

SECTION 501-16 Wipers and Washers

VEHICLE APPLICATION: 2011.00 Focus

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SPECIFICATIONS**Settings for wiper arms**

	Degrees
Angle of wiper arms to windscreen, driver's side (LHD/RHD)	5 ±1
Angle of wiper arms to windscreen, passenger side (LHD/RHD)	4 ±1

Setting for rear wiper arm

	Degrees
Angle between the wiper arm and the rear window, wagon variant	5 ±1
Angle between the wiper arm and the rear window, 3-/5-door variant (not adjustable)	3 ±1

Torque Specifications

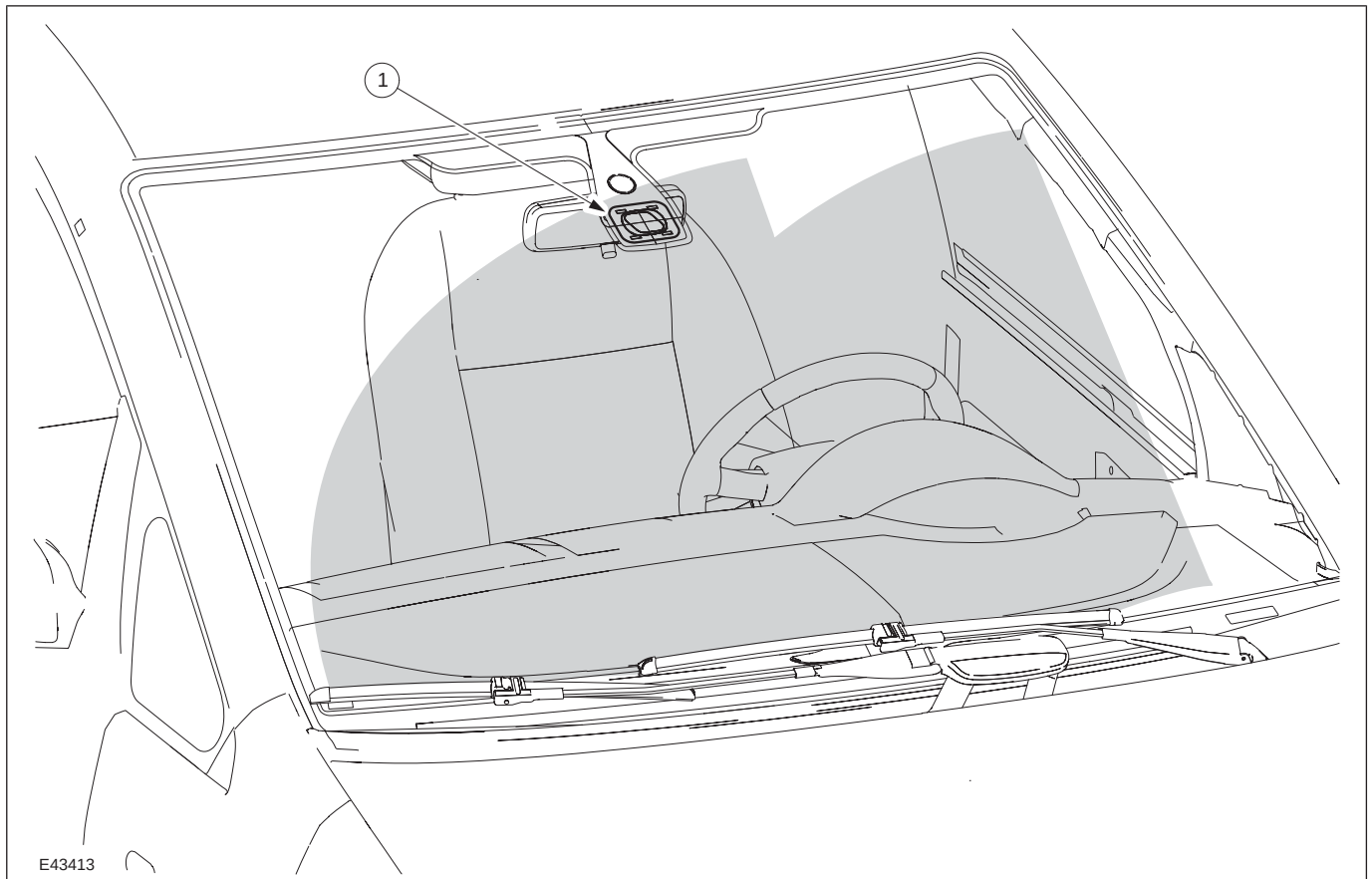
Description	Nm	lb-ft	lb-in
Rear window wiper motor bracket retaining bolts	7	-	62
Rear window wiper arm retaining nut	15	11	-
Nuts, windshield wiper arms	22	16	-
Bolts for windshield wiper motor with linkage	7	-	62
Front wiper motor retaining screws	9	-	80

DESCRIPTION AND OPERATION**Wipers and Washers****Rain sensor****CAUTIONS:**

-  **The automatic windshield wipers must be switched off before the vehicle is driven into a car wash.**
-  **If the windshield is iced up, the wipers may only be activated by the rain sensor after the windshield has been completely defrosted.**

NOTE: The rain sensor is an optical measuring instrument. Contamination such as oil, grease or dust impair its correct function. Before switching on the automatic windshield wipers, the windshield must be clean in the area of the rain sensor.

The rain sensor is built into a housing which is mounted behind the rear view mirror on the windshield.

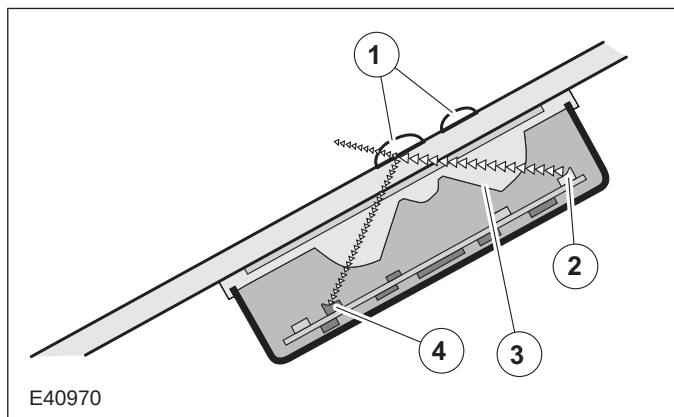


The rain sensor (1) consists of an opto-electronic measuring and evaluation circuit. The sensor can calculate the amount of precipitation falling on the windshield and request that the windshield wipers are switched on.

On the basis of the information provided by the rain sensor, the windshield wipers are then set to the required wipe speed by the generic electronic module (GEM).

DESCRIPTION AND OPERATION

Mode of operation of the rain sensor



Item	Description
1	Raindrop
2	LED
3	Lens
4	Photodiode

The rain sensor consists of three optical components:

- an LED
- a photodiode
- the lens

The photodiode emits an infrared light beam of known intensity; the emitted light passes through the lens and is reflected by the windshield.

The reflected light beam enters back through the lens and then reaches the photodiode. The corresponding value taken without moisture on the windshield is used as the reference value for the automatic calibration process.

Subsequent deviations from this value cause the windshield wipers to be switched on.

If rain lands on the windshield then the light reflected by the windshield has a lower intensity. This loss of intensity is registered by the photodiode and, proportionally to the loss of intensity, the module switches on the windshield wipers with the required wipe speed (in intermittent or continuous mode).

When the automatic windshield wipers are switched on (wiper switch set to intermittent mode) the rain sensor is switched on and performs an automatic calibration according to the current conditions at the windshield.

To perform the automatic calibration, the windshield wipers perform a single wipe regardless of whether the windshield is wet or dry.

If the windshield remains dry after this wipe then the windshield wipers stop until moisture is registered on the windshield above the sensor.

On vehicles built from 12/2005, automatic calibration only takes place if the wiper switch was not set to the rain sensing function before the ignition was switched on.

The sensitivity of the rain sensor can be changed by adjusting the control resistor for the intermittent mode of the windshield wipers.

- Adjusting ring position 1: high sensitivity
 - The wipers wipe even if only a small amount of water has been measured on the windshield.
- Adjusting ring position 6: low sensitivity:
 - The wipers only wipe if a large amount of water has been measured on the windshield.

Windshield wash/wipe system

Wiper functions

The windshield wash/wipe system will only operate if the ignition switch is in the position "I" or "II".

Five wash functions are available: "Off", "Flick-wipe", "Speed 1", "Speed 2" and "Intermittent" or "Automatic wipe" (depending on the vehicle specification).

In "Speed 1" or "Speed 2" mode, the wipers are operating continuously at either normal speed or fast speed.

When the intermittent wipe mode is switched on the windshield wipers operate at normal speed with the following wiper delays:

- Wiper delay 1: 1 second
- Wiper delay 2: 3.5 seconds
- Wiper delay 3: 6 seconds
- Wiper delay 4: 9.5 seconds
- Wiper delay 5: 15.5 seconds
- Wiper delay 6: 22 seconds

NOTE: In the event of a failure, or if the control resistor is not connected the default time for the wiper delay is 8 seconds.

When the windshield washer switch is operated washer fluid is sprayed onto the windshield. After a short delay designed to protect the wiper blades the wipers perform 2 or 3 wipes at low speed.

If when the windshield washer switch is activated the windshield wipers are switched off, then a

DESCRIPTION AND OPERATION

single wipe is performed 4 seconds after the wipers have returned to the home position after performing the 2 or 3 wipes.

If when the windshield washer switch is activated the wipers are in intermittent mode, and if the selected wiper delay time is longer than 6 seconds, then a single wipe is performed 6 seconds after the wipers have returned to the home position after performing the 2 or 3 wipes. If the selected delay time is less than 6 seconds then no post wipe is required.

The post wipe function on the windshield ensures that any water remaining on the windshield after washing is wiped away. It is only required if the wipers are switched off or they are set to intermittent mode.

Automatic wiper function

In vehicles built from 12/2005 without rain sensor, a speed-dependent wiper function is implemented in the GEM on the mid and high-end equipment versions.

When the windshield wipers are switched on, the GEM reduces the wiper speed by one setting if the vehicle is driven at walking speed or comes to a standstill.

When the vehicle speed is increased, the wiper speed automatically returns to the previous setting.

If the wiper lever is actuated during automatic function, the automatic wiper function is switched off and the wiper speed corresponds to the newly-selected setting.

Rear window wash/wipe system

The rear window wash/wipe system will only operate if the ignition switch is in the position "II".

The GEM changes the wiper delay time of the rear window wiper according to the switch setting of the windshield wipers.

If the wiper switch is in the "OFF" position, or in "intermittent" mode or the "automatic wipe" setting (no wiping or low speed wiping), then the wiper delay time for the rear window is 10 seconds.

If the wiper switch is in the "normal speed" position, "fast speed" position or the "automatic wipe" setting

(high speed wiping), then the wiper delay time for the rear window is 6 seconds.

If the switch for the rear window washer is pressed, then washer fluid is sprayed onto the rear window, and the wiper operates continuously at low speed. When the switch is released the rear window wiper performs another 2-3 wipes.

If the switch for the rear window washer fails while switched ON, or if it is continuously operated for more than 60 seconds, then the switch signal is ignored by the GEM, the wiper returns to the park position and a trouble code is stored for the switch.

If reverse gear is engaged and the windshield wiper switch is in the normal, high speed or automatic windshield wiper (wiping at high speed) position, the rear window wiper operates continuously until the gearshift lever is moved back to the neutral position.

If reverse gear is engaged and the windshield wiper switch is in the "intermittent mode" or "automatic windshield wiper" (no wiping or low speed) position, then the rear window wiper follows the movement of the windshield wipers. When the wipers leave the park position the rear window wiper also performs a wipe.

Headlamp washer system

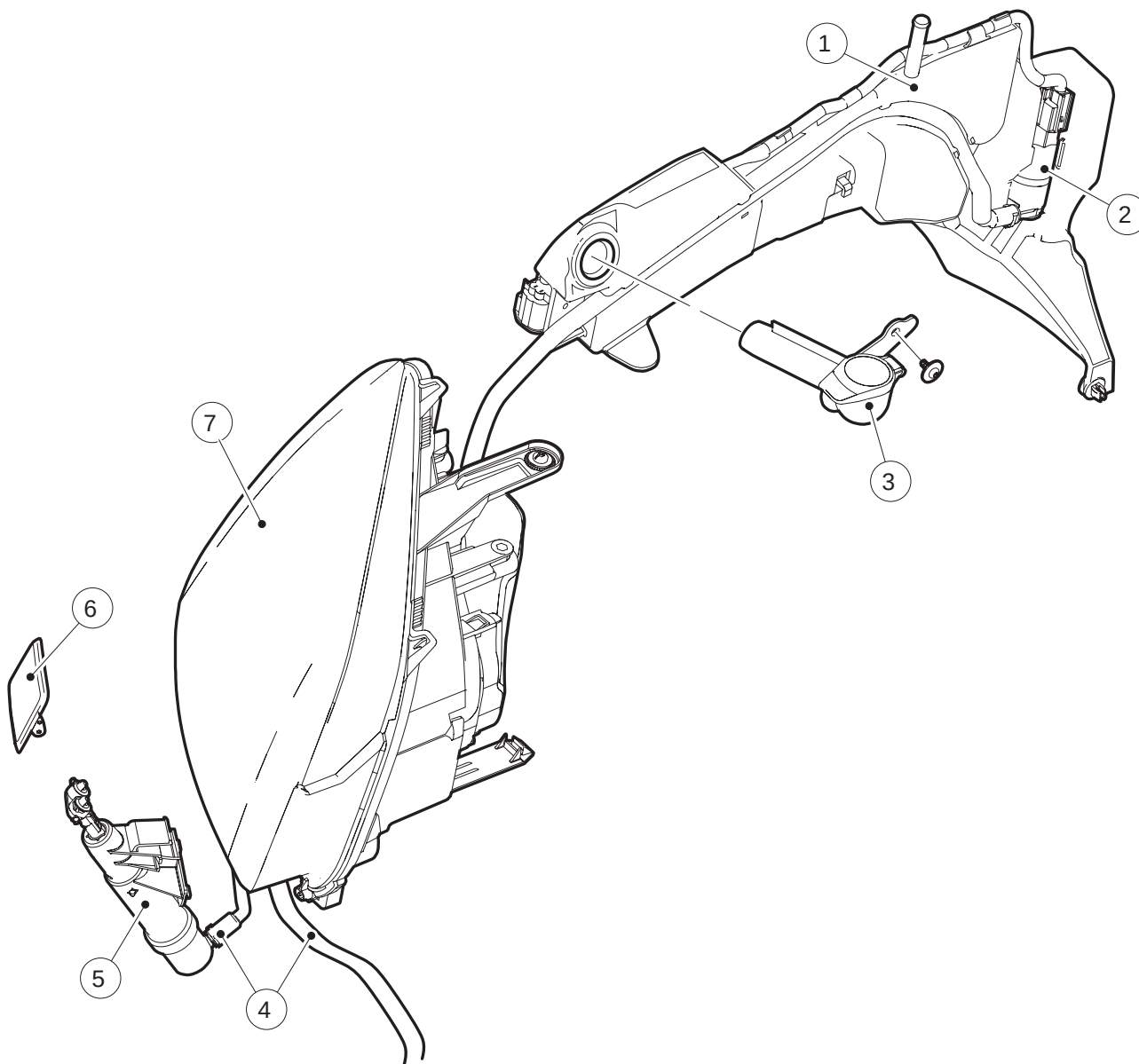
 **CAUTION: Do not operate the headlamp washer system for more than 10 seconds, and never with an empty fluid reservoir.**

The headlamp washer system operates when the windshield washers are actuated if, at the same time, the light switch is set to "low beam" or if the "autolamp" function has switched on the headlamps. The system is controlled electrically by the headlamp washer relay, which is actuated by the GEM.

In order to prevent excessive washer water consumption in vehicles built from 12/2005, the headlamp washer system is only activated on every fourth actuation of the windshield washer switch, provide that 10 minutes have not elapsed since the first actuation of the headlamp washer system. If the windshield washer switch is actuated again after 10 minutes, the headlamp washer system is activated and the timer is restarted.

DESCRIPTION AND OPERATION

Overview



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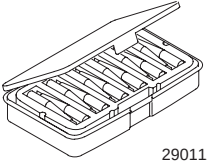
Item	Description
1	Windshield washer reservoir
2	Pump - headlamp washer system
3	Windshield washer reservoir filler neck
4	Hoses - headlamp washer system
5	Headlamp washer system nozzle
6	Cover, headlamp washer system nozzle
7	Headlamp

DIAGNOSIS AND TESTING

Wipers and Washers

Refer to Wiring Diagrams Section 501-16, for schematic and connector information.

Special Tool(s)

 29011A	Terminal Probe Kit 29-011A
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General Equipment

Digital multimeter
The Ford approved diagnostic tool

Description of operation

A diagnosis of the generic electronic module (GEM) can be performed with the Ford approved diagnostic tool. Furthermore, an integrated service mode enables testing of the input and output signals without the need for further tools. To enable activation of service mode:

- switch off the ignition,
- switch off all other electrical consumers,
- apply the handbrake,
- shift to neutral
- and close the doors.

Activating the service mode

Proceed as follows to activate the service mode:

- OPERATE the switch of the heated rear window and HOLD IT THERE
- Turn on the ignition.
- RELEASE the switch of the heated rear window

A signal sounds and the turn signal lamps come on to indicate that service mode has been successfully activated.

NOTE: If the alarm is activated (in vehicles fitted with an anti-theft alarm system), service mode cannot be activated.

Inputs

SWITCH the windshield wiper switch to the "OFF" position to test the input signals. The following is a list of the switch signals to be tested, in no particular order:

- Turn signals (right, left, hazard warning lights)
- Windshield wiper stage I
- Windshield wiper stage II
- Windshield washer system
- Rear window wiper
- Rear window washer system
- Doors open/closed
- Remote control for central locking with double locking
- Hood open/closed (in vehicles equipped with an anti-theft alarm system)
- Tailgate open/closed
- A/C request signal
- Heated windscreen (if fitted)
- Parking Brake
- Brake reservoir fluid level
- Speed control system
- Autolamps
- Low beam
- High beam
- Headlamp flasher
- Marker Lamps
- Reversing lamp
- Liftgate release
- Ignition switch, terminal 15 (turn key to 0 position, then turn key to II position.)

An acoustic signal sounds and the turn signal lamps flash to indicate receipt of each input signal by the generic electronic module.

Test the windshield wiper "intermittent mode" stage input signal (only vehicles with adjustable intermittent mode)

The windshield wiper switch must be switched to "intermittent mode" in order to test the input signal. The delay times of the input signals can then be tested by operating the rotary switch. Each change of the rotary switch position is indicated by an acoustic signal and illumination of the turn signals.

Output signals

SWITCH the wiper switch to the "intermittent" position to test the output signals. PRESSING the heated rear window switch activates the output signals in the following order:

- a. Turn Indicator Left Hand
- b. Turn Indicator Right Hand

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- c. High beam
- d. Low beam
- e. Windshield wiper stage I
- f. Windshield wiper stage II
- g. Heated rear window
- h. Heater blower motor
- i. Headlamp washer (vehicles with gas discharge headlamps)
- j. Electric booster heater (if fitted)
- k. Autolamps (if fitted)
- l. Alarm horn (vehicles with alarm system)
- m. Rear window wiper
- n. Rear heated window relay

When the heated rear window switch is pressed again, the test of the relevant signal is terminated. When the heated rear window switch is pressed once more, the test for the next signal in the list is started.

Ending the service mode

The GEM automatically ends service mode 20 seconds after the last input or at a driving speed of over 7 km/h. However, service mode can be manually ended at any time by proceeding as follows:

- OPERATE the switch of the heated rear window and HOLD IT THERE
- SWITCH OFF the ignition
- RELEASE the switch of the heated rear window

3 signals sound and the turn signal lamps illuminate to indicate that service mode has ended.

Reset service mode

If, after completion of service mode, some functions do not operate or do not operate properly, check the following functions:

- Instrument cluster illumination, side lamps and license plate lamp in autolamps mode
- Rear wiper
- Headlamp Washers
- Electric booster heater
- Active anti-theft sounder
- Heated windshield

If one or more of the listed functions is not OK, it's possible that the cause of the fault is due to not exiting service mode properly. To reactivate the functions correctly, perform the following steps:

1. SWITCH OFF the ignition

2. SWITCH OFF the switch for the windscreen wash/wipe system
3. OPERATE the switch of the heated rear window and HOLD IT THERE
4. Turn on the ignition.
5. RELEASE the heated rear window switch (an acoustic signal will sound if activation has been performed correctly)
6. SWITCH the windscreen wash/wipe switch to the "Intermittent wipe" position
7. OPERATE the heated rear window switch 6 times (the main beam headlamps switch on and off automatically)
8. SWITCH OFF the switch for the windscreen wash/wipe system
9. OPERATE the switch of the heated rear window and HOLD IT THERE
10. SWITCH OFF the ignition
11. RELEASE the heated rear window switch (three acoustic signals will sound if activation has been performed correctly)

After completion of the work, check all the functions.

Inspection and Checking

NOTE: The generic electronic module (GEM) forms part of the central junction box (CJB).

NOTE: If the generic electronic module (GEM) is changed, the new one must be reinitialized. For this purpose, the vehicle-specific data is read out of the module to be replaced using the Ford approved diagnostic tool and is transferred to the new module.

NOTE: Before reading out the vehicle-specific data, remake all the electrical connections to the module to be removed, so that communication between the module and the Ford approved diagnostic tool is ensured.

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical and electrical damage:

NOTE: Ensure correct engagement of the wiring harness connectors.

DIAGNOSIS AND TESTING**Visual Inspection Chart**

Mechanical	Electrical
• Wiper blade(s) • Wiper arm shaft • Washer reservoir • Hose(s) • Nozzles • Check the passenger-side wiper blade for residue-free wiping in the vicinity of the rain sensor. • Check the adhesive pad between the rain sensor and the windshield for trapped air. • Clean wax residues from the windshield in the vicinity of the rain sensor. • Check the windshield for damage/cracks in the vicinity of the rain sensor. • Check that the rain sensor retaining frame is correctly attached to the windshield.	• Fuse(s) • Connector • Wiring harness • Washer pump motor • Headlamp cleaning system pump • Headlamp cleaning system relay • Front/rear window wiper motor • Wash/wipe system switch • Central junction box (CJB) • Battery junction box (BJB)

3. Resolve any obvious causes or concerns found during the visual inspection before carrying out any further tests.
4. If the concern persists after the visual inspection, **PERFORM** a fault diagnosis on the generic electronic module (GEM) using the Ford approved diagnostic tool and **RESOLVE** the fault(s) displayed according to the fault description. **CHECK** the operation of the system.
5. On a vehicle without stored fault(s), continue according to the Symptom Chart and the corresponding symptom.
6. After checking or rectifying the fault(s) and finishing the work, **READ OUT** the fault memory in the generic electronic module (GEM) and **DELETE** any saved faults. After performing a road test and **CHECKING** the system, **READ OUT** the fault memories again.

Trouble Code Table - Generic Electronic Module (GEM)**Trouble Code Table - Generic Electronic Module (GEM)**

DTC	Description	Action
B1447	Circuit of windshield wiper limit switch (park position) faulty (short to ground)	GO to Pinpoint Test G.
B1614	Circuit of rear window wiper switch faulty (short to ground)	GO to Pinpoint Test C.
B2114	Circuit of windshield washer system switch faulty (short to ground)	GO to Pinpoint Test J.
B2115	Circuit of rear window washer system switch faulty (short to ground)	GO to Pinpoint Test J.
B2179	Circuit of front windshield wash/wipe system switch (Intermittent switch position) faulty (short to ground)	GO to Pinpoint Test F.

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DTC	Description	Action
B2180	Circuit of windshield wiper switch (switch position 2) faulty (short to ground)	GO to Pinpoint Test B.
B2181	Circuit of windshield wiper switch (switch position 3) faulty (short to ground)	GO to Pinpoint Test B.
B2258	Circuit of headlamp wash/wipe system relay faulty	GO to Pinpoint Test L.

Symptom Chart**Symptom Chart**

Symptom	Possible Sources	Action
Wipers inoperative	- Fuse - Circuit(s) - Wash/wipe system switch - Front wiper motor - Rear wiper motor - Central junction box (CJB) - Generic Electronic Module (GEM)	GO to Pinpoint Test A.
Brief wipe is inoperative (slow wipe OK)	Wash/wipe system switch	RENEW the wash/wipe system switch. CHECK the operation of the system.
The rear window wiper is inoperative when the windshield wiper is switched on and reverse gear engaged (normal wipe function OK).	- Circuit(s) - Generic Electronic Module (GEM)	CHECK the GEM using the Ford approved diagnostic tool, RENEW if necessary. CHECK the operation of the system. If the concern persists:
The windshield wiper runs constantly at a slow wipe speed with the ignition switched off.	Central junction box (CJB)	RENEW the central junction box (CJB). CHECK the operation of the system.
The windshield wiper runs continuously	- Circuit(s) - Wash/wipe system switch - Central junction box (CJB) - Generic Electronic Module (GEM)	GO to Pinpoint Test B.
The rear window wiper runs continuously	- Circuit(s) - Wash/wipe system switch - Central junction box (CJB) - Generic Electronic Module (GEM) - Rear wiper motor	GO to Pinpoint Test C.

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Symptom	Possible Sources	Action
Slow/fast wipe not working.	- Circuit(s) - Wash/wipe system switch - Front wiper motor - Central junction box (CJB) - Generic Electronic Module (GEM)	GO to Pinpoint Test D.
Intermittent wipe mode of windshield wiper inoperative, vehicles with and without rain sensor (fast/slow wipe OK)	- Circuit(s) - Wash/wipe system switch - Central junction box (CJB) - Generic Electronic Module (GEM) - Rain sensor	GO to Pinpoint Test E.
The windshield wiper runs continuously in intermittent mode	- Circuit(s) - Wash/wipe system switch - Central junction box (CJB) - Generic Electronic Module (GEM)	GO to Pinpoint Test F.
The windshield wiper motor does not return to the park position after being switched off	- Circuit(s) - Front wiper motor - Central junction box (CJB) - Generic Electronic Module (GEM)	GO to Pinpoint Test G.
The rear window wiper motor does not return to the park position after being switched off	- Fuse - Circuit(s) - Rear wiper motor - Central junction box (CJB) - Rear wiper relay	GO to Pinpoint Test H.
The front and rear wash/wipe functions are inoperative (wipe and intermittent function OK)	- Fuse - Circuit(s) - Wash/wipe system switch - Central junction box (CJB) - Generic Electronic Module (GEM)	GO to Pinpoint Test I.
Wash and wipe function (front or rear) in continuous operation for 60 seconds	Wash/wipe system switch	GO to Pinpoint Test J.
The front wash/wipe function is inoperative (rear wash/wipe function OK)	Wash/wipe system switch	RENEW the wash/wipe system switch. CHECK the operation of the system.
The rear wash/wipe function is inoperative (front wash/wipe function OK)	Wash/wipe system switch	RENEW the wash/wipe system switch. CHECK the operation of the system.
Washer system is inoperative	- Circuit(s) - Washer pump motor, front/rear - Central junction box (CJB)	GO to Pinpoint Test K.

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Symptom	Possible Sources	Action
• Headlamp washer system is inoperative	• Fuse • Circuit(s) • Central junction box (CJB) • Generic Electronic Module (GEM) • Battery junction box (BJB) • Headlamp cleaning system pump • Headlamp cleaning system relay	• GO to Pinpoint Test L.
• Headlamp washer system operates continuously	• Fuse • Circuit(s) • Headlamp cleaning system relay • Central junction box (CJB) • Generic Electronic Module (GEM) • Battery junction box (BJB)	• GO to Pinpoint Test M.
• Windshield washer nozzle heater is inoperative	• Circuit(s) • Left/right windshield washer nozzle heater.	• GO to Pinpoint Test N.

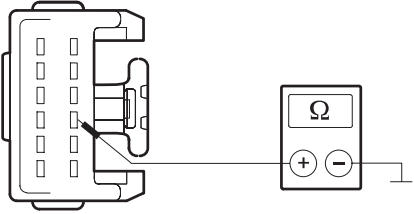
System Check

NOTE: Use a digital multimeter for all electrical measurements.

PINPOINT TEST A : WIPERS INOPERATIVE

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
A1: DETERMINE THE FAULT CONDITION	
	1 Ignition switch in position II.
	2 SWITCH ON windshield wiper.
	3 SWITCH ON rear window wiper. • Are both windshield wipers inoperative? → Yes GO to A2. → No - Windshield wipers inoperative: GO to A4. - Rear window wiper inoperative: GO to A12. - Rear window wiper not returning to the park position: GO to Pinpoint Test H.
A2: CHECK THE GROUND CONNECTION OF THE WASH/WIPE SYSTEM SWITCH FOR OPEN CIRCUIT	
	1 Ignition switch in position 0.
	2 Disconnect wash/wipe system switch from connector C441.

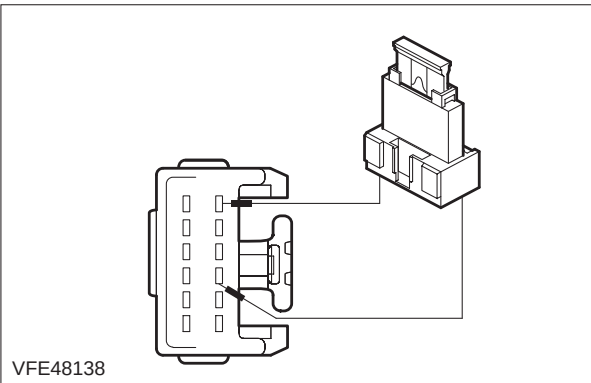
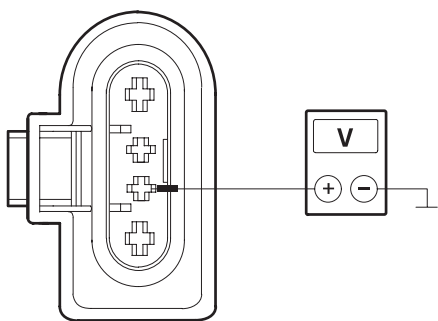
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE0038540	3 Measure resistance between wash/wipe system switch, connector C441, pin 3, circuit 91-KA12 (BK/WH), wiring harness side and ground. Is a resistance of less than 2 Ohms registered? → Yes RENEW the wash/wipe system switch. CHECK the operation of the system. If the concern is not rectified, INSTALL A NEW GEM. CHECK the operation of the system. → No LOCATE and RECTIFY the break in the circuit between the wash/wipe system switch and soldered connection S12 using the Wiring Diagrams. CHECK the operation of the system.
A3: DETERMINE THE EQUIPMENT LEVEL OF THE CENTRAL JUNCTION BOX (CJB).	
	1 Unfasten the CJB and fold it down. Is the location for connector C100 on the top of the CJB? → Yes GO to A4. → No GO to A6.
A4: CHECK FUSE F129 (20 A) (CJB)	
	1 Ignition switch in position 0.
	2 Disconnect Fuse F129 (20 A) (CJB).
	3 CHECK Fuse F129 (20 A) (CJB). Is the fuse OK? → Yes GO to A5. → No RENEW fuse F129 (20 A) (CJB) and CHECK the operation of the system. If the fuse blows again, LOCATE and RECTIFY the short to ground using the Wiring Diagrams. CHECK the operation of the system.
A5: CHECK THE VOLTAGE SUPPLY TO FUSE F129 (20 A) (CJB) FOR OPEN CIRCUIT	
	1 Connect Fuse F129 (20 A) (CJB).
	2 Ignition switch in position II.

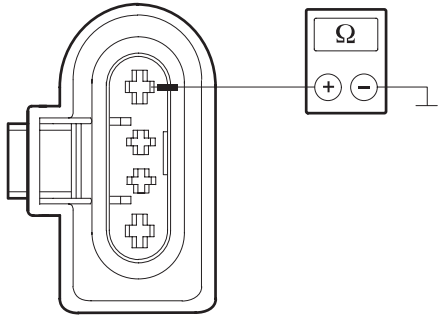
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	3 Measure the voltage between fuse F129 (20 A) (CJB) and ground. Does the meter display battery voltage? → Yes GO to A8. → No RENEW the CJB. CHECK the operation of the system.
A6: CHECK FUSE F50 (20 A) (CJB).	
	1 Ignition switch in position 0.
	2 Disconnect fuse F50 (20 A) (CJB).
	3 CHECK fuse F50 (20 A) (CJB). Is the fuse OK? → Yes GO to A7. → No RENEW fuse F50 (20 A) (CJB) and CHECK the operation of the system. If the fuse blows again, LOCATE and RECTIFY the short to ground using the Wiring Diagrams. CHECK the operation of the system.
A7: CHECK THE VOLTAGE SUPPLY TO FUSE F50 (20A) (CJB) FOR OPEN CIRCUIT	
	1 Connect fuse F50 (20 A) (CJB).
	2 Ignition switch in position II.
	3 Measure the voltage between fuse F50 (20 A) (CJB) and ground. Does the meter display battery voltage? → Yes GO to A8. → No RENEW the CJB. CHECK the operation of the system.
A8: CHECK THE WASH/WIPE SYSTEM SWITCH.	
	1 Ignition switch in position 0.
	2 Disconnect wash/wipe system switch from connector C441.

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TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE48138	3 Connect a fused jumper wire (10 A) at the wash/wipe system switch, connector C441, pin 6, circuit 91S-KA10 (BK/GN) and pin 3, circuit 91-KA12 (BK/WH), wiring harness side.
	4 Ignition switch in position II. Does the windshield wiper motor run continuously at slow wipe speed? → Yes RENEW the wash/wipe system switch. CHECK the operation of the system. → No GO to A9.
A9: CHECK VOLTAGE AT THE WINDSHIELD WIPER MOTOR	
NOTE: The fused jumper wire used in the previous test step is still connected to the wash/wipe system switch.	
	1 Ignition switch in position 0. 2 Disconnect windshield wiper motor from connector C848. 3 Ignition switch in position II.
 VFE0038543	4 Measure the voltage between the front windshield wiper motor, connector C848, pin 2, circuit 32-KA10 (WH/GN), wiring harness side and ground. Does the meter display battery voltage? → Yes GO to A10. → No INSTALL a new GEM. CHECK the operation of the system.
A10: CHECK THE GROUND CONNECTION OF THE FRONT WIPER MOTOR FOR OPEN CIRCUIT	
	1 Ignition switch in position 0.

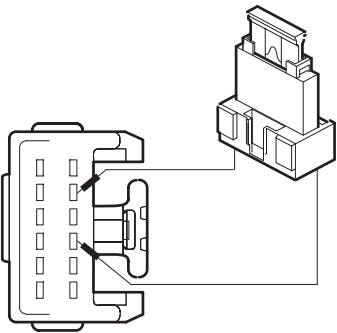
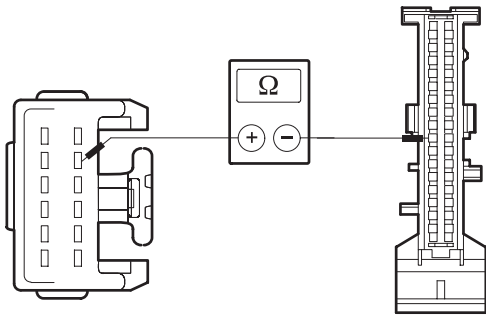
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TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE0038544	2 Measure the resistance between the front windscreen wiper motor, connector C848, pin 4, circuit 31-KA9B (BK), wiring harness side and ground. Is a resistance of less than 2 Ohms registered? → Yes RENEW the windshield wiper motor. CHECK the operation of the system. → No LOCATE and RECTIFY the break in the circuit between the front wiper motor and soldered connection S111 using the Wiring Diagrams. CHECK the operation of the system.
A11: DETERMINE THE EQUIPMENT LEVEL OF THE CENTRAL JUNCTION BOX (CJB).	
	1 Unfasten the CJB and fold it down. Is the location for connector C100 on the top of the CJB? → Yes GO to A12. → No GO to A14.
A12: CHECK FUSE F131 (15 A) (CJB)	
	1 Ignition switch in position 0.
	2 Disconnect Fuse F131 (15 A) (CJB).
	3 CHECK Fuse F131 (15 A) (CJB). Is the fuse OK? → Yes GO to A13. → No RENEW fuse F131 (15 A) and CHECK the operation of the system. If the fuse blows again, LOCATE and RECTIFY the short to ground using the Wiring Diagrams. CHECK the operation of the system.
A13: CHECK THE VOLTAGE SUPPLY TO FUSE F131 (15 A) (CJB) FOR OPEN CIRCUIT	
	1 Connect Fuse F131 (15 A) (CJB).
	2 Ignition switch in position II.

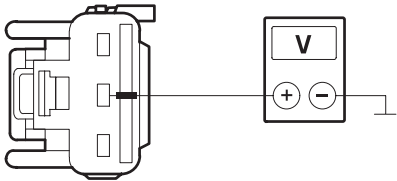
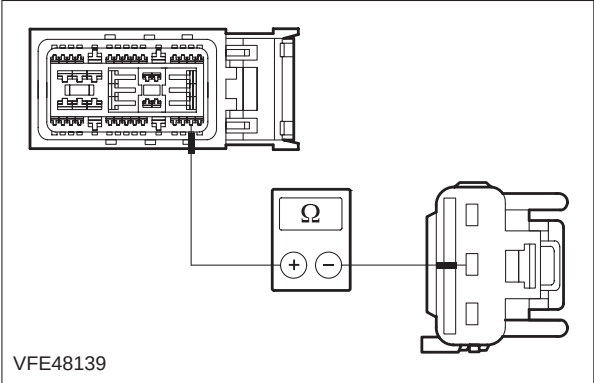
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	3 Measure the voltage between fuse F131 (15 A) (CJB) and ground. Does the meter display battery voltage? → Yes GO to A16. → No RENEW the CJB. CHECK the operation of the system.
A14: CHECK FUSE F78 (15 A) (CJB).	
	1 Ignition switch in position 0.
	2 Disconnect fuse F78 (15 A) (CJB).
	3 CHECK fuse F78 (15 A) (CJB). Is the fuse OK? → Yes GO to A15. → No RENEW fuse F78 (15 A) and CHECK the operation of the system. If the fuse blows again, LOCATE and RECTIFY the short to ground using the Wiring Diagrams. CHECK the operation of the system.
A15: CHECK THE VOLTAGE SUPPLY TO FUSE F78 (15A) (CJB) FOR OPEN CIRCUIT	
	1 Connect fuse F78 (15 A) (CJB).
	2 Ignition switch in position II.
	3 Measure the voltage between fuse F78 (15 A) (CJB) and ground. Does the meter display battery voltage? → Yes GO to A16. → No RENEW the CJB. CHECK the operation of the system.
A16: CHECK THE WASH/WIPE SYSTEM SWITCH.	
	1 Ignition switch in position 0.
	2 Disconnect wash/wipe system switch from connector C441.

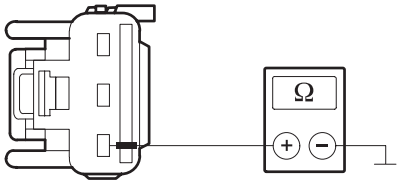
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE0038542	3 Connect a fused jumper wire (10 A) at the wash/wipe system switch, connector C441, pin 5, circuit 91S-KA35 (BK/BU) and pin 3, circuit 91-KA12 (BK/WH), wiring harness side.
	4 Ignition switch in position II. Is the rear window wiper motor running in intermittent wipe mode? → Yes RENEW the wash/wipe system switch. CHECK the operation of the system. → No GO to A17.
A17: CHECK CIRCUIT 91S-KA35 (BK/BU) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR BREAKS	
 VFE0038545	1 Ignition switch in position 0.
	2 Disconnect CJB from connector C103.
	3 Measure the resistance between the wash/wipe system switch, connector C441, pin 5, circuit 91S-KA35 (BK/BU), wiring harness side and the CJB, connector C103, pin 24, circuit 91S-KA35 (BK/BU), CJB side. Is a resistance of less than 2 Ohms registered? → Yes GO to A18. → No LOCATE and RECTIFY the break in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.
A18: CHECK VOLTAGE AT THE REAR WINDOW WIPER MOTOR	
NOTE: The minimum measurement duration is 20 seconds.	
	1 Connect Wash/wipe system switch to connector C441.
	2 Connect CJB to connector C103.

DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	3 Disconnect rear window wiper motor from connector C971.
	4 Ignition switch in position II.
	5 SWITCH ON rear window wiper.
 VFE0038546	6 Measure the voltage between the rear window wiper motor, connector C971, pin 2, circuit 32-KA28 (BK), wiring harness side and ground. Is battery voltage measured approximately every 10 seconds? → Yes GO to A20. → No GO to A19.
A19: CHECK CIRCUIT 32-KA28 (WH/RD OR BK) BETWEEN CENTRAL JUNCTION BOX (CJB) AND REAR WINDOW WIPER MOTOR FOR OPEN CIRCUIT	
 VFE48139	1 Ignition switch in position 0.
	2 Disconnect CJB from connector C100.
	3 Measure the resistance between the CJB, connector C100, pin 14, circuit 32-KA28 (WH/RD), wiring harness side and rear window wiper motor, connector C971, pin 2, circuit 32-KA28 (BK), wiring harness side. Is a resistance of less than 2 Ohms registered? → Yes INSTALL a new GEM. CHECK the operation of the system. → No LOCATE and RECTIFY the break in the circuit between CJB and the rear window wiper motor using the Wiring Diagrams. CHECK the operation of the system.
A20: CHECK THE GROUND CONNECTION OF THE REAR WIPER MOTOR FOR OPEN CIRCUIT	
	1 Ignition switch in position 0.

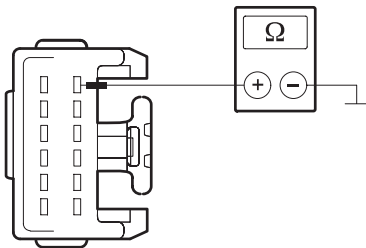
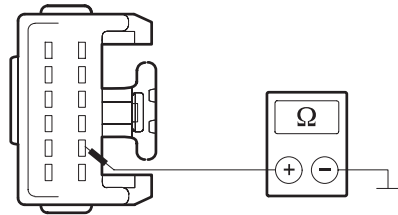
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE0038547	2 Measure the resistance between the rear window wiper motor, connector C971, pin 3, circuit 31-KA28 (BK), wiring harness side and ground. Is a resistance of less than 2 Ohms registered? → Yes INSTALL a new rear window wiper motor. CHECK the operation of the system. → No LOCATE and RECTIFY the break in the circuit between the rear wiper motor and soldered connection S196 using the Wiring Diagrams. CHECK the operation of the system.

PINPOINT TEST B : THE WINDSHIELD WIPER RUNS CONTINUOUSLY

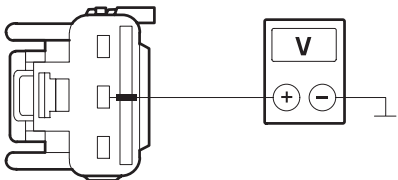
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
B1: DETERMINE THE FAULT CONDITION	
	1 Ignition switch in position 0. 2 Disconnect wash/wipe system switch from connector C441. 3 Ignition switch in position II. - Does the windscreen wiper motor run continuously? → Yes - The windscreen wiper motor runs continuously at slow wipe speed. GO to B2. - The windscreen wiper motor runs continuously at fast wipe speed. GO to B3. → No RENEW the wash/wipe system switch. CHECK the operation of the system.
B2: CHECK CIRCUIT 91S-KA10 (BK/GN) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR SHORT TO GROUND	
	1 Ignition switch in position 0. 2 Disconnect CJB from connector C103.

DIAGNOSIS AND TESTING

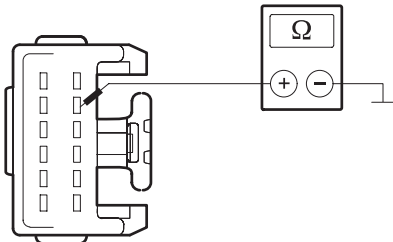
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE0038549	3 Measure resistance between wash/wipe system switch, connector C441, pin 6, circuit 91S-KA10 (BK/GN), wiring harness side and ground. Is the resistance greater than 10,000 Ohms? → Yes INSTALL a new GEM. CHECK the operation of the system. → No LOCATE and RECTIFY the short to ground in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.
B3: CHECK CIRCUIT 91S-KA11 (BK/RD) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR SHORT TO GROUND	
	1 Ignition switch in position 0. 2 Disconnect CJB from connector C103.
 VFE0038550	3 Measure resistance between wash/wipe system switch, connector C441, pin 2, circuit 91S-KA11 (BK/RD), wiring harness side and ground. Is the resistance greater than 10,000 Ohms? → Yes GO to B4. → No LOCATE and RECTIFY the short to ground in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.
B4: CHECK CIRCUIT 32-KA11 (WH/BK) BETWEEN CENTRAL JUNCTION BOX (CJB) AND FRONT WIPER MOTOR FOR SHORT TO BATTERY VOLTAGE	
	1 Disconnect CJB from connector C96. 2 Ignition switch in position II. Does the windshield wiper motor run continuously at fast wipe speed? → Yes LOCATE and RECTIFY short to battery voltage in circuit 32-KA11 (WH/BK) between CJB and the front wiper motor using the Wiring Diagrams. CHECK the operation of the system. → No INSTALL a new GEM. CHECK the operation of the system.

DIAGNOSIS AND TESTING

PINPOINT TEST C : THE REAR WINDOW WIPER RUNS CONTINUOUSLY

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
C1: DETERMINE THE FAULT CONDITION	
	1 Ignition switch in position II. - Does the rear window wiper motor run continuously in intermittent wipe mode? → Yes GO to C3. → No - The rear window wiper motor runs continuously (not in intermittent mode) when the front windscreen wiper is switched off: GO to C2. - The rear window wiper motor runs continuously (not in intermittent mode) when the front wiper is switched on:
C2: CHECK THE CJB	
	1 Ignition switch in position 0. 2 Disconnect rear window wiper motor from connector C971. 3 Ignition switch in position II.
 VFE0038546	4 Measure the voltage between the rear window wiper motor, connector C971, pin 2, circuit 32-KA28 (BK), wiring harness side and ground. - Does the meter display battery voltage? → Yes INSTALL a new GEM. CHECK the operation of the system. → No INSTALL a new rear window wiper motor. CHECK the operation of the system.
C3: CHECK THE WASH/WIPE SYSTEM SWITCH.	
	1 Ignition switch in position 0. 2 Disconnect wash/wipe system switch from connector C441.

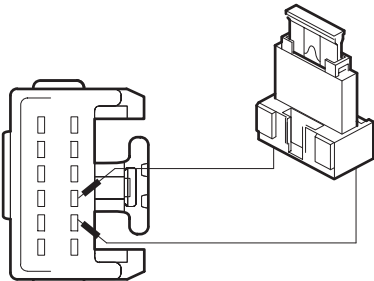
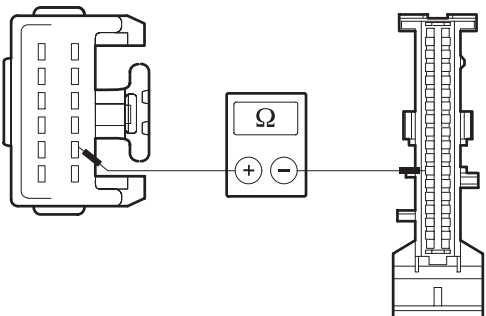
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	3 Ignition switch in position II. - Is the rear window wiper motor running in intermittent wipe mode? → Yes GO to C4. → No RENEW the wash/wipe system switch. CHECK the operation of the system.
C4: CHECK CIRCUIT 91S-KA35 (BK/BU) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR SHORT TO GROUND	
	1 Ignition switch in position 0. 2 Disconnect CJB from connector C103.
 VFE0038551	3 Measure resistance between wash/wipe system switch, connector C441, pin 5, circuit 91S-KA35 (BK/BU), wiring harness side and ground. - Is the resistance greater than 10,000 Ohms? → Yes INSTALL a new GEM. CHECK the operation of the system. → No LOCATE and RECTIFY the short to ground in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.

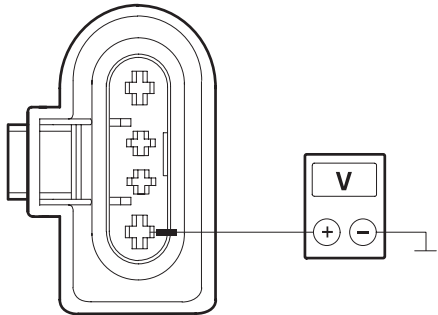
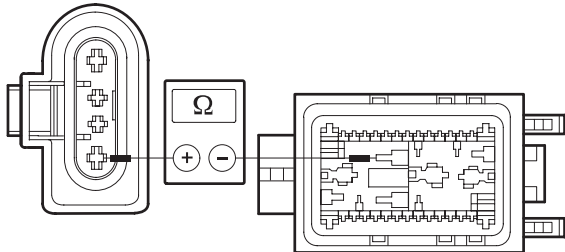
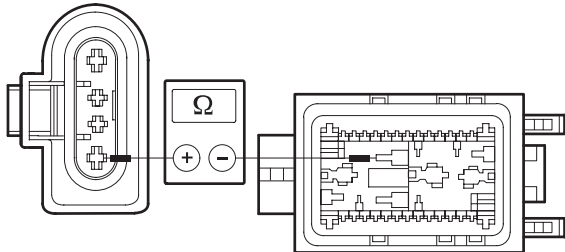
PINPOINT TEST D : SLOW/FAST WIPE NOT WORKING.

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
D1: DETERMINE THE FAULT CONDITION	
	1 Ignition switch in position II. 2 SWITCH ON slow wipe speed. 3 SWITCH ON fast wipe speed. 4 CHECK windshield wipers. - Do the windshield wipers operate at slow speed? → Yes Fast wipe speed inoperative. GO to D2. → No Slow wipe speed inoperative. GO to D6.
D2: CHECK THE WASH/WIPE SYSTEM SWITCH.	
	1 Ignition switch in position 0.

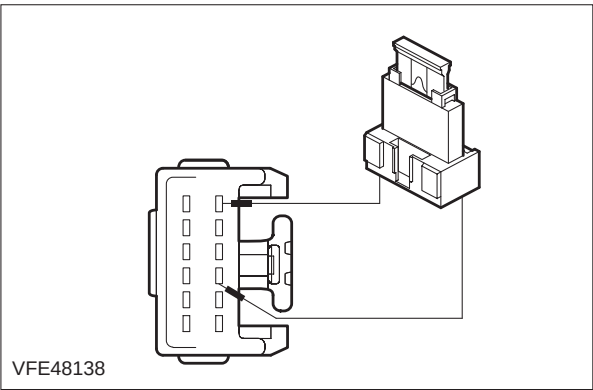
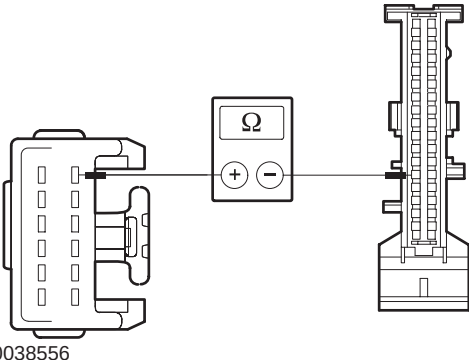
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	2 Disconnect wash/wipe system switch from connector C441.
 VFE0038552	3 Connect a fused jumper wire (10 A) at the wash/wipe system switch, connector C441, pin 2, circuit 91S-KA11 (BK/RD) and pin 3, circuit 91-KA12 (BK/WH), wiring harness side.
	4 Ignition switch in position II. - Do the wipers operate at fast speed? → Yes RENEW the wash/wipe system switch. CHECK the operation of the system. → No GO to D3.
D3: CHECK CIRCUIT 91S-KA11 (BK/RD) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR BREAKS	
	1 Ignition switch in position 0. 2 Disconnect CJB from connector C103.
 VFE0038553	3 Measure the resistance between the wash/wipe system switch, connector C441, pin 2, circuit 91S-KA11 (BK/RD), wiring harness side and the CJB, connector C103, pin 22, circuit 91S-KA11 (BK/RD), wiring harness side. - Is a resistance of less than 2 Ohm registered? → Yes GO to D4. → No LOCATE and RECTIFY the break in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.
D4: CHECK VOLTAGE AT THE WINDSHIELD WIPER MOTOR	
	1 Connect Wash/wipe system switch to connector C441. 2 Connect CJB to connector C103.

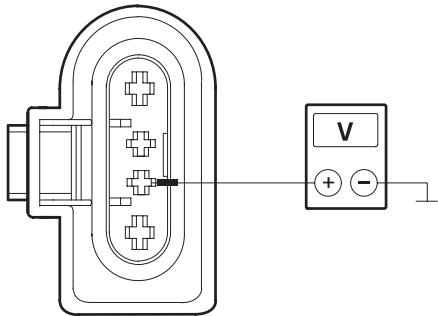
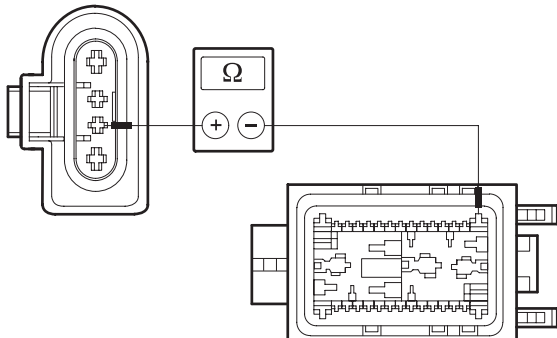
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE0038554	3 Disconnect windshield wiper motor from connector C848.
	4 Ignition switch in position II.
	5 SWITCH ON fast wipe speed.
 VFE0038555	6 Measure the voltage between the front wind-screen wiper motor, connector C848, pin 1, circuit 32-KA11 (WH/BK), wiring harness side and ground. - Does the meter display battery voltage? → Yes RENEW the windshield wiper motor. CHECK the operation of the system. → No GO to D5.
D5: CHECK CIRCUIT 32-KA11 (WH/BK) BETWEEN CENTRAL JUNCTION BOX (CJB) AND FRONT WIPER MOTOR FOR BREAKS	
 VFE0038555	1 Ignition switch in position 0.
	2 Disconnect CJB from connector C96.
	3 Measure the resistance between the CJB, connector C96, pin 23, circuit 32-KA11 (WH/BK), wiring harness side and rear window wiper motor, connector C848, pin 1, circuit 32-KA11 (WH/BK), wiring harness side. - Is a resistance of less than 2 Ohms registered? → Yes INSTALL a new GEM. CHECK the operation of the system. → No LOCATE and RECTIFY the break in the circuit between CJB and the windshield wiper motor using the Wiring Diagrams. CHECK the operation of the system.
D6: CHECK THE WASH/WIPE SYSTEM SWITCH.	
	1 Ignition switch in position 0.
	2 Disconnect wash/wipe system switch from connector C441.

DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE48138	3 Connect a fused jumper wire (10 A) at the wash/wipe system switch, connector C441, pin 6, circuit 91S-KA10 (BK/GN) and pin 3, circuit 91-KA12 (BK/WH), wiring harness side.
	4 Ignition switch in position II. Do the windshield wipers operate at slow speed? → Yes RENEW the wash/wipe system switch. CHECK the operation of the system. → No GO to D7.
D7: CHECK CIRCUIT 91S-KA10 (BK/GN) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR BREAKS	
 VFE0038556	1 Ignition switch in position 0.
	2 Disconnect CJB from connector C103.
	3 Measure the resistance between the wash/wipe system switch, connector C441, pin 6, circuit 91S-KA10 (BK/GN), wiring harness side and the CJB, connector C103, pin 21, circuit 91S-KA10 (BK/GN), wiring harness side. Is a resistance of less than 2 Ohms registered? → Yes GO to D8. → No LOCATE and RECTIFY the break in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.
D8: CHECK VOLTAGE AT THE WINDSHIELD WIPER MOTOR	
	1 Connect Wash/wipe system switch to connector C441.
	2 Connect CJB to connector C103.
	3 Disconnect windshield wiper motor from connector C848.

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TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE0038543	4 SWITCH ON slow wipe speed.
	5 Ignition switch in position II.
	6 Measure the voltage between the front windscreen wiper motor, connector C848, pin 2, circuit 32-KA10 (WH/GN), wiring harness side and ground. - Does the meter display battery voltage? → Yes RENEW the windshield wiper motor. CHECK the operation of the system. → No GO to D9.
D9: CHECK CIRCUIT 32-KA10 (WH/GN) BETWEEN CENTRAL JUNCTION BOX (CJB) AND FRONT WIPER MOTOR FOR BREAKS	
 VFE0038557	1 Ignition switch in position 0.
	2 Disconnect CJB from connector C96.
	3 Measure the resistance between the front windscreen wiper motor, connector C848, pin 2, circuit 32-KA10 (WH/GN), wiring harness side and the CJB, connector C96, pin 41, circuit 32-KA10 (WH/GN), wiring harness side. - Is a resistance of less than 2 Ohms registered? → Yes INSTALL a new GEM. CHECK the operation of the system. → No LOCATE and RECTIFY the break in the circuit between CJB and the windshield wiper motor using the Wiring Diagrams. CHECK the operation of the system.

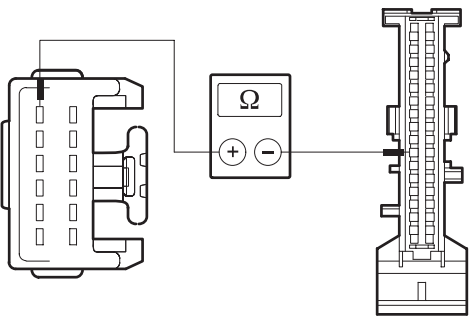
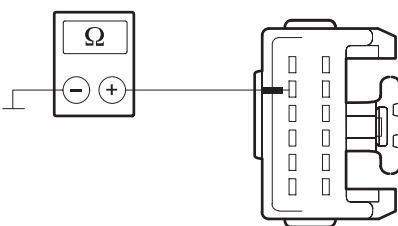
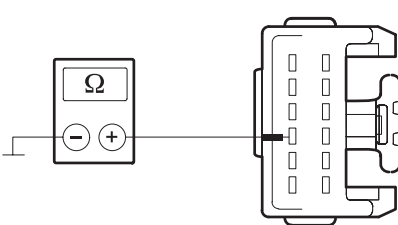
PINPOINT TEST E : INTERMITTENT WIPE MODE OF WINDSHIELD WIPER INOPERATIVE, VEHICLES WITH AND WITHOUT RAIN SENSOR (FAST/SLOW WIPE OK)

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
E1: DETERMINE THE FAULT CONDITION	
	1 Ignition switch in position II.
	2 SWITCH ON slow wipe speed.

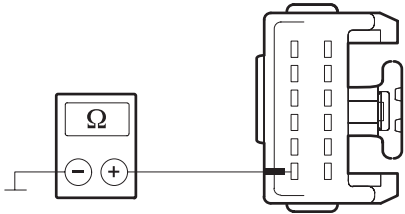
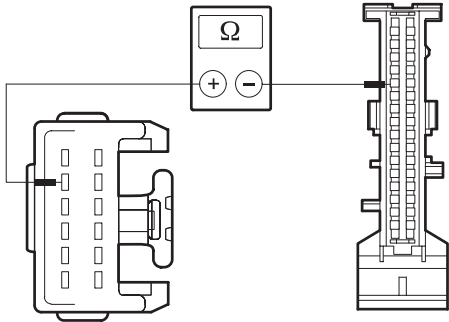
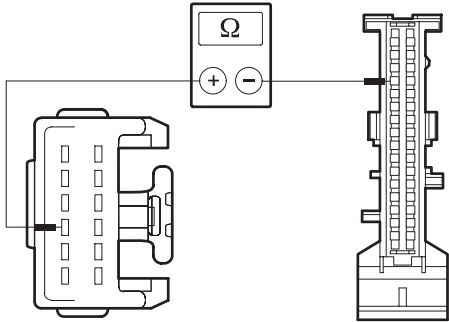
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	3 SWITCH OFF slow wipe speed. - Does the windshield wiper return to the park position? → Yes GO to E2. → No GO to Pinpoint Test G.
E2: NARROW DOWN THE FAULT CONDITION	
NOTE: For vehicles with rain sensor, wet the windshield several times with water in the vicinity of the rain sensor, in order to check whether the windshield wiper motor runs in intermittent wipe mode.	
	1 SWITCH ON intermittent mode at the wash/wipe system switch. - Does the front wiper perform a different wipe cycle to the one set with the wash/wipe switch? → Yes GO to E5. → No - Windshield wiper mode is inoperative: GO to E3. - Vehicles with rain sensor: The windshield wiper motor performs a wipe cycle every six seconds: GO to E12.
E3: CHECK THE WASH/WIPE SYSTEM SWITCH.	
	1 Ignition switch in position 0.
	2 Disconnect wash/wipe system switch from connector C441.
	3 CHECK the wash/wipe system switch according to the component check at the end of this section. - Is the wash/wipe system switch OK? → Yes GO to E4. → No RENEW the wash/wipe system switch. CHECK the operation of the system.
E4: CHECK CIRCUIT 10-KA8 (GY/RD) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR BREAKS	
	1 Disconnect CJB from connector C103.

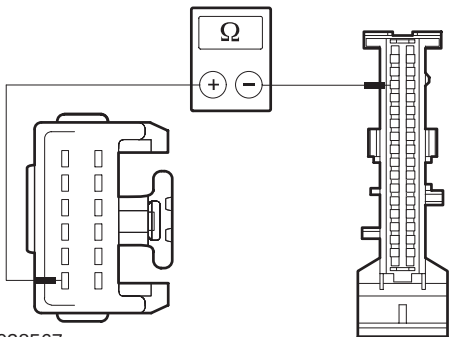
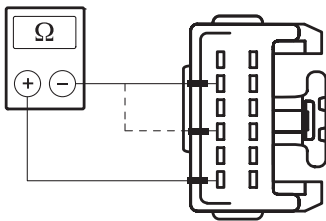
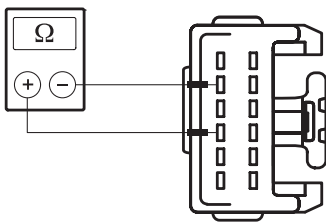
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE0038558	2 Measure the resistance between the wash/wipe system switch, connector C441, pin 12, circuit 91S-KA8 (GY/RD), wiring harness side and the CJB, connector C103, pin 23, circuit 10-KA8 (GY/RD), wiring harness side. Is a resistance of less than 2 Ohms registered? → Yes INSTALL a new GEM. CHECK the operation of the system. → No LOCATE and RECTIFY the break in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.
E5: CHECK CIRCUIT 8-KA47 (WH/GN) FOR SHORT TO GROUND	
	1 Ignition switch in position 0. 2 Disconnect CJB from connector C103.
 VFE0038562	3 Measure resistance between wash/wipe system switch, connector C441, pin 11, circuit 8-KA47 (WH/GN), wiring harness side and ground. Is the resistance greater than 10,000 Ohms? → Yes GO to E6. → No LOCATE and RECTIFY the short to ground in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.
E6: CHECK CIRCUIT 8-KA46 (WH/BU) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR SHORT TO GROUND	
 VFE0038563	1 Measure resistance between wash/wipe system switch, connector C441, pin 9, circuit 8-KA46 (WH/BU), wiring harness side and ground. Is the resistance greater than 10,000 Ohms? → Yes GO to E7. → No LOCATE and RECTIFY the short to ground in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.

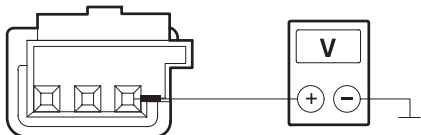
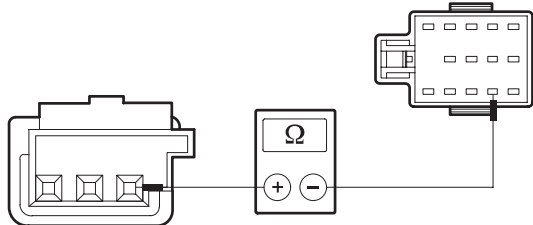
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
E7: CHECK CIRCUIT 8-KA45 (WH/RD) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR SHORT TO GROUND	
 VFE0038564	1 Measure resistance between wash/wipe system switch, connector C441, pin 7, circuit 8-KA45 (WH/RD), wiring harness side and ground. Is the resistance greater than 10,000 Ohms? → Yes GO to E8. → No LOCATE and RECTIFY the short to ground in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.
E8: CHECK CIRCUIT 8-KA47 (WH/GN) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR BREAKS	
 VFE0038565	1 Measure the resistance between the wash/wipe system switch, connector C441, pin 11, circuit 8-KA47 (WH/GN), wiring harness side and the CJB, connector C103, pin 28, circuit 8-KA47 (WH/GN), wiring harness side. Is a resistance of less than 2 Ohms registered? → Yes GO to E9. → No LOCATE and RECTIFY the break in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.
E9: CHECK CIRCUIT 8-KA46 (WH/BU) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR BREAKS	
 VFE0038566	1 Measure the resistance between the wash/wipe system switch, connector C441, pin 9, circuit 8-KA46 (WH/BU), wiring harness side and the CJB, connector C103, pin 29, circuit 8-KA46 (WH/BU), wiring harness side. Is a resistance of less than 2 Ohms registered? → Yes GO to E10. → No LOCATE and RECTIFY the break in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.

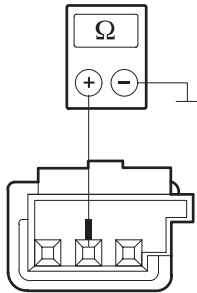
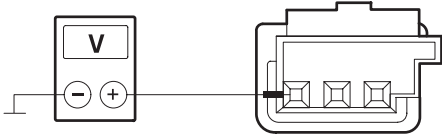
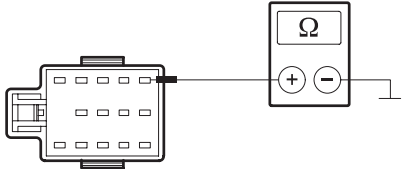
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
E10: CHECK CIRCUIT 8-KA45 (WH/RD) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR BREAKS	
 VFE0038567	1 Measure the resistance between the wash/wipe system switch, connector C441, pin 7, circuit 8-KA45 (WH/RD), wiring harness side and the CJB, connector C103, pin 30, circuit 8-KA45 (WH/RD), wiring harness side. • Is a resistance of less than 2 Ohms registered? → Yes GO to E11. → No LOCATE and RECTIFY the break in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.
E11: CHECK CONTROL WIRES FOR SHORT AGAINST EACH OTHER	
 VFE56585	1 Measure the resistance between the wash/wipe system switch, connector C441, pin 7, circuit 8-KA45 (WH/RD) and pin 11, circuit 8-KA47 (WH/GN) and between pin 7, circuit 8-KA45 (WH/RD) and pin 9, circuit 8-KA46 (WH/BU), wiring harness side.
 VFE56586	2 Measure the resistance between the wash/wipe system switch, connector C441, pin 9, circuit 8-KA46 (WH/BU), and pin 11, circuit 8-KA47 (WH/GN), wiring harness side. • Is the resistance in all the measurements more than 10,000 Ohms? → Yes INSTALL a new GEM. CHECK the operation of the system. → No LOCATE and RECTIFY the short in the circuits between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.
E12: CHECK VOLTAGE SUPPLY TO RAIN SENSOR FOR OPEN CIRCUIT	
	1 Ignition switch in position 0.

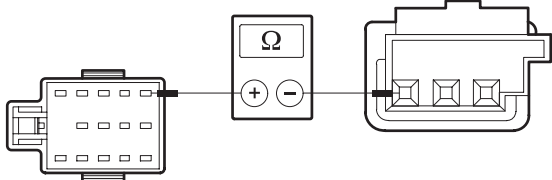
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	2 Disconnect rain sensor from connector C526. 3 Ignition switch in position II.
 VFE0038444	4 Measure the voltage between rain sensor, connector C526, pin 1: – Vehicles with sliding sunroof: circuit 15-KA41 (GN/BK), wiring harness side and ground. – Vehicles without sliding sunroof: circuit 15-AG12B (GN/BK), wiring harness side and ground. • Does the meter display battery voltage? → Yes GO to E14. → No GO to E13.
E13: CHECK THE CJB	
	1 Ignition switch in position 0. 2 Disconnect CJB from connector C98.
 VFE0038568	3 Measure resistance between CJB, connector C98, pin 11: – Vehicles with sliding sunroof: circuit 15-AG12A (GN/BK), wiring harness side and rain sensor, connector C526, pin 1, circuit 15-KA41 (GN/BK), wiring harness side. – Vehicles without sliding sunroof: circuit 15-AG12B (GN/BK), wiring harness side and rain sensor, connector C526, pin 1, circuit 15-AG12B (GN/BK), wiring harness side. • Is the resistance less than 2 ohms? → Yes RENEW the CJB. CHECK the operation of the system. → No LOCATE and RECTIFY the break in the circuit between CJB and the rain sensor using the Wiring Diagrams. CHECK the operation of the system.
E14: CHECK THE GROUND CONNECTION OF THE RAIN SENSOR FOR OPEN CIRCUIT	
	1 Ignition switch in position 0.

DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE0038446	2 Measure resistance between rain sensor, connector C526, pin 2, circuit 91-KA41 (GN/BK), wiring harness side and ground. - Is the resistance less than 2 ohms? → Yes GO to E15. → No LOCATE and RECTIFY the break in the circuit between the rain sensor and soldered connection S203 using the Wiring Diagrams. CHECK the operation of the system.
E15: CHECK SIGNAL CABLE OF RAIN SENSOR FOR SHORT TO BATTERY VOLTAGE	
	1 Disconnect CJB from connector C98. 2 Ignition switch in position II.
 VFE0038449	3 Measure voltage between rain sensor, connector C526, pin 3, circuit 8-KA41 (WH/GN), wiring harness side and ground. - Does the meter display battery voltage? → Yes LOCATE and RECTIFY the short to battery voltage in the circuit between CJB and the rain sensor using the Wiring Diagrams. CHECK the operation of the system. → No GO to E16.
E16: CHECK SIGNAL CABLE OF RAIN SENSOR FOR SHORT TO GROUND	
	1 Ignition switch in position 0.
 VFE0038450	2 Measure resistance between the CJB, connector C98, pin 12, circuit 8-KA41 (WH/GN), wiring harness side and ground. - Is the resistance greater than 10,000 Ohms? → Yes GO to E17. → No LOCATE and RECTIFY the short to ground in the circuit between CJB and the rain sensor using the Wiring Diagrams. CHECK the operation of the system.

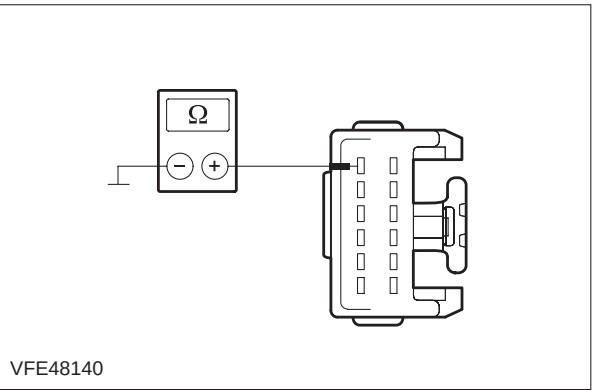
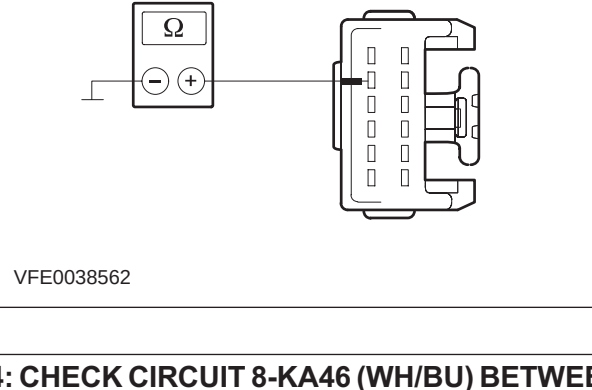
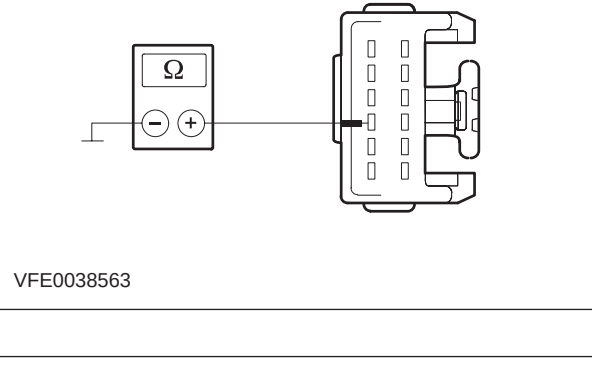
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
E17: CHECK SIGNAL CABLE OF RAIN SENSOR FOR OPEN CIRCUIT	
 VFE0038451	1 Measure the resistance between the CJB, connector C98, pin 12, circuit 8-KA41 (WH/GN), wiring harness side and the rain sensor, connector C526, pin 3, circuit 8-KA41 (WH/GN), wiring harness side. • Is the resistance less than 2 ohms? → Yes RENEW the rain sensor. CHECK the operation of the system. If the concern is not rectified, INSTALL A NEW GEM. CHECK the operation of the system. → No LOCATE and RECTIFY the break in the circuit between CJB and the rain sensor using the Wiring Diagrams. CHECK the operation of the system.

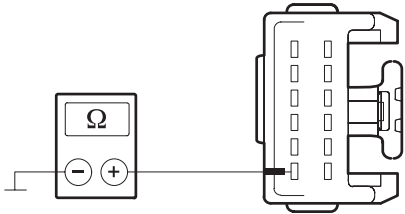
PINPOINT TEST F : THE WINDSHIELD WIPER RUNS CONTINUOUSLY IN INTERMITTENT MODE

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
F1: CHECK THE WASH/WIPE SYSTEM SWITCH.	
	1 Ignition switch in position 0. 2 Disconnect wash/wipe system switch from connector C441. 3 CHECK the wash/wipe system switch according to the component check at the end of this section. • Is the wash/wipe system switch OK? → Yes GO to F2. → No RENEW the wash/wipe system switch. CHECK the operation of the system.
F2: CHECK CIRCUIT 10-KA8 (GY/RD) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR SHORT TO GROUND	
	1 Disconnect CJB from connector C103.

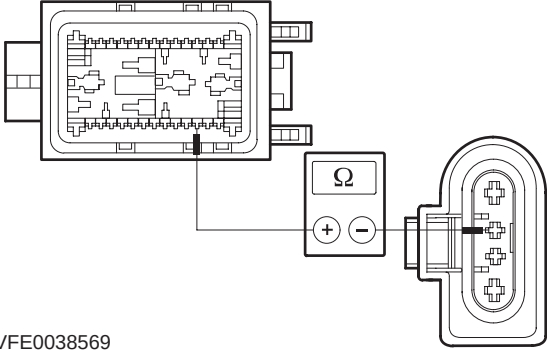
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE48140	2 Measure the resistance between the wash/wipe system switch, connector C441, pin 12, circuit 10-KA8 (GY/RD), wiring harness side and ground. - Is the resistance greater than 10,000 Ohms? → Yes GO to F3. → No LOCATE and RECTIFY the short to ground in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.
F3: CHECK CIRCUIT 8-KA47 (WH/GN) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR SHORT TO GROUND	
 VFE0038562	1 Measure resistance between wash/wipe system switch, connector C441, pin 11, circuit 8-KA47 (WH/GN), wiring harness side and ground. - Is the resistance greater than 10,000 Ohms? → Yes GO to F4. → No LOCATE and RECTIFY the short to ground in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.
F4: CHECK CIRCUIT 8-KA46 (WH/BU) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR SHORT TO GROUND	
 VFE0038563	1 Measure resistance between wash/wipe system switch, connector C441, pin 9, circuit 8-KA46 (WH/BU), wiring harness side and ground. - Is the resistance greater than 10,000 Ohms? → Yes GO to F5. → No LOCATE and RECTIFY the short to ground in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.

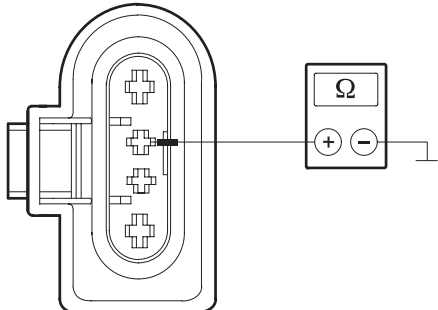
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
F5: CHECK CIRCUIT 8-KA45 (WH/RD) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR SHORT TO GROUND	
 VFE0038564	1 Measure resistance between wash/wipe system switch, connector C441, pin 7, circuit 8-KA45 (WH/RD), wiring harness side and ground. • Is the resistance greater than 10,000 Ohms? → Yes INSTALL a new GEM. CHECK the operation of the system. → No LOCATE and RECTIFY the short to ground in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.

PINPOINT TEST G : THE WINDSHIELD WIPER MOTOR DOES NOT RETURN TO THE PARK POSITION AFTER BEING SWITCHED OFF

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
G1: CHECK CIRCUIT 31S-KA9 (BK/OG) BETWEEN FRONT WIPER MOTOR AND CENTRAL JUNCTION BOX (CJB) FOR BREAKS	
 VFE0038569	1 Ignition switch in position 0. 2 Disconnect windshield wiper motor from connector C848. 3 Disconnect CJB from connector C96.
	4 Measure the resistance between the front windscreen wiper motor, connector C848, pin 3, circuit 31S-KA9 (BK/OG), wiring harness side and the CJB, connector C96, pin 12, circuit 31S-KA9 (BK/OG), wiring harness side. • Is a resistance of less than 2 Ohms registered? → Yes GO to G2. → No LOCATE and RECTIFY the break in the circuit between windshield wiper motor and the CJB using the Wiring Diagrams. CHECK the operation of the system.

DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
G2: CHECK CIRCUIT 31S-KA9 (BK/OG) BETWEEN CENTRAL JUNCTION BOX (CJB) AND FRONT WIPER MOTOR FOR SHORT TO GROUND	
 VFE0038570	1 Measure the resistance between the front windscreen wiper motor, connector C848, pin 3, circuit 31S-KA9 (BK/OG), wiring harness side and ground. • Is the resistance greater than 10,000 Ohms? → Yes CHECK the front wiper motor according to the component test at the end of this section and RENEW as necessary. CHECK the operation of the system. If the concern is not rectified, INSTALL A NEW GEM. CHECK the operation of the system. → No LOCATE and RECTIFY the short to ground in the circuit between CJB and the windshield wiper motor using the Wiring Diagrams. CHECK the operation of the system.

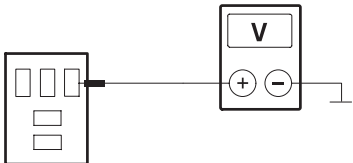
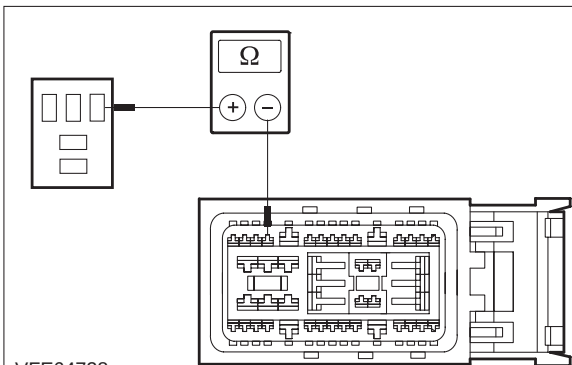
PINPOINT TEST H : THE REAR WINDOW WIPER MOTOR DOES NOT RETURN TO THE PARK POSITION AFTER BEING SWITCHED OFF

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
H1: DETERMINE THE BUILD YEAR	
	1 Check the build date via the chassis number. • Was the vehicle built before 03/2005? → Yes GO to H13. → No GO to H2.
H2: DETERMINE THE EQUIPMENT LEVEL OF THE CENTRAL JUNCTION BOX (CJB).	
	1 Unfasten the CJB and fold it down. • Is the location for connector C100 on the top of the CJB? → Yes GO to H3. → No GO to H5.
H3: CHECK FUSE F141 (10 A) (CJB)	
	1 Ignition switch in position 0. 2 Disconnect Fuse F141 (10 A) (CJB).

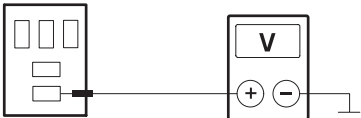
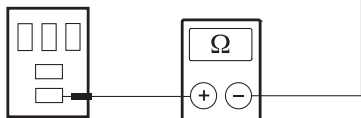
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	3 CHECK Fuse F141 (10 A) (CJB). Is the fuse OK? → Yes GO to H4. → No RENEW fuse F141 (10 A) (CJB) and CHECK the operation of the system. If the fuse blows again, LOCATE and RECTIFY the short to ground using the Wiring Diagrams. CHECK the operation of the system.
H4: CHECK THE VOLTAGE SUPPLY TO FUSE F141 (10 A) (CJB) FOR OPEN CIRCUIT	
	1 Connect Fuse F141 (10 A) (CJB).
	2 Ignition switch in position II.
	3 Measure the voltage between fuse F141 (10 A) (CJB) and ground. Does the meter display battery voltage? → Yes GO to H7. → No RENEW the CJB. CHECK the operation of the system.
H5: CHECK FUSE F84 (10 A) (CJB).	
	1 Ignition switch in position 0.
	2 Disconnect Fuse F84 (10 A) (CJB).
	3 CHECK Fuse F84 (10 A) (CJB). Is the fuse OK.? → Yes GO to H6. → No RENEW fuse F84 (10 A) (CJB) and CHECK the operation of the system. If fuse blows again, LOCATE and REMEDY the short to ground with the aid of the wiring diagrams. CHECK the operation of the system.
H6: CHECK THE VOLTAGE SUPPLY TO FUSE F84 (10A) (CJB) FOR OPEN CIRCUIT	
	1 Connect Fuse F84 (10 A) (CJB).
	2 Ignition switch in position II.

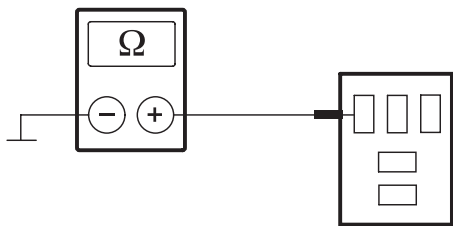
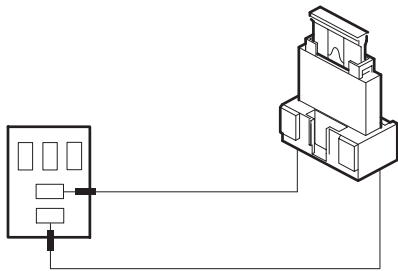
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	3 Measure the voltage between fuse F84 (10 A) (CJB) and ground. Is battery voltage measured? → Yes GO to H7. → No RENEW the CJB. CHECK the operation of the system.
H7: CHECK VOLTAGE SUPPLY TO REAR WIPER RELAY FOR OPEN CIRCUIT (PIN 1)	
	1 Ignition switch in position 0. 2 Disconnect Rear wiper relay from socket C1100. 3 Ignition switch in position II.
 E0036110	4 Measure the voltage between the rear wiper relay, socket C1100, pin 1, circuit 15S-KA28 (GN/BU), socket side and ground. Is battery voltage measured? → Yes GO to H9. → No GO to H8.
H8: CHECK CIRCUIT 15S-KA28 (GN/BU) BETWEEN CENTRAL JUNCTION BOX (CJB) AND REAR WIPER RELAY (PIN 1) FOR OPEN CIRCUIT	
	1 Ignition switch in position 0. 2 Disconnect CJB from connector C100.
 VFE64728	3 Measure the resistance between the CJB, connector C100, pin 35, circuit 15S-KA28 (GN/BU), wiring harness side and the rear wiper relay, socket C1100, pin 1, circuit 15S-KA28 (GN/BU), socket side. Is a resistance of less than 2 Ohm registered? → Yes RENEW the CJB. CHECK the operation of the system. → No LOCATE and RECTIFY the break in the circuit between the CJB and the rear wiper relay using the Wiring Diagrams. CHECK the operation of the system.

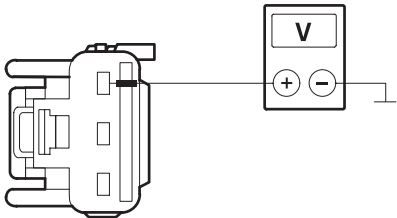
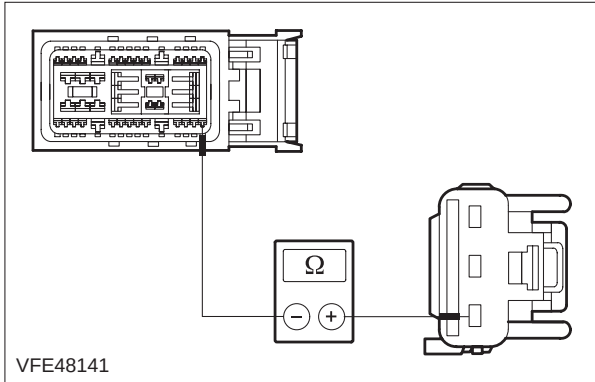
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
H9: CHECK VOLTAGE SUPPLY TO REAR WIPER RELAY FOR OPEN CIRCUIT (PIN 3)	
 VFE0016103	1 Measure the voltage between the rear wiper relay, socket C1100, pin 3, circuit 29-KA28 (OG/BU), socket side and ground. • Is battery voltage measured? → Yes GO to H11. → No GO to H10.
H10: CHECK CIRCUIT 29-KA28 (OG/BU) BETWEEN CENTRAL JUNCTION BOX (CJB) AND REAR WIPER RELAY (PIN 3) FOR OPEN CIRCUIT	
 VFE64729	1 Ignition switch in position 0.
	2 Disconnect CJB from connector C100.
	3 Measure the resistance between the CJB, connector C100, pin 15, circuit 29-KA28 (OG/BU), wiring harness side and the rear wiper relay, socket C1100, pin 3, circuit 29-KA28 (OG/BU), socket side. • Is a resistance of less than 2 Ohms registered? → Yes RENEW the CJB. CHECK the operation of the system. → No LOCATE and RECTIFY the break in the circuit between the CJB and the rear wiper relay using the Wiring Diagrams. CHECK the operation of the system.
H11: CHECK THE GROUND CONNECTION OF THE REAR WIPER RELAY FOR OPEN CIRCUIT	
	1 Ignition switch in position 0.

DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE0016108	2 Measure the resistance between the rear wiper relay, socket C1100, pin 2, circuit 31-KA28 (BK), socket side and ground. Is a resistance of less than 2 Ohm registered? → Yes GO to H12. → No LOCATE and RECTIFY the break in the circuit between the rear window wiper relay and soldered connection S216 using the Wiring Diagrams. CHECK the operation of the system.
H12: CHECK THE REAR WIPER RELAY	
 VFE0008746	1 Connect a fused bridging cable (15 A) to the rear wiper relay, socket C1100, pin 3, circuit 29-KA28 (OG/BU) and pin 5, circuit 29S-KA28 (OG/BU), socket side.
	2 Ignition switch in position II.
	3 SWITCH the rear wiper ON and OFF.
	4 CHECK the rear wiper. Does the rear wiper return to the park position? → Yes RENEW the rear wiper relay. CHECK the operation of the system. → No GO to H13.
	H13: CHECK THE VOLTAGE SUPPLY TO THE REAR WIPER MOTOR
NOTE: Only for vehicles built from 03/2005: The fused bridging cable used in the previous step is still connected to the rear wiper relay.	
	1 Ignition switch in position 0.
	2 Disconnect rear window wiper motor from connector C971.
	3 Ignition switch in position II.

DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE0038571	4 Measure the voltage between the rear window wiper motor, connector C971, pin 1, circuit 29-KA28 (BK), wiring harness side and ground. - Does the meter display battery voltage? → Yes INSTALL a new rear window wiper motor. CHECK the operation of the system. → No - Vehicles built from 03/2005: LOCATE and RECTIFY the break in the circuit between the rear wiper relay and the rear wiper motor using the Wiring Diagrams. CHECK the operation of the system. - Vehicles built before 03/2005: GO to H14.
H14: CHECK CIRCUIT 29-KA28 (OG/BU AND BK) BETWEEN CENTRAL JUNCTION BOX (CJB) AND REAR WINDOW WIPER MOTOR FOR OPEN CIRCUIT	
 VFE48141	1 Ignition switch in position 0. 2 Measure the resistance between the CJB, connector C100, pin 15, circuit 29-KA28 (OG/BU), wiring harness side and rear window wiper motor, connector C971, pin 1, circuit 29-KA28 (BK), wiring harness side. Is a resistance of less than 2 Ohms registered? → Yes RENEW the CJB. CHECK the operation of the system. → No LOCATE and RECTIFY the break in the circuit between CJB and the rear window wiper motor using the Wiring Diagrams. CHECK the operation of the system.

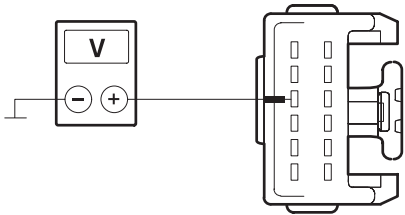
PINPOINT TEST I : THE FRONT AND REAR WASH/WIPE FUNCTIONS ARE INOPERATIVE (WIPE AND INTERMITTENT FUNCTION OK)

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
I1: DETERMINE THE EQUIPMENT LEVEL OF THE CENTRAL JUNCTION BOX (CJB).	
	1 Unfasten the CJB and fold it down. Is the location for connector C100 on the top of the CJB? → Yes GO to I2. → No GO to I4.

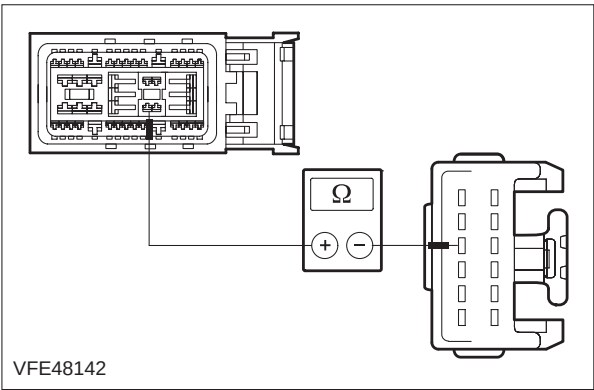
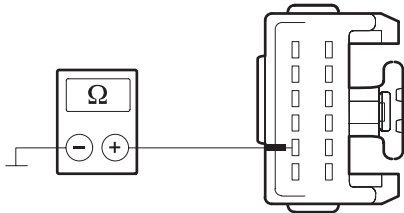
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
I2: CHECK FUSE F136 (15 A) (CJB)	
	1 Ignition switch in position 0.
	2 Disconnect Fuse F136 (15 A) (CJB).
	3 CHECK Fuse F136 (15 A) (CJB). - Is the fuse OK? → Yes GO to I3. → No RENEW fuse F136 (15 A) (CJB). CHECK the operation of the system. If the fuse blows again, LOCATE and RECTIFY the short to ground using the Wiring Diagrams. CHECK the operation of the system.
I3: CHECK THE VOLTAGE SUPPLY TO FUSE F136 (CJB) FOR OPEN CIRCUIT	
	1 Connect Fuse F136 (15 A) (CJB).
	2 Ignition switch in position II.
	3 Measure the voltage between fuse F136 (15 A) (CJB) and ground. - Does the meter display battery voltage? → Yes GO to I6. → No RENEW the CJB. CHECK the operation of the system.
I4: CHECK FUSE F47 (15 A) (CJB).	
	1 Ignition switch in position 0.
	2 Disconnect fuse F47 (15 A) (CJB).
	3 CHECK fuse F47 (15 A) (CJB). - Is the fuse OK? → Yes GO to I5. → No RENEW fuse F47 (15 A) (CJB). CHECK the operation of the system. If the fuse blows again, LOCATE and RECTIFY the short to ground using the Wiring Diagrams. CHECK the operation of the system.
I5: CHECK THE VOLTAGE SUPPLY TO FUSE F47 (CJB) FOR OPEN CIRCUIT	
	1 Connect fuse F47 (15 A) (CJB).

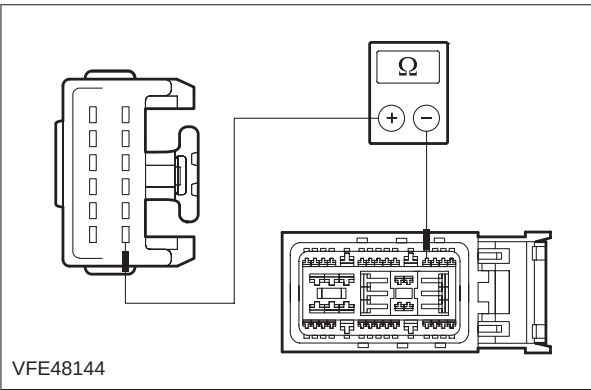
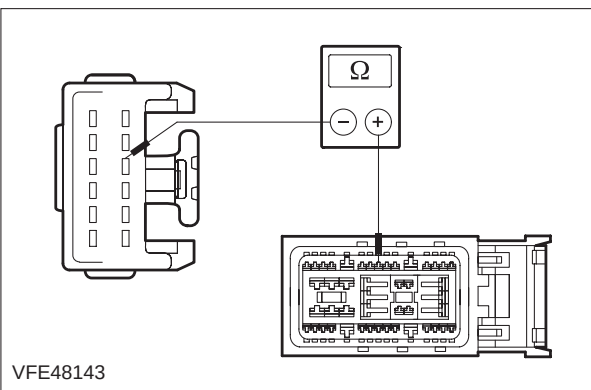
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	2 Ignition switch in position II. 3 Measure the voltage between fuse F47 (15 A) (CJB) and ground. - Does the meter display battery voltage? → Yes GO to I6. → No RENEW the CJB. CHECK the operation of the system.
I6: CHECK VOLTAGE AT THE WASH/WIPE SYSTEM SWITCH.	
	1 Ignition switch in position 0. 2 Disconnect wash/wipe system switch from connector C441. 3 Ignition switch in position II.
 VFE0038573	4 Measure voltage between wiper/washer switch, connector C441, pin 10, circuit 15-KA19 (GN/OG), wiring harness side and ground. - Does the meter display battery voltage? → Yes GO to I8. → No GO to I7.
I7: CHECK THE CJB	
	1 Ignition switch in position 0. 2 Disconnect CJB from connector C102.

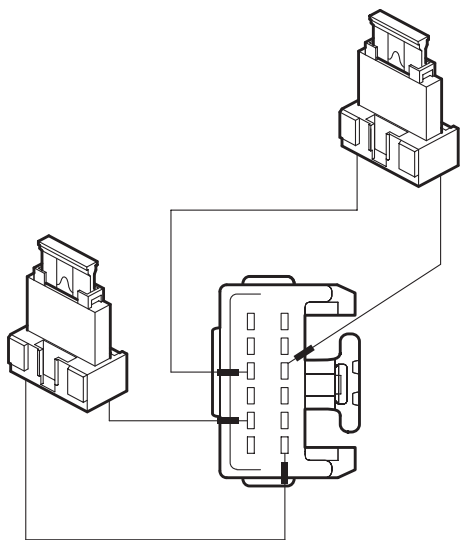
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE48142	3 Measure resistance between CJB, connector C102, pin 20, circuit 15-KA19 (GN/OG), wiring harness side and wash/wipe system switch, connector C441, pin 10, circuit 15-KA19 (GN/OG), wiring harness side. Is the resistance less than 2 ohms? → Yes RENEW the CJB. CHECK the operation of the system. → No LOCATE and RECTIFY the break in the circuit between the CJB and the wash/wipe system switch using the Wiring Diagrams. CHECK the operation of the system.
I8: CHECK THE GROUND CONNECTION OF THE WASH/WIPE SYSTEM SWITCH FOR OPEN CIRCUIT	
 VFE0038575	1 Ignition switch in position 0. 2 Measure the resistance between the wash/wipe system switch, connector C441, pin 8, circuit 31-KA36 (BK), wiring harness side and ground. Is a resistance of less than 2 Ohms registered? → Yes GO to I9. → No LOCATE and RECTIFY the break in the circuit between the wash/wipe system switch and soldered connection S6 using the Wiring Diagrams. CHECK the operation of the system.
I9: CHECK CIRCUIT 32-KA34 (WH/BK) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR BREAKS	
	1 Disconnect CJB from connector C102.

DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE48144	2 Measure the resistance between the wash/wipe system switch, connector C441, pin 1, circuit 32-KA34 (WH/BK), wiring harness side and the CJB, connector C102, pin 43, circuit 32-KA34 (WH/BK), wiring harness side. Is a resistance of less than 2 Ohms registered? → Yes GO to I10. → No LOCATE and RECTIFY the break in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.
I10: CHECK CIRCUIT 33-KA34 (YE/BK) BETWEEN WASH/WIPE SWITCH AND CENTRAL JUNCTION BOX (CJB) FOR BREAKS	
 VFE48143	1 Measure the resistance between the wash/wipe system switch, connector C441, pin 4, circuit 33-KA34 (YE/BK), wiring harness side and the CJB, connector C102, pin 39, circuit 33-KA34 (YE/BK), wiring harness side. Is a resistance of less than 2 Ohms registered? → Yes GO to I11. → No LOCATE and RECTIFY the break in the circuit between the wash/wipe system switch and CJB using the Wiring Diagrams. CHECK the operation of the system.
I11: CHECK THE WASH/WIPE SYSTEM SWITCH.	
	1 Connect CJB to connector C102.

DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE49131	2 Two fused jumper wires (10 A) at the wash/wipe system switch, connector C441: – Connect pin 8, circuit 31-KA36 (BK) and Pin 1, circuit 32-KA34 (WH/BK), wiring harness side. – Connect pin 10, circuit 15-KA19 (GN/OG) and Pin 4, circuit 33-KA34 (YE/BK), wiring harness side.
	3 Ignition switch in position II. • Is the front wash/wipe function operative? → Yes RENEW the wash/wipe system switch. CHECK the operation of the system. → No RENEW the CJB. CHECK the operation of the system.

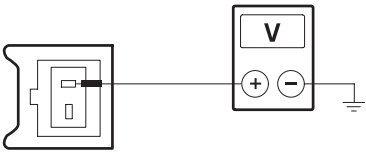
PINPOINT TEST J : WASH AND WIPE FUNCTION (FRONT OR REAR) IN CONTINUOUS OPERATION FOR 60 SECONDS

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
J1: DETERMINE THE FAULT CONDITION	
	1 Ignition switch in position II.

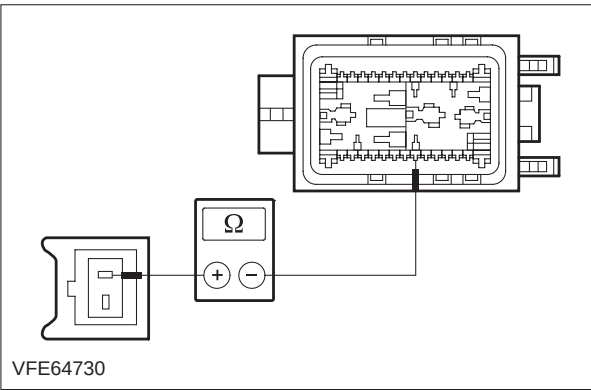
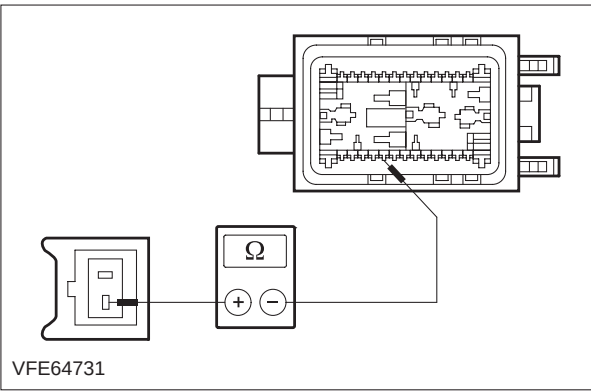
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	2 CHECK the front or rear wash/wipe function. Is the wash/wipe function (front) in continuous operation for 60 seconds and then automatically switched off? → Yes RENEW the wash/wipe system switch. CHECK the operation of the system. → No Wash and wipe function (rear) in continuous operation for 60 seconds: RENEW the wash/wipe switch. CHECK the operation of the system.

PINPOINT TEST K : WASHER SYSTEM IS INOPERATIVE

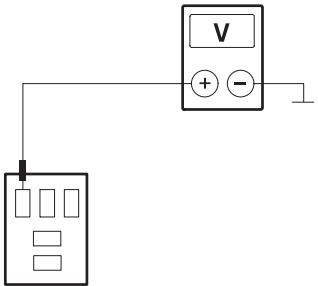
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
K1: CHECK THE VOLTAGE AT THE FRONT/REAR WASHER PUMP MOTOR	
NOTE: Wash/wipe system switch in the OFF position	
 VFE0008568	1 Ignition switch in position 0.
	2 Disconnect front/rear washer pump motor from connector C828.
	3 Ignition switch in position II.
	4 Measure the voltage between the front/rear washer pump motor, connector C828, pin 1, circuit 33-KA34(A) (YE/BK), wiring harness side and ground. Is battery voltage measured? → Yes GO to K3. → No GO to K2.
K2: CHECK CIRCUIT 33-KA34(A) (YE/BK) BETWEEN FRONT/REAR WASHER PUMP MOTOR AND CENTRAL JUNCTION BOX (CJB) FOR BREAKS	
	1 Ignition switch in position 0.
	2 Disconnect CJB from connector C96.

DIAGNOSIS AND TESTING

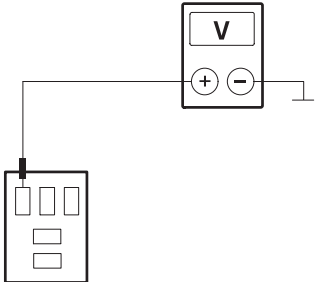
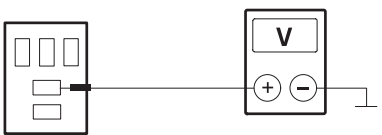
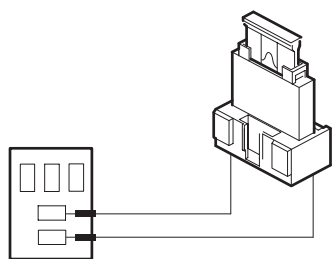
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE64730	3 Measure the resistance between the front/rear washer pump motor, connector C828, pin 1, circuit 33-KA34(A) (YE/BK), wiring harness side and the CJB, connector C96, pin 9, circuit 33-KA34(A) (YE/BK), wiring harness side. Is a resistance of less than 2 Ohms registered? → Yes RENEW the CJB. CHECK the operation of the system. → No LOCATE and RECTIFY the break in the circuit between front/rear washer pump motor and the CJB using the Wiring Diagrams. CHECK the operation of the system.
K3: CHECK THE VOLTAGE AT THE WASHER PUMP MOTOR	
 VFE0015948	1 Measure the voltage between the front/rear washer pump motor, connector C828, pin 2, circuit 32-KA34(A) (WH/BK), wiring harness side and ground. Does the meter display battery voltage? → Yes INSTALL A NEW front/rear washer pump motor. CHECK the operation of the system. → No GO to K4.
K4: CHECK CIRCUIT 32-KA34(A) (WH/BK) BETWEEN FRONT/REAR WASHER PUMP MOTOR AND CENTRAL JUNCTION BOX (CJB) FOR BREAKS	
 VFE64731	1 Ignition switch in position 0. 2 Measure the resistance between the front/rear washer pump motor, connector C828, pin 2, circuit 32-KA34(A) (WH/BK), wiring harness side and the CJB, connector C96, pin 6, circuit 32-KA34(A) (WH/BK), wiring harness side. Is a resistance of less than 2 Ohms registered? → Yes RENEW the CJB. CHECK the operation of the system. → No LOCATE and RECTIFY the break in the circuit between front/rear washer pump motor and the CJB using the Wiring Diagrams. CHECK the operation of the system.

DIAGNOSIS AND TESTING

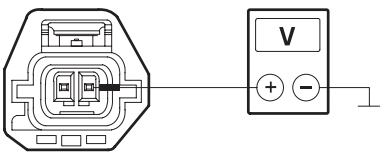
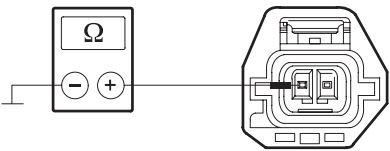
PINPOINT TEST L : HEADLAMP WASHER SYSTEM IS INOPERATIVE

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
L1: CHECK FUSE F23 (30 A) (BJB)	
	1 Ignition switch in position 0.
	2 Disconnect fuse F23 (30 A) (BJB).
	3 CHECK fuse F23 (30 A) (BJB). - Is the fuse OK? → Yes GO to L2. → No RENEW fuse F23 (30 A) (BJB) CHECK the operation of the system. If the fuse blows again, LOCATE and RECTIFY the short to ground using the Wiring Diagrams. CHECK the operation of the system.
L2: CHECK THE VOLTAGE SUPPLY TO FUSE F23 (30 A) (BJB) FOR OPEN CIRCUIT	
	1 Connect fuse F23 (30 A) (BJB).
	2 Measure the voltage between fuse F23 (30 A) (BJB) and ground. - Does the meter display battery voltage? → Yes GO to L3. → No CHECK BJB and if necessary RENEW. CHECK the operation of the system.
L3: CHECK CIRCUIT 31S-KA24 (BK/RD) BETWEEN THE HEADLAMP WASHER RELAY AND THE GEM FOR SHORT TO BATTERY VOLTAGE.	
	1 Disconnect headlamp cleaning system relay from socket C1009.
	2 Ignition switch in position II.
 VFE0016132	3 Measure the voltage between the headlamp washer relay, socket C1009, pin 2, circuit 31S-KA24 (BK/RD), BJB side and ground. - Does the meter display battery voltage? → Yes GO to L4. → No GO to L5.

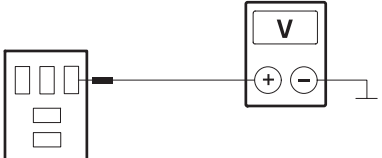
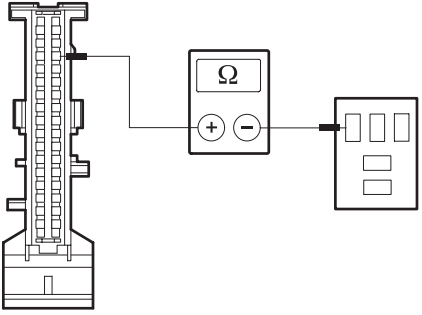
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
L4: CHECK CIRCUIT 31S-KA24 (BK/RD) BETWEEN THE HEADLAMP WASHER RELAY AND THE CJB FOR SHORT TO BATTERY VOLTAGE.	
	1 Ignition switch in position 0. 2 Disconnect CJB from connector C95.
 VFE0016132	3 Measure the voltage between the headlamp washer relay, socket C1009, pin 2, circuit 31S-KA24 (BK/RD), BJB side and ground. • Does the meter display battery voltage? → Yes LOCATE and RECTIFY the short to battery voltage in the circuit between the headlamp washer relay and the CJB with the aid of the Wiring Diagrams. CHECK the operation of the system. → No INSTALL a new GEM. CHECK the operation of the system.
L5: CHECK VOLTAGE SUPPLY OF HEADLAMP CLEANING SYSTEM RELAY FOR OPEN CIRCUIT	
 VFE0019862	1 Measure the voltage between the headlamp cleaning system relay, socket C1009, pin 5, circuit 30-KA25 (RD), BJB side and ground. • Does the meter display battery voltage? → Yes GO to L6. → No LOCATE and RECTIFY the break in the circuit between fuse F23 (BJB) and the headlamp cleaning system relay using the Wiring Diagrams. CHECK the operation of the system.
L6: CHECK HEADLAMP RELAY	
 VFE0019865	1 Connect a fused jumper wire (30 A) at the headlamp cleaning system relay, socket C1009, between pin 5 and pin 3, BJB side. • Does the headlamp cleaning system pump run? → Yes GO to L9. → No GO to L7.

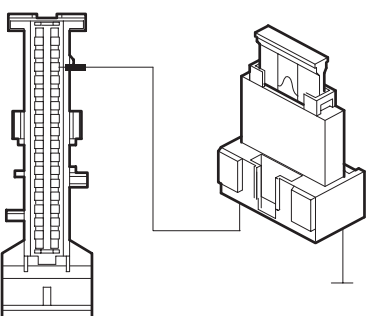
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
L7: CHECK CIRCUIT 15S-KA21(A) (GN/YE) BETWEEN THE HEADLAMP CLEANING SYSTEM RELAY AND THE HEADLAMP CLEANING SYSTEM PUMP FOR OPEN CIRCUIT	
NOTE: The fused jumper wire used in the previous test step is still connected to the headlamp cleaning system relay.	
 VFE0038583	1 Disconnect headlamp cleaning system pump from connector C745.
	2 Measure the voltage between the headlamp washer pump, connector C745, pin 1, circuit 15S-KA21(A) (GN/YE), wiring harness side and ground. • Does the meter display battery voltage? → Yes GO to L8. → No LOCATE and RECTIFY the break in the circuit between the headlamp cleaning system relay and the headlamp cleaning system pump using the Wiring Diagrams. CHECK the operation of the system.
L8: CHECK GROUND SUPPLY OF HEADLAMP CLEANING SYSTEM PUMP FOR OPEN CIRCUIT	
 VFE0038584	1 Ignition switch in position 0.
	2 Measure the resistance between the headlamp washer pump, connector C745, pin 2, circuit 31-KA21(A) (BK), wiring harness side and ground. • Is the resistance less than 2 ohms? → Yes RENEW the headlamp cleaning system pump. CHECK the operation of the system. → No LOCATE and RECTIFY the break in the circuit between the headlamp cleaning system pump and soldered connection S109 using the Wiring Diagrams. CHECK the operation of the system.

DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
L9: CHECK VOLTAGE SUPPLY OF HEADLAMP CLEANING SYSTEM RELAY (CONTROL CIRCUIT) FOR OPEN CIRCUIT	
 VFE0016104	1 Measure the voltage between the headlamp cleaning system relay, socket C1009, pin 1, circuit 15-KA24 (GN/OG), BJB side and ground. • Does the meter display battery voltage? → Yes GO to L10. → No LOCATE and RECTIFY the break in the circuit between soldered connection S164 and the headlamp cleaning system relay using the Wiring Diagrams. CHECK the operation of the system.
L10: CHECK CONTROL CIRCUIT OF HEADLAMP CLEANING SYSTEM RELAY FOR OPEN CIRCUIT	
 VFE0038586	1 Ignition switch in position 0.
	2 Disconnect CJB from connector C95.
	3 Measure the resistance between the headlamp cleaning system relay, socket C1009, pin 2, circuit 31S-KA24 (BK/RD), BJB side and CJB, connector C95, pin 14, circuit 31S-KA24 (BK/RD), wiring harness side. • Is the resistance less than 2 ohms? → Yes GO to L11. → No LOCATE and RECTIFY the break in the circuit between the headlamp cleaning system relay and CJB using the Wiring Diagrams. CHECK the operation of the system.
L11: CHECK HEADLAMP CLEANING SYSTEM RELAY	
	1 Connect headlamp cleaning system relay to socket C1009.
	2 Ignition switch in position II.

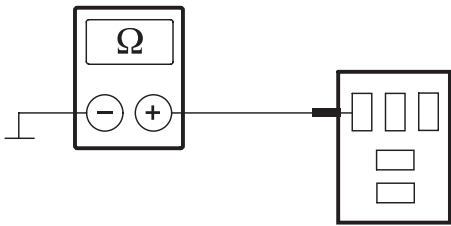
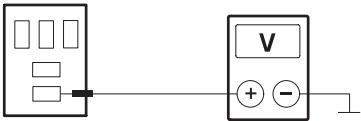
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE0038585	3 Use a fused jumper wire (10 A) to connect to the CJB, connector C95, pin 14, circuit 31S-KA24 (BK/RD) and ground. Does the headlamp cleaning system pump run? → Yes INSTALL a new GEM. CHECK the operation of the system. → No RENEW the headlamp cleaning system relay. CHECK the operation of the system.

PINPOINT TEST M : HEADLAMP WASHER SYSTEM OPERATES CONTINUOUSLY

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
M1: NARROW DOWN THE FAULT CONDITION	
	1 Ignition switch in position 0. 2 Disconnect CJB from connector C95. 3 Ignition switch in position II. 4 CHECK headlamp cleaning system pump. Does the headlamp cleaning system pump run continuously? → Yes GO to M2. → No INSTALL a new GEM. CHECK the operation of the system.
M2: CHECK HEADLAMP CLEANING SYSTEM RELAY	
	1 Ignition switch in position 0. 2 Disconnect headlamp cleaning system relay from socket C1009.

DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE0016108	3 Measure the resistance between the headlamp cleaning system relay, socket C1009, pin 2, circuit 31S-KA24 (BK/RD), BJB side and ground. Is the resistance greater than 10,000 Ohms? → Yes GO to M3. → No LOCATE and RECTIFY the short to ground in the circuit between headlamp cleaning system relay and the CJB using the Wiring Diagrams. CHECK the operation of the system.
M3: CHECK CIRCUIT 15S-KA21 (GN/YE) BETWEEN HEADLAMP CLEANING SYSTEM RELAY AND HEADLAMP CLEANING SYSTEM PUMP FOR SHORT TO BATTERY VOLTAGE	
	1 Ignition switch in position II.
 VFE0016103	2 Measure the voltage between the headlamp cleaning system relay, socket C1009, pin 3, circuit 15S-KA21 (GN/YE), BJB side and ground. Does the meter display battery voltage? → Yes LOCATE and RECTIFY the short to battery voltage in circuit 15S-KA21 (GN/YE) between the headlamp cleaning system relay and the headlamp cleaning system pump using the Wiring Diagrams. CHECK the operation of the system. → No RENEW the headlamp cleaning system relay. CHECK the operation of the system.

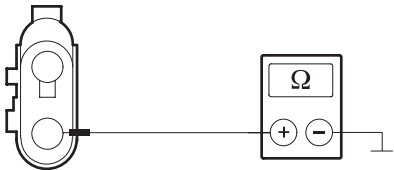
PINPOINT TEST N : WINDSHIELD WASHER NOZZLE HEATER IS INOPERATIVE

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
N1: DETERMINE THE FAULT CONDITION	
	1 Ignition switch in position II.

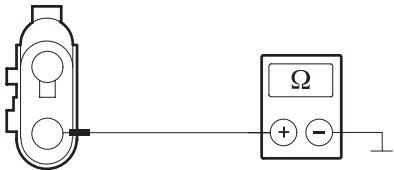
DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	2 DETERMINE which windshield washer nozzle heater is inoperative. - Are both windshield washer nozzle heaters inoperative? → Yes GO to N2. → No - Left windscreen washer nozzle heater is inoperative: GO to N3. - Right windscreen washer nozzle heater is inoperative: GO to N5.
N2: CHECK VOLTAGE SUPPLY TO WINDSHIELD WASHER NOZZLE HEATER FOR OPEN CIRCUIT	
	1 Ignition switch in position 0. 2 Disconnect Left-hand windshield washer nozzle heater from connector C721. 3 Ignition switch in position II.
 VFE0016017	4 Measure voltage between left-hand windshield washer nozzle heater, connector C721, pin 1, circuit 15-HB13 (GN/BU), wiring harness side and ground. Does the meter display battery voltage? → Yes LOCATE and RECTIFY break in circuit 31-HB1 (BK), between soldered connection S122 and soldered connection S109 using the Wiring Diagrams. CHECK the operation of the system. → No LOCATE and RECTIFY break in circuit 15-HB1 (GN/BU), between soldered connection S123 and fuse F47 (CJB) using the Wiring Diagrams. CHECK the operation of the system.
N3: CHECK VOLTAGE SUPPLY TO LEFT WINDSHIELD WASHER NOZZLE HEATER FOR OPEN CIRCUIT	
	1 Ignition switch in position 0. 2 Disconnect Left-hand windshield washer nozzle heater from connector C721. 3 Ignition switch in position II.

DIAGNOSIS AND TESTING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE0016017	4 Measure voltage between left-hand windshield washer nozzle heater, connector C721, pin 1, circuit 15-HB13 (GN/BU), wiring harness side and ground. Does the meter display battery voltage? → Yes GO to N4. → No LOCATE and RECTIFY break in circuit between soldered connection S123 and left-hand windshield washer nozzle heater using the Wiring Diagrams. CHECK the operation of the system.
N4: CHECK GROUND SUPPLY TO LEFT WINDSHIELD WASHER NOZZLE HEATER FOR OPEN CIRCUIT	
 VFE0022794	1 Ignition switch in position 0. 2 Measure the resistance between the left-hand windshield washer nozzle heater, connector C721, pin 2, circuit 31-HB13 (BK), wiring harness side and ground. Is the resistance less than 2 ohms? → Yes RENEW the left-hand windshield washer nozzle heater. CHECK the operation of the system. → No LOCATE and RECTIFY break in circuit between left-hand windshield washer nozzle heater and soldered connection S122 using the Wiring Diagrams. CHECK the operation of the system.
N5: CHECK VOLTAGE SUPPLY TO RIGHT WINDSHIELD WASHER NOZZLE HEATER FOR OPEN CIRCUIT	
	1 Ignition switch in position 0.
	2 Disconnect Right-hand windshield washer nozzle heater from connector C720.
	3 Ignition switch in position II.

DIAGNOSIS AND TESTING

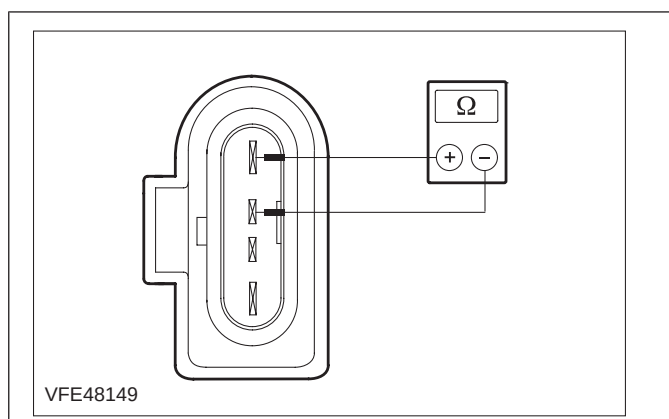
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 VFE0016017	4 Measure voltage between right-hand windshield washer nozzle heater, connector C720, pin 1, circuit 15-HB26 (GN/RD), wiring harness side and ground. Does the meter display battery voltage? → Yes GO to N6. → No LOCATE and RECTIFY break in circuit between soldered connection S123 and right-hand windshield washer nozzle heater using the Wiring Diagrams. CHECK the operation of the system.
N6: CHECK GROUND SUPPLY TO RIGHT WINDSHIELD WASHER NOZZLE HEATER FOR OPEN CIRCUIT	
 VFE0022794	1 Ignition switch in position 0. 2 Measure the resistance between the right-hand windshield washer nozzle heater, socket C720, pin 2, circuit 31-HB26 (BK), wiring harness side and ground. Is the resistance less than 2 ohms? → Yes RENEW the right-hand windshield washer nozzle heater. CHECK the operation of the system. → No LOCATE and RECTIFY break in circuit between right-hand windshield washer nozzle heater and soldered connection S122 using the Wiring Diagrams. CHECK the operation of the system.

Component Tests

Front wiper motor

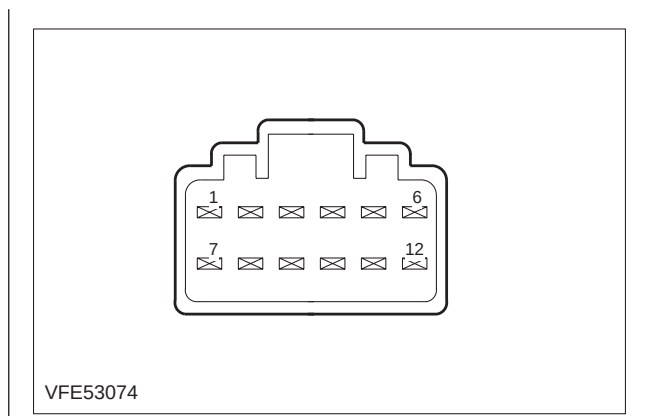
1. TEST the front windshield wiper motor in park position:

- Measure the resistance at the front windscreen wiper motor between pin 3 and pin 4 (or the housing of the wiper motor).
- Is the resistance less than 2 ohms?
 - If yes then the wiper motor is OK.
 - If not, RENEW the wiper motor.



DIAGNOSIS AND TESTING**Wash/wipe system switch**

Pin assignment:

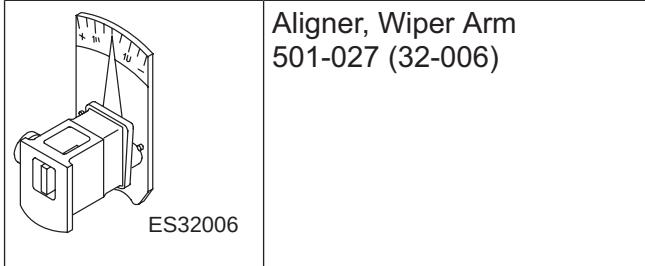


Circuit to test	Connect ohmmeter to the following terminal pins	Set the switch to the following position	The switch is OK if
Intermittent	3 and 12	Intermittent	Circuit closed
Variable delay	3 and 7	Intermittent level 1	Circuit closed
	3 and 9	Intermittent level 1	Circuit open
	3 and 11	Intermittent level 1	Circuit open
Variable delay	3 and 7	Intermittent level 2	Circuit closed
	3 and 9	Intermittent level 2	Circuit closed
	3 and 11	Intermittent level 2	Circuit open
Variable delay	3 and 7	Intermittent level 3	Circuit open
	3 and 9	Intermittent level 3	Circuit closed
	3 and 11	Intermittent level 3	Circuit open
Variable delay	3 and 7	Intermittent level 4	Circuit open
	3 and 9	Intermittent level 4	Circuit closed
	3 and 11	Intermittent level 4	Circuit closed
Variable delay	3 and 7	Intermittent level 5	Circuit closed
	3 and 9	Intermittent level 5	Circuit closed
	3 and 11	Intermittent level 5	Circuit closed
Variable delay	3 and 7	Intermittent level 6	Circuit closed
	3 and 9	Intermittent level 6	Circuit open
	3 and 11	Intermittent level 6	Circuit closed

GENERAL PROCEDURES

Windshield Wiper Blade and Pivot Arm Adjustment

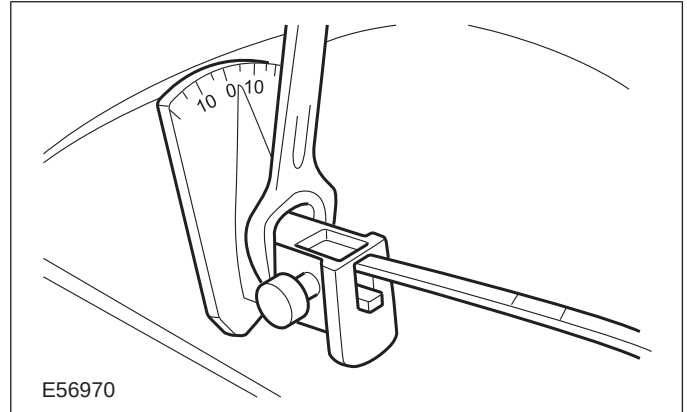
Special Tool(s)



General Equipment

Aero-Wiper Measuring and Adjusting Tools AWPE 02 (Order No. 511 5124 001 00)

Using an open-ended wrench on the special tool, adjust the wiper arm. For additional information, **refer to Specifications.**



Vehicles without beam blade wipers

1. **CAUTION:** Make sure that the wiper motor is in the park position.

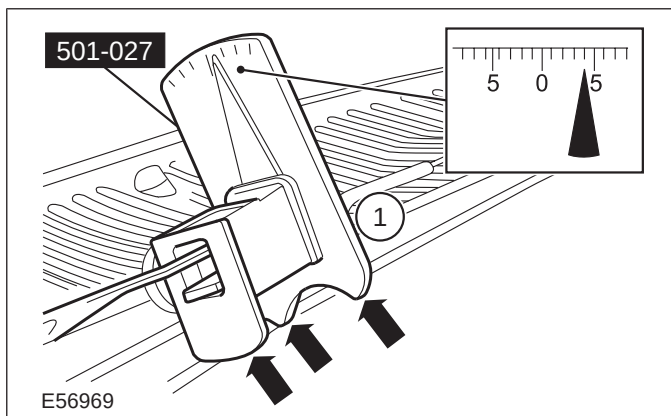
Remove the wiper blade.

2. Insert the wiper arm in the special tool and place the special tool on the windshield.
3. **NOTE:** All three support points of the special tool must be in contact with the glass.

NOTE: The angle of the wiper on the scale must point from the zero center line to the center of the windshield/rear window. Ignore the sign (+/-) on the alignment tool.

Using the special tool, read off the angle between the wiper arm and the windshield.

1. Center of windshield

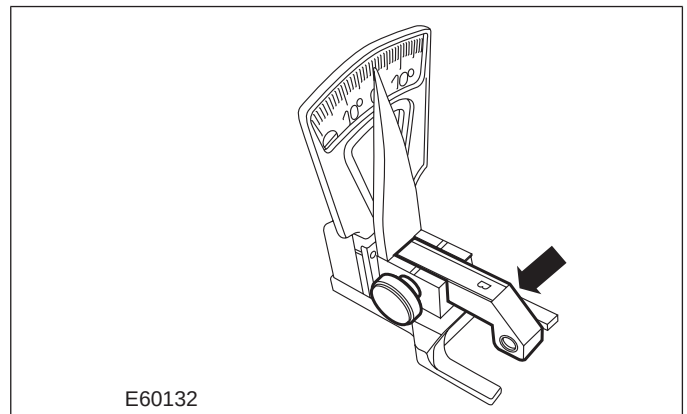


4. **NOTE:** Lift the special tool away from the glass when correcting the angle, in order to prevent damage.

5. Remove the special tool.
6. Install the wiper blade.

Vehicles with beam blade wipers

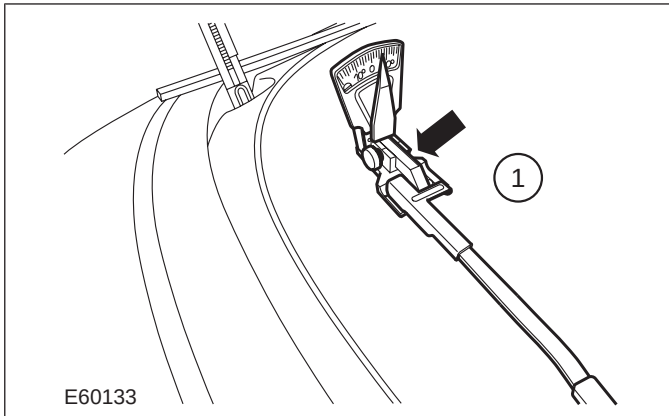
1. Connect the adapter "B" with the angle measuring instrument.
 - Tighten the knurled screw finger tight.



2. **CAUTION:** Make sure that the wiper motor is in the park position.
Remove the wiper blade.
3. Insert the wiper arm in the angle measuring instrument and place the angle measuring instrument on the windshield.

GENERAL PROCEDURES

1. Center of windshield



6. Remove the angle measuring instrument.

7. Install the wiper blade.

4. NOTE: All three support points of the angle measuring instrument must be in contact with the glass.

NOTE: The angle of the wiper on the scale must point from the zero center line to the center of the windshield/rear window. Ignore the sign (+/-) on the alignment tool.

Using the angle measuring instrument, read off the angle between the wiper arm and the windshield.

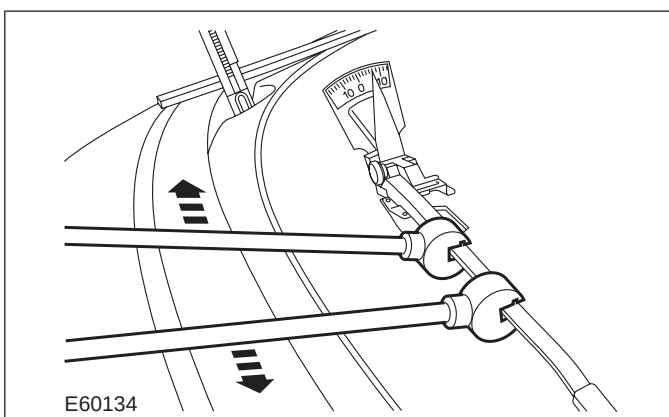
5. CAUTIONS:

⚠ Make sure that no mechanical force is applied to the wiper blade holder while adjusting the angle.

⚠ The wiper arm must not be adjusted by more than three degrees. If a bigger adjustment is necessary, check the wiper arm for damage, replace if necessary.

NOTE: Lift the angle measuring instrument away from the glass when correcting the angle, in order to prevent damage.

Using the adjusting tool and the counter holder, adjust the wiper arm. For additional information, **refer to Specifications.**

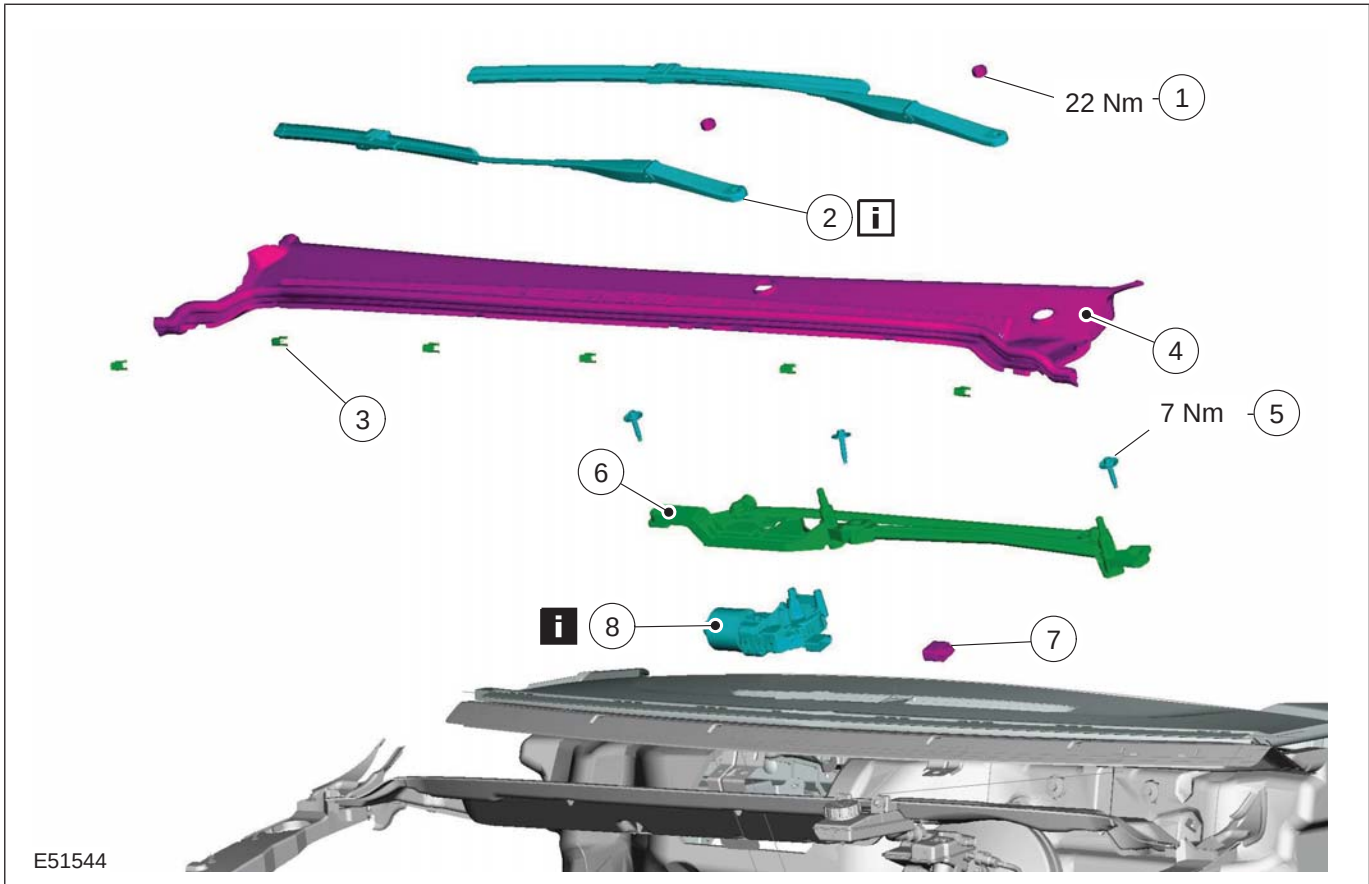


REMOVAL AND INSTALLATION

Windshield Wiper Motor

1. Remove the components in the order indicated in the following illustration(s) and table(s).

 **CAUTION:** Make sure that the windshield wiper motor is in the park position.



Item	Description
1	Windshield wiper arm nuts
2	Windshield wiper arms See Installation Detail
3	Clips, cowl panel grille
4	Cowl panel grille
5	Bolts for windshield wiper motor with linkage
6	Front wiper linkage

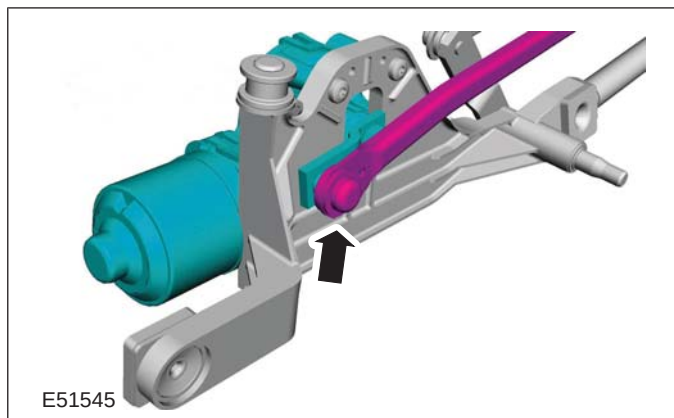
Item	Description
7	Windshield wiper motor connector
8	Windshield wiper motor See Removal Detail

2. To install, reverse the removal procedure.
3. Check the angle of the windshield wiper arms in relation to the windshield.
- For additional information, **refer to:**
Windshield Wiper Blade and Pivot Arm Adjustment (501-16 Wipers and Washers, General Procedures).

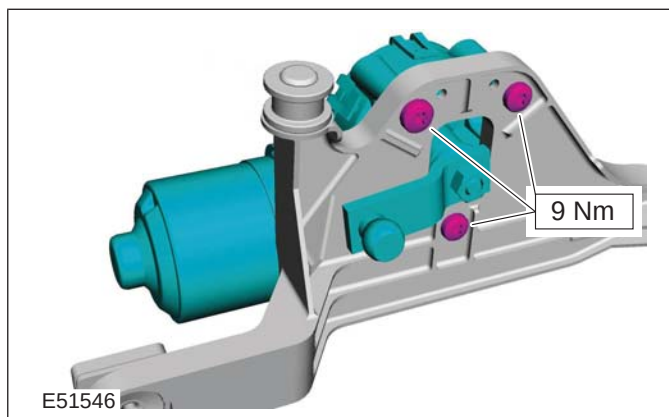
Removal Details

REMOVAL AND INSTALLATION**Item 8 Windshield wiper motor**

1. Detach the wiper linkage from the Windshield wiper motor lever arm.



2. Remove the windshield wiper motor bolts.



3. Pull windshield wiper motor from the wiper motor bracket.

**Installation Details****Item 2 Windshield wiper arms**

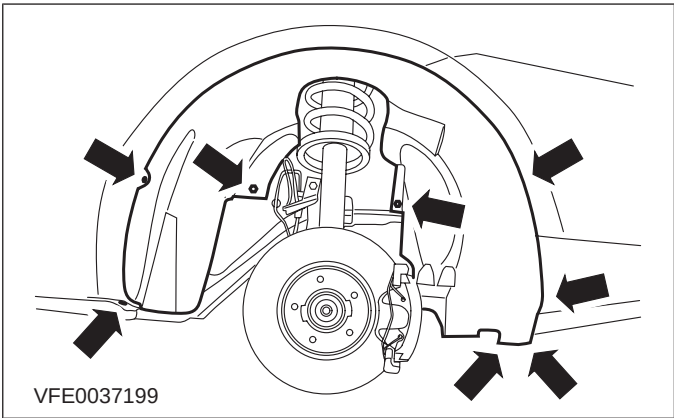
- CAUTION:** Move the windshield wiper motor to park position before installing the windshield wiper arms.

REMOVAL AND INSTALLATION

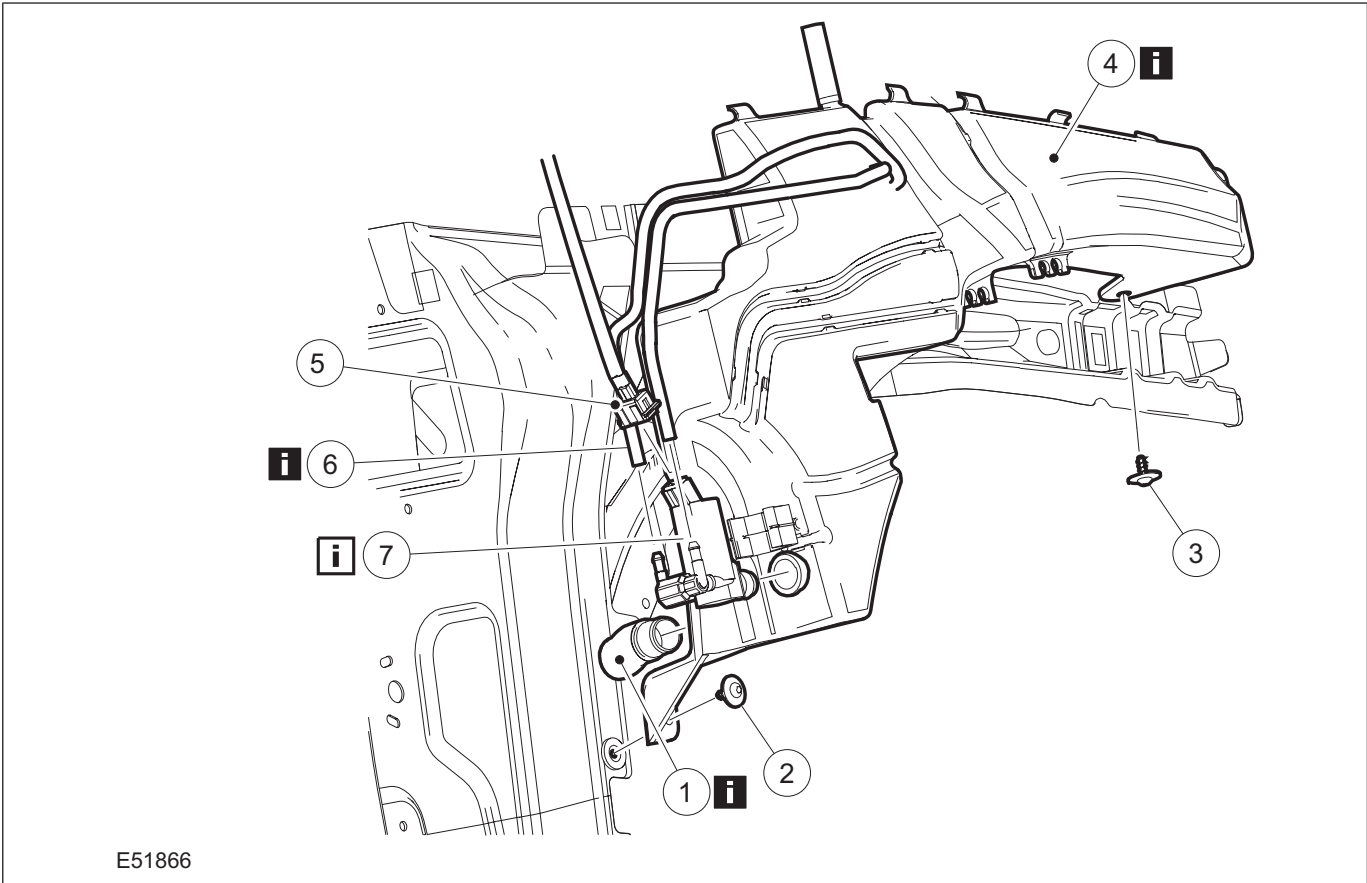
Windshield Washer Pump(32 624 0)

1. Empty the windshield washer reservoir.
2. Detach the right-hand front wheel.
- For additional information, refer to: **Wheel and Tire** (204-04 Wheels and Tires, Removal and Installation).

3. Remove the right-hand wheelhouse cover.



4. Remove the components in the order indicated in the following illustration(s) and table(s).



Item	Description
1	Front windscreen washer lower reservoir connecting piece See Removal Detail
2	Windshield washer upper reservoir lower retaining bolt

Item	Description
3	Windshield washer upper reservoir upper retaining bolt
4	Windshield washer upper reservoir See Removal Detail
5	Front windscreen washer pump connector

REMOVAL AND INSTALLATION

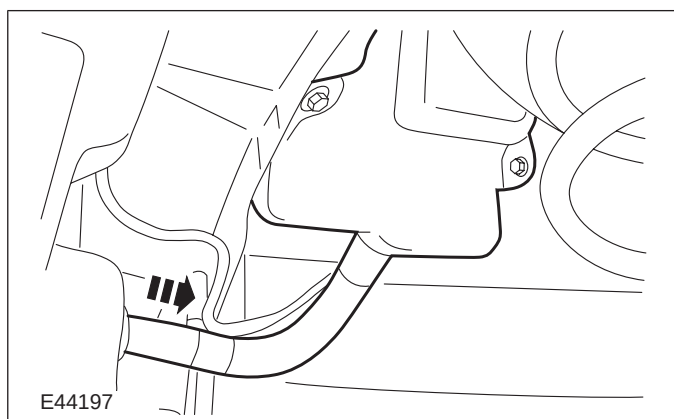
Item	Description
6	Windshield washer pump hoses. See Removal Detail

Item	Description
7	Windshield washer pump See Installation Detail

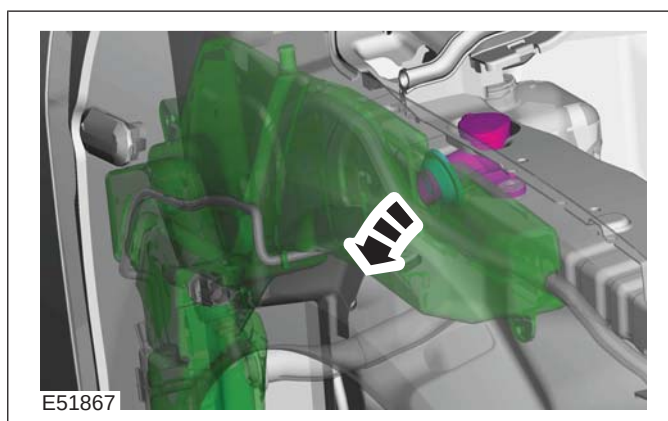
5. To install, reverse the removal procedure.

Removal Details**Item 1** Front windscreen washer lower reservoir connecting piece

1. Pull the connecting piece of the lower reservoir from the upper reservoir.

**Item 4** Windshield washer upper reservoir

1. Pull the reservoir from the filler neck.

**Item 6** Windshield washer pump hoses.

1. Unclip the reservoir hoses.

Installation Details**Item 7** Windshield washer pump

1. Coat the pump rubber seal – on the front windscreen washer with soap prior to installation.

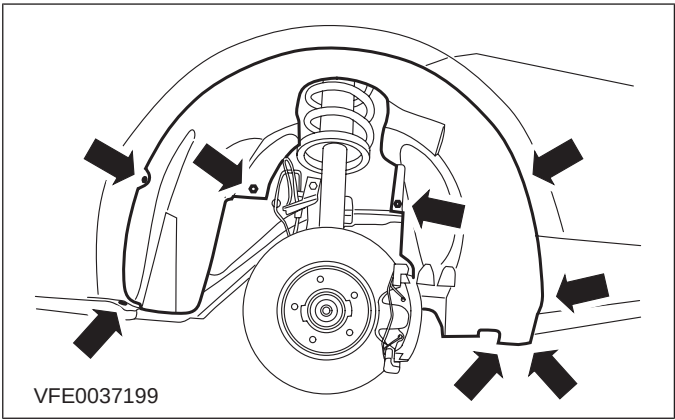
REMOVAL AND INSTALLATION

Windshield Washer Pump and Reservoir

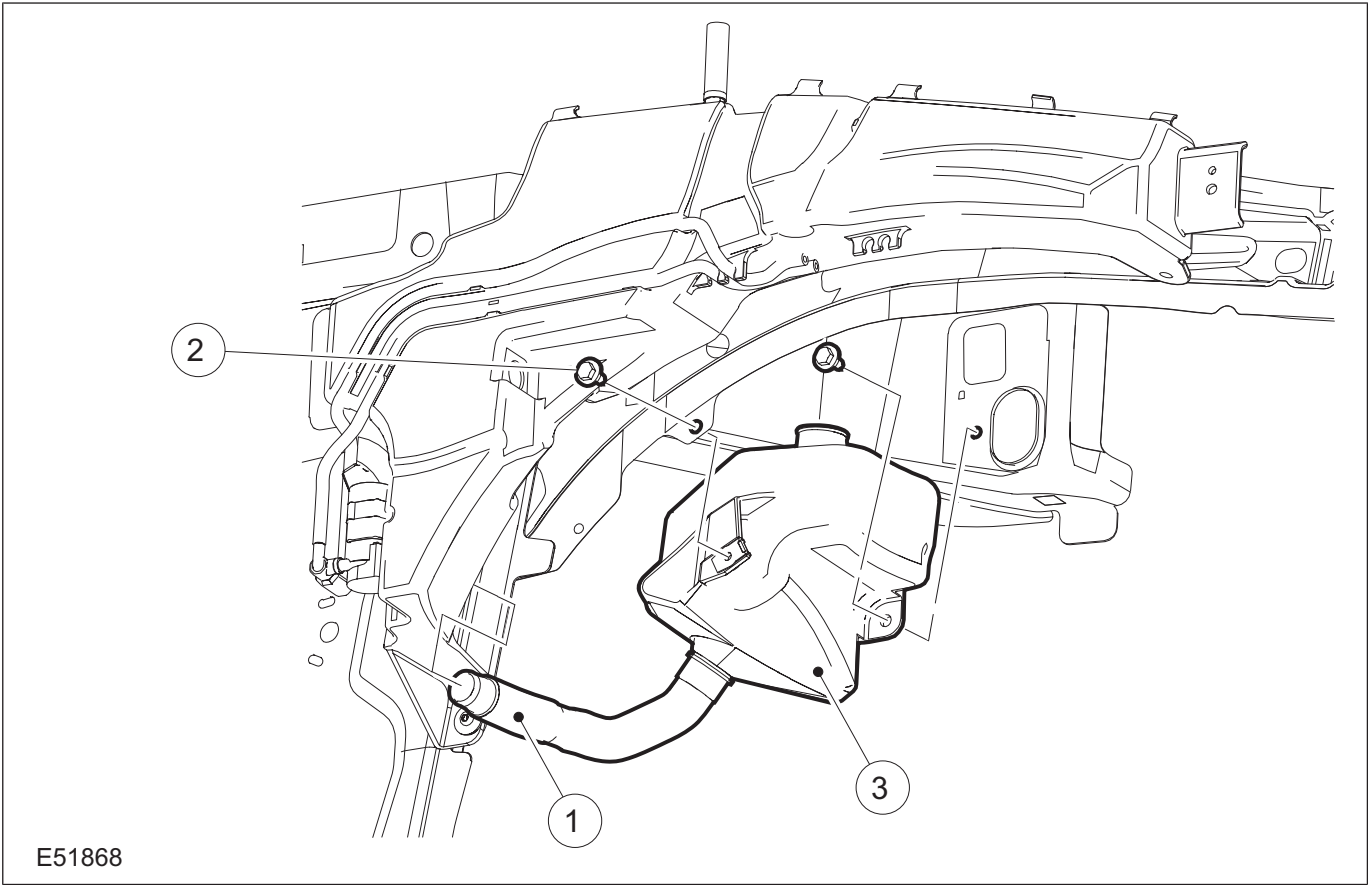
- 1. Empty the windshield washer reservoir.
- 2. Detach the right-hand front wheel.

For additional information, refer to: **Wheel and Tire** (204-04 Wheels and Tires, Removal and Installation).

- 3. Remove the right-hand wheelhouse cover.

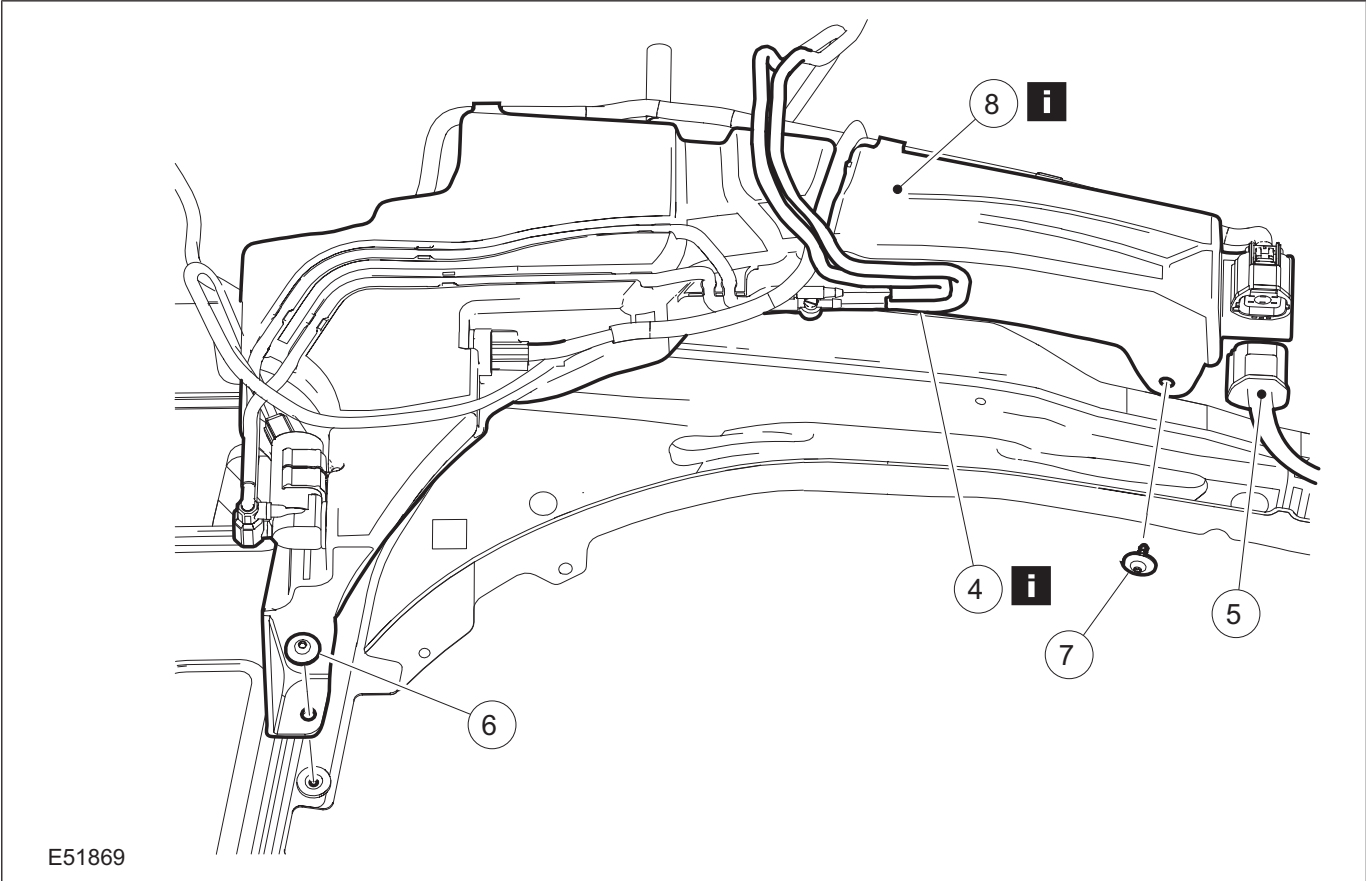


- 4. Remove the components in the order indicated in the following illustration(s) and table(s).



Item	Description
1	Front windscreen washer lower reservoir connecting piece
2	Front windscreen washer lower reservoir retaining bolts
3	Front windscreen washer lower reservoir

REMOVAL AND INSTALLATION



Item	Description
4	Windshield washer pump hoses. See Removal Detail
5	Front windscreen washer upper reservoir wiring harness connector
6	Windshield washer upper reservoir lower retaining bolt

Item	Description
7	Windshield washer upper reservoir upper retaining bolt
8	Windshield washer upper reservoir See Removal Detail

5. To install, reverse the removal procedure.

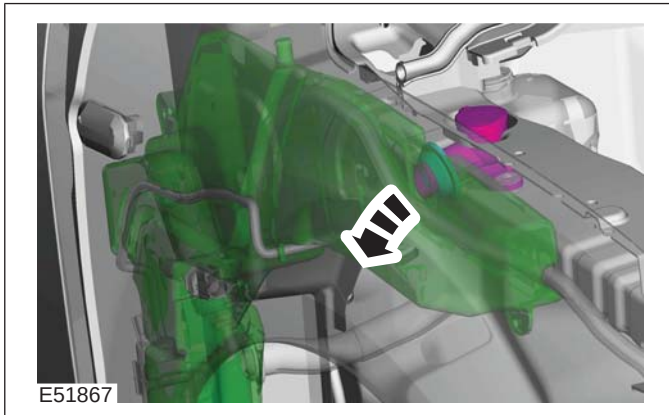
Removal Details

Item 4 Windshield washer pump hoses.

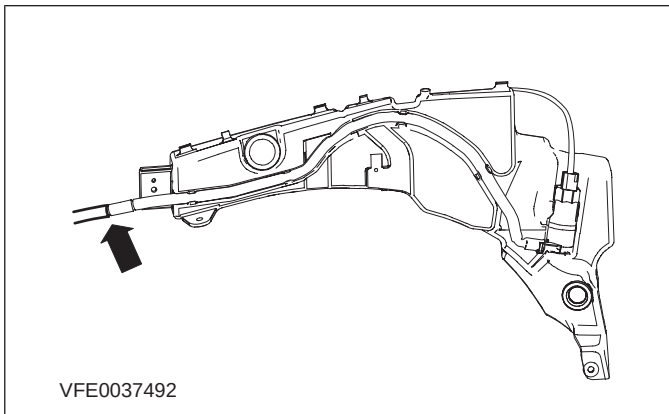
1. Unclip the reservoir hoses.

REMOVAL AND INSTALLATION**Item 8 Windshield washer upper reservoir**

1. Pull the reservoir from the filler neck.



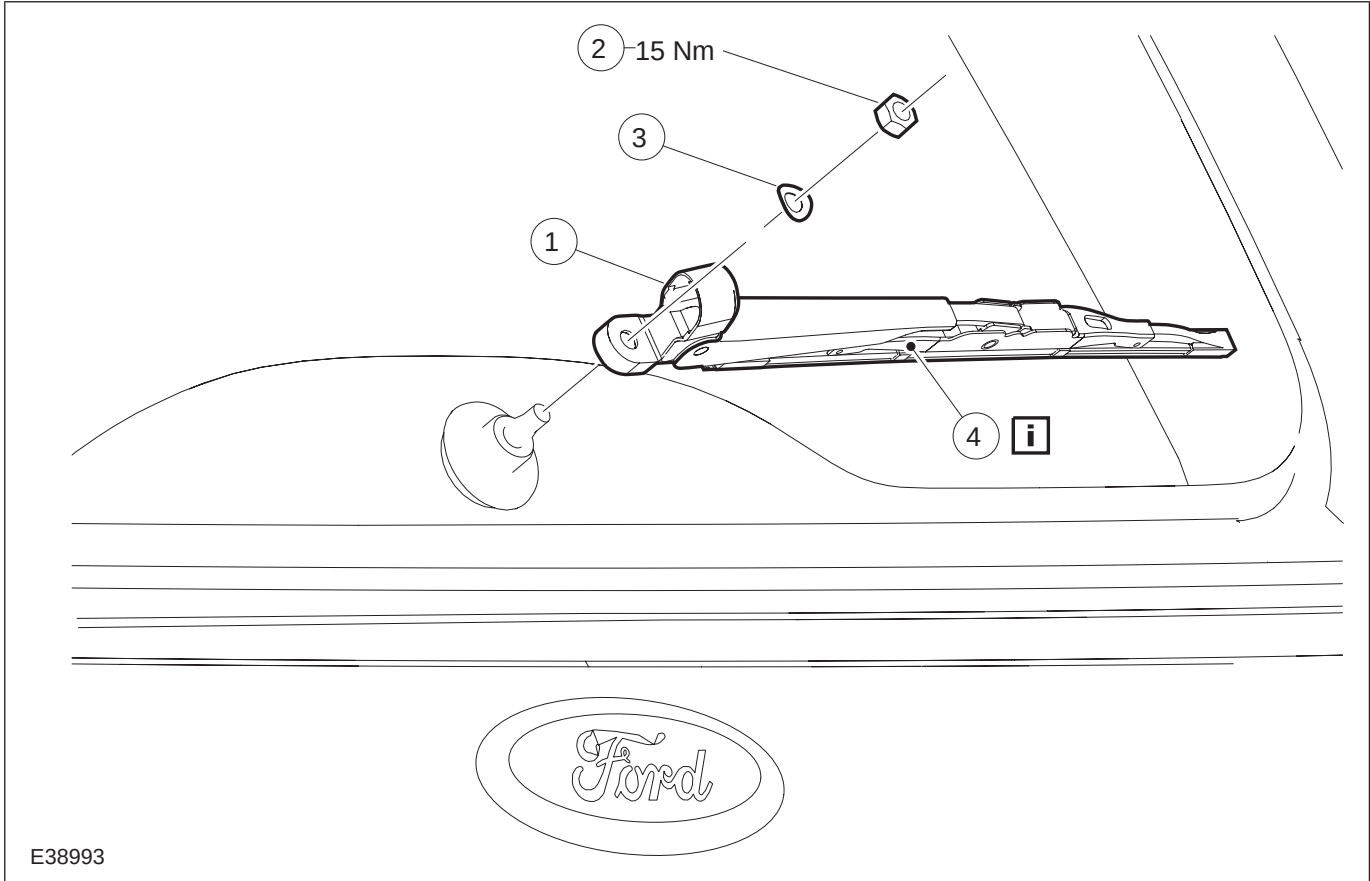
2. Disconnect windshield washer pump hose (if fitted).



REMOVAL AND INSTALLATION

Rear Window Wiper Motor

-  **CAUTION:** Ensure that the wiper motor is in the park position.
1. Remove the components in the order indicated in the following illustration(s) and table(s).

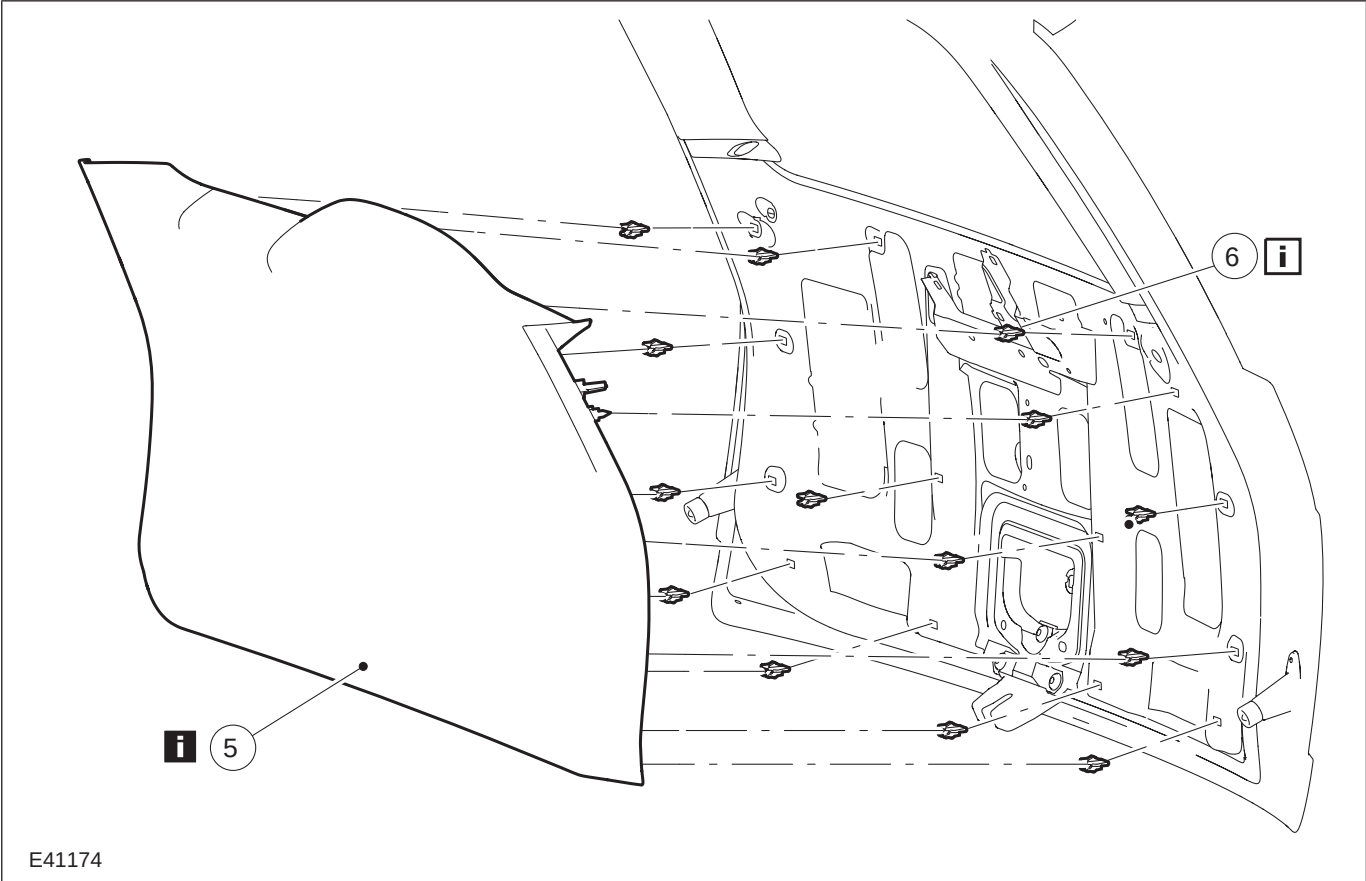


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Item	Description
1	Cap of rear window wiper arm nut
2	Nut of rear window wiper arm

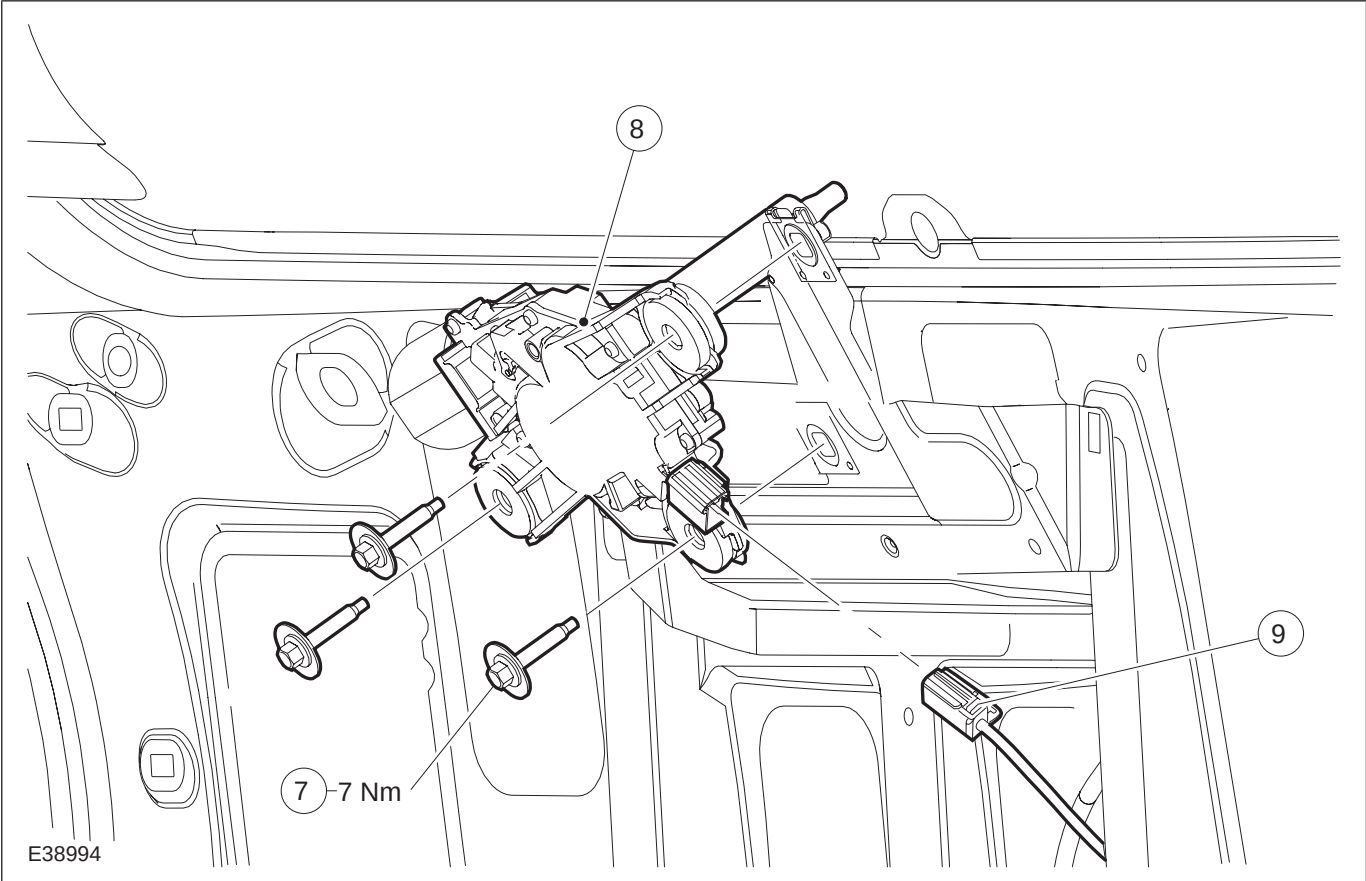
Item	Description
3	Washer of rear window wiper arm
4	Rear window wiper arm See Installation Detail

REMOVAL AND INSTALLATION



Item	Description
5	Liftgate trim panel See Removal Detail
6	Liftgate trim panel retaining clips See Installation Detail

REMOVAL AND INSTALLATION



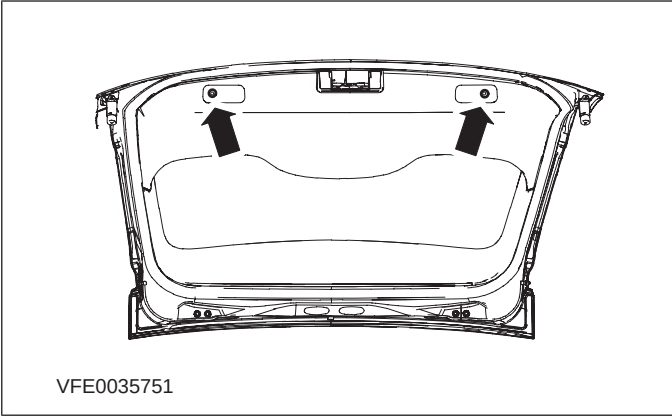
Item	Description
7	Rear window wiper motor bolts
8	Rear window wiper motor
9	Rear window wiper motor connector

2. To install, reverse the removal procedure.

Removal Details

Item 5 Liftgate trim panel

1. Remove the liftgate trim panel bolts.



Installation Details

REMOVAL AND INSTALLATION**Item 4** Rear window wiper arm

CAUTION: Move the rear window wiper motor to the park position before installing the rear window wiper arm.

Item 6 Liftgate trim panel retaining clips

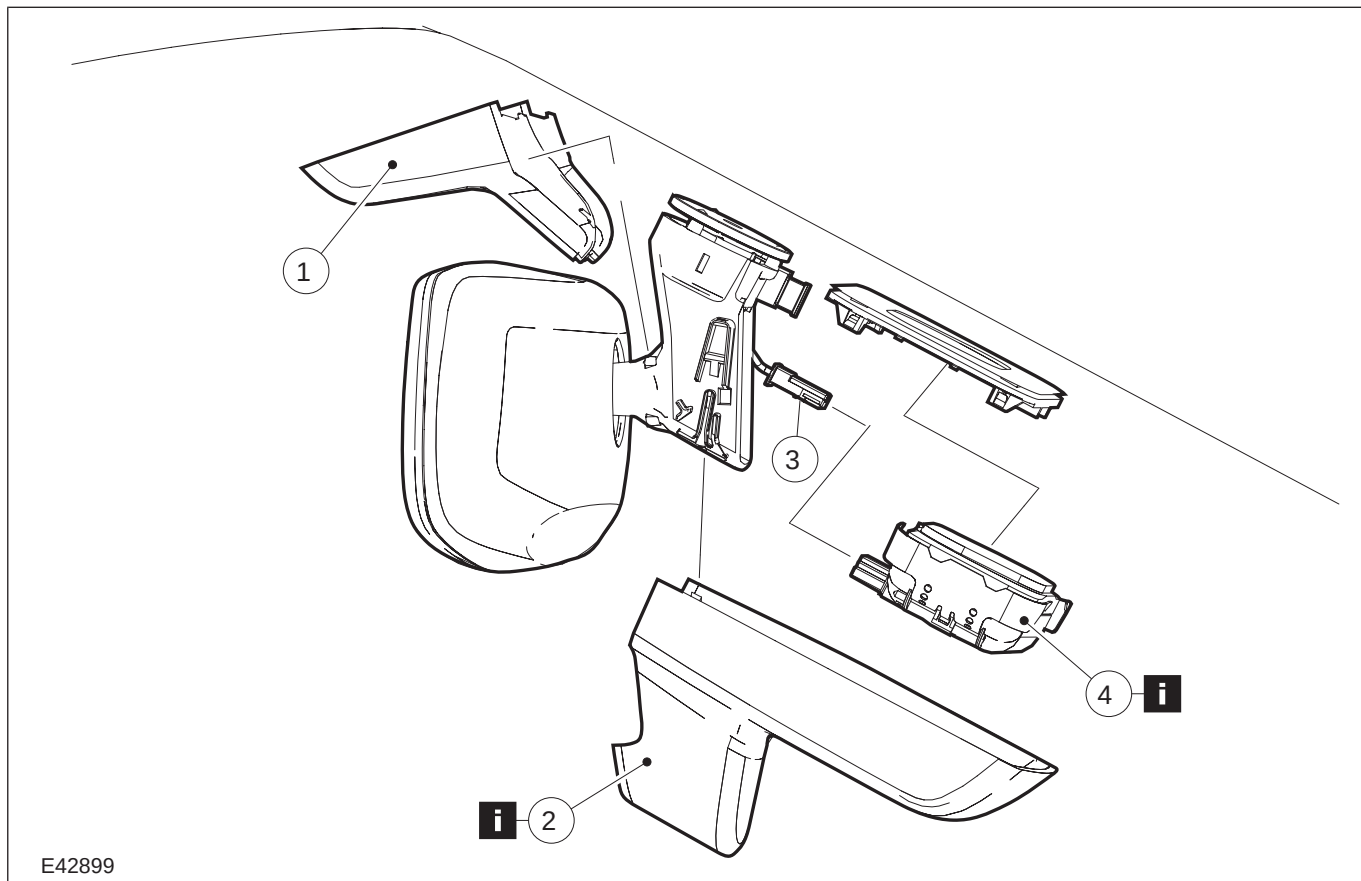
1. Install the liftgate trim panel retaining clips.

REMOVAL AND INSTALLATION

Rain Sensor

CAUTION: Do not touch the optical sensor silicon pads in order to prevent damage and dirt ingress.

1. Remove the components in the order indicated in the following illustration(s) and table(s).



Item	Description
1	Upper mirror bracket cover
2	Lower mirror bracket cover See Removal Detail

Item	Description
3	Rain sensor connector
4	Rain sensor See Removal Detail

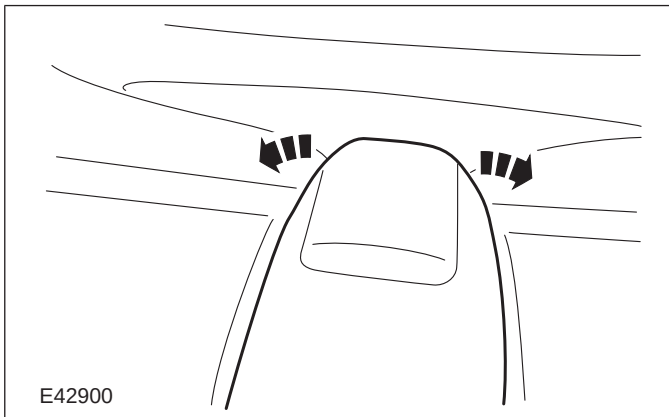
2. To install, reverse the removal procedure.

CAUTION: Make sure that the mating faces are clean and free of foreign material.

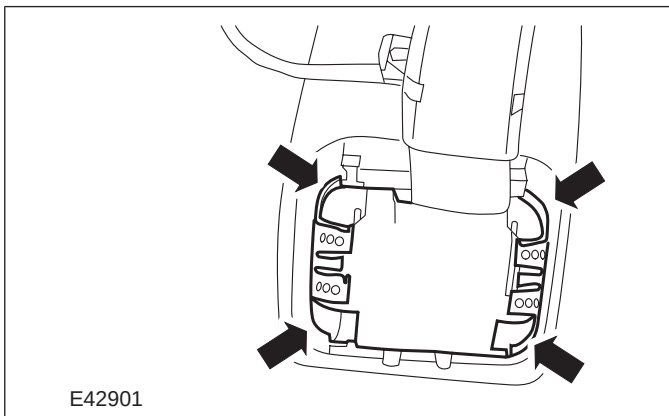
Removal Details

REMOVAL AND INSTALLATION**Item 2 Lower mirror bracket cover**

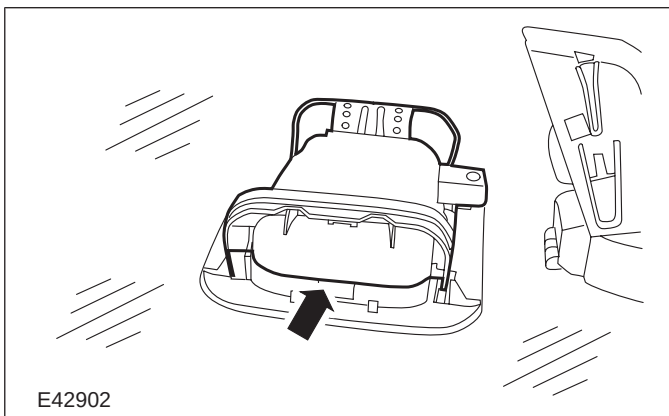
1. Unclip the lower mirror bracket cover.

**Item 4 Rain sensor**

1. Release the catches.



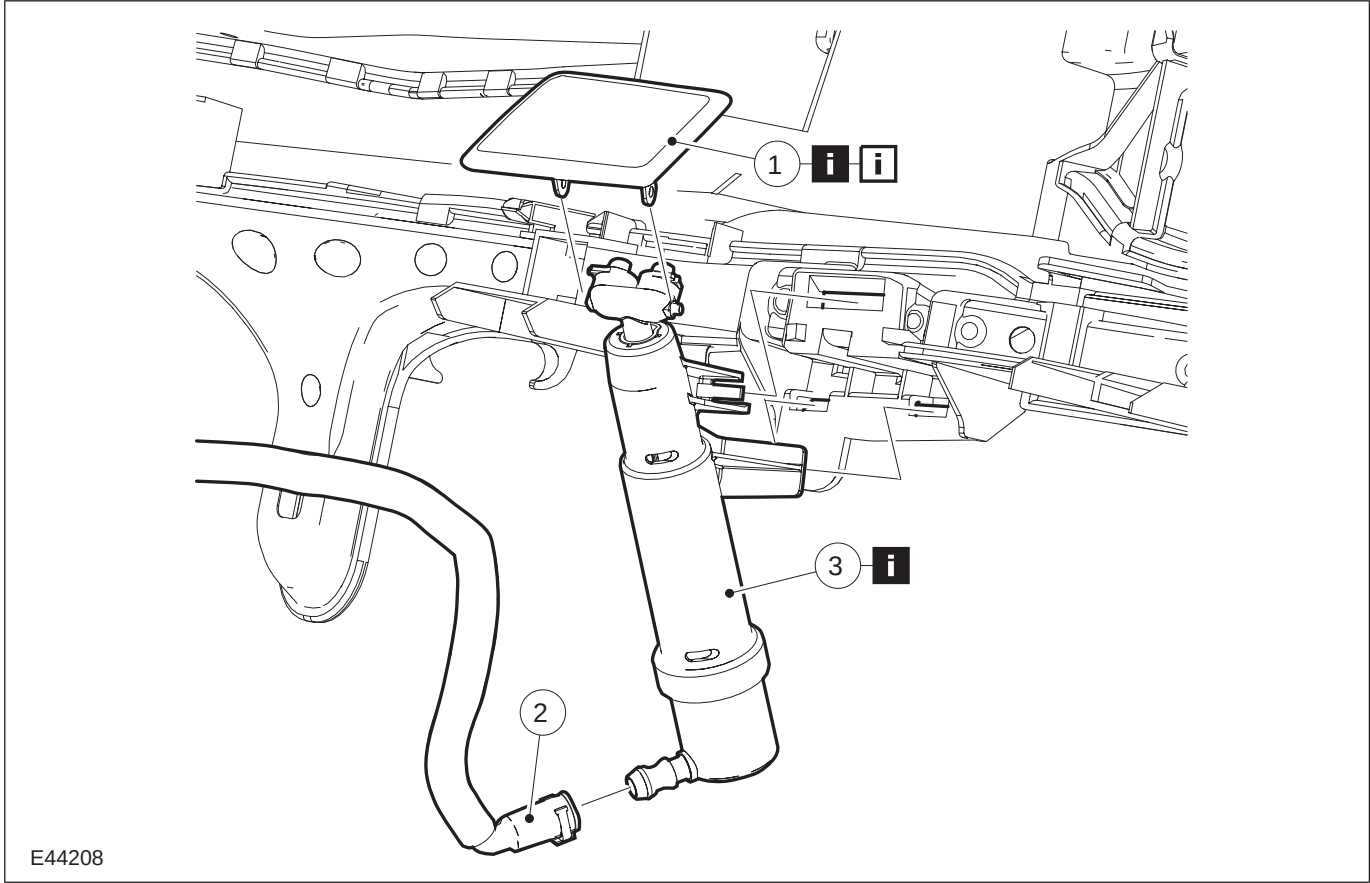
2. Unclip the rain sensor (right-hand side shown).



REMOVAL AND INSTALLATION

Headlamp Washer Jet(32 678 0)

1. Remove the headlamp assembly.
2. Remove the components in the order indicated in the following illustration(s) and table(s).



Item	Description
1	Cover, headlamp washer system nozzle See Removal Detail See Installation Detail
2	Headlamp washer jet pressure hose
3	Headlamp washer jet See Removal Detail

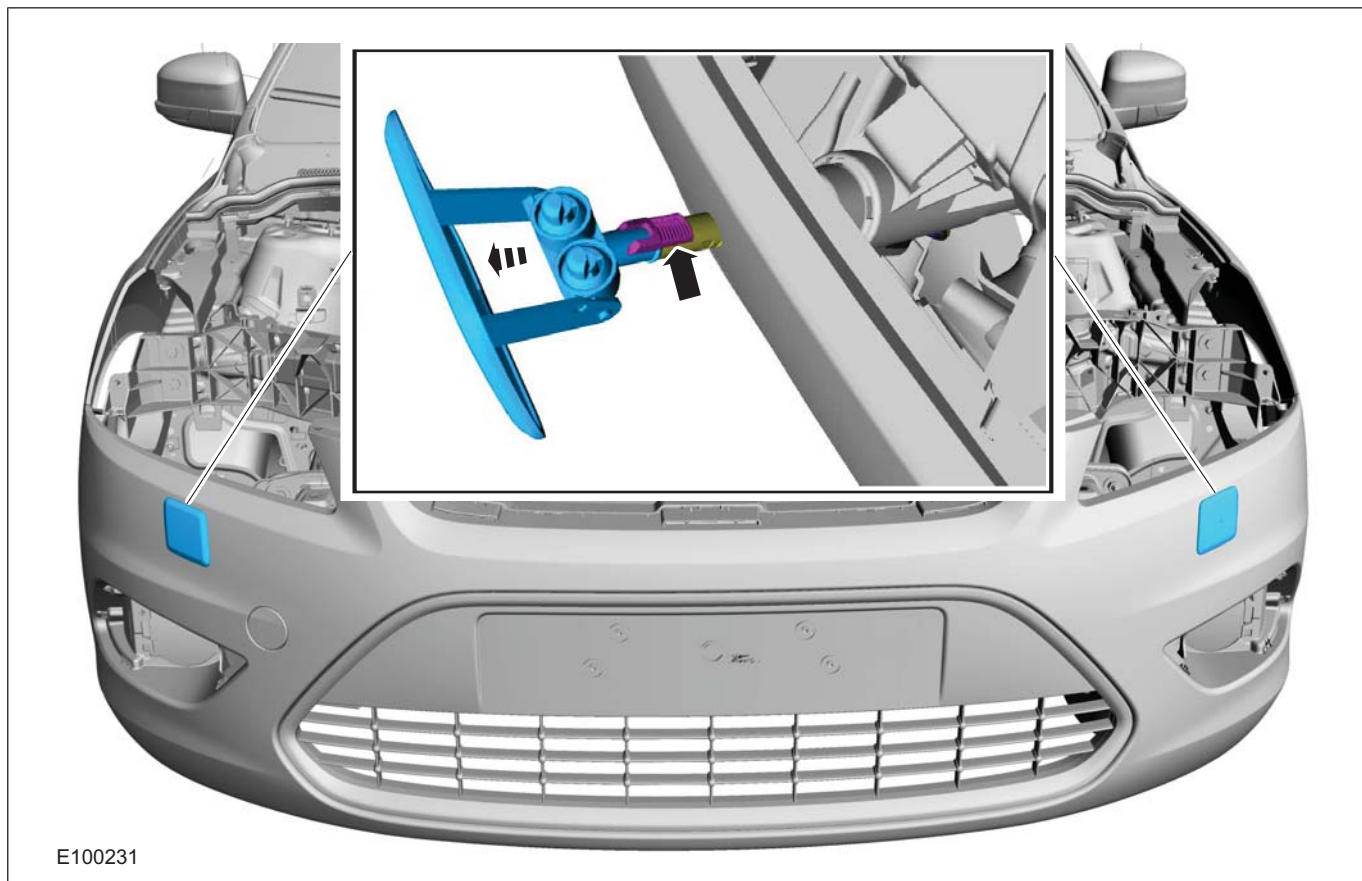
3. To install, reverse the removal procedure.

Removal Details

Item 1 Cover, headlamp washer system nozzle

1. Pull out and hold the headlamp washer jet telescopic rod.

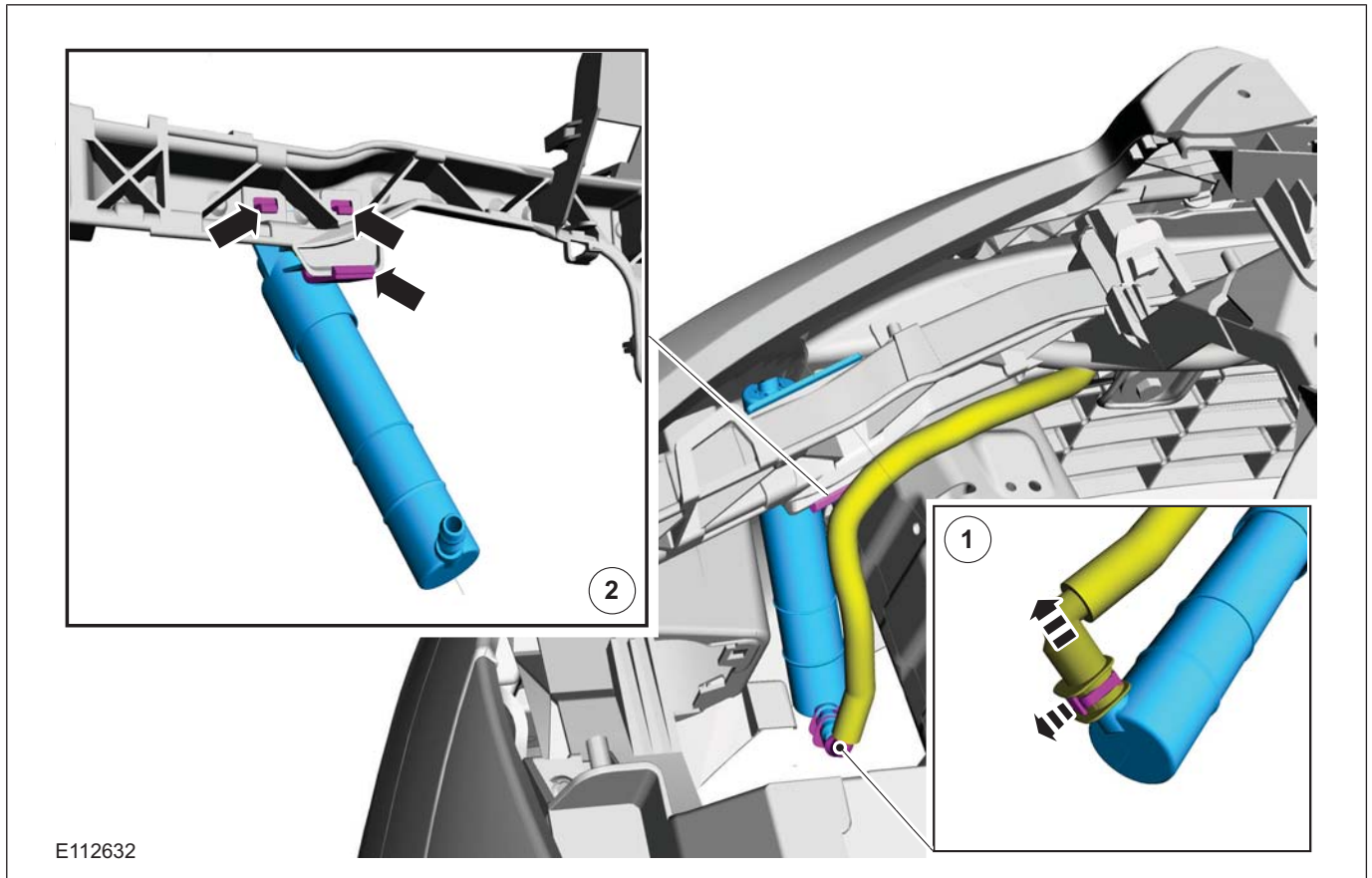
REMOVAL AND INSTALLATION

**Item 3 Headlamp washer jet**

1. Disconnect the high-pressure hose from the headlamp washer jet.

2. Unclip the headlamp washer jet from behind.

REMOVAL AND INSTALLATION



Installation Details

Item 1 Cover, headlamp washer system nozzle

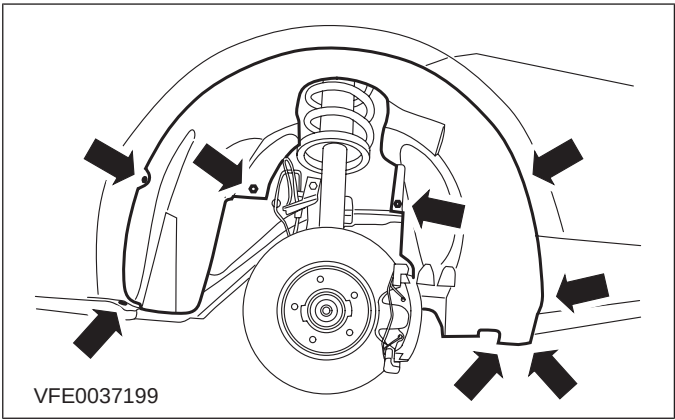
1. Push the headlamp washer jet cover together with the telescopic rod to the stop on the bumper cover.

REMOVAL AND INSTALLATION

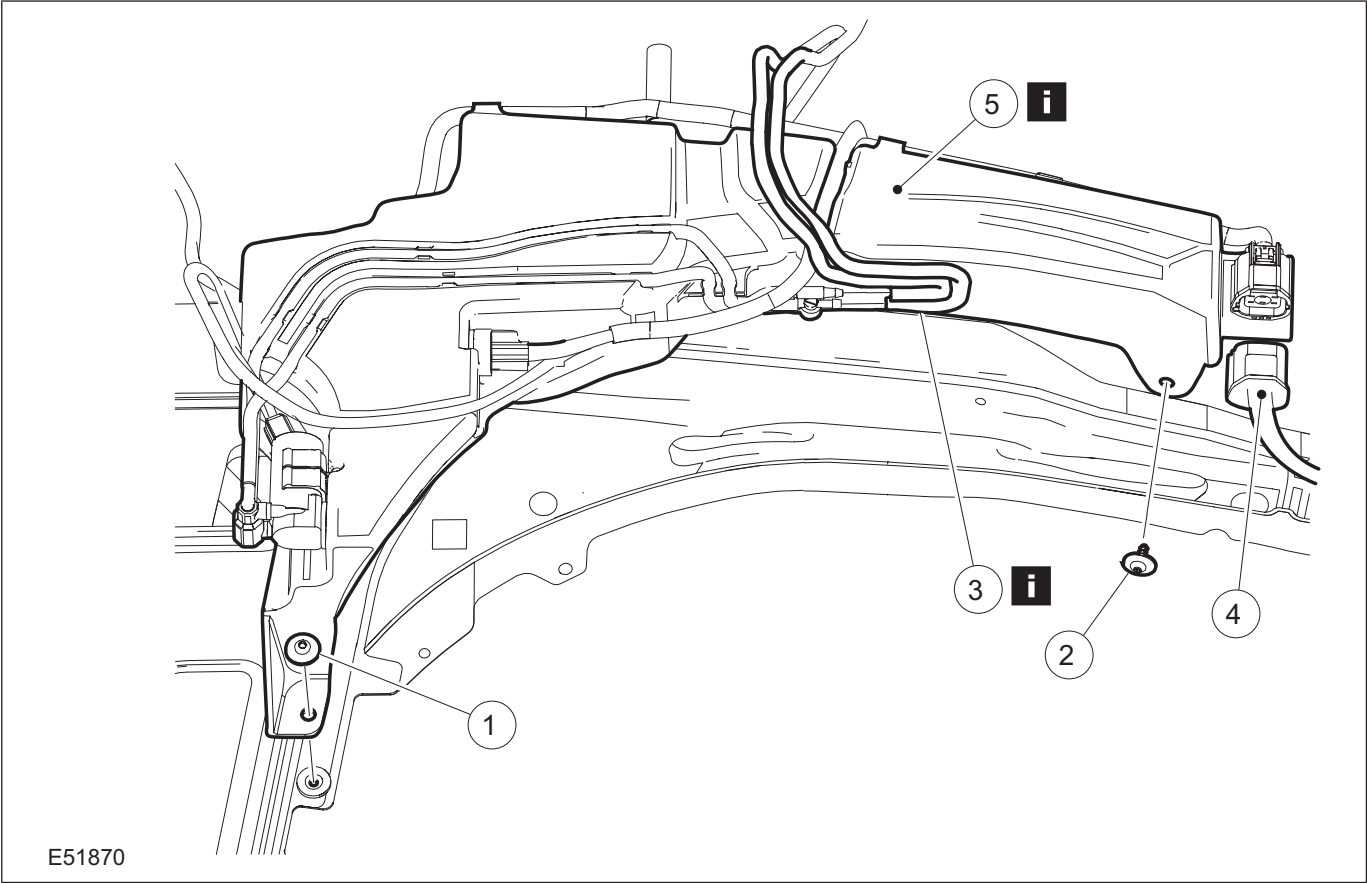
Headlamp Washer Pump

- 1. Empty the windshield washer reservoir.
- 2. Detach the right-hand front wheel.
- For additional information, refer to: **Wheel and Tire** (204-04 Wheels and Tires, Removal and Installation).

- 3. Remove the right-hand wheel arch trim panel.



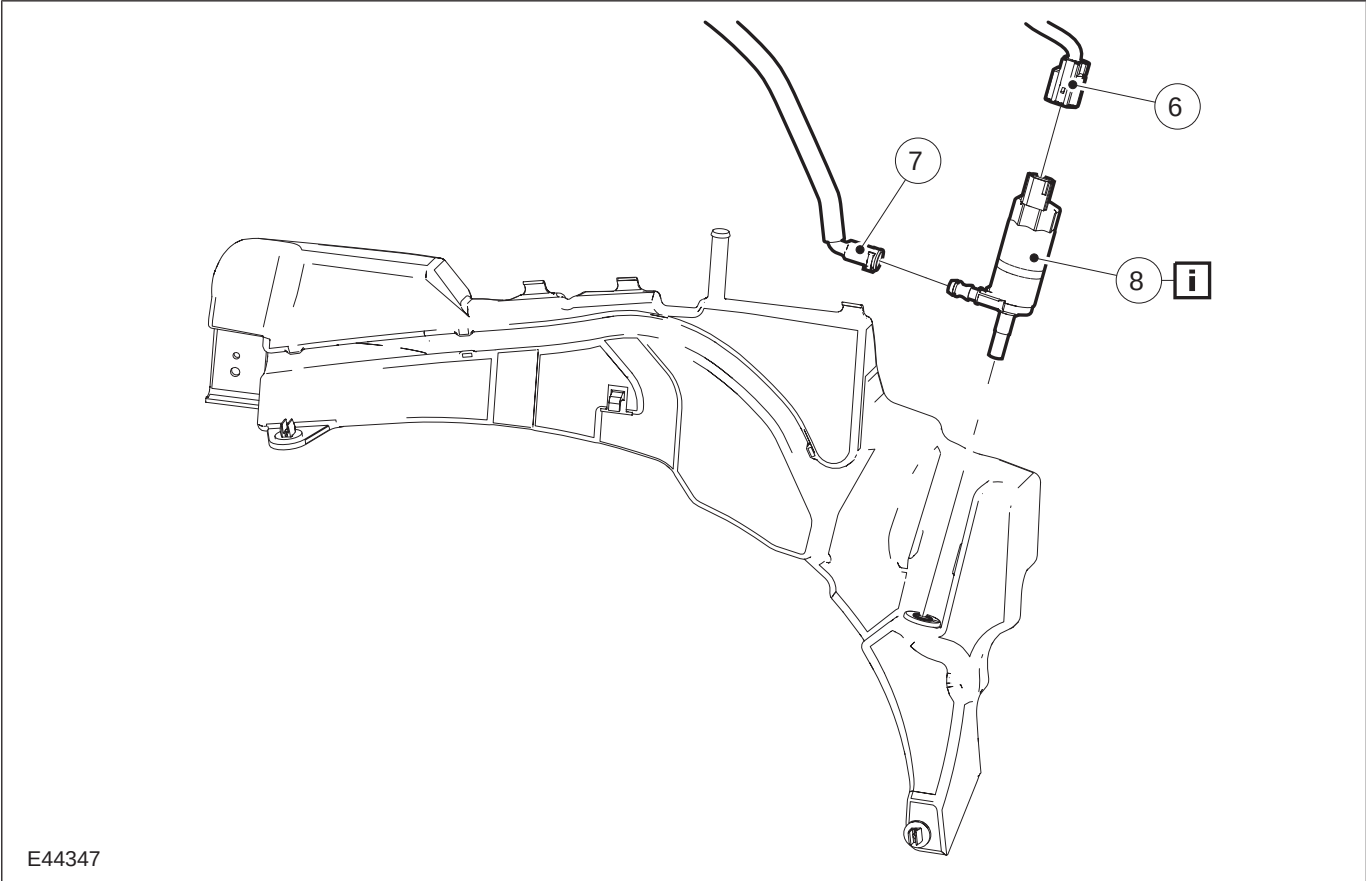
- 4. Remove the components in the order indicated in the following illustration(s) and table(s).



Item	Description
1	Windshield washer upper reservoir lower retaining bolt
2	Windshield washer upper reservoir upper retaining bolt

Item	Description
3	Windshield washer pump hoses. See Removal Detail
4	Front windscreen washer pump connector
5	Windshield washer upper reservoir See Removal Detail

REMOVAL AND INSTALLATION



Item	Description
6	Headlamp washer pump connector
7	Headlamp washer pump hose –
8	Headlamp washer pump – See Installation Detail

5. To install, reverse the removal procedure.

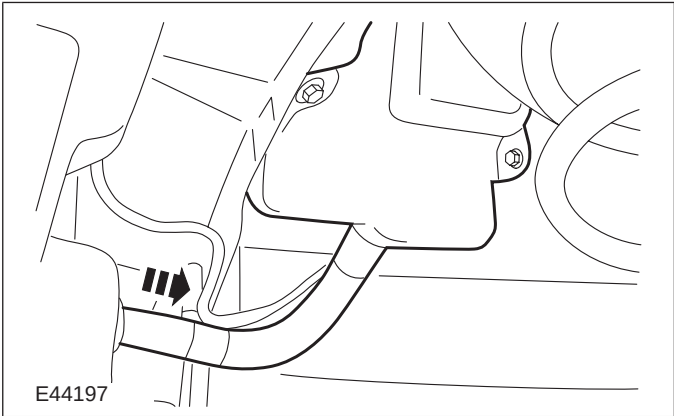
Removal Details

Item 3 Windshield washer pump hoses.

1. Unclip the reservoir hoses.

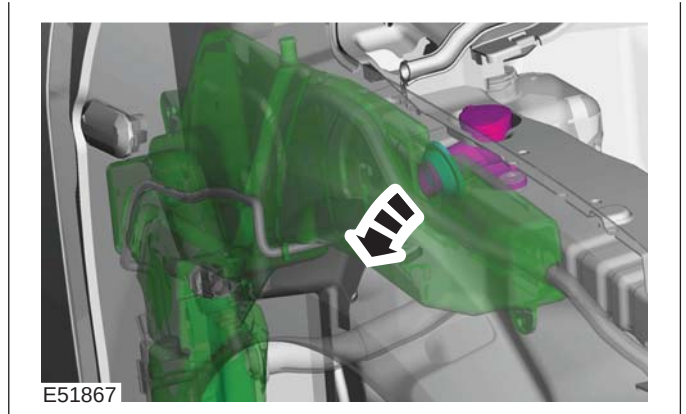
Item 5 Windshield washer upper reservoir

1. Pull the connecting piece of the lower reservoir from the upper reservoir.



REMOVAL AND INSTALLATION

2. Pull the reservoir from the filler neck.

**Installation Details****Item 8 Headlamp washer pump –**

1. Coat the pump rubber seal on the headlamp washer with soap solution prior to installation.