

SECTION : 501-16 Wipers and Washers

VEHICLE APPLICATION : 2008.0 Falcon

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SPECIFICATIONS

General Specifications

Description	Specification
Front	
Driver W/S wiper arm length	525mm
Passenger W/S wiper arm length	580mm
Driver W/S wiper blade length	600mm
Passenger W/S wiper blade length	500mm

Torque Specification

Description	Nm
W/S wiper pivot shaft nut (Driver and passenger)	19 - 24
W/S wiper motor bolts (H.J.K)	9 - 15
W/S wiper motor crank nut (L)	16 - 20
W/S wiper motor linkage bolts and nuts (ABCDE)	6.8 - 9.2
Windshield washer reservoir nut	5.2 - 7.2
Windshield washer reservoir bolts	6.8 - 9.2



DESCRIPTION AND OPERATION

Wiper and Washer - Front

The W/S wipers and washer system consists of the following:





- W/S wiper blade (x2)
- W/S wiper arm - Driver
- W/S wiper arm - Passenger
- W/S wiper motor
- W/S wiper linkage
- W/S wiper/washer switch
- Control through body electronic module (BEM)
- W/S washer reservoir
- W/S washer pumper
- W/S washer nozzle jet (x2)



DIAGNOSIS AND TESTING

Wipers and Washers

Refer to wiring diagrams section 501-16 for schematic and connector information.

Special Tools	
	Electrical Multimeter 3505 or equivalent BA / BF / FG
	Vehicle Communication Module (VCM) BA / BF / FG
	Integrated Diagnostic System/ Portable Diagnostic System (IDS/PDS) BA / BF / FG
	SABRE Electrical System Tester 010-00736 or equivalent BA / BF / FG

Principles of operation

The wiper system has four different operating modes: off mode, low-speed mode, high-speed mode, and speed sensitive interval mode.

In the off mode, there is no windshield wiper motor activity, and the windshield wiper motor is in the PARK position.

In the on mode, the windshield wiper motor is set to a low-speed setting. The wiper/washer switch provides voltage to the windshield wiper motor through the low-speed circuit. The windshield wiper motor provides ground through a dedicated ground circuit.

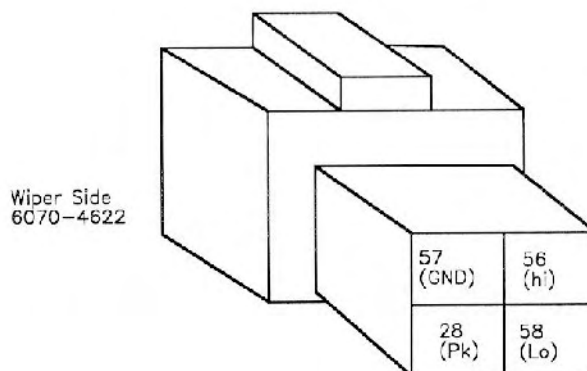
In the high-speed mode, the windshield wiper motor is set to a high-speed setting. The wiper/washer switch provides voltage to the windshield wiper motor through the high speed circuit. The windshield wiper motor provides ground through a dedicated ground circuit.

In the interval mode, the windshield wiper motor is set to a low-speed setting. The windshield wiper interval relay is activated at the beginning of each wipe and deactivated when the windshield wiper motor park switch reaches the run position. The interval relay is part of the wiper/washer electrical system.

When the wiper/washer switch is in the interval position, the windshield wipers will make a single sweep followed by a pause. The interval frequency can be varied by rotating the control. The frequency will auto adjust to the vehicle speed.

To engage the windshield wiper, pull the knob of the wiper/washer switch toward the steering wheel. When the wiper/washer switch is in the OFF or INT position, the windshield wipers and washers will run as long as the knob is depressed (up to 10 seconds). When the knob is released, the washer will stop immediately, but the windshield wipers will continue to run for two or three sweeps, then return to their previous set operation. Washer engagement does not affect the windshield wiper operation when the wiper/washer switch is in the LOW or HIGH position, but the washer will be deactivated if the knob is held for longer than 10 seconds.

Connector Circuit Reference



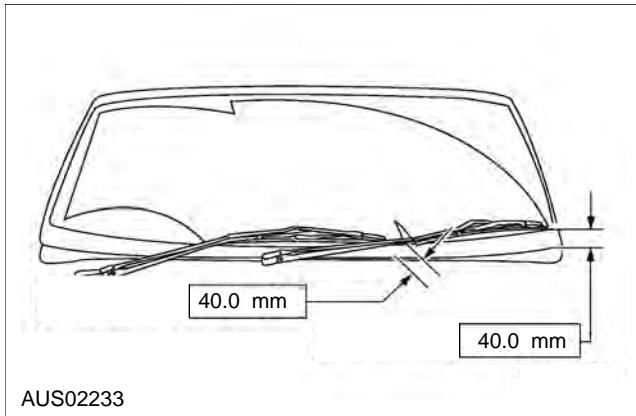
Pin Number(s)	Circuit Designation/Description
28	(BR) Park switch
58	(RD) Low speed
57	(BLK) Earth
56	(BL) High speed



GENERAL PROCEDURES

Windshield Wiper Blade and Pivot Arm Adjustment

1. Cycle and park the windshield wipers.
2. Verify that the RH and LH wiper blades are located at the specified position.



3. If not within specification, remove the windshield wiper pivot arms and reposition to the proper locations. For additional information, refer to Wiper Pivot Arm - Front procedure in this section.

Function	Wire Colour	Voltage Supply (V)
High Speed	Blue	+ 12V
	Black	0V (GRND)
Low Speed	Red	+ 12V
	Black	0V (GRND)
Park Signal	Brown	Check for continuity between the wires: - continuity will break (open circuit) when motor rotates into park position.
	Black	

3. The wiper park function is controlled by the body electronic module (BEM). The wiper motor generates a break-to-park signal via an internal switch mechanism. Testing of the park switch requires the connections to be made as per low speed function. With the motor running in low speed, continuity between the brown and black wire will be stopped briefly (go open circuit), once every revolution of the wiper motor output shaft (seen as one up and down wipe cycle on the screen).

Washer Hose Repair

1. Locate and verify the leaking washer hose.
2. Cut the hose cleanly and remove the damaged portion of the washer hose.
3. Install a washer hose adaptor between the cut ends of the hose.

NOTE: In difficult cases, replacement of the total hose may be required. For additional information, refer to Washer Hose procedure in this section.

Windscreen Wiper Motor Test

1. Using an equivalent vehicle power supply (12V DC), locate and disconnect the wiper motor loom plug from the vehicle electrical system.

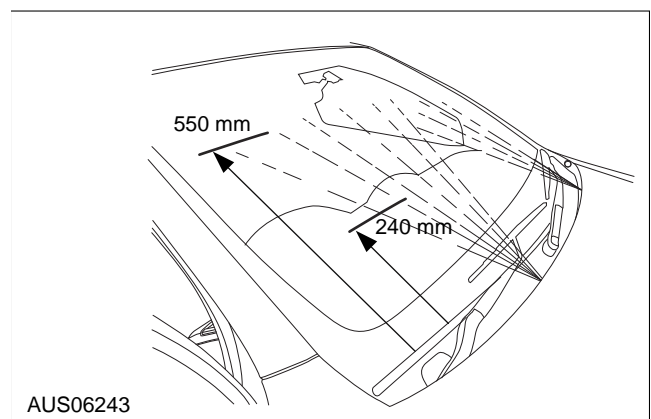
NOTE: The plug can be accessed in the engine bay. No removal of the windscreen wiper or vehicle components is required.

2. To check each wiper motor function, apply power to the appropriate plug terminal as described in the following table. Refer to Connector Circuit Reference - Wiper Motor Plug for terminal location.

Washer Jet Inspection and Adjustment

Inspection

1. Operate the washer jets and note the position of the water contact area.
2. Ensure that the contact area is no lower than 240mm or higher than 550mm above the top edge of the cowl grille.



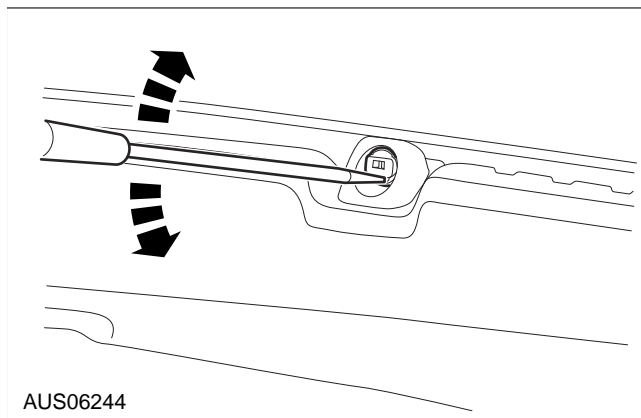
3. If the washer jet contact area is outside of this range, adjust to suit. See procedure below.



GENERAL PROCEDURES (Continued)

Adjustment

1. Insert a small flat blade screw driver into the nozzle.
2. Rotate the nozzle up and down to the desired position.



3. Re-inspect the washer aim to ensure the correct position.

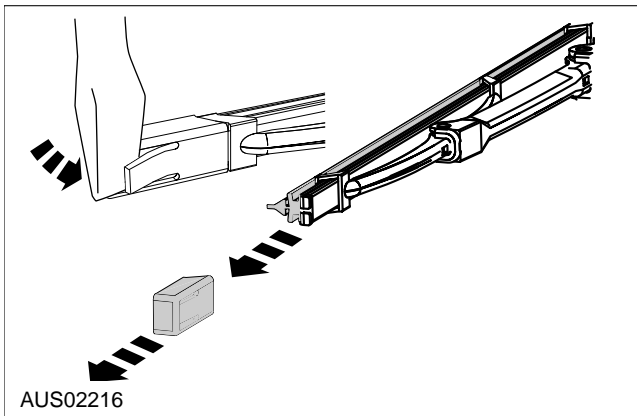


REMOVAL AND INSTALLATION

Windscreen Wiper Blade Insert

Removal

1. Lift (by the tip) the wiper arm away from the screen as far as it will go, it will be held in that position by spring tension.
2. Press to disengage the spring clip on the blade and pull the wiper blade assembly off the wiper arm.
3. Using a small screw driver, lift the retention lug and slide the cap off the refill. Discard the old refill components.



Installation

1. The replacement refill is supplied with one end cap and a small retaining clip fitted. Remove the small clip.
2. Carefully slide the end without the cap into the metal support ensuring that the refill passes through each metal claw.
3. Assemble the new end cap supplied with the refill onto the end of the refill ensuring that the retention lug on the end cap is securely located behind the two upturned ends of the metal rails.

NOTE: Do not reuse old end caps.

4. Refit the blade onto the arm ensuring the plastic locking clip snaps into the hole in the arm hook.

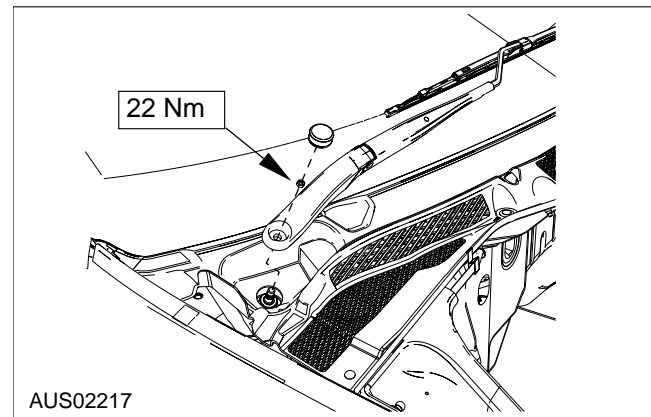
Windscreen Wiper Arm and Blade

Removal

1. Lift the plastic cover from the spindle end of the wiper arm.
2. Remove the nut attaching the wiper arm to the pivot spindle.
3. Prise the wiper arm from the serrated tapered seat on the spindle.
4. Cycle the wiper motor to correct park position.

Installation

1. Position the wiper arm on the spindle.
2. Tighten the attaching nut finger tight and rotate the arm to the correct position.



3. Tighten the attaching nut to the specified torque.
4. Replace the plastic cover.
5. Ensure the wiper arms are in the correct position. For additional information, refer Windshield Wiper Blade and Pivot Arm Adjustment procedure in this section.

Windscreen Wiper Motor and Linkage Assembly

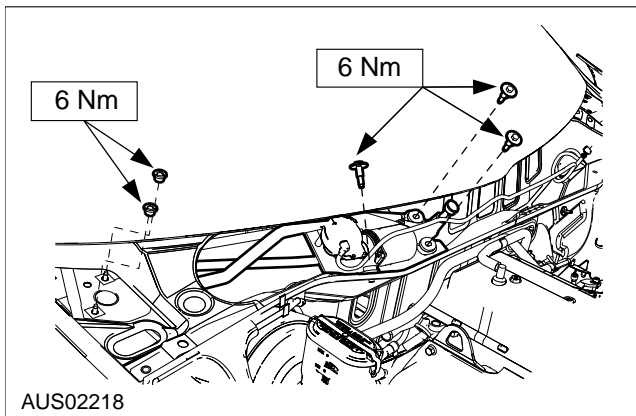
Removal

1. Park the windscreen wiper system.
2. Remove the wiper arms from the pivots. For additional information, refer to Windscreen Wiper Arm and Blade procedure in this section.
3. Remove the cowl panel grille. For additional information, refer to Section 501-02.
4. Remove the 3 bolts which hold the passenger pivot end of the assembly to the body.



REMOVAL AND INSTALLATION (Continued)

- Remove the 2 nuts which retain the driver's side pivot to the body. Push the pivot into the plenum.



- Disconnect the wiring from the wiper motor.
- Carefully withdraw the motor and linkage assembly towards the passenger side through the hole in the cowl area.
- Remove the components as necessary from the linkage.

Installation

- Ensure the linkage is in park position.
- Slide the motor and linkage assembly through the hole where the passenger pivot mounts, locate the driver's side pivot and hand start the nuts on the securing studs.
- Locate the 3 mounting screws at the passenger pivot mounting points.
- Tighten the 3 screws and 2 nuts.
- Connect the wiring to the wiper motor.
- Operate the motor to ensure park position.
- Install the cowl panel grille. For additional information, refer to Section 501-02.
- Install the wiper arms. For additional information, refer to Windscreen Wiper Arm and Blade procedure in this section.

Wiper Motor from the W/S Wiper Linkage Assembly

Removal

- Remove the windscreen wiper motor and linkage assembly. For additional information, refer to windscreen wiper motor and linkage assembly procedure in this section.
- Remove the link end from the wiper motor crank ball pin.

- Clamp the wiper motor and linkage assembly in a vice via the wiper motor crank.

NOTE: This is to ensure the wiper motor does not rotate during step 4.

- Loosen and remove the 3 wiper motor mounting bolts.
- Remove the wiper motor from the linkage.

Installation

- To install, reverse the removal procedure.

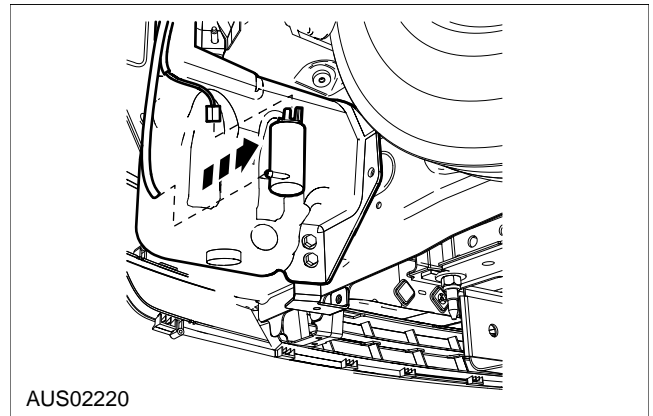
Washer Pump

Removal

- Remove the front left wheel. For additional information, refer to Section 204-04.
- Remove the front left fender splash shield. For additional information, refer to Section 501-02.

NOTE: To prevent spilling windshield washer fluid, drain the windshield washer reservoir before removal.

- Disconnect the washer pump electrical connection.
- Disconnect the washer hose from the washer pump.
- Remove the washer pump from the vehicle.



Installation

CAUTION: ⚠ Do not operate the windshield washer pump prior to filling the windshield reservoir.

- Dip the washer pump inlet into water and immediately insert the washer pump into the washer reservoir grommet.
- Dip the washer hose in water and immediately push washer hose (10mm) onto the washer pump outlet.
- Reconnect the electrical connector to the washer pump.



REMOVAL AND INSTALLATION (Continued)

4. Fill the windshield washer reservoir with clean water and Motorcraft R1-47 screen wash solution or equivalent.
5. Install the front left fender splash shield. For additional information, refer to Section 501-02.
6. Install the front left wheel. For additional information, refer to Section 204-04.

Windshield Washer Reservoir

Removal

1. Remove the front left wheel. For additional information, refer to Section 204-04.
2. Remove the front left fender splash shield. For additional information, refer to Section 501-02.

NOTE: To prevent spilling windshield washer fluid, drain the windshield washer reservoir before removal.

3. Disconnect the electrical connector from the washer pump.
4. Remove the washer cap from the reservoir so that the washer cap does not become obstructive at windshield washer reservoir removal stage.
5. Disconnect the washer hose from the washer pump.
6. Remove the windshield washer reservoir retaining bolts (x2) and nut.
7. Lower the windshield washer reservoir and remove from the vehicle.

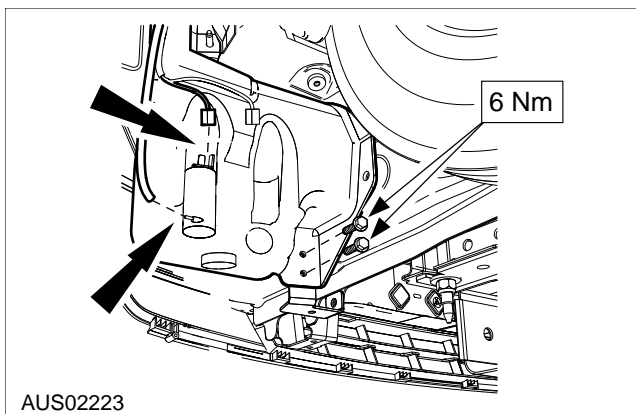
Installation

CAUTION:  Do not operate the windshield washer pump prior to filling the windshield washer reservoir.

1. Locate the windshield washer reservoir on the stud and install the windshield washer reservoir retaining nut.

NOTE: Do not tighten at this stage.

2. Fit the 2 self tapping bolts and tighten to 5 - 7 Nm.

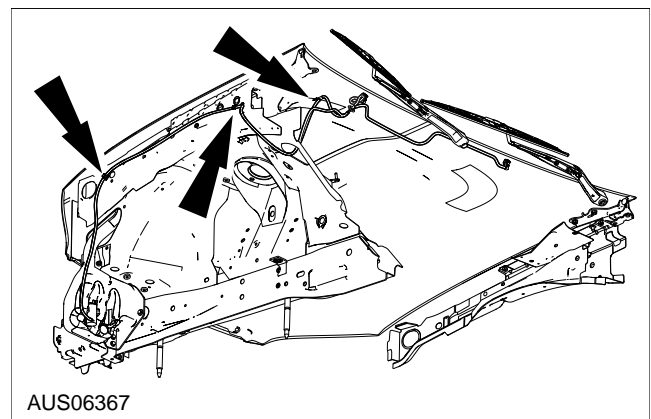


3. Tighten the windshield washer reservoir retaining nut to 5 - 7 Nm.
4. Dip the washer hose in water and immediately push hose (10mm) onto the washer pump outlet.
5. Connect the electrical connector to the washer pump.
6. Fit the washer cap to the reservoir.
7. Fill the windshield washer reservoir with clean water and Motorcraft R1-47 screen wash solution or equivalent.

Washer Hose

Removal and Installation

1. Follow the hose locations as shown in the figure below and unclip or pull off as necessary.



Windshield Wiper/Washer Switch

The above switch is a component of the steering column multifunction switch. To remove or install the switch the entire steering column multifunction switch must be removed or installed.

Please refer to Section 211-04 for additional information regarding installation and removal of the steering column multifunction switch.

