

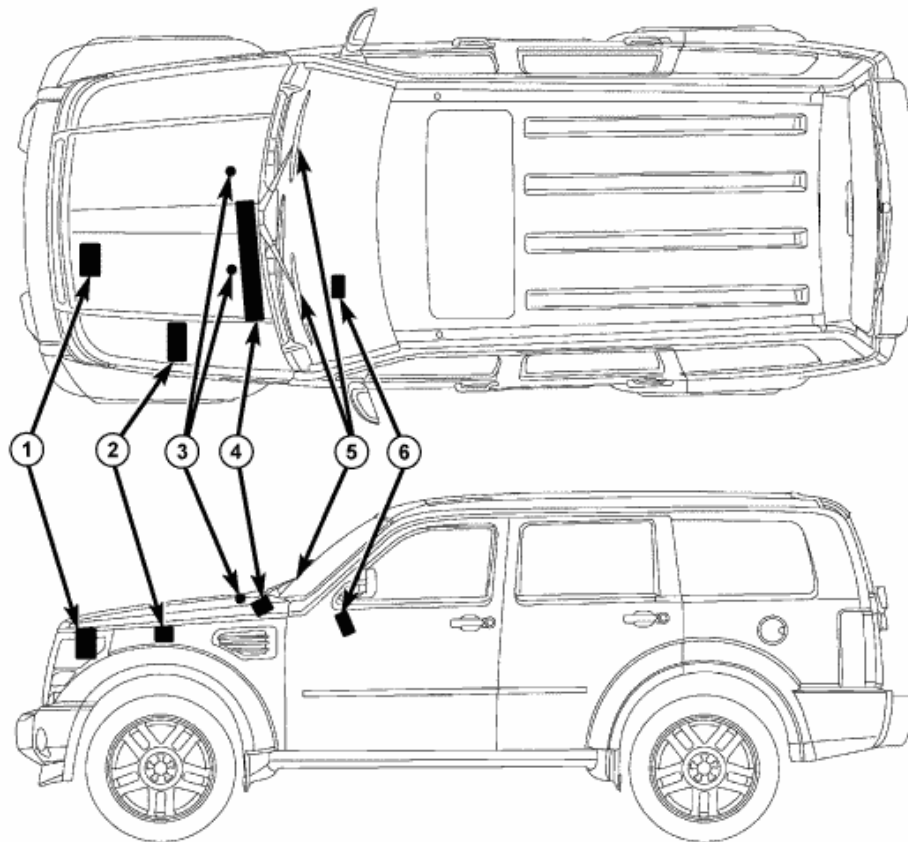
2007 ACCESSORIES AND EQUIPMENT

Wipers/Washers - Service Information - Nitro

WIPERS/WASHERS

DESCRIPTION

FRONT WIPER AND WASHER SYSTEM



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Fig. 1: Front Wiper And Washer System Components
Courtesy of CHRYSLER LLC

An electrically operated intermittent front wiper and washer system is standard factory-installed safety equipment on this vehicle. The wiper and washer system includes the following major components, which are described in further detail elsewhere in this service information:

- **Electro Mechanical Instrument Cluster** - The Electro Mechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) is located on the instrument panel directly in front of the driver. Refer to **DESCRIPTION**.
- **Front Washer Nozzle (3)** - Two fluidic front washer nozzles with integral check valves are secured by integral latch features to dedicated openings in the hood panel near the base of the windshield.

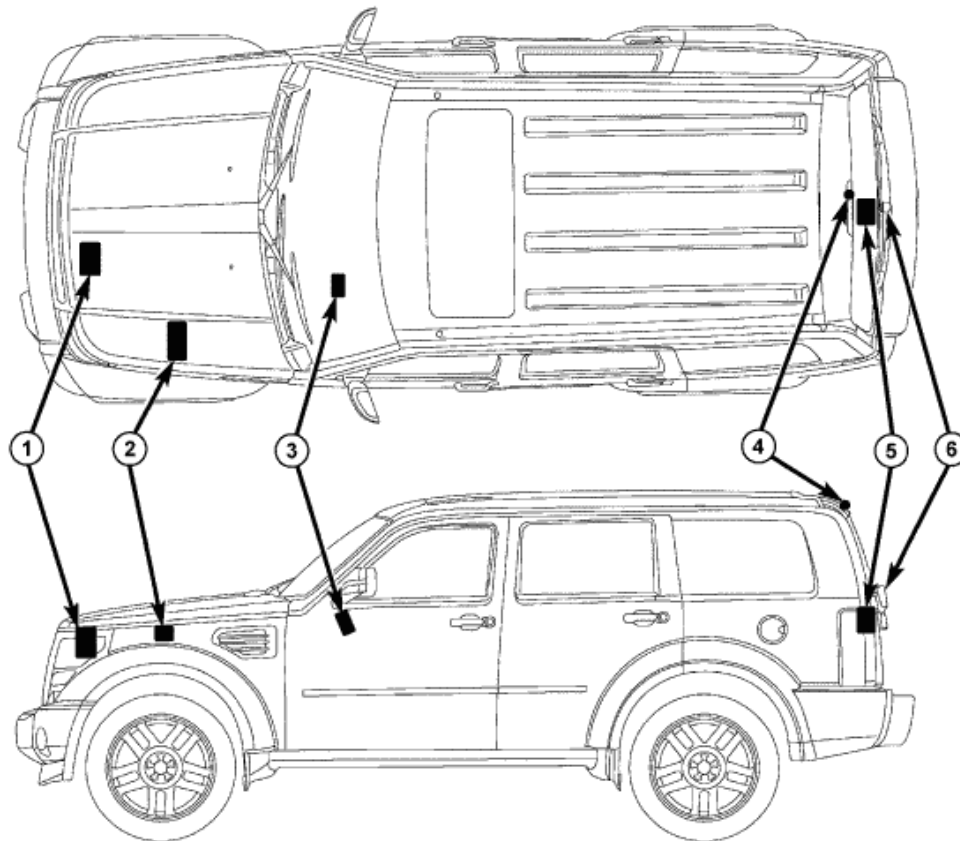
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- **Front Washer Plumbing** - The plumbing for the washer system consists of rubber hoses and molded rubber or plastic fittings. The plumbing is routed across the front of the engine compartment to the right side of the engine compartment from the washer reservoir on the left side of the cooling module, and through the cowl plenum panel to the underside of the hood panel and the washer nozzles.
- **Front Wiper Arms And Blades (5)** - The two front wiper arms are secured with nuts to the threaded ends of the two wiper pivot shafts, which extend through the cowl plenum cover/grille panel located near the base of the windshield. The two equal length front wiper blades are each secured to their equal length wiper arms with an integral latch, and are parked on the glass near the bottom of the windshield when the wiper system is not in operation.
- **Front Wiper Module (4)** - The wiper pivot shafts are the only visible components of the front wiper module. The remainder of the module is concealed within the cowl plenum area beneath the cowl plenum cover/grille panel. The wiper module includes the wiper module bracket, three rubber-isolated wiper module mounts, the wiper motor, the wiper motor crank arm, the two wiper drive links, and the two wiper pivots.
- **Right Multi-Function Switch (6)** - The right (wiper) multi-function switch and the left (lighting) multi-function switch are secured to brackets integral to the clockspring housing on the top of the steering column just below the steering wheel. The right multi-function switch is connected by a short jumper harness to the Steering Control Module (SCM), which is internal to the left multi-function switch housing. Only the switch control stalk extending from the right side of the steering column is visible, while the remainder of the switch is concealed beneath the steering column shrouds. The right multi-function switch is dedicated to providing all of the driver controls for both the front and rear wiper and washer systems.
- **Steering Control Module** - The Steering Control Module (SCM) is internal to the left multi-function switch housing, which is secured to a bracket integral to the left side of the clockspring housing on the top of the steering column just below the steering wheel. Only the left switch control stalk extending from the left side of the steering column is visible, while the remainder of the switch housing containing the SCM is concealed beneath the steering column shrouds. Refer to **DESCRIPTION** .
- **Totally Integrated Power Module (2)** - The Totally Integrated Power Module (TIPM) is located in the engine compartment, near the battery. Refer to **DESCRIPTION** .
- **Washer Pump/Motor** - The reversible electric washer pump/motor unit is located in a dedicated hole on the lower outboard side of the washer reservoir, on the left side of the cooling module fan shroud. This single reversible washer pump/motor provides washer fluid to either the front or rear washer system plumbing, depending upon the direction of the pump motor rotation.
- **Washer Reservoir (1)** - The washer reservoir is integral to the coolant reserve bottle, which sits astride the fan shroud of the cooling module. The reservoir filler cap is accessed from the left front corner of the engine compartment.

Hard wired circuitry connects the front wiper and washer system components to the electrical system of the vehicle. These hard wired circuits are integral to several wire harnesses, which are routed throughout the vehicle and retained by many different methods. These circuits may be connected to each other, to the vehicle electrical system and to the front wiper and washer system components through the use of a combination of soldered splices, splice block connectors, and many different types of wire harness terminal connectors and insulators. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

REAR WIPER AND WASHER SYSTEM



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Fig. 2: Rear Wiper And Washer System Components
 Courtesy of CHRYSLER LLC

An electrically operated fixed interval intermittent rear wiper and washer system is standard factory-installed equipment on this vehicle. The rear wiper and washer system includes the following major components, which are described in further detail elsewhere in this service information:

- **Electro Mechanical Instrument Cluster** - The Electro Mechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) is located on the instrument panel directly in front of the driver. Refer to **DESCRIPTION**.
- **Rear Washer Nozzle (4)** - A fluidic rear washer nozzle is secured by integral latch features to a mounting hole on the right side of the Center High Mounted Stop Lamp (CHMSL) on the liftgate outer panel above the liftgate glass opening.
- **Rear Washer Plumbing** - The plumbing for the washer system consists of rubber hoses and molded rubber or plastic fittings. The plumbing is routed across the front of the engine compartment to the right side of the engine compartment from the washer reservoir on the left side of the cooling module, and through the dash into the passenger compartment. Then it is routed up the right cowl side and A-pillar to the headliner, and above the headliner to the upper liftgate opening header, then through the upper inner liftgate panel to the rear washer nozzle.
- **Rear Wiper Arm And Blade (6)** - The single rear wiper arm is secured by a nut directly to the rear wiper motor output shaft, which extends through the center of the liftgate outer panel near the base of the

liftgate glass. The single rear wiper blade is secured to the rear wiper arm with an integral latch, and is parked at the base of the liftgate glass when the rear wiper system is not in operation.

- **Rear Wiper Motor (5)** - The rear wiper motor includes the motor bracket and three rubber-isolated mounting tabs. The wiper motor output shaft is the only visible component of the rear wiper motor. The remainder of the motor is concealed by the liftgate inner trim just below the liftgate glass opening.
- **Right Multi-Function Switch (3)** - The right (wiper) multi-function switch and the left (lighting) multi-function switch are secured to brackets integral to the clockspring housing, on the top of the steering column just below the steering wheel. The right multi-function switch is connected by a short jumper harness to the Steering Control Module (SCM), which is internal to the left multi-function switch housing. Only the switch control stalk extending from the right side of the steering column is visible, while the remainder of the switch is concealed beneath the steering column shrouds. The right multi-function switch is dedicated to providing all of the driver controls for both the front and rear wiper and washer systems.
- **Steering Control Module** - The Steering Control Module (SCM) is internal to the left multi-function switch housing, which is secured to a bracket integral to the left side of the clockspring housing on the top of the steering column just below the steering wheel. Only the left switch control stalk extending from the left side of the steering column is visible, while the remainder of the switch housing containing the SCM is concealed beneath the steering column shrouds. Refer to **DESCRIPTION** .
- **Totally Integrated Power Module (2)** - The Totally Integrated Power Module (TIPM) is located in the engine compartment, near the battery. Refer to **DESCRIPTION** .
- **Washer Pump/Motor** - The reversible electric washer pump/motor unit is located in a dedicated hole on the lower outboard side of the washer reservoir, on the left side of the cooling module fan shroud. This single reversible washer pump/motor provides washer fluid to either the front or rear washer system plumbing, depending upon the direction of the pump motor rotation.
- **Washer Reservoir (1)** - The washer reservoir is integral to the coolant reserve bottle, which sits astride the fan shroud of the cooling module. The reservoir filler cap is accessed from the left front corner of the engine compartment.

Hard wired circuitry connects the rear wiper and washer system components to the electrical system of the vehicle. These hard wired circuits are integral to several wire harnesses, which are routed throughout the vehicle and retained by many different methods. These circuits may be connected to each other, to the vehicle electrical system and to the rear wiper and washer system components through the use of a combination of soldered splices, splice block connectors, and many different types of wire harness terminal connectors and insulators. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

OPERATION

FRONT WIPER AND WASHER SYSTEM

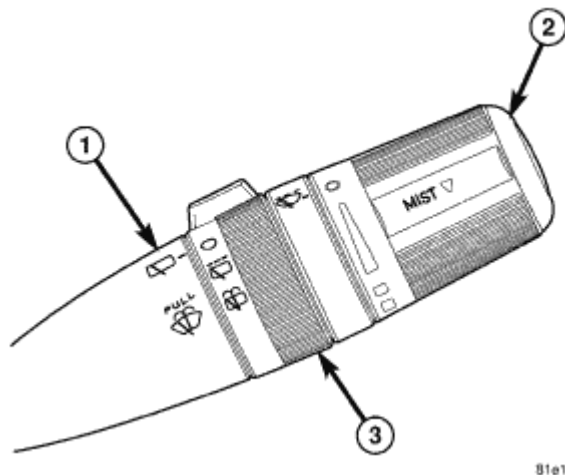


Fig. 3: Right (Wiper) Multi-Function Switch
Courtesy of CHRYSLER LLC

The front wiper and washer system is designed to provide the vehicle operator with a convenient, safe, and reliable means of maintaining visibility through the windshield glass. The various components of this system are designed to convert electrical energy produced by the vehicle electrical system into the mechanical action of the wiper blades to wipe the outside surface of the glass, as well as into the hydraulic action of the washer system to apply washer fluid stored in an on-board reservoir to the area of the glass to be wiped. When combined, these components provide the means to effectively maintain clear visibility for the vehicle operator by removing excess accumulations of rain, snow, bugs, mud, or other minor debris from the outer surface of the windshield glass that might be encountered while driving the vehicle under numerous types of inclement operating conditions.

The vehicle operator initiates all front and rear wiper and washer system functions with the control stalk of the right (wiper) multi-function switch (1) that extends from the right side of the steering column, just below the steering wheel. Rotating the control knob (2) on the end of the control stalk, selects the OFF, DELAY, LOW, or HIGH front wiper system operating modes. In the DELAY mode, the control knob also allows the vehicle operator to select from one of five intermittent wipe delay intervals.

Pulling the control stalk rearward actuates the momentary front washer system switch, which selects the WASH and WIPE-AFTER-WASH modes, depending upon when and how long the switch is held closed. Pushing the control stalk downward actuates a momentary switch and selects the MIST mode, which cycles the wiper blades for as long as the switch is held closed then completes the current cycle and parks the blades at the base of the windshield after the switch is released.

The right multi-function switch provides hard wired analog and resistor multiplexed inputs to the Steering Control Module (SCM) internal to the left (lighting) multi-function switch housing for all of the wiper and washer system functions. The SCM then sends electronic **wiper** and **washer switch** status messages to the Electro Mechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN), over a Local Interface Network (LIN) data bus. The EMIC responds to the SCM inputs by sending electronic **wiper** and **washer system** request messages to the Totally Integrated Power Module (TIPM) over the Controller Area Network (CAN) data bus requesting the appropriate wiper and washer system operating modes.

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Front wiper and washer system operation is completely controlled by the SCM, EMIC and TIPM logic circuits, and that logic will only allow these systems to operate when the ignition switch is in the ACCESSORY or ON positions. The TIPM uses intelligent, high current, self-protected high side switches to control wiper system operation by energizing or de-energizing the wiper motor low and high speed brushes. The TIPM uses an H-bridge circuit to control the operation of the reversible washer pump/motor unit. The right multi-function switch circuitry receives battery current and a clean ground output from the SCM, then provides analog and multiplexed inputs to the SCM to indicate the selected front wiper and front washer system mode.

The hard wired circuits and components of the front wiper and washer system may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the front wiper and washer system or the electronic controls or communication between other modules and devices that provide some features of the front wiper and washer system. The most reliable, efficient, and accurate means to diagnose the front wiper and washer system or the electronic controls and communication related to front wiper and washer system operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

OPERATING MODES

Following are paragraphs that briefly describe the operation of each of the front wiper and washer system operating modes.

CONTINUOUS WIPE MODE

When the LOW position of the control knob on the control stalk of the right (wiper) multi-function switch is selected the SCM sends an electronic **wiper switch low** status message to the EMIC over the LIN data bus, the EMIC relays an electronic **wiper switch low** request message to the TIPM over the CAN data bus, then the TIPM directs battery current to the low speed brush of the wiper motor, causing the wipers to cycle at low speed.

When the HIGH position of the control knob is selected the SCM sends an electronic **wiper switch high** status message to the EMIC, the EMIC relays an electronic **wiper switch high** request message to the TIPM, then the TIPM directs battery current to the high speed brush of the wiper motor, causing the wipers to cycle at high speed.

When the OFF position of the multi-function switch control knob is selected, the SCM sends an electronic **wiper switch off** status message to the EMIC, the EMIC relays an electronic **wiper switch off** request message to the TIPM, then one of two events will occur. The event that occurs depends upon the position of the wiper blades on the windshield at the moment that the control knob OFF position is selected.

If the wiper blades are in the down position on the windshield when the OFF position is selected, the park switch that is integral to the wiper motor is closed to ground, which provides a hard wired park switch sense input to the TIPM. The TIPM then de-energizes the wiper motor and the wiper motor ceases to operate. If the wiper blades are not in the down position on the windshield at the moment the OFF position is selected, the park switch is an open circuit and the TIPM continues running the wiper motor at low speed until the wiper blades are in the down position on the windshield and the park switch input to the TIPM is again closed to ground.

INTERMITTENT WIPE MODE

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When the control knob on the control stalk of the right (wiper) multi-function switch is moved to one of the five DELAY interval positions the SCM sends an electronic **wiper switch delay interval** status message to the EMIC, the EMIC relays an electronic **wiper switch delay interval** request message to the TIPM, then the TIPM electronic intermittent wipe logic circuit responds by calculating the correct length of time between wiper sweeps based upon the selected delay interval input.

The TIPM monitors the changing state of the wiper motor park switch through a hard wired park switch sense input. This input allows the TIPM to determine the proper intervals at which to energize and de-energize the wiper motor intermittently for one low speed cycle at a time.

The TIPM logic is also programmed to provide vehicle speed sensitivity to the selected intermittent wipe delay intervals. In order to provide this feature the TIPM monitors electronic **vehicle speed** messages from the Controller Antilock Brake (CAB) or the Powertrain Control Module (PCM) and doubles the selected delay interval whenever the vehicle speed is about 16 kilometers-per-hour (10 miles-per-hour) or less.

MIST WIPE MODE

When the control stalk of the right (wiper) multi-function switch is moved downward to the momentary MIST position, the SCM sends an electronic **wiper mist mode** status message to the EMIC, the EMIC relays an electronic **wiper mist mode** request message to the TIPM, then the TIPM energizes the low speed brush of the wiper motor for as long as the switch is held closed, then de-energizes the motor when the state of the switch changes to open, parking the wiper blades near the base of the windshield. The TIPM can operate the front wiper motor in this mode for only one low speed cycle at a time, or for an indefinite number of sequential low speed cycles, depending upon how long the switch is held closed.

WASH MODE

When the control stalk of the right (wiper) multi-function switch is pulled rearward to the front momentary WASH position for more than about one-half second with the wiper system operating, the SCM sends an electronic **washer switch** status message to the EMIC, the EMIC relays an electronic **washer switch** request message to the TIPM, then the TIPM directs battery current and ground to the washer pump/motor. This will cause the washer pump/motor to be energized in the front wash direction for as long as the switch is held closed (up to approximately 10 seconds) and to be de-energized when the control stalk is released.

When the control stalk is pulled rearward to the front momentary WASH position while the front wiper system is operating in one of the DELAY interval positions, the washer pump/motor operation is the same. However, the TIPM also overrides the selected delay interval and operates the front wiper motor in a continuous low speed mode for as long as the control stalk is held in the front momentary WASH position, then reverts to the selected delay interval several wipe cycles after the control stalk is released. If the WASH switch is held closed for more than approximately 10 seconds, the TIPM will suspend washer pump/motor operation until the control stalk is released for about 2 seconds and then cycled back to the WASH position.

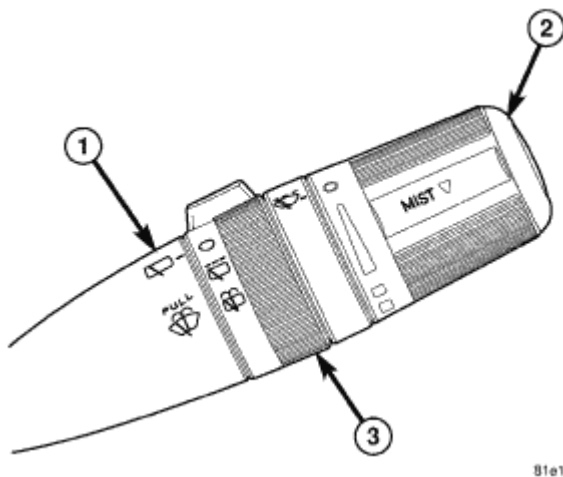
WIPE-AFTER-WASH MODE

When the control stalk of the right (wiper) multi-function switch is pulled rearward to the front momentary WASH position for more than about one-half second while the wiper system is not operating, the SCM sends an electronic **washer switch** status message to the EMIC, the EMIC relays an electronic **washer switch** request message to the TIPM, and the TIPM directs battery current and ground to the washer pump/motor and energizes

the wiper motor in a continuous low speed mode for as long as the switch is held closed (up to approximately 10 seconds). When the control stalk is released, the TIPM de-energizes the washer pump/motor immediately, but allows the wiper motor to operate for two or three additional wipe cycles before it de-energizes the wiper motor and parks the wiper blades near the base of the windshield.

If the control stalk is held rearward for more than about 10 seconds, the TIPM will suspend washer pump/motor operation until the stalk is released for about 2 seconds and then cycled back to the WASH position; however, the wipers will continue to operate for as long as the switch is held closed. The TIPM monitors the changing state of the wiper motor park switch through a hard wired wiper park switch sense circuit input. This input allows the TIPM to count the number of wipe cycles that occur after the control stalk is released, and to determine the proper interval at which to de-energize the wiper motor to complete the WIPE-AFTER-WASH mode cycle.

REAR WIPER AND WASHER SYSTEM



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Fig. 4: Right (Wiper) Multi-Function Switch

Courtesy of CHRYSLER LLC

The rear wiper and washer system is designed to provide the vehicle operator with a convenient, safe, and reliable means of maintaining visibility through the liftgate glass. The various components of this system are designed to convert electrical energy produced by the vehicle electrical system into the mechanical action of the wiper blade to wipe the outside surface of the glass, as well as into the hydraulic action of the washer system to apply washer fluid stored in an on-board reservoir to the area of the glass to be wiped. When combined, these components provide the means to effectively maintain clear visibility for the vehicle operator by removing excess accumulations of rain, snow, bugs, mud, or other minor debris from the outer surface of the liftgate glass that might be encountered while driving the vehicle under numerous types of inclement operating conditions.

The vehicle operator initiates all front and rear wiper and washer system functions with the control stalk (1) of the right (wiper) multi-function switch that extends from the right side of the steering column, just below the steering wheel. Rotating the control sleeve (3) on the control stalk to the OFF or INTERMITTENT detent positions or the momentary WASH position selects the rear wiper and washer system operating modes.

The right multi-function switch provides hard wired analog and resistor multiplexed inputs to the Steering

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Control Module (SCM) integral to the left (lighting) multi-function switch for all of the wiper and washer system functions. The SCM then sends electronic **rear wiper/washer switch** status messages to the Electro Mechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) over a Local Interface Network (LIN) data bus. The EMIC then sends electronic **rear wiper/washer switch** request messages to the Totally Integrated Power Module (TIPM) over the Controller Area Network (CAN) data bus requesting the appropriate rear wiper and washer system operating modes.

Rear wiper and washer system operation is completely controlled by the SCM, EMIC and TIPM logic circuits, and that logic will only allow these systems to operate when the ignition switch is in the ACCESSORY or ON positions. The TIPM uses intelligent, high current, self-protected high side switches to control wiper system operation by energizing or de-energizing the rear wiper motor. The TIPM uses an H-bridge circuit to control the operation of the reversible washer pump/motor unit. The right multi-function switch circuitry receives a clean ground output from the SCM on a multi-function switch return circuit, then provides analog and resistor multiplexed inputs to the SCM to indicate the selected rear wiper and rear washer system mode.

The hard wired circuits and components of the rear wiper and washer system may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the rear wiper and washer system or the electronic controls or communication between other modules and devices that provide some features of the rear wiper and washer system. The most reliable, efficient, and accurate means to diagnose the rear wiper and washer system or the electronic controls and communication related to rear wiper and washer system operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

OPERATING MODES

Following are paragraphs that briefly describe the operation of each of the rear wiper and washer system operating modes.

INTERMITTENT WIPE MODE

When the INTERMITTENT WIPE position of the control sleeve on the control stalk of the right multi-function switch is selected, the SCM sends an electronic **rear wiper switch** status message to the EMIC over the LIN data bus, then the EMIC relays an electronic **rear wiper switch** request message to the TIPM over the CAN data bus, and the TIPM directs battery current to the rear wiper motor at fixed delay intervals to enable the rear wiper motor intermittent wipe mode.

WASH MODE

When the control sleeve of the right multi-function switch is rotated counterclockwise past the INTERMITTENT detent position to the momentary rear WASH position, the SCM sends an electronic **rear washer switch** status message to the EMIC over the LIN data bus, then the EMIC relays an electronic **rear washer switch** request message to the TIPM over the CAN data bus, and the TIPM directs battery current to the rear wiper motor and directs battery current and ground to the washer pump/motor unit. These outputs will cause the washer pump motor and the rear wiper motor to operate continuously for as long as the switch is held closed up to approximately 10 seconds. The washer pump is de-energized as soon as the control sleeve is released, but the rear wiper motor continues to operate for two to three continuous cycles before reverting to the fixed delay interval operation. The TIPM uses a hard wired output from a park switch internal to the rear wiper motor as an additional logic input to monitor the position of the rear wiper blade on the glass and to control the

number of continuous wiper sweeps following washer operation.

DIAGNOSIS AND TESTING

FRONT WIPER AND WASHER SYSTEM

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the supplemental restraint system before attempting any steering wheel, steering column, airbag, occupant classification system, seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the supplemental restraint system. Failure to take the proper precautions could result in accidental airbag deployment.

If the front wiper motor operates, but the wipers do not move on the windshield, replace the ineffective front wiper module. If the washer pump/motor operates, but no washer fluid is dispensed on the glass; or, if the wipers operate, but chatter, lift, or do not clear the glass, clean and inspect the front wiper and washer system components as required. See CLEANING, and INSPECTION.

The hard wired front wiper and washer system circuits and components may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the front wiper and washer system or the electronic controls or communication between other modules and devices that provide some features of the front wiper and washer system. The most reliable, efficient, and accurate means to diagnose the front wiper and washer system or the electronic controls and communication related to front wiper and washer system operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

NOTE: The front wiper and washer switches are integral to the right multi-function switch. The right multi-function switch is hard wired to the left multi-function switch/Steering Control Module (SCM), which communicates with the Electro Mechanical Instrument Cluster (EMIC)/Cab Compartment Node (CCN) over the Local Interface Network (LIN) data bus. Before performing any of the following tests, determine whether the other functions of the right and left multi-function switch/SCM are operational. If only the right multi-function switch functions are inoperative, test and repair the right multi-function switch or the jumper harness between the right and left multi-function switches before attempting to repair the Front Wiper and Washer System. If both the right and left multi-function switch/SCM functions are ineffective, diagnose and repair that problem before attempting to repair the Front Wiper and Washer System.

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CONDITION	POSSIBLE CAUSES	CORRECTION
WIPER MOTOR DOES NOT OPERATE IN ANY SWITCH POSITION	<ol style="list-style-type: none"> 1. Ineffective motor ground circuit. 2. Ineffective motor feed circuits. 3. Ineffective EMIC (CCN) inputs or outputs. 4. Ineffective TIPM inputs or outputs. 5. Ineffective wiper motor. 	<ol style="list-style-type: none"> 1. Test and repair open wiper motor ground circuit if required. 2. Test and repair low speed and high speed feed circuits between TIPM and front wiper motor if required. 3. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information. 4. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information. 5. Test and replace open or shorted wiper motor as required.
WIPER MOTOR OPERATES SLOWLY IN ALL SWITCH POSITIONS	<ol style="list-style-type: none"> 1. Ineffective wiper motor. 2. Amperage draw too low. 3. Amperage draw too high. 	<ol style="list-style-type: none"> 1. Check amperage draw with linkage disconnected from wiper motor crank arm. Correct draw should be about 6 amperes. If incorrect, refer to the appropriate Possible Cause that follows: 2. Test and repair shorted low and high speed feed circuits if required. 3. With linkage disconnected from wiper motor crank arm check linkage and pivots for binding. If binding is detected, repair or replace front wiper module if required. If no linkage binding detected, replace the front wiper motor if required.
WIPERS RUN AT HIGH SPEED WITH SWITCH LOW SPEED SELECTED OR AT LOW SPEED WITH SWITCH HIGH SPEED SELECTED	<ol style="list-style-type: none"> 1. Ineffective motor feed circuit wiring. 	<ol style="list-style-type: none"> 1. Test and repair low speed and high speed feed circuits between TIPM and front wiper motor if required.

REAR WIPER AND WASHER SYSTEM

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the supplemental restraint system before attempting any steering wheel, steering column, airbag, occupant classification system, seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the supplemental restraint system. Failure to take the proper precautions could result in accidental airbag deployment.

If the rear wiper motor operates, but the wiper motor output shaft does not move, replace the ineffective rear

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wiper motor. If the washer pump/motor operates, but no washer fluid is dispensed on the glass; or, if the wiper operates, but chatters, lifts, or does not clear the glass, clean and inspect the rear wiper and washer system components as required. See **CLEANING**, and **INSPECTION**.

The hard wired rear wiper and washer system circuits and components may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the rear wiper and washer system or the electronic controls or communication between other modules and devices that provide some features of the rear wiper and washer system. The most reliable, efficient, and accurate means to diagnose the rear wiper and washer system or the electronic controls and communication related to rear wiper and washer system operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

NOTE: **The rear wiper and washer switches are integral to the right multi-function switch. The right multi-function switch is hard wired to the left multi-function switch/Steering Control Module (SCM), which communicates with the Electro Mechanical Instrument Cluster (EMIC)/Cab Compartment Node (CCN) over the Local Interface Network (LIN) data bus. Before performing any of the following tests, determine whether the other functions of the right and left multi-function switch/SCM are operational. If only the right multi-function switch functions are inoperative, test and repair the right multi-function switch or the jumper harness between the right and left multi-function switches before attempting to repair the Rear Wiper and Washer System. If both the right and left multi-function switch/SCM functions are ineffective, diagnose and repair that problem before attempting to repair the Rear Wiper and Washer System.**

CONDITION	POSSIBLE CAUSES	CORRECTION
WIPER MOTOR DOES NOT OPERATE IN ANY SWITCH POSITION	<ol style="list-style-type: none">1. Ineffective motor ground circuit.2. Ineffective motor feed circuits.3. Ineffective EMIC (CCN) inputs or outputs.4. Ineffective TIPM inputs or outputs.5. Ineffective wiper motor.	<ol style="list-style-type: none">1. Test and repair open wiper motor ground circuit if required.2. Test and repair motor feed circuit between TIPM and rear wiper motor if required.3. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information.4. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.5. Test and replace open or shorted wiper motor if required.
WIPER MOTOR OPERATES SLOWLY	<ol style="list-style-type: none">1. Improper wiper motor amperage draw.	<ol style="list-style-type: none">1. Check amperage draw with wiper arm disconnected from rear wiper motor output shaft. Correct draw should be about 6 amperes. If incorrect, refer to the

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	2. Amperage draw too low.	appropriate Possible Cause that follows: 2. Test and repair the shorted rear wiper motor signal and fused ignition switch output (run - accessory) circuits if required.
	3. Amperage draw too high.	3. With wiper arm disconnected from wiper motor output shaft check for binding between output shaft and rubber grommet in liftgate glass. If binding is detected, lubricate or replace grommet if required. If no binding is detected, replace the wiper motor if required.

CLEANING

FRONT WIPER AND WASHER SYSTEM

WIPER SYSTEM

CAUTION: Protect the rubber squeegees of the wiper blades from any petroleum-based cleaners, solvents, or contaminants. These products can rapidly deteriorate the rubber squeegees.

The squeegees of wiper blades exposed to the elements for a long time tend to lose their wiping effectiveness. Periodic cleaning of the squeegees is suggested to remove any deposits of salt or road film. The wiper blades, arms, and windshield glass should only be cleaned using a sponge or soft cloth and windshield washer fluid, a mild detergent, or a non-abrasive cleaner. If the wiper blades continue to leave streaks, smears, hazing, or beading on the glass after thorough cleaning of the squeegees and the glass, the entire wiper blade assembly must be replaced.

WASHER SYSTEM

CAUTION: Never introduce petroleum-based cleaners, solvents, or contaminants into the washer system. These products can rapidly deteriorate the rubber seals and hoses of the washer system, as well as the rubber squeegees of the wiper blades.

CAUTION: Never use compressed air to flush the washer system plumbing. Compressed air pressures are too great for the washer system plumbing components and will result in further system damage. Never use sharp instruments to clear a plugged washer nozzle or damage to the nozzle orifice and improper nozzle spray patterns will result.

If the washer system is contaminated with foreign material, drain the washer reservoir by removing the washer pump/motor unit from the reservoir. Clean foreign material from the inside of the washer pump inlet filter screen and the washer reservoir using clean washer fluid, a mild detergent, or a non-abrasive cleaner. Flush

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foreign material from the washer system plumbing by first disconnecting the washer hose from the washer nozzle, then running the washer pump/motor to run clean washer fluid or water through the system. A plugged or restricted washer nozzle should be carefully back-flushed using compressed air. If the washer nozzle obstruction cannot be cleared, replace the washer nozzle.

REAR WIPER AND WASHER SYSTEM

WIPER SYSTEM

The squeegee of a wiper blade exposed to the elements for a long time tends to lose its wiping effectiveness. Periodic cleaning of the squeegee is suggested to remove any deposits of salt or road film. The wiper blade, arm, and liftgate glass should only be cleaned using a sponge or soft cloth and windshield washer fluid, a mild detergent, or a non-abrasive cleaner. If the wiper blade continues to leave streaks, smears, hazing, or beading on the glass after thorough cleaning of the squeegees and the glass, the entire wiper blade assembly must be replaced.

CAUTION: Protect the rubber squeegee of the wiper blade from any petroleum-based cleaners, solvents, or contaminants. These products can rapidly deteriorate the rubber squeegee.

WASHER SYSTEM

If the washer system is contaminated with foreign material, drain the washer reservoir by removing the washer pump/motor from the reservoir. Clean foreign material from the inside of the washer pump/motor inlet filter screen and the washer reservoir using clean washer fluid, a mild detergent, or a non-abrasive cleaner. Flush foreign material from the washer system plumbing by first disconnecting the washer hose from the rear washer nozzle, then running the washer pump/motor to run clean washer fluid or water through the system. A plugged or restricted rear washer nozzle should be carefully back-flushed using compressed air. If the washer nozzle obstruction cannot be cleared, replace the rear washer nozzle.

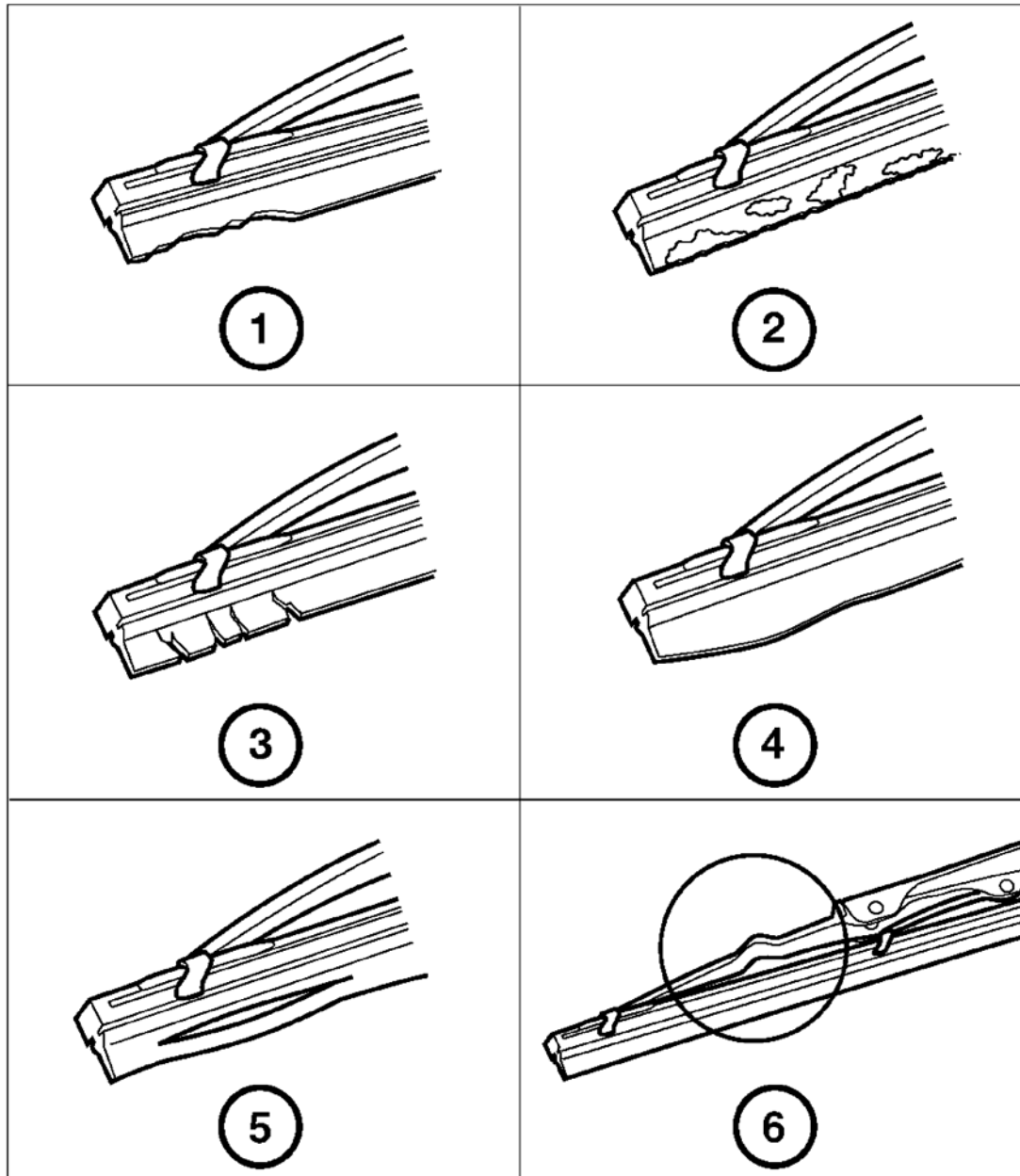
CAUTION: Never introduce petroleum-based cleaners, solvents, or contaminants into the washer system. These products can rapidly deteriorate the rubber seals and hoses of the washer system, as well as the rubber squeegee of the wiper blade.

CAUTION: Never use compressed air to flush the washer system plumbing. Compressed air pressures are too great for the washer system plumbing components and will result in further system damage. Never use sharp instruments to clear a plugged washer nozzle or damage to the nozzle orifice and improper nozzle spray patterns will result.

INSPECTION

FRONT WIPER AND WASHER SYSTEM

WIPER SYSTEM



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Fig. 5: Inspecting Wiper Blades
Courtesy of CHRYSLER LLC

The wiper blades and wiper arms should be inspected periodically, not just when wiper performance problems are experienced. This inspection should include the following points:

1. Carefully inspect the wiper blades for any indications of worn or uneven edges (1), foreign material deposits (2), hardening or cracking (3), deformation or fatigue (4), or splitting (5). Inspect the wiper blade support components and the wiper arms for damage (6) or corrosion. If the wiper arms and blades are

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contaminated with any foreign material, clean them and the glass as required. See **CLEANING**. If a wiper blade or arm is damaged, or if corrosion is evident, replace the affected wiper arm or blade with a new unit. Do not attempt to repair a wiper arm or blade that is damaged or corroded.

2. Carefully lift the wiper blade off of the glass. Note the action of the wiper arm hinge. The wiper arm should pivot freely at the hinge, but with no lateral looseness evident. If there is any binding evident in the wiper arm hinge, or if there is evident lateral play in the wiper arm hinge, replace the wiper arm.

CAUTION: Do not allow the wiper arm to spring back against the glass without the wiper blade in place or the glass may be damaged.

3. Once proper hinge action of the wiper arm is confirmed, check the hinge for proper spring tension. Remove the wiper blade from the wiper arm. Either place a small postal scale between the blade end of the wiper arm and the glass, or carefully lift the blade end of the arm away from the glass using a small fish scale. On vehicles with unequal wiper arm lengths, be certain that measurements on both arms are taken at a point an equal distance from their wiper arm hinge pins. Compare the scale readings between the right and left wiper arms. Replace a wiper arm if it has comparatively lower spring tension, as evidenced by a lower scale reading.
4. After cleaning and inspecting the wiper components and the glass, if the wiper blade still fails to clear the glass without smearing, streaking, chattering, hazing, or beading, replace the wiper blade.

WASHER SYSTEM

The washer system components should be inspected periodically, not just when washer performance problems are experienced. This inspection should include the following points:

1. Check for ice or other foreign material in the washer reservoir. If contaminated, clean and flush the washer system. See **CLEANING**.
2. Inspect the washer plumbing for pinched, leaking, deteriorated, or incorrectly routed hoses and damaged or disconnected hose fittings. Replace damaged or deteriorated hoses and hose fittings. Leaking washer hoses can sometimes be repaired by cutting the hose at the leak and splicing it back together using an in-line connector fitting. Similarly, sections of deteriorated hose can be cut out and replaced by splicing in new sections of hose using in-line connector fittings. Whenever routing a washer hose or a wire harness containing a washer hose, it must be routed away from hot, sharp, or moving parts. Also, sharp bends that might pinch the washer hose must be avoided.

REAR WIPER AND WASHER SYSTEM

WIPER SYSTEM

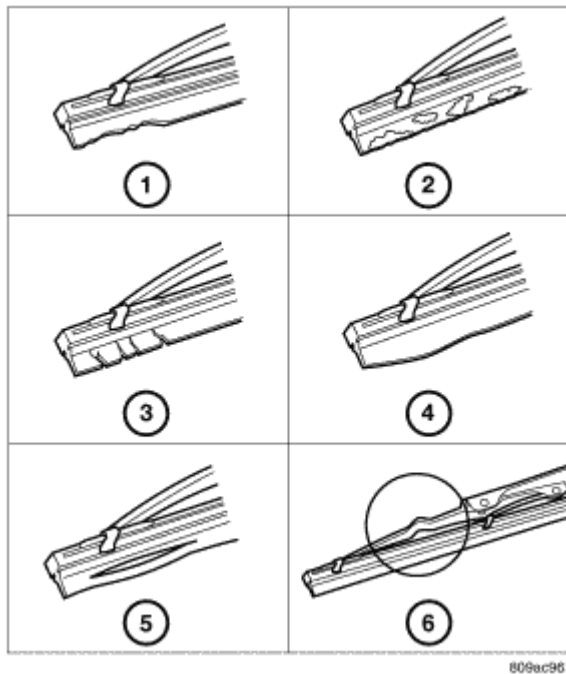


Fig. 6: Inspecting Wiper Blades
Courtesy of CHRYSLER LLC

The rear wiper blade and wiper arm should be inspected periodically, not just when wiper performance problems are experienced. This inspection should include the following points:

1. Carefully inspect the wiper blade for any indications of worn or uneven edges (1), foreign material deposits (2), hardening or cracking (3), deformation or fatigue (4), or splitting (5). Inspect the wiper blade support components and the wiper arm for damage (6). If the wiper arm and blade are contaminated with any foreign material, clean them and the glass as required. See **CLEANING**. If the wiper blade or arm is damaged, replace it with a new unit. Do not attempt to repair a wiper arm or blade that is damaged or corroded.
2. Carefully lift the wiper blade off of the glass. Note the action of the wiper arm hinge. The wiper arm should pivot freely at the hinge, but with no lateral looseness evident. If there is any binding evident in the wiper arm hinge, or there is evident lateral play in the wiper arm hinge, replace the wiper arm.

CAUTION: Do not allow the wiper arm to spring back against the glass without the wiper blade in place or the glass may be damaged.

3. Once proper hinge action of the wiper arm is confirmed, check the hinge for proper spring tension. The spring tension of the wiper arm should be sufficient to cause the rubber squeegee to conform to the curvature of the glass. Replace a wiper arm if it has insufficient spring tension to maintain contact between the squeegee and the glass.
4. After cleaning and inspecting the wiper components and the glass, if the wiper blade still fails to clear the glass without smearing, streaking, chattering, hazing, or beading, replace the wiper blade.

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The washer system components should be inspected periodically, not just when washer performance problems are experienced. This inspection should include the following points:

1. Check for ice or other foreign material in the washer reservoir. If contaminated, clean and flush the washer system. See **CLEANING**.
2. Inspect the washer plumbing for pinched, leaking, deteriorated, or incorrectly routed hoses and damaged or disconnected hose fittings. Replace damaged or deteriorated hoses and hose fittings. Leaking washer hoses can sometimes be repaired by cutting the hose at the leak and splicing it back together using an in-line connector fitting. Similarly, sections of deteriorated hose can be cut out and replaced by splicing in new sections of hose using in-line connector fittings. Whenever routing a washer hose or a wire harness containing a washer hose, it must be routed away from hot, sharp, or moving parts. Also, sharp bends that might pinch the washer hose must be avoided.

SPECIFICATIONS

SPECIFICATIONS - WIPER AND WASHER SYSTEMS

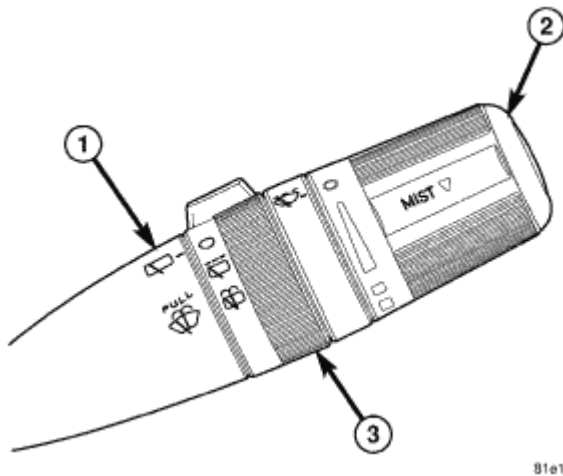
TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Right Multi-Function Switch Mounting Screw	1	-	10
Front Wiper Arm Mounting Nuts	24	18	215
Rear Wiper Arm Mounting Nut	12	9	106
Front Wiper Module Mounting Screws	7.5	-	67
Front Wiper Module Mounting Nut	8	-	72
Rear Wiper Motor Bracket Mounting Screws	5.5	-	49

RIGHT MULTI-FUNCTION SWITCH

DESCRIPTION

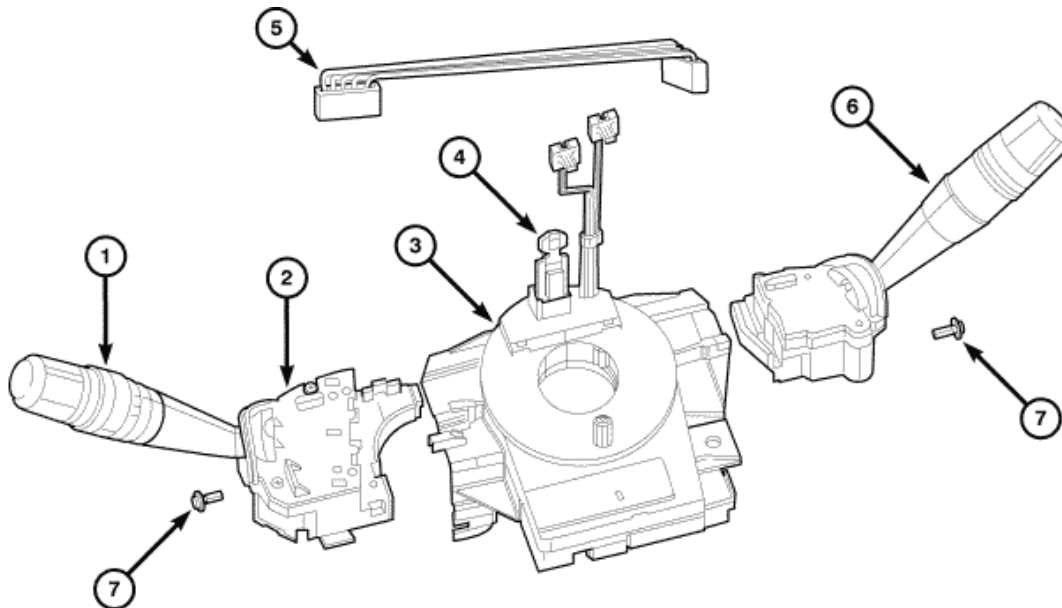
RIGHT MULTI-FUNCTION SWITCH



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Fig. 7: Right (Wiper) Multi-Function Switch
 Courtesy of CHRYSLER LLC

The right (wiper) multi-function switch is located on the right side of the steering column, just below the steering wheel. This switch is the primary control for the front and rear wiper and washer systems. The only visible components of the switch are the control stalk (1), control knob (2) and control sleeve (3) that extend through the steering column shrouds on the right side of the column. The remainder of the switch including its mounting provisions and electrical connection are concealed beneath the shrouds.



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Fig. 8: Steering Control Module Components
 Courtesy of CHRYSLER LLC

The switch housing and controls (6) are constructed of molded black plastic. Each of the switch controls has white International Control and Display Symbol graphics applied to it, which clearly identify its many functions. A single screw (7) through a mounting tab integral to the back of the switch housing, and a slide tab

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integral to the bottom of the switch housing secure the switch to the mounting bracket integral to the clockspring (3). A single connector receptacle containing seven terminal pins is integral to the inboard end of the switch housing and is connected by a jumper wire harness (5) directly to the Steering Control Module (SCM), which is internal to the housing (2) of the left multi-function switch (1).

The right (wiper) multi-function switch provides the vehicle operator with a control interface for the following wiper and washer system functions:

- **Continuous Front Wipers** - The right multi-function switch control knob provides detent switching for two continuous front wipe modes, low speed or high speed.
- **Intermittent Front Wipers** - The right multi-function switch control knob provides detent switching for the intermittent front wipe mode with five minor detent delay interval positions.
- **Front Wiper Mist Mode** - The right multi-function switch control stalk includes momentary switching of the front wiper motor low speed circuit to provide a mist mode features (sometimes referred to as pulse wipe), which allows the vehicle operator to momentarily operate the front wipers for one or more complete cycles.
- **Front Washer Mode** - The right multi-function switch control stalk provides momentary switching for control of the front washer system operation.
- **Intermittent Rear Wipe Mode** - The right multi-function switch control sleeve provides detent switching for a single fixed interval intermittent rear wiper mode.
- **Rear Washer Mode** - The right multi-function switch control sleeve provides two momentary switch positions for control of rear washer system operation.

The right multi-function switch cannot be adjusted or repaired. If any function of the switch is ineffective, or if the switch is damaged, the entire switch unit must be replaced. The clockspring (with the multi-function switch mounting bracket), the left multi-function switch (with the SCM), the right multi-function switch and the jumper wire harness are each available for separate service replacement.

OPERATION

RIGHT MULTI-FUNCTION SWITCH

The right (wiper) multi-function switch uses a combination of resistor multiplexing and conventional analog switching to control the many functions and features it provides. The switch receives a clean ground from the Steering Control Module (SCM), then provides resistor multiplexed and conventional analog return outputs to the SCM to indicate the selected switch positions. The SCM then sends electronic **switch status** messages over a Local Interface Network (LIN) data bus to the Electro Mechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN), and the EMIC relays electronic **wiper** and **washer switch** request messages over the Controller Area Network (CAN) data bus to other electronic modules in the vehicle.

If the SCM detects no inputs from the right multi-function switch, it transmits an electronic **Signal Not Available (SNA)** status message over the LIN data bus. The SNA status signals the EMIC to request other electronic modules to implement a fail-safe mode of operation for the front and rear wiper systems. The fail-safe mode will maintain the last selected front and rear wiper system operation for the remainder of the current ignition cycle, after which both wiper systems will default to OFF.

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The right multi-function switch as well as the hard wired inputs and outputs of the switch may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, the most reliable, efficient and accurate means to diagnose this component requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

Following are descriptions of how the right multi-function switch is operated to control the many front and rear wiper and washer system functions and features it provides:

- **Front Wiper Control** - The control knob on the end of the right multi-function switch control stalk is rotated to one of the two continuous wiper detents, to one of five intermittent wiper detents, or to the OFF position to select the front wiper mode. The SCM reads the input from the right multi-function switch and sends electronic **wiper switch** status messages over the LIN data bus to the EMIC, which relays an electronic **wiper switch** request message over the CAN data bus to other electronic modules in the vehicle.
- **Front Wiper Mist Mode** - The front wiper mist mode is requested when the right multi-function switch control stalk is depressed downward towards the floor to a momentary MIST position. The front wiper motor will continue to operate, one complete cycle at a time, for as long as the control stalk is held in this position. The SCM reads the resistor multiplexed input from the right multi-function switch and sends an electronic **wiper switch** status message over the LIN data bus to the EMIC, which relays an electronic **wiper switch** request message over the CAN data bus to other electronic modules in the vehicle.
- **Front Washer Control** - The right multi-function switch control stalk is pulled rearward towards the steering wheel to a momentary WASH position to activate the washer pump/motor in the front washer mode. The washer pump/motor will continue to operate for as long as the control stalk is held in this position. The SCM reads the resistor multiplexed input from the right multi-function switch and sends an electronic **washer switch** status message over the LIN data bus to the EMIC, which relays an electronic **washer switch** request message over the CAN data bus to other electronic modules in the vehicle.
- **Rear Wiper Control** - The rear wiper mode is selected when the right multi-function switch control sleeve is rotated to the fixed interval intermittent rear wipe detent position, or the OFF detent position. The SCM reads the input from the right multi-function switch and sends an electronic **wiper switch** status message over the LIN data bus to the EMIC, which relays an electronic **wiper switch** request message over the CAN data bus to other electronic modules in the vehicle.
- **Rear Washer Control** - The right multi-function switch control sleeve is rotated to one of two momentary WASH positions, either fully forward or fully rearward, to activate the washer pump/motor in the rear washer mode. The washer pump/motor will continue to operate in the rear washer mode until the control sleeve is released. The SCM reads the input from the right multi-function switch and sends an electronic **washer switch** status message over the LIN data bus to the EMIC, which relays an electronic **washer switch** request message over the CAN data bus to other electronic modules in the vehicle.

DIAGNOSIS AND TESTING

RIGHT MULTI-FUNCTION SWITCH

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the supplemental restraint system before attempting any steering wheel, steering column, airbag, occupant classification system, seat belt tensioner, impact sensor, or instrument panel component diagnosis or

service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the supplemental restraint system. Failure to take the proper precautions could result in accidental airbag deployment.

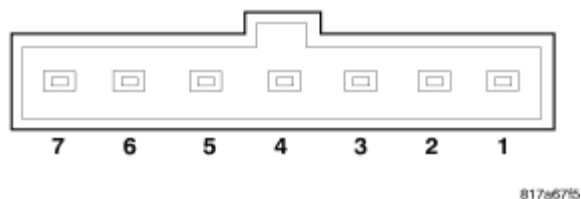


Fig. 9: Right Multi-Function Switch Connector
Courtesy of CHRYSLER LLC

The right multi-function switch as well as the hard wired inputs and outputs of the switch may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the Steering Control Module (SCM) or the electronic controls or communication between other modules and devices that provide some features of the front and rear wiper and washer systems. The most reliable, efficient and accurate means to diagnose the SCM or the electronic controls and communication related to SCM operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

1. Remove the right multi-function switch from the integral mounting bracket on the right side of the clockspring. See **REMOVAL**.
2. Using an ohmmeter, test the resistance between the terminals of the switch as shown in the three Function Tests tables. For all functions except those of the control stalk the values should be either less than 100 ohms (switch CLOSED) or greater than 1 megohm (switch OPEN).

CONTROL STALK FUNCTION TESTS			
FUNCTION	PINS		RESISTANCE
	1	7	
Front Wash	X	X	10000 Ohms
Front Mist	X	X	5490 Ohms

CONTROL KNOB FUNCTION TESTS			
FUNCTION	BETWEEN PIN 7 (GROUND) AND PINS		
	4	5	6
Off	CLOSED	CLOSED	OPEN
Front Delay 1	CLOSED	CLOSED	CLOSED
Front Delay	CLOSED	OPEN	CLOSED

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2			
Front Delay 3	OPEN	OPEN	CLOSED
Front Delay 4	OPEN	CLOSED	CLOSED
Front Delay 5	OPEN	CLOSED	OPEN
Front Wiper Low	OPEN	OPEN	OPEN
Front Wiper High	CLOSED	OPEN	OPEN

CONTROL SLEEVE FUNCTION TESTS		
FUNCTION	BETWEEN PIN 7 (GROUND) AND PINS	
	2	3
Off	CLOSED	OPEN
Rear Wipe	CLOSED	CLOSED
Rear Wash	OPEN	CLOSED

- If the switch fails any of the tests, replace the ineffective right multi-function switch as required. If the switch tests okay, but the switch input to the Steering Control Module (SCM) remains incorrect, be certain to check for a short or open in the jumper harness between the right multi-function switch and the SCM.

REMOVAL

RIGHT MULTI-FUNCTION SWITCH

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the supplemental restraint system before attempting any steering wheel, steering column, airbag, occupant classification system, seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the supplemental restraint system. Failure to take the proper precautions could result in accidental airbag deployment.

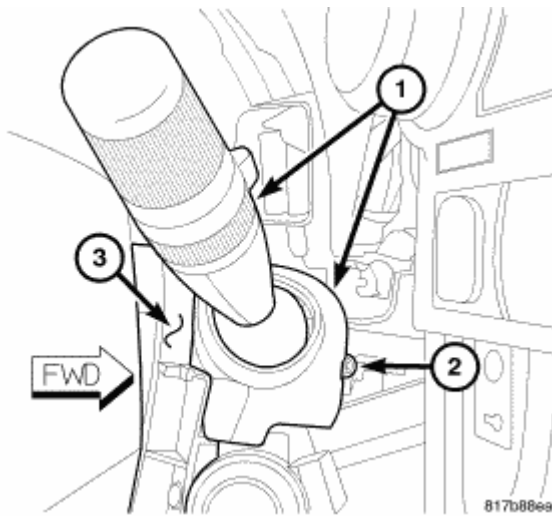


Fig. 10: Right Multi-Function Switch
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove both the upper and lower shrouds from the steering column. Refer to **REMOVAL**.
3. Remove the screw (2) that secures the right multi-function switch (1) to the mounting bracket integral to the right side of the clockspring (3) on the steering column.
4. Slide the switch away from the clockspring far enough to disengage the slide tabs on the switch housing from the channel formations in the mounting bracket.

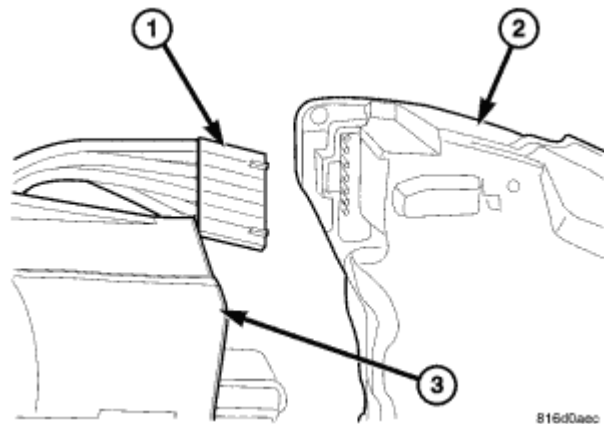


Fig. 11: Identifying Jumper Wire Harness Connector, Right Multi-Function Switch & Clockspring
 Courtesy of CHRYSLER LLC

5. Disconnect the jumper wire harness connector (1) from the connector receptacle on the inboard end of the right multi-function switch (2).
6. Remove the switch from the clockspring (3).

INSTALLATION

RIGHT MULTI-FUNCTION SWITCH

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the supplemental restraint system before attempting any steering wheel, steering column, airbag, occupant classification system, seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the supplemental restraint system. Failure to take the proper precautions could result in accidental airbag deployment.

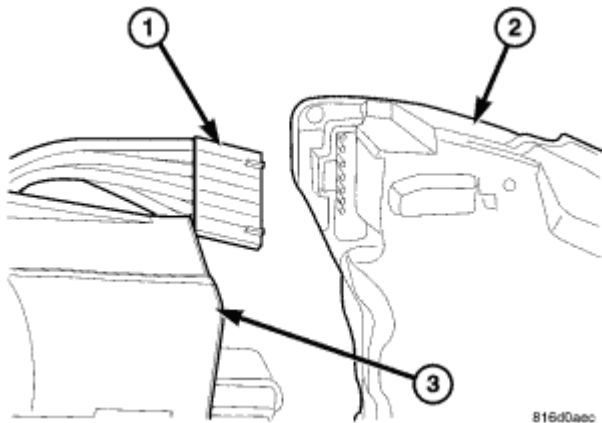


Fig. 12: Identifying Jumper Wire Harness Connector, Right Multi-Function Switch & Clockspring
Courtesy of CHRYSLER LLC

1. Position the right multi-function switch (2) close enough to the mounting bracket (3) integral to the right side of the clockspring to reconnect the jumper wire harness connector (1) to the connector receptacle on the inboard side of the switch housing.
2. Align the slide tabs on the switch housing with the channel formations integral to the clockspring mounting bracket, then slide the switch into the bracket until it is firmly seated.

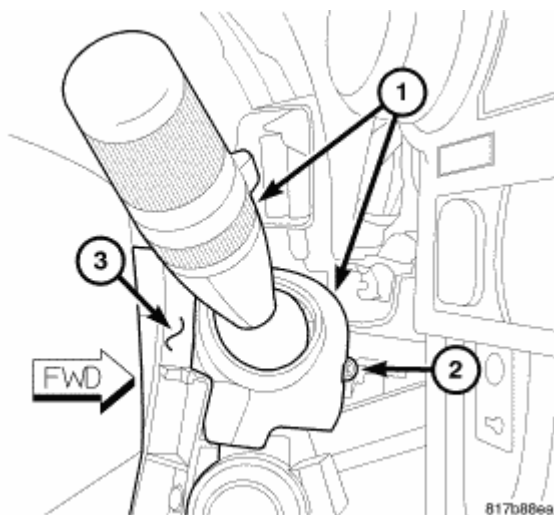


Fig. 13: Right Multi-Function Switch

Courtesy of CHRYSLER LLC

3. Install and tighten the screw (2) that secures the mounting tab on the back of the right multi-function switch (1) to the mounting bracket on the clockspring (3). Tighten the screw to 1 N.m (10 in. lbs.).
4. Reinstall the upper and lower shrouds onto the steering column. Refer to **INSTALLATION**.
5. Reconnect the battery negative cable.

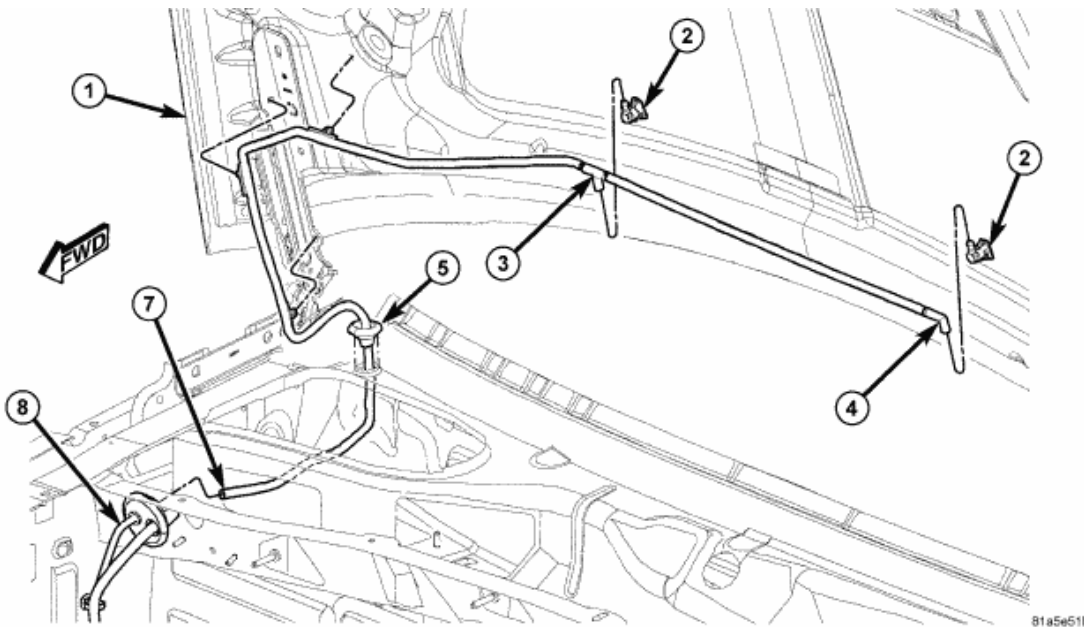
WASHER HOSES/TUBES**DESCRIPTION****FRONT WASHER PLUMBING**

Fig. 14: Left-Hand Drive
Courtesy of CHRYSLER LLC

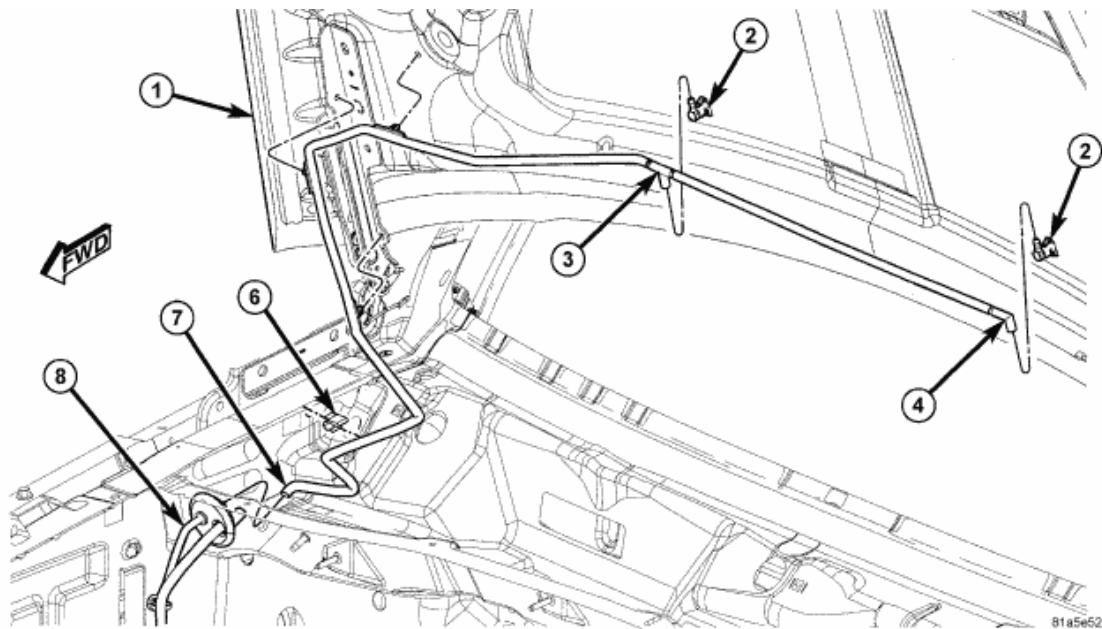


Fig. 15: Right-Hand Drive
 Courtesy of CHRYSLER LLC

The front washer plumbing consists of a small diameter rubber hose (8) that is routed from the barbed outlet nipple of the reversible electric washer pump/motor unit on the washer reservoir on the left side of the engine compartment side by side with the rear washer hose and the front end module wiring across the cooling module at the front to the right side of the engine compartment. The front washer hose is then routed along with the front end module wiring across the top of the right front inner wheel house to the cowl plenum assembly where they pass through a rubber grommet in the front of the plenum panel into the plenum area.

Within the plenum area, the front washer hose is connected by an in-line plastic connector to the hood washer hose (7). The hood hose is routed through a rubber grommet (5) on left-hand drive vehicles, or through an S-clip (6) on right-hand drive vehicles out of the plenum area toward the upper hinge bracket on the left side of the hood panel (1). Molded plastic routing clips secure the hoses to the upper hinge bracket and the left side of the inner hood reinforcement. The washer nozzle hose is then secured within the rear channel bracket for the hood silencer on the underside of the inner hood reinforcement cowl between the two front washer nozzles (2).

A molded rubber tee fitting (3) connects the hood washer hose to the right washer nozzle, while a molded rubber elbow (4) connects the hose to the left washer nozzle.

Washer hose is available for service only as roll stock, which must then be cut to length. The molded plastic or rubber washer hose fittings cannot be repaired. If these fittings are ineffective or damaged, they must be replaced.

REAR WASHER PLUMBING

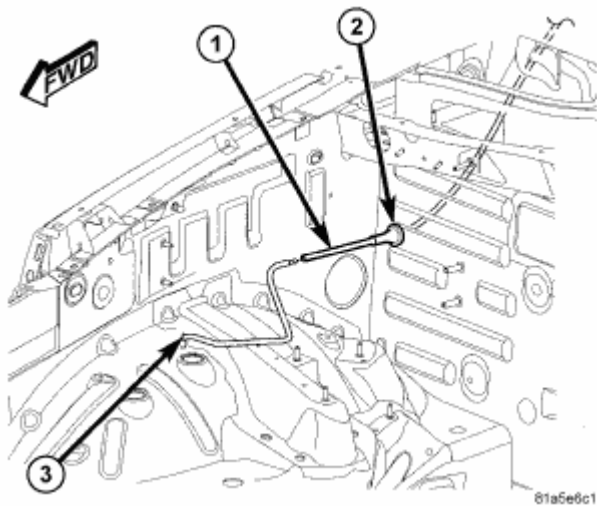


Fig. 16: Identifying Headliner Hose, Rubber Grommet & Small Diameter Rubber Hose
 Courtesy of CHRYSLER LLC

The rear washer plumbing consists of small diameter rubber hose (3) that is routed from the barbed outlet nipple of the reversible electric washer pump/motor unit on the washer reservoir on the left side of the engine compartment side by side with the front washer hose and the front end module wiring across the cooling module at the front to the right side of the engine compartment. The rear washer hose is then routed along with the front end module wiring across the top of the right front inner wheel house to the dash panel, where an in-line plastic fitting connects the rear washer hose to the headliner hose (1), which passes into the passenger compartment through a rubber grommet (2).

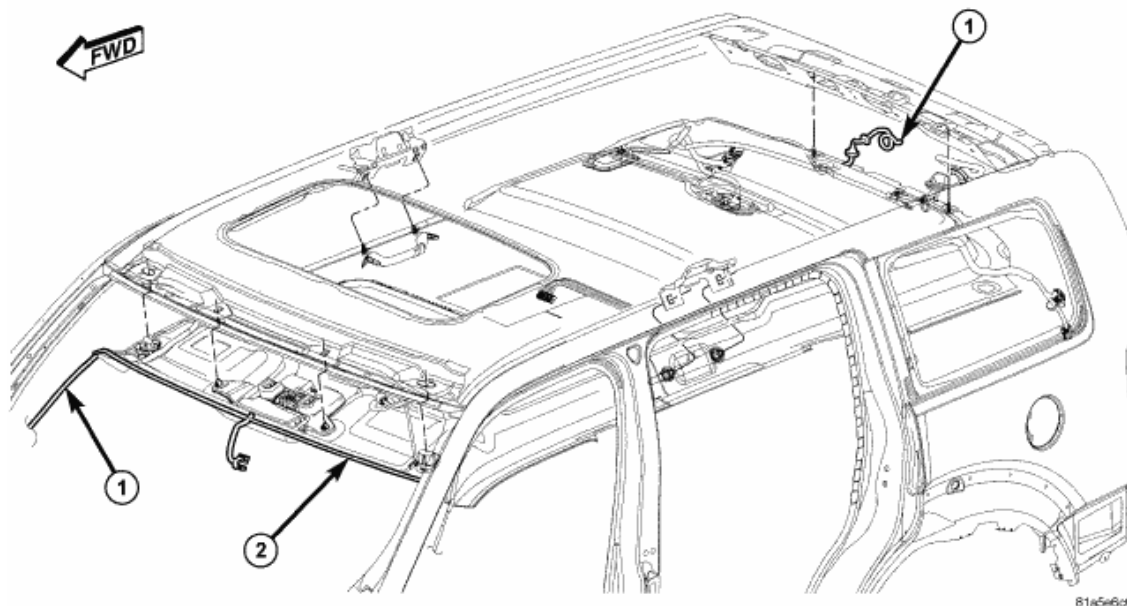


Fig. 17: Identifying Headliner & Headliner Hose
 Courtesy of CHRYSLER LLC

The headliner hose is routed below the instrument panel in the passenger compartment near the right cowl side

2007 Dodge Nitro R/T

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inner panel and up the right A-pillar to the headliner (2). The headliner hose is glued to the headliner substrate and routed along the right roof side rail to the rear of the vehicle. At the rear of the vehicle, the headliner hose passes through rubber grommets and a hole at the rear portion of the roof rear inner header panel and the upper liftgate inner panel where it is connected to the rear washer nozzle in the Center High Mounted Stop Lamp (CHMSL).

The headliner washer hose is integral to the headliner unit and, if ineffective or damaged, the headliner unit must be replaced. However, the headliner hose can be cut and spliced with a plastic in-line connector fitting to facilitate headliner removal without the need to remove the instrument panel. Refer to **REMOVAL** .

Washer hose is available for service only as roll stock, which must then be cut to length. The molded plastic washer hose fittings cannot be repaired. If these fittings are ineffective or damaged, they must be replaced.

OPERATION

FRONT WASHER PLUMBING

Washer fluid in the washer reservoir is pressurized and fed by the washer pump/motor through the front washer system plumbing and fittings to the two front washer nozzles. Whenever routing the washer hose or a wire harness containing a washer hose, it must be routed away from hot, sharp, or moving parts; and, sharp bends that might pinch the hose must be avoided.

REAR WASHER PLUMBING

Washer fluid in the washer reservoir is pressurized and fed by the washer pump/motor through the rear washer system plumbing and fittings to the rear washer nozzle located in the Center High Mounted Stop Lamp (CHMSL) on the upper outer liftgate panel above the liftgate glass opening. Whenever routing the washer hose or a wire harness containing a washer hose, it must be routed away from hot, sharp, or moving parts; and, sharp bends that might pinch the hose must be avoided.

WASHER NOZZLE

DESCRIPTION

FRONT WASHER NOZZLE

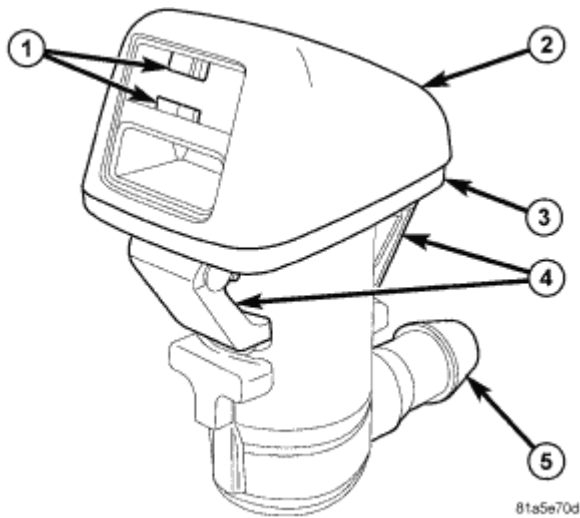


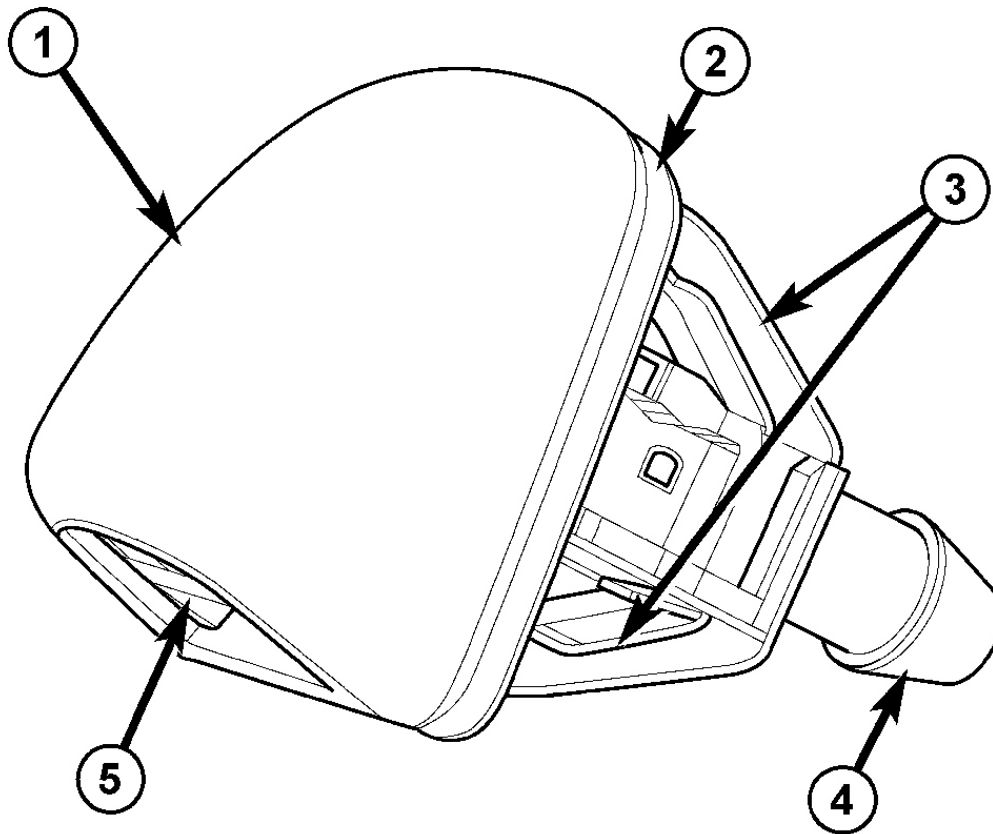
Fig. 18: Front Washer Nozzle
Courtesy of CHRYSLER LLC

The fluidic front washer nozzles (2) are constructed of molded plastic and include an integral check valve. Each nozzle has two integral latches (4) that secure them in dedicated holes in the hood panel near the base of the windshield. The domed upper surface of the washer nozzle is visible on the outside of the hood panel, and the dual nozzle orifices (1) are oriented towards the windshield glass.

An integral diaphragm type check valve is contained within the body of each nozzle. A rubber seal (3) seals the nozzle to the outer surface of the hood panel. The washer plumbing fitting (5) for the washer nozzle extends below the hood panel and is accessible from the engine compartment.

The front washer nozzles cannot be adjusted or repaired and, if ineffective or damaged, they must be replaced.

REAR WASHER NOZZLE



81590594

Fig. 19: Rear Washer Nozzle
Courtesy of CHRYSLER LLC

The fluidic rear washer nozzle (1) is constructed of molded plastic. The rear washer nozzle is secured by two integral latch features (3) within a mounting hole integral to the Center High-Mounted Stop Lamp (CHMSL) on the outer liftgate panel above the liftgate glass opening. The domed outer surface of the washer nozzle is visible on the exterior surface of the CHMSL lens, and the nozzle orifice (5) is oriented downward towards the liftgate glass.

A rubber gasket (2) seals the nozzle to the outer surface of the CHMSL lens. The washer plumbing fitting (4) for the washer nozzle extends behind the lamp and is concealed between the liftgate inner and outer panels.

The rear washer nozzle cannot be adjusted or repaired and, if ineffective or damaged, it must be replaced.

OPERATION

REAR WASHER NOZZLE

The rear washer nozzle is designed to dispense washer fluid into the wiper pattern area on the outside of the liftgate glass. Pressurized washer fluid is fed to the nozzle from the washer reservoir by the washer pump/motor through a single hose, which is attached to a barbed nipple on the back of the rear washer nozzle. A fluidic matrix within the washer nozzle causes the pressurized washer fluid to be emitted from the nozzle orifice as an oscillating stream to more effectively cover a larger area of the glass to be cleaned.

FRONT WASHER NOZZLE

The two front washer nozzles are designed to dispense washer fluid into the wiper pattern area on the outside of the windshield glass. Pressurized washer fluid is fed to each nozzle from the washer reservoir by the washer pump/motor unit through a single hose, which is attached to a barbed nipple on each washer nozzle below the inner hood panel. A fluidic matrix within the washer nozzle causes the pressurized washer fluid to be emitted from the nozzle orifice as an oscillating stream to more effectively cover a larger area of the glass to be cleaned.

The integral check valve in each nozzle prevents washer fluid from draining out of the washer supply hoses back to the washer reservoir. This drain-back would result in a lengthy delay after the washer switch is actuated until washer fluid was dispensed through the nozzles, because the washer pump would have to refill the washer plumbing from the reservoir to the nozzles. Such a drain-back condition could also result in water, dirt, or other outside contaminants being siphoned into the washer system through the washer nozzle orifice. This water could subsequently freeze and plug the nozzle, while other contaminants could interfere with proper nozzle operation and cause improper nozzle spray patterns. In addition, the check valve prevents washer fluid from siphoning through the washer nozzles after the washer pump stops operating.

When the washer pump pressurizes and pumps washer fluid from the reservoir through the washer plumbing, the fluid pressure unseats a diaphragm from over a sump well within the nozzle by overriding the spring pressure applied to it by a piston. With the diaphragm unseated, washer fluid is allowed to flow toward the nozzle orifice. When the washer pump stops operating, the spring pressure on the piston seats the diaphragm over the sump well in the nozzle and fluid flow in either direction within the washer plumbing is prevented.

REMOVAL

REAR WASHER NOZZLE

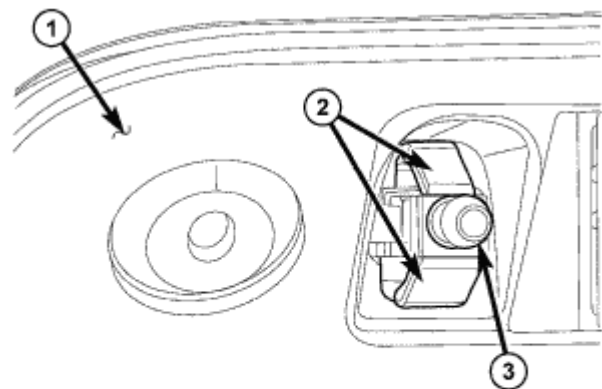


Fig. 20: Identifying Center High-Mounted Stop Lamp (CHMSL), Integral Latch Features & Barbed Nipple

Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the Center High-Mounted Stop Lamp (CHMSL) (1) from the liftgate outer panel. Refer to **REMOVAL**.
3. Disconnect the rear washer supply hose from the barbed nipple (3) on the back of the rear washer nozzle.
4. From the back of the CHMSL housing, depress the two integral latch features (2) of the nozzle, and push the nozzle out through the face of the lamp lens.

FRONT WASHER NOZZLE

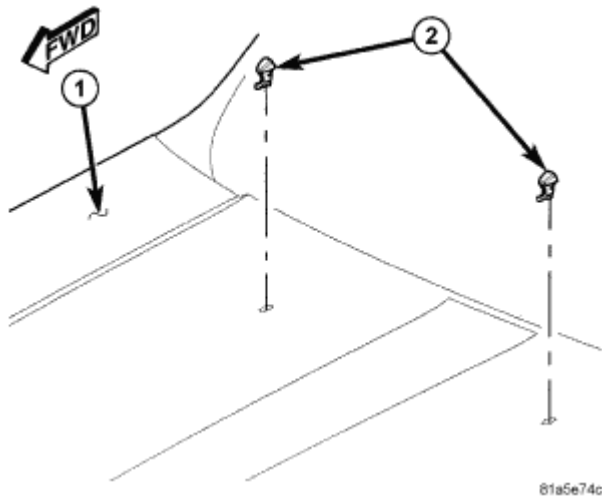


Fig. 21: Identifying Underside Of Hood & Front Washer Nozzle

Courtesy of CHRYSLER LLC

1. From the underside of the hood (1), remove the push-in retainers that secure the hood silencer pad to the inner hood reinforcement as necessary to access the front washer nozzle (2) hose connections.
2. Disconnect the hose from the barbed nipple of the front washer nozzle.
3. From the underside of the hood, release the integral latches of the front washer nozzle and push the nozzle out through the mounting hole toward the top side of the hood.
4. Remove the nozzle from the top of the hood panel.

INSTALLATION

REAR WASHER NOZZLE

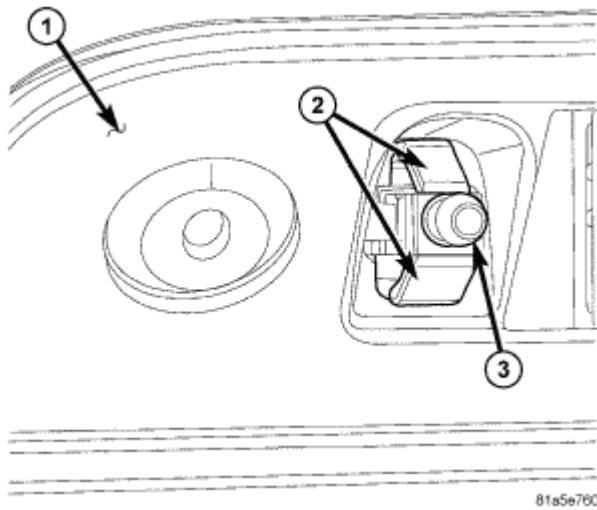


Fig. 22: Identifying Center High-Mounted Stop Lamp (CHMSL), Integral Latch Features & Barbed Nipple

Courtesy of CHRYSLER LLC

1. Be certain that the rubber gasket is installed around the base of the rear washer nozzle and that it is in good condition.
2. Insert the nozzle nipple (3) through the mounting hole from the face of the Center High-Mounted Stop Lamp (CHMSL) lens (1) with the nozzle orifice oriented downward.
3. Using hand pressure, press the nozzle firmly and evenly into the mounting hole until both integral latch features (2) are fully engaged on the back of the CHMSL housing.
4. Reconnect the rear washer supply hose to the barbed nipple of the nozzle.
5. Reinstall the CHMSL onto the liftgate outer panel. Refer to **INSTALLATION** .
6. Reconnect the battery negative cable.

FRONT WASHER NOZZLE

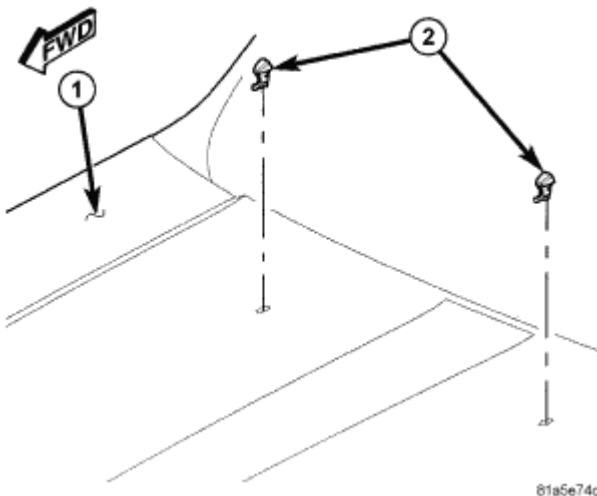
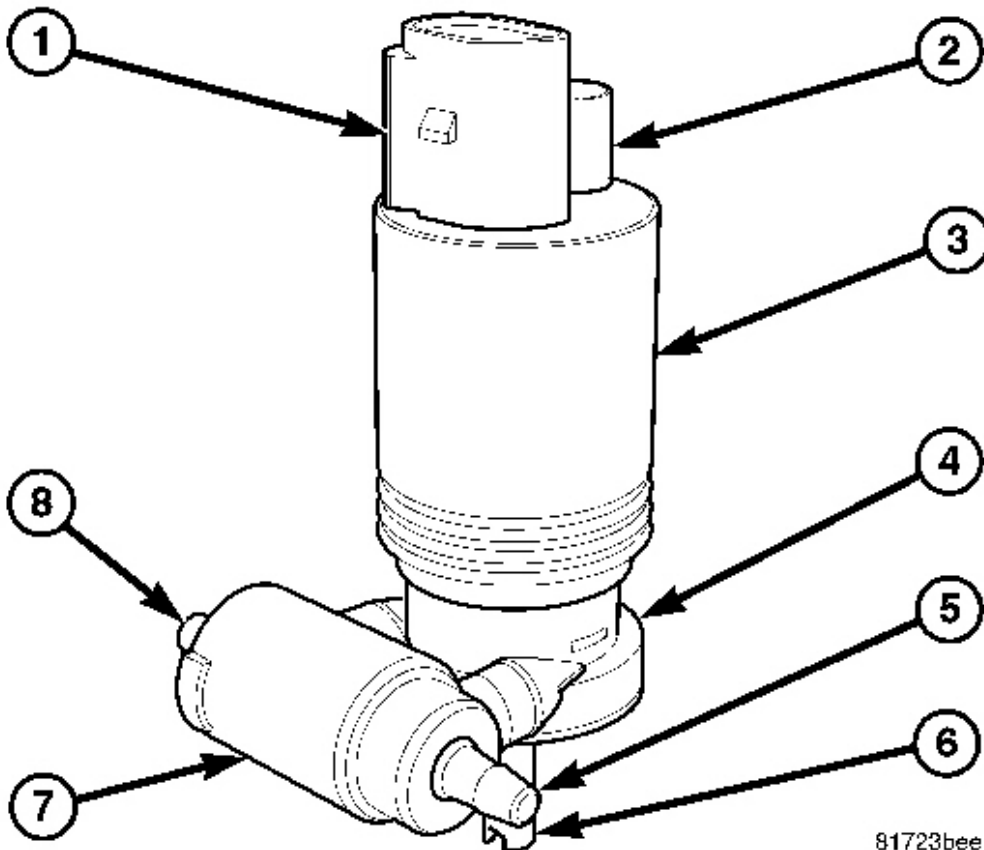


Fig. 23: Identifying Underside Of Hood & Front Washer Nozzle

Courtesy of CHRYSLER LLC

1. Position the front washer nozzle (2) to the mounting hole on the outside of the hood panel (1).
2. Align the anti-rotation tab of the nozzle with the anti-rotation notch in the mounting hole.
3. Using hand pressure, push firmly and evenly on the top of the nozzle until the integral latches lock into place on the underside of the hood.
4. From the underside of the hood, reconnect the washer hose to the barbed nipple of the nozzle.
5. Reinstall the push-in retainers that secure the hood silencer pad to the inner hood reinforcement.

WASHER PUMP/MOTOR**DESCRIPTION****WASHER PUMP/MOTOR**

81723bee

Fig. 24: Washer Pump/Motor
Courtesy of CHRYSLER LLC

The washer pump/motor unit is located on the top of a sump area on the left outboard side of the washer reservoir, which is integral to the coolant reserve bottle on the left side of the cooling module in the engine compartment. A small permanently lubricated and sealed reversible electric motor (3) is coupled to the rotor-type washer pump (4). The use of an integral valve body (7) allows the washer pump/motor unit to provide washer fluid to either the front or the rear washer systems, depending upon the direction of the motor/pump impeller rotation.

An inlet nipple (6) on the pump housing passes through a rubber grommet seal/filter screen installed in a dedicated mounting hole of the washer reservoir sump. The filter screen prevents most debris from entering the pump housing. When the pump is installed in the reservoir the front barbed outlet nipple (5) on the pump valve body housing connects the unit to the front washer hose, and the rear barbed outlet nipple (8) connects the unit to the rear washer hose. The letters **F** and **R** molded into the valve body housing adjacent to each nipple provide further clarification of the nipple assignments.

The washer pump/motor unit is retained on the reservoir by the interference fit between the pump inlet nipple and the grommet seal, which is a light press fit. The top of the washer pump is also secured to the washer reservoir by the use of a snap fit between the motor housing and a receptacle molded into the reservoir that allows for mounting of the washer pump without the use of fasteners. An integral connector receptacle (1) on the top of the motor housing connects the unit to the vehicle electrical system through a dedicated take out and connector of the headlamp and dash wire harness.

The washer pump/motor unit cannot be repaired. If ineffective or damaged, the entire washer pump/motor unit must be replaced.

OPERATION

WASHER PUMP/MOTOR

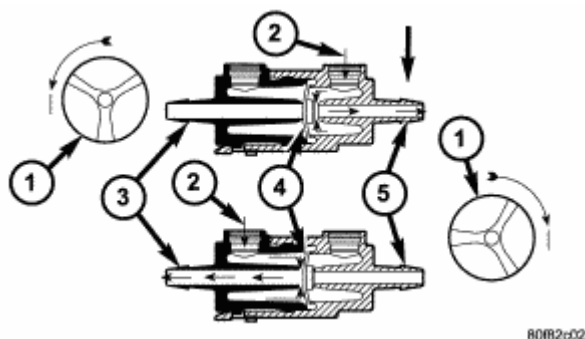


Fig. 25: Identifying Pump/Motor Operation
Courtesy of CHRYSLER LLC

The washer pump/motor unit features a reversible electric motor. The direction of the motor is controlled by hard wired outputs from the momentary front and rear washer switch circuitry contained within the right (wiper) control stalk of the multi-function switch. When battery current and ground are applied to the two pump motor terminals, the motor rotates in one direction. When the polarity of these connections is reversed, the motor

rotates in the opposite direction.

When the pump motor is energized, the rotor-type pump pressurizes the washer fluid and forces it through one of the two pump outlet nipples, and into the front or rear washer plumbing. Washer fluid is drawn through the pump inlet nipple from the washer reservoir to the inlet port of the washer pump housing. An integral valve body is located in a housing on the outlet port side (2) of the pump housing. A diaphragm (4) in this valve body controls which washer system plumbing receives the washer fluid being pressurized by the pump. When the pump is not operating the diaphragm is biased to close all washer fluid flow in the rear washer system and, in this way it also performs the function of the rear washer system check valve.

When the pump impeller (1) rotates in the counterclockwise direction (viewed from the bottom), the biased diaphragm is sealing off the rear washer system outlet and nipple so the pressurized washer fluid is pushed out through the pump front outlet port and the front washer outlet nipple (5). When the pump impeller rotates in the clockwise direction (viewed from the bottom), pressurized washer fluid is pushed out through the pump rear outlet port and moves the diaphragm to open the rear washer outlet nipple and seal off the front washer outlet nipple, then the pressurized washer fluid is pushed out through the rear washer outlet nipple (3).

The washer pump/motor unit and the hard wired circuits between the motor and the multi-function switch may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information.

REMOVAL

WASHER PUMP/MOTOR

NOTE: The washer pump/motor can be removed from the washer reservoir without removing the reservoir from the vehicle.

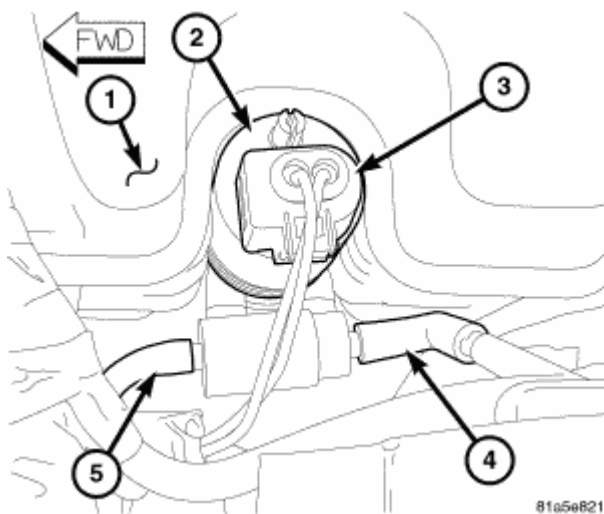


Fig. 26: Identifying Washer Reservoir, Motor Housing, Front End Module Wire Harness Connector & Washer Hoses

Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.

2. Siphon the washer fluid from the washer reservoir (1) on the left side of the cooling module in the engine compartment into a clean container for reuse.
3. Disconnect the front end module wire harness connector (3) from the washer pump/motor unit connector receptacle on the top of the motor housing (2).
4. Disconnect the two washer hoses (4 and 5) from the two washer pump/motor unit outlet nipples.
5. Firmly grasp the top of the washer pump/motor housing and pull it lightly outward from the washer reservoir far enough to disengage the top of the motor from the receptacle in the reservoir. Care must be taken not to damage the reservoir.
6. Pull the washer pump/motor unit straight up and out of the washer reservoir far enough to disengage the inlet nipple from the rubber grommet seal/filter screen in the reservoir.
7. Remove the rubber grommet seal/filter screen for the washer pump from the pump mounting hole in the washer reservoir and discard.

INSTALLATION

WASHER PUMP/MOTOR

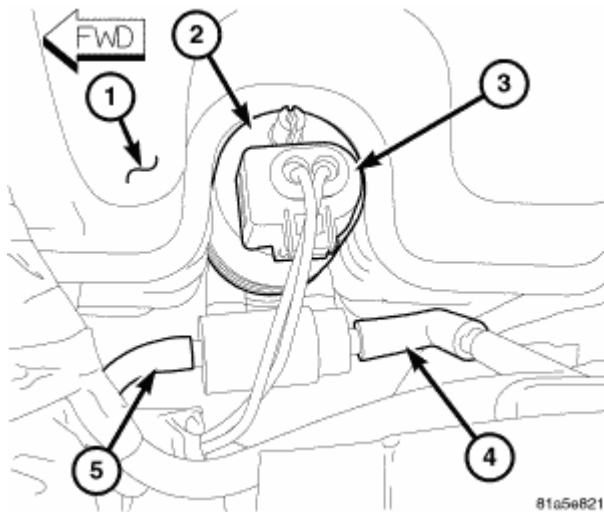


Fig. 27: Identifying Washer Reservoir, Motor Housing, Front End Module Wire Harness Connector & Washer Hoses

Courtesy of CHRYSLER LLC

1. Install a new rubber grommet seal/filter screen unit into the washer pump mounting hole in the washer reservoir (1). Always use a new rubber grommet seal/filter screen on the reservoir.
2. Position the inlet nipple of the washer pump (2) to the rubber grommet seal/filter screen in the washer reservoir.
3. Using hand pressure, press firmly and evenly downward on the washer pump/motor unit until the inlet nipple is fully seated in the rubber grommet seal/filter screen in the pump mounting hole of the reservoir.
4. Align the top of the washer pump/motor housing with the receptacle in the washer reservoir.
5. Using hand pressure, press firmly and evenly on the top of washer pump/motor unit until the motor housing snaps into the reservoir receptacle.

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6. Reconnect the front (5) and rear (4) washer hoses to the two barbed pump outlet nipples.
7. Reconnect the front end module wire harness connector (3) for the washer pump/motor unit to the connector receptacle on the top of the motor housing.
8. Reconnect the battery negative cable.
9. Refill the washer reservoir with the washer fluid siphoned from the reservoir during the removal procedure.

WASHER RESERVOIR

DESCRIPTION

WASHER RESERVOIR

The molded translucent plastic washer fluid reservoir is integral to the engine coolant overflow bottle. This unit sits astride the top of the fan shroud at the front of the engine compartment, with the washer reservoir on the left side of the shroud and the coolant overflow bottle on the right. A single washer fluid reservoir is used for both the front and rear washer systems.

A bright yellow plastic filler cap with a rubber seal and an International Control and Display Symbol icon for **Windshield Washer** and the text **WASHER FLUID ONLY** molded into it snaps over the open end of the washer reservoir filler neck. The cap hinges on and is secured to a molded-in hook formation on the top of the reservoir just behind the filler neck when it is removed for inspecting or adjusting the fluid level in the reservoir.

There is a dedicated hole on the top of a sump area and an integral molded receptacle on the lower left facing side of the reservoir provided for the mounting of the washer/pump motor unit. These features allow for mounting of the washer pump/motor unit without the use of fasteners.

The washer reservoir is serviced only as a unit with the engine coolant reserve bottle. The washer reservoir cannot be repaired and, if ineffective or damaged, the coolant reserve bottle/washer reservoir unit must be replaced. The grommet seal/filter screen for the washer pump/motor unit and the filler cap are each available for individual service replacement.

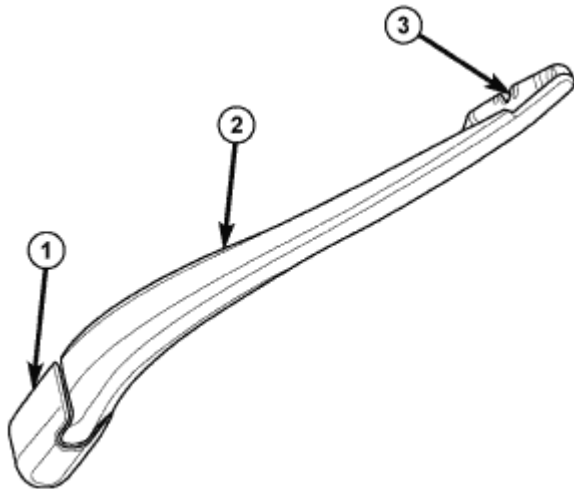
OPERATION

WASHER RESERVOIR

The washer fluid reservoir provides a secure, on-vehicle storage location for a large reserve of washer fluid for operation of the front and rear washer systems. The washer reservoir filler neck provides a clearly marked and readily accessible point from which to add washer fluid to the reservoir. The washer/pump motor unit is located in a sump area near the bottom of the reservoir to be certain that washer fluid will be available to the pump as the fluid level in the reservoir becomes depleted. The washer pump/motor unit is mounted above the lowest position in the sump.

WIPER ARM

DESCRIPTION

REAR WIPER ARM

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Fig. 28: Rear Wiper Arm
Courtesy of CHRYSLER LLC

The rear wiper arm is the rigid member located between the rear wiper motor output shaft that protrudes through the liftgate outer panel below the center of the liftgate glass opening and the wiper blade on the outside of the glass. The wiper arm is constructed of molded black plastic. A hinged pivot end is also molded plastic.

A molded black plastic nut cover (1) with two pivot pins on one end and a snap feature on the other fits over the wiper arm retaining nut to conceal the nut and mounting hole following wiper arm installation. The wiper arm hinge and tension spring are concealed on the underside of the wide end of the arm (2), while integral latch features (3) concealed on the underside of the narrow end of the wiper arm accept the pivot pin of the matching molded plastic wiper blade unit.

The rear wiper arm cannot be adjusted or repaired. If damaged or ineffective, the entire wiper arm unit must be replaced.

FRONT WIPER ARM

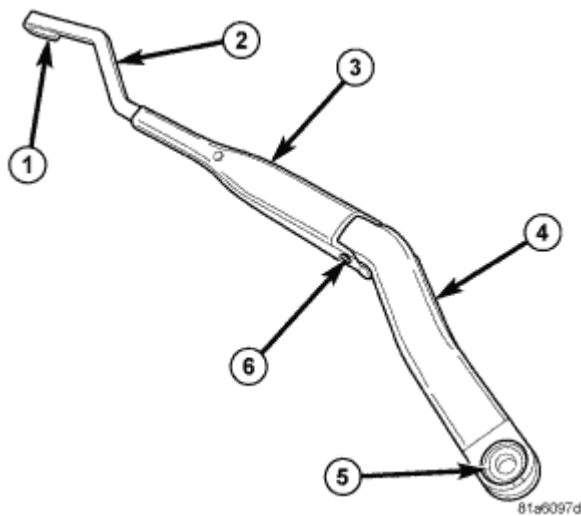


Fig. 29: Front Wiper Arm
Courtesy of CHRYSLER LLC

The front wiper arms are the rigid members located between the wiper pivots that protrude from the cowl plenum cover/grille panel near the base of the windshield and the wiper blades on the windshield glass. These wiper arms feature an over-center hinge that allows easy access to the windshield glass for cleaning. The wiper arm has a die cast metal pivot end (4) with a large tapered mounting hole (5) at one end. A molded black plastic cap fits over the wiper arm retaining nut to conceal the nut and this mounting hole following wiper arm installation.

The wide end of a tapered, stamped steel channel (3) hinges on and is secured with a hinge pin (6) to the blade end of the wiper arm pivot end. One end of a long, rigid, stamped steel strap (2) with a small hole near its pivot end is riveted and crimped within the narrow end of the stamped steel channel. The tip of the wiper blade end of this strap is bent back under itself to form a small hook (1). Concealed within the stamped steel channel, one end of a long tension spring is engaged with a wire hook on the underside of the die cast pivot end, while the other end of the spring is hooked through the small hole in the steel strap. The entire wiper arm has a satin black finish applied to all of its visible surfaces.

A wiper arm cannot be adjusted or repaired. If damaged or ineffective, the entire wiper arm unit must be replaced.

OPERATION

REAR WIPER ARM

The rear wiper arm is designed to mechanically transmit the motion from the rear wiper motor output shaft to the rear wiper blade. The wiper arm must be properly indexed to the motor output shaft in order to maintain the proper wiper blade travel on the glass. The tapered hole in the wiper arm pivot end interlocks with the serrations on the outer circumference of the tapered motor output shaft, allowing positive engagement and finite adjustment of this connection.

A hex nut secures the wiper arm pivot end to the threads on the rear wiper motor output shaft and the plastic cover snaps over this connection for a neat appearance. The spring-loaded wiper arm hinge controls the down-

force applied through the tip of the wiper arm to the wiper blade on the glass. The latch formation on the tip of the wiper arm provides a cradle for securing and latching the wiper blade pivot pin to the wiper arm.

FRONT WIPER ARM

The front wiper arms are designed to mechanically transmit the motion from the wiper pivots to the wiper blades. The wiper arm must be properly indexed to the wiper pivot in order to maintain the proper wiper blade travel on the glass. The tapered mounting hole in the wiper arm pivot end interlocks with the serrations on the tapered outer circumference of the wiper pivot shaft, allowing positive engagement and finite adjustment of this connection.

The mounting nuts lock the wiper arms to the threaded studs of the wiper pivot shafts. The spring-loaded wiper arm hinge controls the down-force applied through the tip of the wiper arm to the wiper blade on the glass. The hook formation on the tip of the wiper arm provides a cradle for securing and latching the wiper blade pivot block to the wiper arm.

REMOVAL

FRONT WIPER ARM

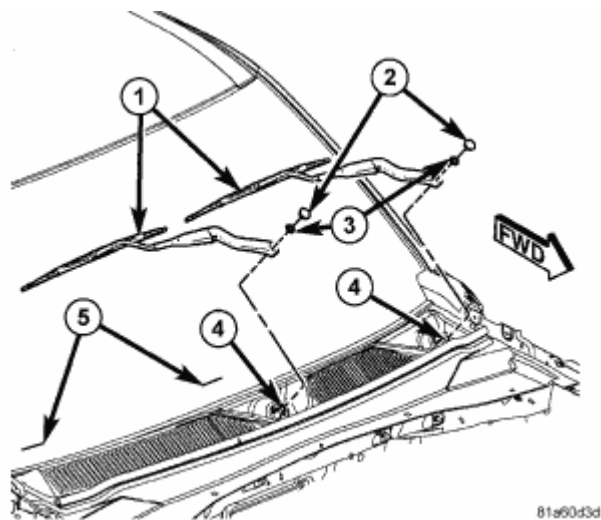
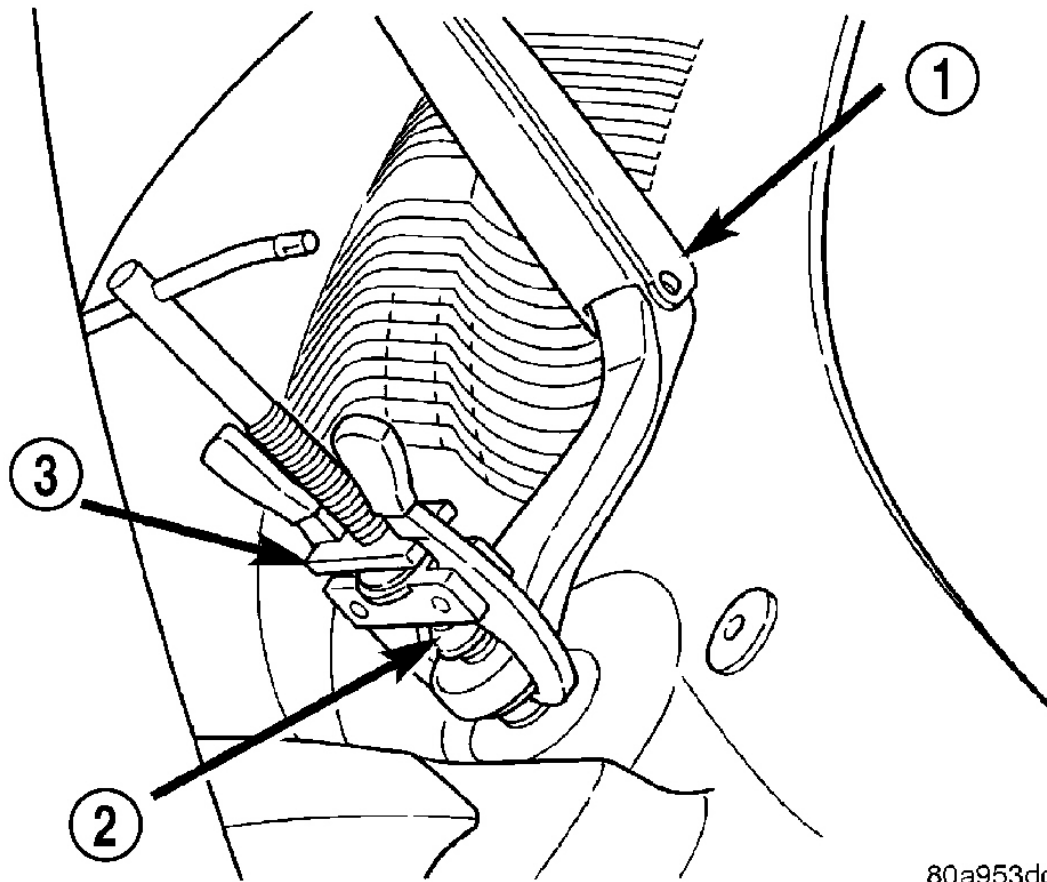


Fig. 30: Identifying Front Wiper Arms, Plastic Nut Cap, Nut & Wiper Alignment Lines
Courtesy of CHRYSLER LLC

1. Lift the front wiper arm (1) to its over-center position to hold the wiper blade off of the glass and relieve the spring tension on the wiper arm to pivot shaft connection.
2. Carefully pry the plastic nut cap (2) off of the pivot end of the wiper arm.
3. Remove the nut (3) that secures the wiper arm to the wiper pivot shaft (4).



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Fig. 31: Disengaging Wiper Arm from Pivot Shaft
Courtesy of CHRYSLER LLC

4. If necessary, use a suitable battery terminal puller (3) to disengage the wiper arm (1) from the pivot shaft (2).
5. Remove the front wiper arm pivot end from the pivot shaft.

REAR WIPER ARM

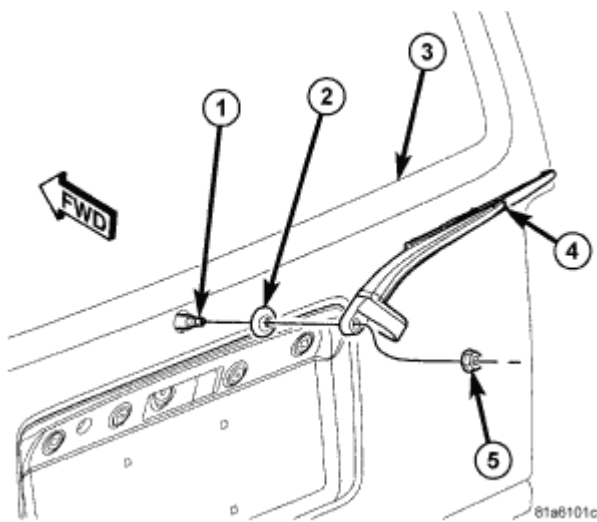


Fig. 32: Rear Wiper Arm Components
Courtesy of CHRYSLER LLC

1. Unsnap and swing the molded plastic nut cover off of the pivot end of the wiper arm (4).
2. Remove the nut (5) that secures the wiper arm to the rear wiper motor output shaft (1).

CAUTION: The use of a battery terminal puller when removing the rear wiper arm is **NOT** recommended as this may damage the rear wiper arm.

3. Use a slight rocking action to disengage the rear wiper arm pivot end from the output shaft and remove the wiper arm.

INSTALLATION

FRONT WIPER ARM

NOTE: Be certain that the wiper motor is in the park position before attempting to install the front wiper arms. Turn the ignition switch to the ON position and move the right (wiper) multi-function switch control knob to its OFF position. If the wiper pivots move, wait until they stop moving, then turn the ignition switch back to the OFF position. The front wiper motor is now in its park position.

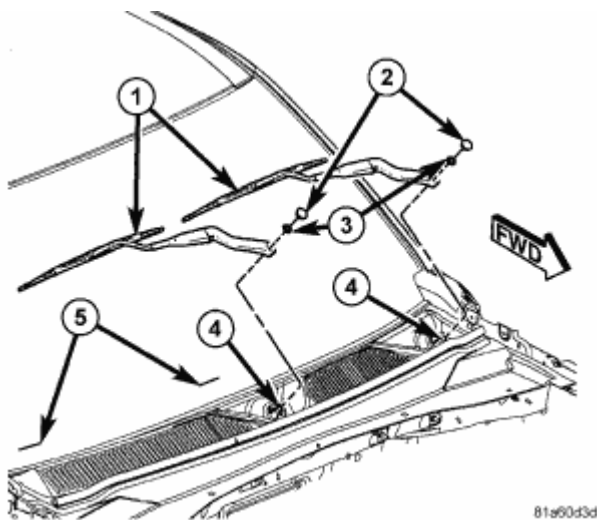


Fig. 33: Identifying Front Wiper Arms, Plastic Nut Cap, Nut & Wiper Alignment Lines
 Courtesy of CHRYSLER LLC

1. The front wiper arms (1) must be indexed to the pivot shafts with the front wiper motor in the park position to be properly installed. Position the wiper arm pivot ends onto the wiper pivot shafts (4) so that the tip of the wiper blade is aligned with the wiper alignment lines (5) located near the lower margin of the windshield glass.
2. Once the wiper blade is aligned, lift the wiper arm away from the windshield slightly to relieve the spring tension on the pivot end and push the pivot end of the wiper arm down firmly and evenly over the pivot shaft.
3. Install and tighten the nut (3) that secures the wiper arm to the pivot shaft. Tighten the nut to 24 N.m (18 ft. lbs.).
4. Wet the windshield glass, then operate the front wipers. Turn the front wipers OFF, then check for the correct wiper arm position and readjust as required.
5. Reinstall the plastic nut cap (2) onto the wiper arm pivot nut.

REAR WIPER ARM

NOTE: Be certain that the rear wiper motor is in the park position before attempting to install the rear wiper arm. Turn the ignition switch to the ON position and move the rear wiper switch to its OFF position. If the wiper motor output shaft moves, wait until it stops moving, then turn the ignition switch back to the OFF position. The wiper motor is now in its park position.

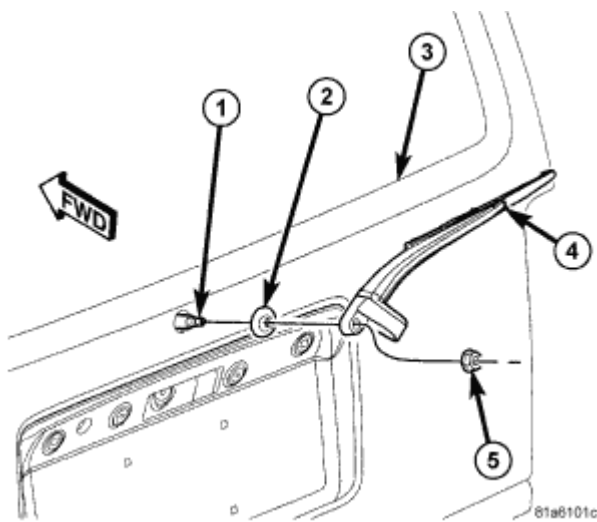


Fig. 34: Rear Wiper Arm Components
 Courtesy of CHRYSLER LLC

1. The rear wiper arm (4) must be indexed to the rear wiper motor output shaft with the motor in the park position to be properly installed. Position the wiper arm pivot end onto the output shaft so that the tip of the wiper blade is aligned with the upper edge of the lower liftgate glass blackout area (3).
2. With the rear wiper arm properly indexed, push the tapered mounting hole on the pivot end of the wiper arm down over the output shaft.
3. Install and tighten the nut (5) that secures the rear wiper arm to the output shaft. Tighten the nut to 12 N.m (9 ft. lbs.).
4. Fold and snap the molded plastic nut cover over the nut on the pivot end of the rear wiper arm.
5. Wet the lift glass and operate the rear wiper. Turn the rear wiper switch to the OFF position, then check for correct wiper arm position and readjust as required.

WIPER BLADE

DESCRIPTION

FRONT WIPER BLADE

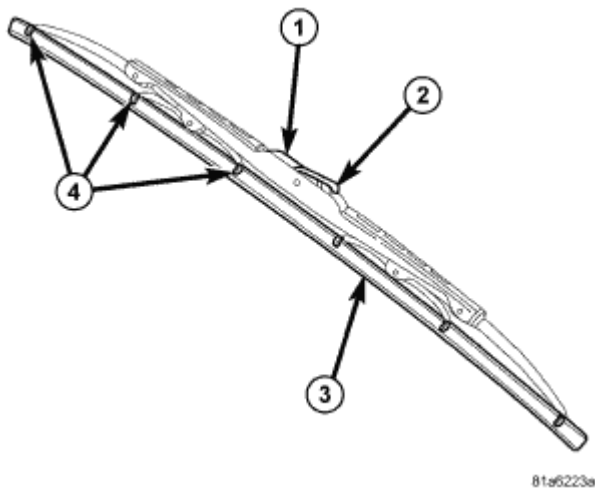


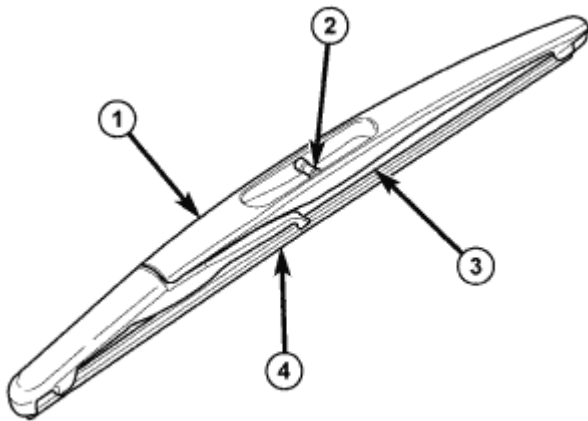
Fig. 35: Front Wiper Blade
 Courtesy of CHRYSLER LLC

Each front wiper blade is secured by an integral latching pivot block (2) to the hook formation on the tip of each wiper arm, and rests on the glass near the base of the windshield when the wipers are not in operation. The wiper blade consists of the following components:

- **Superstructure (1)** - The superstructure includes several stamped steel bridges and links with claw formations (4) that grip the wiper blade element. Also included in this unit is the latching, molded plastic pivot block that secures the superstructure to the wiper arm. On vehicles manufactured for export markets, the driver side front wiper blade has an additional molded black plastic airfoil secured to the superstructure, which is oriented toward the base of the windshield when the front wipers are in their parked position. All of the metal components of the wiper blade have a satin black finish applied.
- **Element (3)** - The wiper element or squeegee is the resilient rubber member of the wiper blade that contacts the glass.
- **Flexor** - The flexor is a rigid metal component running along the length of each side of the wiper element where it is gripped by the claws of the superstructure.

All vehicles have interchangeable windshield wiper blades with non-replaceable rubber elements (squeegees), except those export vehicles with an airfoil on the wiper blade superstructure. The blades are 47.50 centimeter (18.70 inch) long. The wiper blades cannot be adjusted or repaired and, if ineffective, worn, or damaged the entire wiper blade unit must be replaced.

REAR WIPER BLADE



81a62d4d

Fig. 36: Rear Wiper Blade
 Courtesy of CHRYSLER LLC

The rear wiper blade is secured by an integral pivot pin (2) to the latch formations on the underside of the tip of the rear wiper arm, and rests near the top of the lift glass when the rear wiper system is not in operation. The rear wiper blade consists of the following components:

- **Superstructure (1)** - The superstructure includes a molded black plastic bridge and plastic links with claw formations that grip the wiper blade element. Also included in this unit is the molded plastic pivot pin that secures the superstructure to the wiper arm.
- **Element (4)** - The wiper element or squeegee is the resilient rubber member of the wiper blade that contacts the glass.
- **Flexor (3)** - The flexor is a rigid metal component running along the length of each side of the wiper element where it is gripped by the claws of the superstructure.

The rear wiper blade is 26.00 centimeters (10.24 inches) long with a replaceable element (squeegee). The wiper blade superstructure cannot be adjusted or repaired. If ineffective, worn or damaged the entire wiper blade unit must be replaced.

OPERATION

FRONT WIPER BLADE

The wiper blades are moved back and forth across the glass by the wiper arms when the wipers are being operated. The wiper blade superstructure is the flexible frame that grips the wiper blade element and evenly distributes the force of the spring-loaded wiper arm along the length of the element. The combination of the wiper arm force and the flexibility of the superstructure makes the element conform to and maintain proper contact with the glass, even as the blade is moved over the varied curvature that may be encountered across the glass surface.

The wiper element flexor provides the claws of the blade superstructure with a rigid, yet flexible component on the element which can be gripped. The rubber element is designed to be stiff enough to maintain an even

cleaning edge as it is drawn across the glass, yet resilient enough to conform to the glass surface and flip from one cleaning edge to the other each time the wiper blade changes directions. The airfoil used on the driver side wiper blade of vehicles manufactured for certain markets is designed to reduce the lifting effect caused by air moving over the vehicle at higher highway speeds.

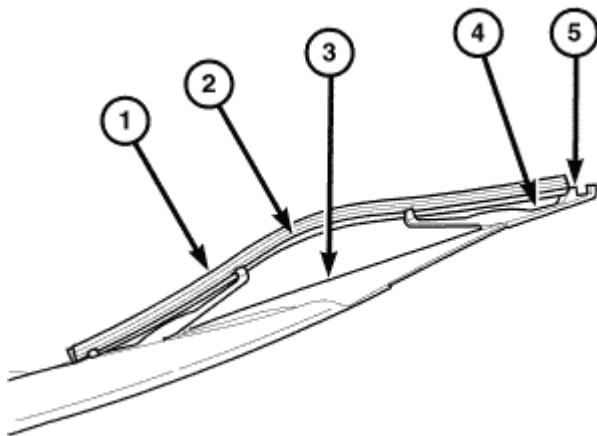
REAR WIPER BLADE

The rear wiper blade is moved back and forth across the glass by the wiper arm when the rear wiper system is in operation. The wiper blade superstructure is the flexible frame that grips the wiper blade element and evenly distributes the force of the spring-loaded wiper arm along the length of the element. The combination of the wiper arm force and the flexibility of the superstructure makes the element conform to and maintain proper contact with the glass, even as the blade is moved over the varied curvature found across the glass surface.

The wiper element flexor provides the claws of the blade superstructure with a rigid, yet flexible component on the element which can be gripped. The rubber element is designed to be stiff enough to maintain an even cleaning edge as it is drawn across the glass, but resilient enough to conform to the glass surface and flip from one cleaning edge to the other each time the wiper blade changes directions.

STANDARD PROCEDURE

REAR WIPER ELEMENT REPLACEMENT



81a3b343

Fig. 37: Rear Wiper Element Replacement
Courtesy of CHRYSLER LLC

1. Remove the rear wiper blade (3) from the wiper arm. See **REMOVAL**.
2. Grasp one of the wiper blade links (4) firmly with one hand, and grasp the wiper element (1) and flexors (2) midway between the two links with the other hand.
3. Pull the element and flexor away from the blade far enough to disengage them from the end pair of claws (5) of one link.
4. Slide the element and flexor toward the loose end to disengage them from the remaining sets of claws.
5. Reverse this process to install a new element and flexors into the wiper blade.

6. Reinstall the wiper blade onto the wiper arm. See **INSTALLATION**.

REMOVAL

REAR WIPER BLADE

CAUTION: Do not allow the wiper arm to spring back against the glass without the wiper blade in place or the glass may be damaged.

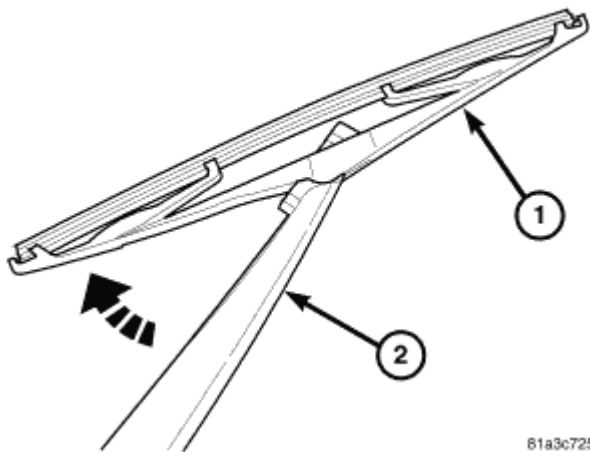


Fig. 38: Rear Wiper Blade
Courtesy of CHRYSLER LLC

1. Remove the rear wiper arm (2), wiper blade and element (1) from the vehicle as a unit. See **REMOVAL**.
2. To remove the blade from the arm, swing the end of the wiper blade nearest to the wiper motor away from the wiper arm to its travel limit.
3. Now press the end of the wiper blade nearest to the wiper motor away from the wiper arm against its stop far enough to unsnap the wiper blade pivot pin from the latch features on the underside of the wiper arm.

FRONT WIPER BLADE

CAUTION: Do not allow the wiper arm to spring back against the glass without the wiper blade in place or the glass may be damaged.

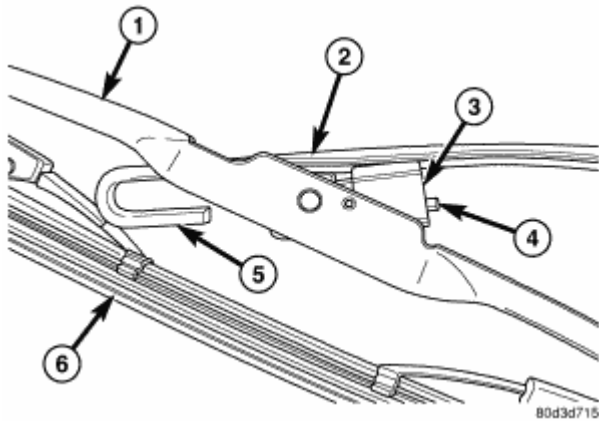


Fig. 39: Front Wiper Blade

Courtesy of CHRYSLER LLC

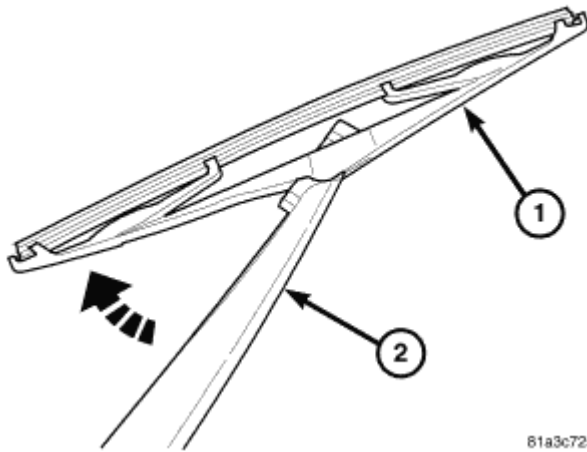
NOTE: The notched end of the wiper element flexor should always be oriented towards the end of the wiper blade that is nearest to the wiper pivot.

1. Lift the wiper arm (2) to raise the wiper blade and element (6) off of the glass, until the wiper arm hinge is in its over-center position.
2. To remove the blade from the arm, depress the latch release tab (4) on the pivot block (3) under the tip of the arm and slide the blade away from the tip towards the pivot end of the arm far enough to disengage the pivot block from the hook formation (5) on the end of the arm.
3. Extract the hook formation on the tip of the wiper arm through the opening in the wiper blade superstructure (1) just ahead of the pivot block.
4. Gently lower the tip of the wiper arm onto the glass.

INSTALLATION

REAR WIPER BLADE

CAUTION: Do not allow the wiper arm to spring back against the glass without the wiper blade in place or the glass may be damaged.

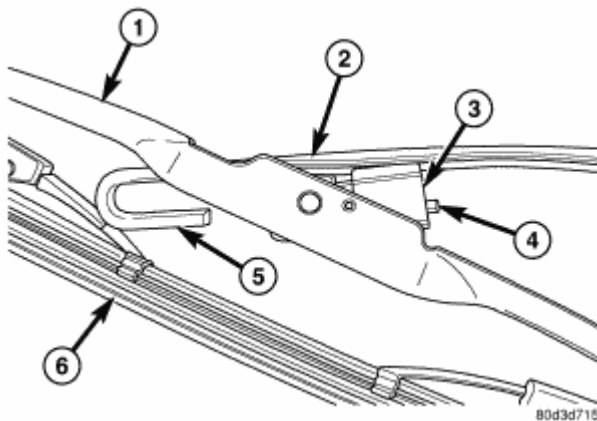
**Fig. 40: Rear Wiper Blade**

Courtesy of CHRYSLER LLC

1. Position the wiper blade (1) under the tip of the wiper arm (2), aligning the pivot pin near the center of the blade superstructure with the latch features on the underside of the tip of the arm.
2. Squeeze the arm and blade together until the blade pivot pin snaps into the latch features of the arm.
3. Reinstall the rear wiper arm, wiper blade and element onto the vehicle as a unit. See INSTALLATION.

FRONT WIPER BLADE

CAUTION: Do not allow the wiper arm to spring back against the glass without the wiper blade in place or the glass may be damaged.

**Fig. 41: Front Wiper Blade**

Courtesy of CHRYSLER LLC

NOTE: The notched end of the wiper element flexor should always be oriented towards the end of the wiper blade that is nearest to the wiper pivot.

1. Lift the wiper arm (2) off of the windshield glass, until the wiper arm hinge is in its over-center position.
2. Position the wiper blade near the hook formation (5) on the tip of the arm with the notched end of the wiper element flexor oriented towards the end of the wiper arm that is nearest to the wiper pivot.
3. Insert the hook formation on the tip of the arm through the opening in the blade superstructure (1) ahead of the pivot block (3) far enough to engage the pivot block into the hook.
4. Slide the pivot block up into the hook formation on the tip of the wiper arm until the latch release tab (4) snaps into its locked position. Latch engagement will be accompanied by an audible click.
5. Gently lower the wiper blade and element (6) onto the glass.

WIPER MODULE

DESCRIPTION

FRONT WIPER MODULE

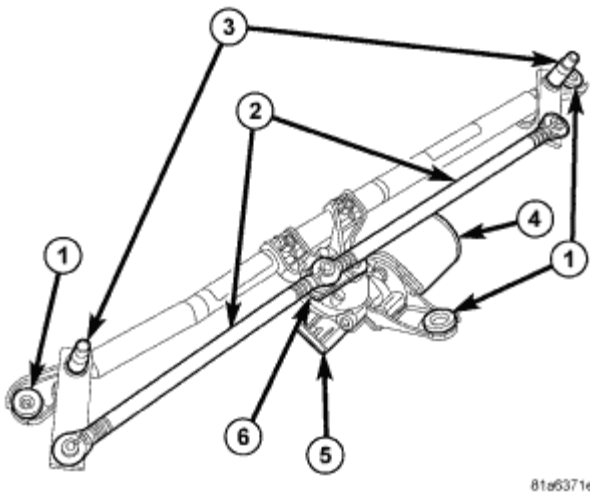


Fig. 42: Front Wiper Module Components
Courtesy of CHRYSLER LLC

The front wiper module is secured within the cowl plenum panel beneath the cowl plenum cover/grille panel. The ends of the wiper pivot shafts (3) protrude through dedicated openings in the cowl plenum cover/grille panel to drive the wiper arms and blades and are the only visible components of the front wiper module.

The front wiper module consists of the following major components:

- **Bracket** - The front wiper module bracket consists of a long tubular steel main member that has a die cast pivot bracket formation near each end where the two wiper pivots are secured. A die cast mounting bracket for the wiper motor (4) is secured with two screws near the center of the main member. Each of the two wiper pivot brackets secures the module to the cowl plenum with a screw through a rubber insulator (1), and a third rubber insulator on the motor bracket secures the module with a nut to a stud located in the bottom of the cowl plenum.
- **Crank Arm (6)** - The front wiper motor crank arm is a stamped steel unit with a hole on the driven end

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that is secured to the wiper motor output shaft with a nut, and has a ball stud secured to the drive end.

- **Linkage (2)** - Two tubular steel drive links connect the wiper motor crank arm to the wiper pivot lever arms. The right side drive link has a plastic socket-type bushing on each end. The left side drive link has a plastic socket-type bushing on one end, and a plastic sleeve-type bushing on the other end. The socket-type bushing on one end of each drive link is snap-fit over the ball stud on the lever arm of its respective pivot. The left side drive link sleeve-type bushing end is then fit over the motor crank arm ball stud, and the other socket-type bushing of the right side drive link is snap-fit over the exposed end of the wiper motor crank arm ball stud.
- **Motor** - The front wiper motor is secured with two screws near the center of the main tubular member of the wiper module bracket, and through a rubber insulator to a stud in the bottom of the cowl plenum. An integral connector receptacle (5) connects the motor to the vehicle electrical system through a take out and connector of the front end module wire harness. A nut secures the wiper motor crank arm to the motor output shaft. The two-speed permanent magnet wiper motor features an integral transmission, an internal park switch, and an internal automatic resetting circuit breaker.
- **Pivots** - The two front wiper pivots are secured within the die cast pivot brackets on the outboard ends of the wiper module main member. The lever arms that extend from the center of the pivot shafts each have a ball stud on their end. The upper end of each pivot shaft where the wiper arms will be fastened each is tapered and serrated with a threaded stud formation at the tip. The lower ends of the pivot shafts are installed through lubricated bushings in the pivot brackets and are secured with snap rings.

The front wiper module cannot be adjusted or repaired. If any component of the module is ineffective or damaged, the entire front wiper module unit must be replaced.

OPERATION

FRONT WIPER MODULE

The front wiper module operation is controlled by the battery current inputs received by the wiper motor through the Totally Integrated Power Module (TIPM). The wiper motor speed is controlled by current flow to either the low speed or the high speed set of brushes. The park switch is a single pole, single throw, momentary switch within the wiper motor that is mechanically actuated by the wiper motor transmission components. The park switch alternately closes the wiper park switch sense circuit to ground or to battery current, depending upon the position of the wipers on the glass. This feature allows the motor to complete its current wipe cycle after the wiper system has been turned OFF, and to park the wiper blades in the lowest portion of the wipe pattern. The automatic resetting circuit breaker protects the motor from overloads.

The wiper motor crank arm, the two wiper linkage members and the two wiper pivots mechanically convert the rotary output of the wiper motor to the back and forth wiping motion of the wiper arms and blades on the glass.

The hard wired inputs and outputs of the front wiper motor may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the front wiper motor or the electronic controls or communication between other modules and devices that provide some features of the front wiper and washer system. The most reliable, efficient, and accurate means to diagnose the front wiper motor or the electronic controls and communication related to front wiper motor operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

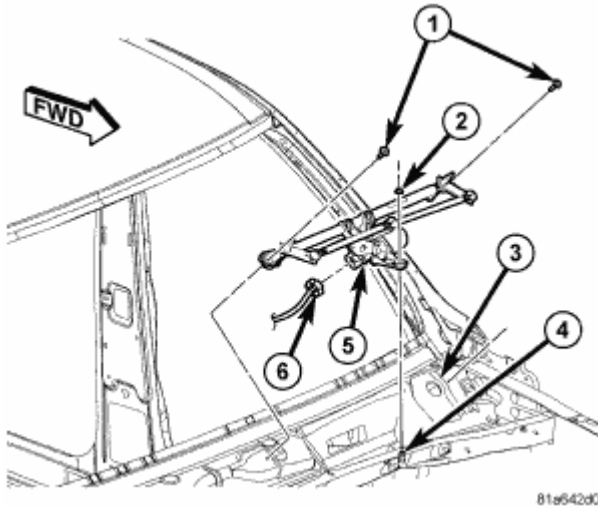
REMOVAL**FRONT WIPER MODULE**

Fig. 43: Identifying Screws, Nut, Cowl Plenum, Weld Stud, Wiper Motor & Wire Harness Connector
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove both front wiper arms from the wiper pivots. See **REMOVAL**.
3. Remove the cowl plenum cover/grille panel from over the cowl plenum. Refer to **REMOVAL** .
4. Disconnect the wire harness connector (6) for the front wiper motor (5) from the motor connector receptacle.
5. Remove the two screws (1) that secure the ends of the front wiper module bracket to the cowl plenum (3).
6. Remove the nut (2) that secures the front wiper motor bracket rubber insulator to the weld stud (4) located on the bottom of the cowl plenum.
7. Remove the front wiper module from the cowl plenum as a unit.

INSTALLATION**FRONT WIPER MODULE**

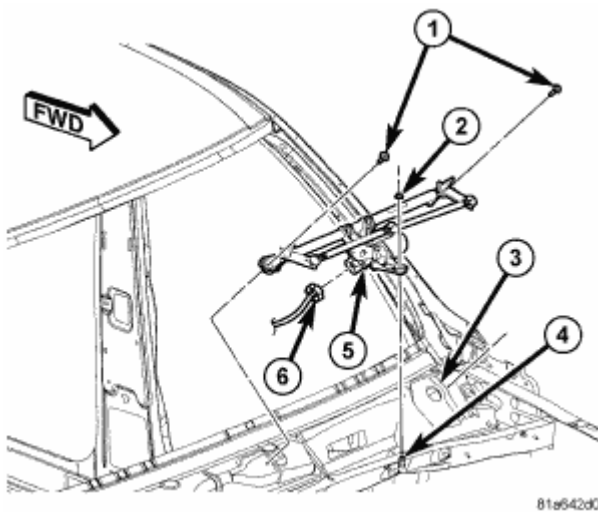


Fig. 44: Identifying Screws, Nut, Cowl Plenum, Weld Stud, Wiper Motor & Wire Harness Connector
Courtesy of CHRYSLER LLC

1. Position the front wiper module into the cowl plenum (3) as a unit.
2. Position the front wiper motor bracket rubber insulator over the weld stud (4) located on the bottom of the cowl plenum.
3. Loosely install the two screws (1) that secure the ends of the front wiper module bracket to the cowl plenum. Tighten the outboard screw, followed by the inboard screw. Tighten the screws to 8 N.m (72 in. lbs.).
4. Install and tighten the nut (2) that secures the front wiper motor bracket rubber insulator to the two weld stud on the bottom of the cowl plenum. Tighten the nut to 7.5 N.m (67 in. lbs.).
5. Reconnect the wire harness connector (6) for the front wiper motor (5) to the motor connector receptacle.
6. Reinstall the cowl plenum cover/grille panel over the cowl plenum. Refer to **INSTALLATION** .

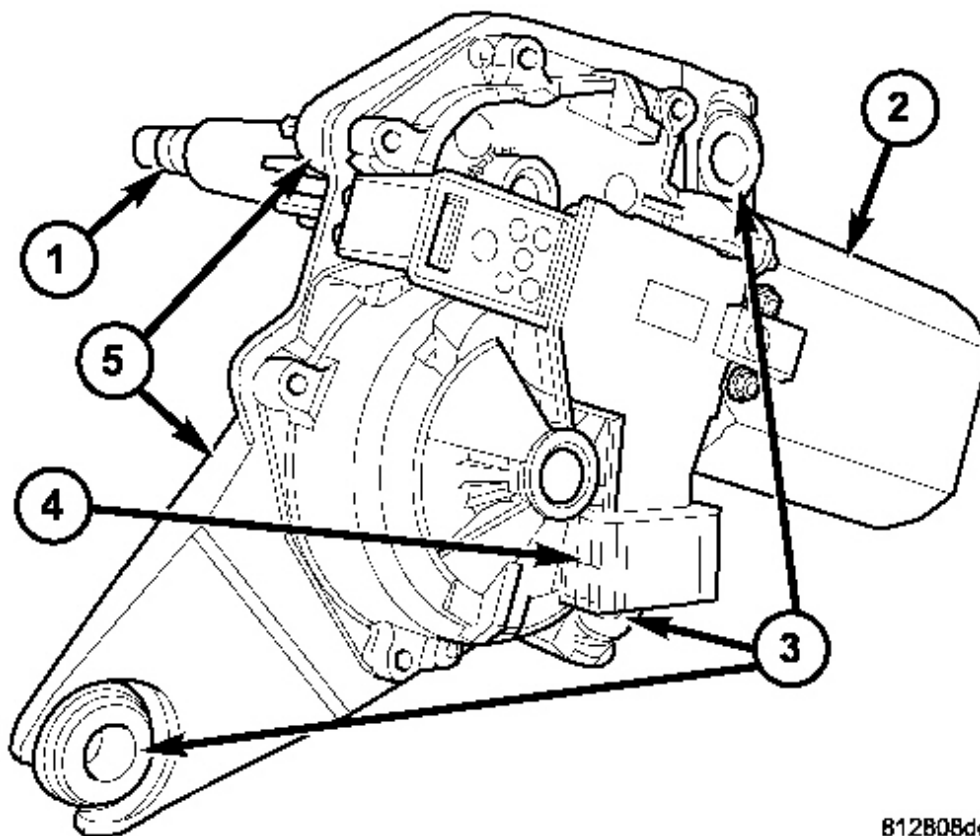
NOTE: Be certain to turn the ignition switch to the ON position, then turn the front wiper switch ON and OFF again to cycle the wiper motor and linkage to their natural park position before reinstalling the front wiper arms onto the wiper pivots.

7. Reinstall both front wiper arms onto the wiper pivots. See **INSTALLATION**.
8. Reconnect the battery negative cable.

WIPER MOTOR

DESCRIPTION

REAR WIPER MOTOR



B12B08dd

Fig. 45: Locating Rear Window Wiper Motor Components
 Courtesy of CHRYSLER LLC

The rear wiper motor (2) is concealed within the liftgate, below the liftgate glass and behind the liftgate inner trim panel. The end of the motor output shaft (1) that extends through the liftgate outer panel to drive the rear wiper arm and blade is the only visible component of the rear wiper motor. A rubber bezel and grommet is engaged within the output shaft hole of the liftgate outer panel and seals the output shaft where it passes through the panel. An integral connector receptacle (4) connects the rear wiper motor to the vehicle electrical system through a dedicated take out and connector of the liftgate wire harness. The rear wiper motor consists of the following major components:

- **Bracket (5)** - The rear wiper motor bracket consists of a molded plastic mounting plate for the wiper motor that is secured with screws to the wiper motor housing, and through three rubber isolators (3) to the liftgate inner panel.
- **Motor** - The single-speed permanent magnet rear wiper motor is secured with screws to the rear wiper

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motor bracket. The wiper motor includes an integral transmission, a motor output shaft, an automatic resetting circuit breaker, and the rear wiper motor park switch.

The rear wiper motor cannot be adjusted or repaired. If any component of the motor is ineffective or damaged, the entire rear wiper motor unit must be replaced. The motor output shaft bezel and grommet, nut, and nut cover are available for individual service replacement.

OPERATION

REAR WIPER MOTOR

The rear wiper motor operation is controlled by the Totally Integrated Power Module (TIPM), which uses intelligent, high current, self-protected high side switches to control rear wiper system operation for energizing or de-energizing the rear wiper motor. The TIPM uses internal programming and electronic messages received over the Controller Area Network (CAN) data bus from the Electro Mechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) to provide the appropriate rear wiper and washer system operating modes. The EMIC uses electronic messages received from the Steering Control Module (SCM) over a Local Interconnect Network (LIN) data bus to determine when to send electronic rear wiper system requests to the TIPM.

The rear wiper motor park switch is a single pole, single throw, momentary switch within the wiper motor that is mechanically actuated by the wiper motor transmission components. The park switch alternately closes and opens a path to ground for the rear wiper motor electronic control logic circuitry of the TIPM, depending upon the position of the rear wiper blade on the liftgate glass. This input allows the electronic logic circuits of the TIPM to control all of the electronic features of rear wiper motor operation and to keep the motor energized long enough to complete its current wipe cycle and park the wiper blade after the wiper system or the ignition switch has been turned OFF.

The rear wiper motor is grounded at all times through a take out in the body wire harness that is secured to a ground location in the passenger compartment. The automatic resetting circuit breaker protects the motor from overloads. The rear wiper motor transmission converts the rotary output of the wiper motor to the back and forth wiping motion of the rear wiper arm and blade on the liftgate glass.

The hard wired inputs and outputs of the rear wiper motor may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the rear wiper motor or the electronic controls or communication between other modules and devices that provide some features of the rear wiper and washer system. The most reliable, efficient, and accurate means to diagnose the rear wiper motor or the electronic controls and communication related to rear wiper motor operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

REMOVAL

REAR WIPER MOTOR

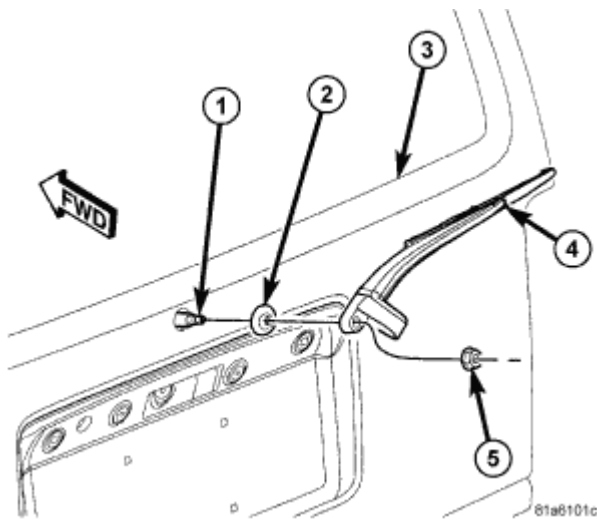


Fig. 46: Rear Wiper Arm Components
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the rear wiper arm (4) from the rear wiper motor output shaft (1). See **REMOVAL**.

NOTE: The output shaft bezel and grommet (2) does not have to be removed to remove the rear wiper motor from the liftgate.

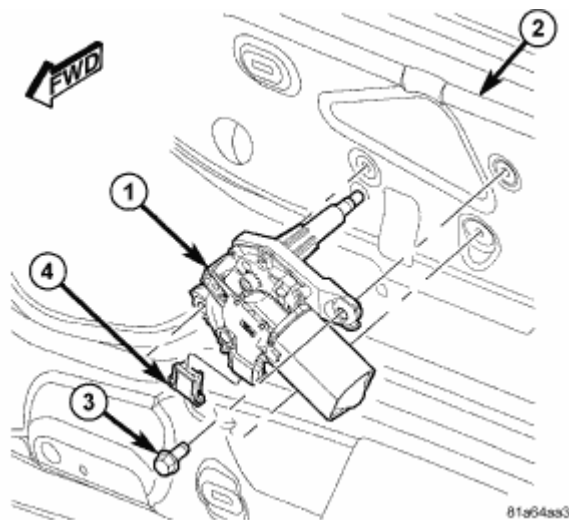


Fig. 47: Identifying Rear Wiper Motor, Liftgate Inner Panel, Screws & Wire Harness Connector
 Courtesy of CHRYSLER LLC

3. Remove the trim panel from the liftgate inner panel (2). Refer to **REMOVAL**.
4. Disconnect the wire harness connector (4) from the rear wiper motor (1).
5. Remove the three screws (3) that secure the motor mounting bracket to the liftgate inner panel.
6. Remove the motor from the liftgate.

7. Remove the bezel and rubber grommet on the outer liftgate panel from the output shaft housing. **Be certain to take proper precautions to protect the outer liftgate panel and its paint finish from damage during this procedure.**

INSTALLATION

REAR WIPER MOTOR

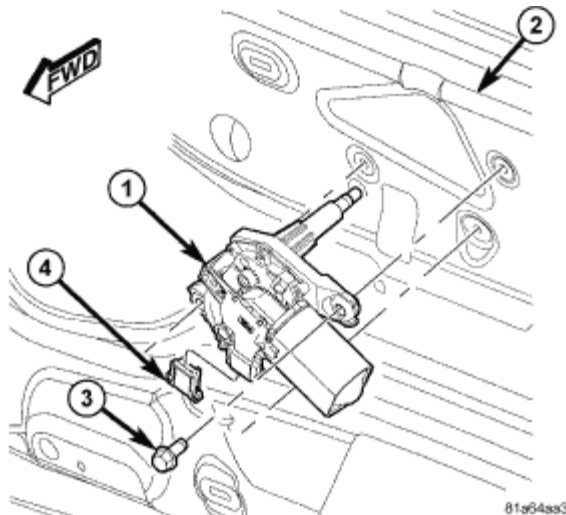


Fig. 48: Identifying Rear Wiper Motor, Liftgate Inner Panel, Screws & Wire Harness Connector
Courtesy of CHRYSLER LLC

1. If the output shaft bezel and grommet were removed from the outside of the liftgate, install the rubber bezel and grommet into the mounting hole of the liftgate outer panel.
2. Position the rear wiper motor and bracket unit (1) onto the liftgate inner panel (2) as a unit.
3. Install and tighten the three screws (3) that secure the mounting bracket to the liftgate. Tighten the screws to 5.5 N.m (47 in. lbs.).
4. Reconnect the wire harness connector to the motor connector receptacle.
5. Reinstall the trim panel onto the liftgate inner panel. Refer to **INSTALLATION**.

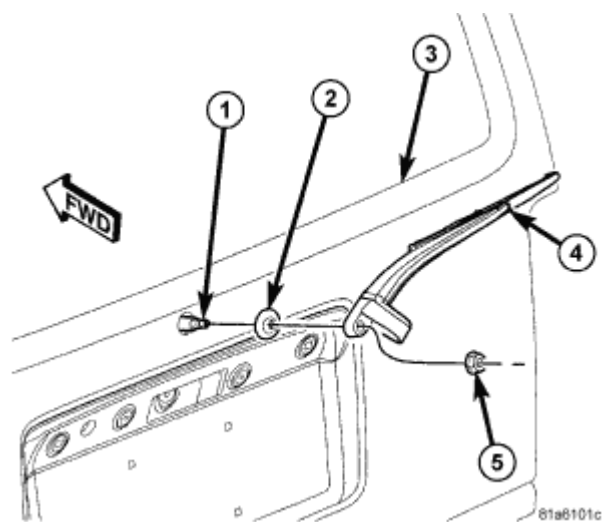


Fig. 49: Rear Wiper Arm Components
Courtesy of CHRYSLER LLC

6. Reinstall the rear wiper arm (4) onto the output shaft (1). See **INSTALLATION**.
7. Reconnect the battery negative cable.