascender

Problem:

How to determine if the vehicle is equipped with a moisture sensitive wiper motor.

Solution:

Vehicles equipped with this feature have a rain sensor permanently mounted to the inside of the windshield. The sensor is located next to the rear view mirror.



Moisture Sensor

Moisture Sensitive Wipers: How They Work

The moisture sensor monitors moisture accumulation on the windshield and provides an input to the windshield wiper motor module. The windshield wiper motor module will provide the correct wiper speed accordingly.

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Grounding Wiper Motor Corrects Parking and Other Problems

Application: All vehicles with electric wiper motors

Problem: Motor will not park, will not shut off, parks in middle of windshield, or motor will not run.

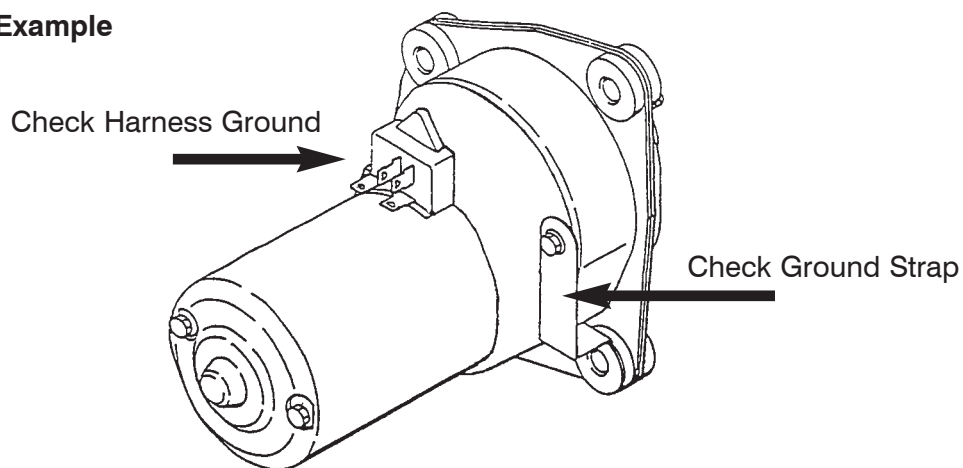
Cause: Resistance in ground path to motor.

Solution: Connect a ground strap from engine block to the motor case. If necessary scrape some paint off motor to insure a good connection.

If motor operates, check wiring harness ground, terminal ground lug or ground strap if equipped for good connection. Also check for paint on motor bosses where the mounting bracket is fastened.

If motor still fails to operate correctly, check switch and the circuit.

Example



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ProTech Bulletin Summary: Motors

Before replacing any motor, the cause of original unit failure must be determined and corrected. Installing a replacement unit without correcting the problem will lead to early failure. Always refer to the vehicle service manual for specific installation procedures and specifications. The ProTech bulletins listed below cover topics that should be done BEFORE, DURING or AFTER installation of the replacement unit. They assist with part selection, describe typical problems and solutions, and provide installation help and service advice.

WIPER MOTORS

Before Installation:

PT 40-0002 Do not run motor before installed
PT 40-0005 40-158 park problem caused by defective pulseboard

During Installation:

PT 40-0001 Faulty ground causes park problems
PT 40-0008 Replacement unit solves water intrusion problem; vehicle checks

After Installation:

PT 40-0003 Bench Test for 40-169: test motor operation off vehicle
PT 40-0004 Bench Test for 40-158, 159, 192, 1003, 1004
PT 40-0007 Bench Test for 40-190, 191
PT 40-0009 Bench Test 40-267, 297, 299

WINDOW LIFT MOTORS

Before Installation:

PT 42-0002 Ford picture guide

After Installation:

PT 42-0001 Bench Test for 2-wire window lift motors
PT 42-0003 Window Lift switch test
PT 42-0004 Weatherstripping and regulator binding cause poor performance
PT 42-0005 Noisy operation on cable-type regulators may not be caused by motor

TRANSFER CASE MOTORS

Before Installation:

PT 48-0001 Protect replacement unit from water intrusion

After Installation:

PT 48-0002 Ford units require transfer of sensor wiring and pins

CARDONE Technical Service develops ProTech bulletins that are intended to help the installer avoid common installation and service errors. The information presented is derived from our own experience and product knowledge gained from component analysis and research. Following these tips will ensure the best possible performance and service life of the replacement unit.

Please note that these bulletins are provided for your technical information only and are not authorization for repair.

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Protecting GM Wiper Motors from Water Intrusion

Application:

All wiper motors

Problem:

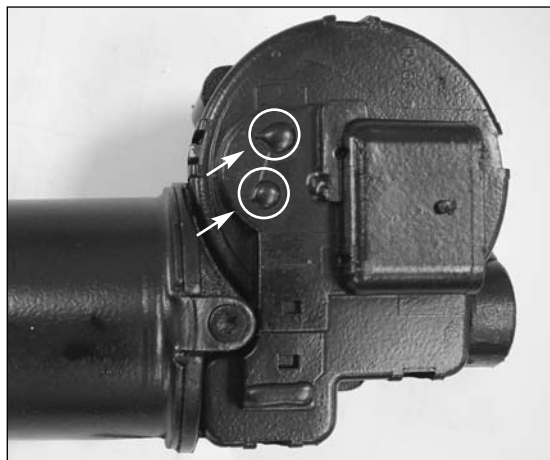
Wiper motors with and without integrated electronic pulse board not working properly or at all.

Cause:

Wiper motor and/or electronic components may have failed due to water intrusion.

Solution:

To protect the replacement wiper motor and pulse board, be sure water does not drain on wiper motor assembly. Remove any debris that might block or restrict the flow of drain water to the left or right fender well areas. Be sure to also check for proper operation of control switch and associated wiring.



CARDONE Upgrade:

To prevent water intrusion, our replacement units are re-engineered to overcome original design flaws. Vent holes that allow water entry are blocked, therefore protecting the motor & its electronic components.

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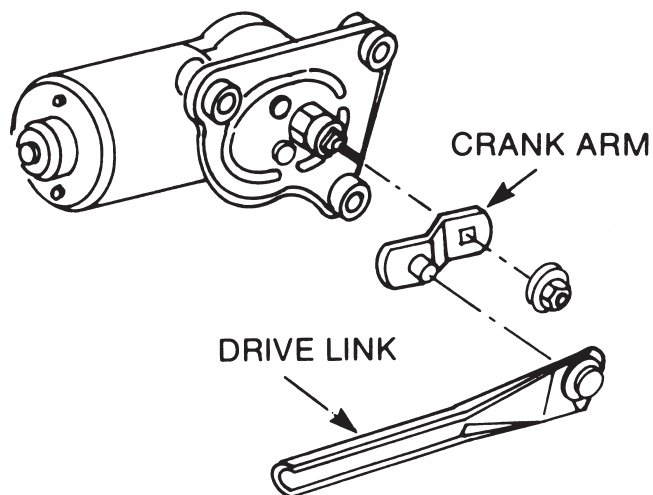
Operating Wiper Motor Before Installation Causes Problems

Application: All Electric Wiper Motors.

Problem: Replacement wiper motor parks in wrong position.

Cause: Power was applied to the unit before installation moving it off park position.

Solution: Remove linkage from installed unit, operate motor on high speed for 5 seconds, then switch to park position. Reinstall linkage so wiper arms are in park position. Operate unit and test for proper operation. If not correct, test motor ground (see Pro Tech PT 40-0001), also refer to vehicle service manual for specific installation procedures.



Note: CARDONE units are supplied in the correct park position.

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Wiper Motor Bench Test 40-120, 121, 140, 154, 155

Application:

Vehicles using 40-120, 121, 140, 154, 155

Problem:

Replacement motor is not functioning properly or has the same problem as the original unit.

Solution:

The following test is performed without the original wiring or switch. If the motor operates correctly, inspect and test the vehicle wiring and switch. These tests will help you correctly diagnose the problem and avoid unnecessary cost and labor.

Bench Test:

Minimum power supply requirements: 12 volts DC, 5 amps. See motor connector graphic for pin locations.

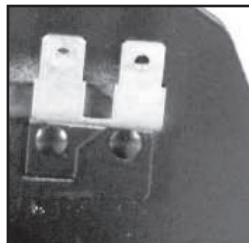
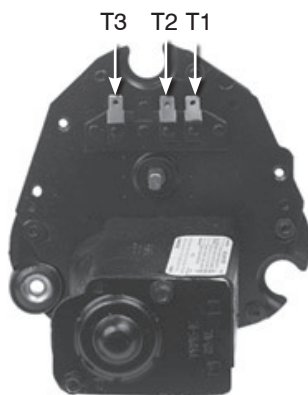
IMPORTANT: Connect power supply ground (-12 VDC) to motor ground strap for all tests. Be certain the connection is good.

High Speed Test

1. Connect power supply +12 VDC to pin T1.
2. Connect power supply ground (-12 VDC) to T2. Motor runs high speed.

Low Speed and Park Test

1. Connect power supply +12 volts to pin T1.
2. Connect power supply ground (-12 VDC) to T2 and T3. Motor runs low speed.
3. Disconnect ground to T2, motor parks.



Some units may be supplied with a double-lugged terminal T1. (Either lug can be used for test).

Note:

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Wiper Motor Bench Test for 40-158, 159, 192, 1003 & 1004

Applications:

GM vehicles using Wiper Motor part numbers 40-158, 159, 192, 1003, 1004.

Problem:

Determining if the Wiper Motor and Pulse Board are good.

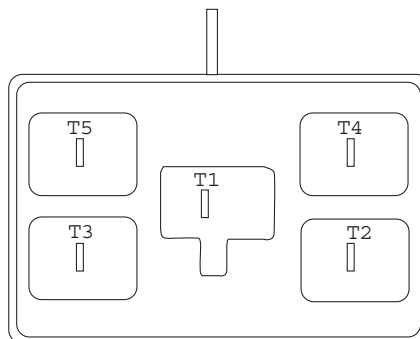
Solution:

Follow the bench test procedure below to test the motor and Pulse Board.

- Step 1** Using a jumper wire, connect battery ground to both motor housing and terminal T1. Do not disconnect for all steps.
- Step 2** Using a jumper wire, connect +12 volts to terminal T4. DO NOT DISCONNECT FOR ALL STEPS.
- Step 3** Connect +12 volts also to T2. Motor runs slow-speed.
- Step 4** Using another jumper wire, connect +12 volts to T3 (While still connected to T2). Motor runs high-speed.
- Step 5** Disconnect T3 (Back to low speed), disconnect T2, motor runs for three rotations then parks.

View of connector end with locking tab at top.

T1 through T5 represent connector spade terminal positions.



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Wiper Motor Bench Test for 40-169

Application:

GM vehicles using wiper motor 40-169.

Problem:

Determining if the wiper motor and pulse board are good.

Solution:

Follow the bench test procedure below to test the motor and pulseboard.

Step 1 Connect battery ground to motor housing and terminal T1.
Do not disconnect for all steps.

Step 2 Connect +12 volts (15 amp source minimum) to terminal T2.
Motor runs low speed.

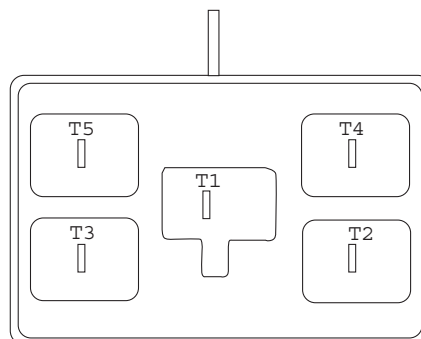
Step 3 Disconnect +12 volts from terminal T2 and connect to terminal T3.
Motor runs high speed.

NOTE: If motor does not run in step 1 or 2 check pulseboard contacts. If contacts are good replace the pulseboard.

Step 4 Disconnect +12 volts from terminal T3 and connect to terminal T4.
Using a jumper wire connect terminals T2 and T5. Motor runs and parks.

View of connector end with locking tab at top.

T1 through T5 represent connector spade terminal positions.



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Wiper Motor Bench Test for 40-190 and 40-191

Application:

GM vehicles using wiper motor 40-190 and 191.

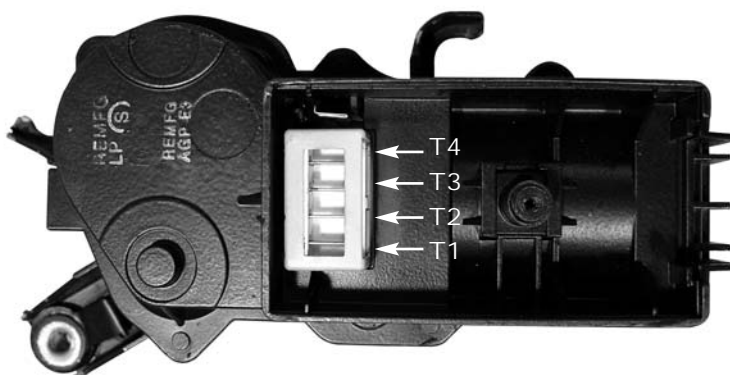
Problem:

Determining if wiper motor is functioning.

Cause:

Follow the bench test procedure below to test motor.

- Test set up: Power source must provide 12 volts DC, 15 amp minimum.
Battery ground must be connected to the motor housing for all tests.
Disconnect motor from vehicle wiring for all tests.
- Low Speed: Connect +12 volts to terminal T2. Motor runs in low speed.
- High speed: Connect +12 volts to terminal T1. Motor runs in high speed.
- Park: Connect +12 volts to terminal T4. Connect a jumper wire to terminal T2 and T3. Motor runs, parks and stops.



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Wiper Motor Bench Test for 40-299, 40-297 and 40-267

Application:

Ford Trucks using Wiper Motors 40-299, 40-297 and 40-267

Problem:

Determining if wiper motor is functioning.

Solution:

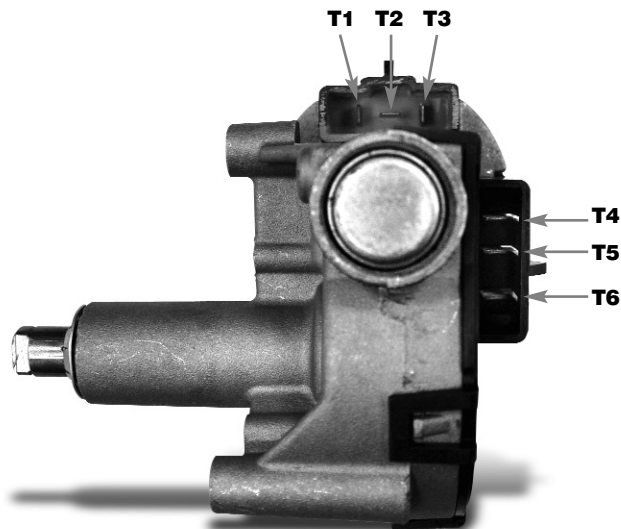
Follow the bench test procedure below to test motor. If motor runs during each test (Low Speed, High Speed and Park), the motor is functioning properly.

Note: Power source must provide 12 volts DC, 15 amp minimum.

Low Speed: Connect +12 volts to terminal T2. Connect battery negative (ground) to terminal T3. Motor runs clockwise (looking at motor shaft) in low speed.

High speed: Connect +12 volts to terminal T1. Connect power supply ground to terminal T1. Motor runs clockwise in high speed.

Park: Connect +12 volts to terminal T6. Connect battery negative to T3 and to T4. Connect a jumper wire between terminal T2 and T5. Motor runs, parks and stops.



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Wiper Motor Bench Test for 40-446

Application:

Vehicles using 40-446

Problem:

Determining if wiper motor is functioning correctly.

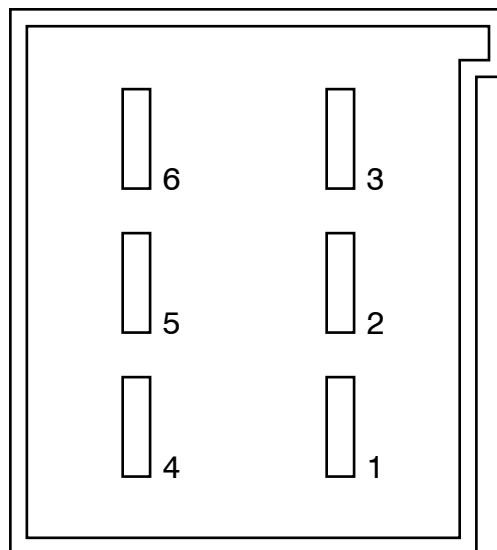
Solution:

The following test is performed off the vehicle without the original wiring or switch. If the motor operates correctly, the vehicle wiring and switch must be inspected and tested.

Bench Test:

Minimum power supply requirements: 12 volts DC, 5 amps. See motor connector graphic for pin locations

1. Connect power supply ground (-12 VDC) to pin 3 for all tests.
2. Connect power supply +12 VDC to pins 1 and 2. Motor will oscillate.
3. Disconnect voltage to pin 2. Motor will park.
4. Disconnect all wires, end of test.



Motor Connector

Note:

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Wiper Motor Bench Test for 40-10005

Application:

Vehicles using 40-10005

Problem:

Determining if wiper motor is functioning correctly.

Solution:

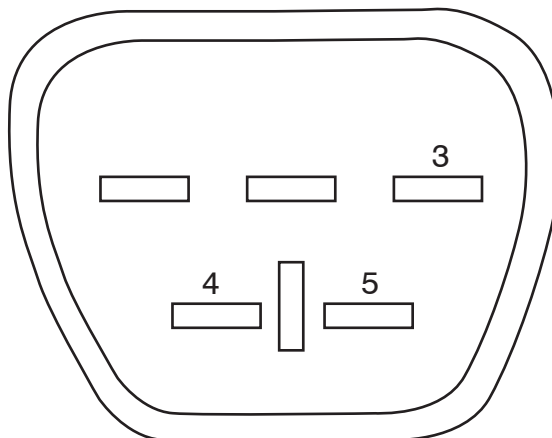
The following test is performed off the vehicle without the original wiring or switch. If the motor operates correctly, the vehicle wiring and switch must be inspected and tested for a problem.

Bench Test:

Minimum power supply requirements: 12 volts DC, 15 amps. See motor connector graphic for pin locations.

1. Connect power supply ground (-12 VDC) to the motor body or pin 4. Leave connected for all tests.
2. Connect +12 VDC to pin 3, motor runs clockwise LOW speed. Motor runs until power is disconnected, then coasts to stop.
3. Remove power to pin 3.
4. Connect +12 VDC to pin 5, motor runs clockwise HIGH speed. Motor runs until power is disconnected, then coasts to stop.

NOTE: Park can only be tested on-car, refer to the vehicle service manual for test directions.



Motor Connector

Note:

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Wiper Motor Bench Test for 43-4318

Application:

Vehicles using 43-4318

Problem:

Determining if wiper motor is functioning correctly.

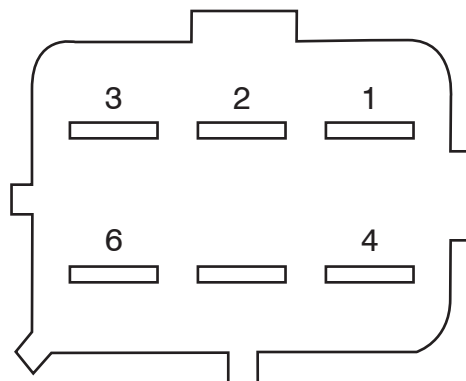
Solution:

The following test is performed off the vehicle without the original wiring or switch. If the motor operates correctly, the vehicle wiring and switch must be inspected and tested for a problem.

Bench Test:

Minimum power supply requirements: 12 volts DC, 15 amps. See motor connector graphic for pin locations.

1. Connect power supply ground (-12 VDC) to pin 6. Leave connected for all tests.
2. Connect +12 VDC to pin 4. Leave connected for all tests.
3. Connect ground (-12 VDC) to pin 3, motor runs LOW speed. Motor runs until ground to pin 3 is disconnected, then coasts to stop.
4. Remove ground to pin 3.
5. Connect -12 VDC to pin 1, motor runs clockwise HIGH speed. Motor runs until ground is disconnected, then coasts to stop.
6. Disconnect ground to pin 1.
7. Connect a jumper from pin 2 to pin 3, motor parks and comes to hard stop.
NOTE: If motor is already in the park position it will not run in step 7.
8. Test complete.



Motor Connector

Note:

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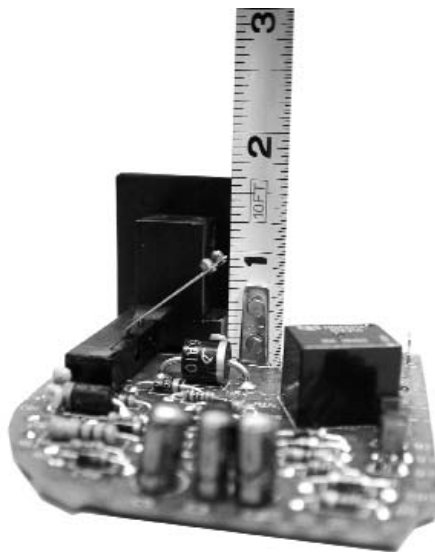
81-158PB Replacement Pulse Board Park Problem

Application: CARDONE Wiper Motor Pulse Board part number 81-158PB. See catalog for proper vehicle applications.

Problem: Wipers will not park after replacing Pulse Board.

Cause: Contact arms on Pulse Board may not be contacting Wiper Motor. Packing material or movement during shipping may have bent contacts.

Solution: Check position of contact arms before installation. Contacts should be approximately 1 inch (25 mm) above circuit board (see picture). Correct contact position ensures proper Wiper Motor parking function.

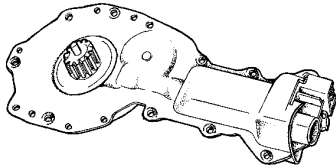


Note: Refer to PROTECH PT 40-0003 and PT 40-0004 for additional troubleshooting tests for Wiper Motors and Pulse Boards.

Window Lift Motors

Re-engineered to perform better than new

CARDONE's Motors coverage includes:



- Window Lift Gear Kits
- Window Lift Motors
- Wiper Motors

O.E. Gaskets - CARDONE, through extensive engineering research, has found that O.E. gaskets are often weak and are the cause of motor failure. CARDONE remanufactures all of its Window Lift Motors with a top quality gasket as a replacement for the O.E. gasket. The strength of the gasket ensures the unit will be protected in all situations. This saves the customer time and money from unnecessary repairs.



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