DESCRIPTION AND OPERATION > VEHICLE THEFT SECURITY SYSTEM > DESCRIPTION - VEHICLE THEFT SECURITY SYSTEM

The Vehicle Theft Security System (VTSS) includes various features that provide protection against unauthorized vehicle access and operation. VTSS is comprised of two primary subsystems: Sentry Key Immobilizer System (SKIS) and the Vehicle Theft Alarm (VTA). Additional details of each of these subsystems and their components can be found elsewhere within this service information.

Except for the Sentry Key transponders which rely upon Radio Frequency (RF) communication, hard wired circuitry connects the VTA and SKIS 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 SKIS or VTA 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 SYSTEM WIRING DIAGRAMS article. 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.

DESCRIPTION AND OPERATION > VEHICLE THEFT SECURITY SYSTEM > OPERATION - VEHICLE THEFT SECURITY SYSTEM

The VTSS is comprised of two primary subsystems: SKIS and VTA. Additional operational details on each of these two subsystems of the VTSS can be found elsewhere within this service information.

DESCRIPTION AND OPERATION > SENTRY KEY IMMOBILIZER SYSTEM > DESCRIPTION - SENTRY KEY IMMOBILIZER SYSTEM

The Sentry Key Immobilizer System (SKIS) is factory-installed standard equipment on this vehicle. The SKIS provides passive vehicle protection, immobilizing the vehicle by preventing the engine from operating unless a valid electronically encoded key or FOB with Integrated Key (FOBIK) is detected. In vehicles not equipped with the optional Passive Entry - Keyless Go (PEKG) system the valid key must be present in the ignition lock cylinder. In vehicles equipped with the PEKG system, the valid FOBIK must only be present somewhere within the passenger compartment of the vehicle for the engine to continue to operate. Vehicles with this equipment can be readily identified by the illumination of the security indicator in the Instrument Panel Cluster (IPC) for about three seconds after the status of the ignition transitions to On as a SKIS bulb test.

The SKIS includes the following major components, which are described in further detail elsewhere in this service information:

- **Body Control Module** - The Body Control Module (BCM) is concealed within the instrument panel outboard of the steering column. Refer to MODULE, BODY CONTROL, DESCRIPTION AND OPERATION .

- **Ignition Switch** - The ignition switch is located on the right side of the steering column in vehicles without the optional PEKG system.
- **Keyless Ignition Node** - The Keyless Ignition Node/KIN (also known as the start and stop switch or the push button switch) is located on the right side of the steering column in vehicles with the optional PEKG system. (Refer to DESCRIPTION AND OPERATION).
- **Low Frequency Antenna** - Vehicles equipped with the PEKG system have several low frequency antenna units strategically placed within the vehicle. (Refer to DESCRIPTION AND OPERATION).
- **Powertrain Control Module** - The Powertrain Control Module (PCM) is located in the engine compartment and provides the SKIS engine control logic. Refer to MODULE, POWERTRAIN CONTROL, DESCRIPTION AND OPERATION .
- **Radio Frequency Hub Module** - The Radio Frequency Hub Module (RFHM) is located on the upper liftgate opening header where it is concealed above the rear headliner trim. Refer to MODULE, RADIO FREQUENCY (RF HUB), DESCRIPTION AND OPERATION .
- **Security Indicator** - A security indicator is integral to the IPC. Refer to DESCRIPTION AND OPERATION .
- **Sentry Key Immobilizer Module** - In vehicles not equipped with the optional PEKG system the Sentry Key Immobilizer Module (SKIM) is integral to the BCM. Refer to MODULE, BODY CONTROL, DESCRIPTION AND OPERATION . In vehicles equipped with the optional PEKG system the SKIM is integral to the RFHM. Refer to MODULE, RADIO FREQUENCY (RF HUB), DESCRIPTION AND OPERATION .
- **Sentry Key Immobilizer Antenna** - A antenna ring is located around the circumference of the ignition switch lock cylinder and concealed beneath the steering column shrouds in vehicles without the optional PEKG system. Refer to ANTENNA, SENTRY KEY, DESCRIPTION AND OPERATION .
- **Sentry Key Transponder** - The Sentry Key transponder microchip is located on the circuit board within the Remote Keyless Entry (RKE) transmitter of each ignition key or within each FOBIK. Refer to KEY, TRANSPONDER, DESCRIPTION AND OPERATION .

The BCM, the PCM and the RFHM each contain a microcontroller and programming that allow them to communicate with each other and other electronic modules in the vehicle using the Controller Area Network (CAN) data bus. In addition, in vehicles so equipped the KIN and the RFHM communicate with each other using a Local Interface Network (LIN) data bus. Refer to COMMUNICATION, DESCRIPTION AND OPERATION .

Except for the Sentry Key transponders, which rely upon Radio Frequency (RF) communication, hard wired circuitry connects the various SKIS 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 SKIS 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 SYSTEM WIRING DIAGRAMS article. 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.

DESCRIPTION AND OPERATION > SENTRY KEY IMMOBILIZER SYSTEM >

OPERATION - SENTRY KEY IMMOBILIZER SYSTEM

The SKIS is designed to provide passive protection against unauthorized vehicle use by disabling the engine after about two seconds of running, whenever any method other than a valid Sentry Key or FOBIK is used to attempt starting the vehicle. The SKIS is considered a passive protection system because it is always active when the ignition system is energized and does not require any customer intervention.

In vehicles without the optional PEKG system the SKIS uses Radio Frequency (RF) communication to obtain confirmation that the key in the ignition switch lock cylinder is a valid key for operating the vehicle. In vehicles with the optional PEKG system the SKIS uses Low Frequency (LF) Radio Frequency (RF) communication to obtain confirmation that the FOBIK within the passenger compartment is valid for operating the vehicle.

In vehicles without the optional PEKG system the microcontroller-based BCM contains the SKIS software. The BCM monitors a hard wired input from the Sentry Key antenna. In vehicles with the optional PEKG system the microcontroller-based RFHM uses electronic messages over a dedicated LIN data bus to communicate with the KIN. In both systems the BCM or the RFHM also use electronic messages to communicate with other electronic modules in the vehicle over the CAN data bus. Refer to COMMUNICATION, DESCRIPTION AND OPERATION .

The BCM or the RFHM performs a self-test of the SKIS each time the status of the ignition transitions out of Off, and will store fault information in the form of a Diagnostic Trouble Code (DTC) if a system malfunction is detected. The BCM or the RFHM will also send an electronic message to the IPC if a fault is detected, and the IPC responds by illuminating the security indicator or displaying a textual message in the Electronic Vehicle Information Center (EVIC) display.

The hard wired circuits between components related to the SKIS may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate SYSTEM WIRING DIAGRAMS article. 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 SKIS or the electronic controls and communication between other modules and devices that provide some features of the SKIS. The most reliable, efficient and accurate means to diagnose the SKIS or the electronic controls and communication related to SKIS operation requires the use of a diagnostic scan tool. Refer to the appropriate Diagnostic & Testing article.

DESCRIPTION AND OPERATION > VEHICLE THEFT ALARM > DESCRIPTION - VEHICLE THEFT ALARM

The Vehicle Theft Alarm (VTA) is factory-installed equipment on this vehicle. VTA is available in two different configurations; base and premium. The base system provides perimeter vehicle protection by monitoring the vehicle doors, the ignition status and the liftgate. In vehicles built for certain markets where it is required equipment, the perimeter protection also includes monitoring of the hood.

The premium system adds vehicle interior intrusion and anti-tilt protection to the features found in the base system. If unauthorized vehicle access, intrusion or tampering is detected with either of these systems, either the vehicle horn or an alarm siren (if equipped) is pulsed as an audible deterrent and certain exterior lamps are flashed as a visual deterrent.

The VTA includes the following major components, which are described in further detail elsewhere in this service information:

- **Ajar Switches** - An ajar switch is integral to the latch mechanism of each front door, rear door and the liftgate. In vehicles manufactured for certain markets where it is required or equipped with the optional remote start system, a hood ajar switch is integral to the left hood latch mechanism.
- **Alarm Siren Module** - An alarm siren module is located on the engine compartment side of the dash panel. The alarm siren is used only in vehicles built for sale in certain markets where it is required equipment. Refer to SIREN, DESCRIPTION AND OPERATION .
- **Body Control Module** - The Body Control Module (BCM) is concealed within the instrument panel outboard of the steering column. Refer to MODULE, BODY CONTROL, DESCRIPTION AND OPERATION .
- **Ignition Switch** - The ignition switch is located on the right side of the steering column in vehicles without the optional Passive Entry - Keyless Go (PEKG) system. (Refer to DESCRIPTION AND OPERATION).
- **Keyless Ignition Node** - The Keyless Ignition Node (KIN) (also known as the start and stop switch or the push button switch) is located on the right side of the steering column in vehicles with the optional PEKG system. (Refer to DESCRIPTION AND OPERATION).
- **Radio Frequency Hub Module** - The Radio Frequency Hub Module (RFHM) is located on the upper liftgate opening header where it is concealed above the rear headliner trim. The RFHM is only part of the vehicle theft alarm in vehicles equipped with the optional PEKG system. Refer to MODULE, RADIO FREQUENCY (RF HUB), DESCRIPTION AND OPERATION .
- **Security Indicator** - The security indicator is integral to the Instrument Panel Cluster (IPC) located in the instrument panel above the steering column and directly in front of the driver. Refer to DESCRIPTION AND OPERATION .
- **Ultrasonic And Anti-tilt Module** - In vehicles equipped with the premium VTA, an Ultrasonic and Anti-tilt Module (UAM) is integral to the roof lamp unit in the headliner near the center of the upper windshield opening header panel.

The BCM, the IPC and the RFHM each contain a microcontroller and programming that allow them to communicate with each other and other electronic modules in the vehicle using the Controller Area Network (CAN) data bus. In addition, in vehicles so equipped the KIN, the RFHM, the UAM, the alarm siren module and the BCM communicate with each other using a Local Interface Network data bus. Refer to COMMUNICATION, DESCRIPTION AND OPERATION .

DESCRIPTION AND OPERATION > VEHICLE THEFT ALARM > OPERATION - VEHICLE THEFT ALARM

The base version of the VTA is designed to provide either active or passive perimeter protection of the vehicle by monitoring the vehicle doors, the ignition status, the liftgate and the power lock switches. In vehicles built for certain markets where it is required equipment, or those equipped with the optional remote start system (North America Free Trade Agreement/NAFTA market only), the BCM also monitors an input from the hood ajar switch integral to the left hood latch. If the VTA system detects any attempt to compromise a monitored vehicle system or feature, the vehicle horn is pulsed as an audible deterrent and certain exterior lamps are flashed as a visual deterrent.

The BCM includes the logic and control circuits for the base versions of the VTA. Each of the ajar switches provides hard wired inputs to the BCM, while the BCM provides control outputs to the vehicle horns and lighting systems. In vehicles not equipped with the optional PEKG system, the BCM also monitors the status of the ignition switch through a hard wired input. In vehicles equipped with the PEKG system, the RFHM monitors the status of the KIN through a private serial bus and relays this information to the BCM as electronic messages transmitted over the CAN data bus.

The premium version of the VTA includes an UAM. The UAM provides interior intrusion protection as well as vehicle tow-away and tire theft protection. The UAM includes the logic and control circuits for these features of the VTA and is also a slave node communicating over the Local Interface Network (LIN) data bus. The UAM is armed and disarmed by electronic messages received over the LIN data bus from the BCM, which is a LIN master node. While armed, the UAM uses external ultrasonic transmit and receive transducers to monitor the vehicle interior for movement as well as internal accelerometers to monitor vehicle pitch and roll. When an exception is detected, the UAM relays this information to the BCM over the LIN data bus, and the BCM invokes the VTA audible and visual alerts. In vehicles with a UAM, the horn output function of the BCM is replaced by an output of the alarm siren module that is controlled by the BCM over the LIN data bus.

The hard wired circuits between components related to the VTA system may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate SYSTEM WIRING DIAGRAMS article. 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 VTA system or the electronic controls and communication between modules and devices that provide some features of the VTA system. The most reliable, efficient and accurate means to diagnose the VTA system or the electronic controls and communication related to VTA system operation requires the use of a diagnostic scan tool. Refer to the appropriate Diagnostic & Testing article.

DESCRIPTION AND OPERATION > VEHICLE THEFT ALARM > OPERATION - VEHICLE THEFT ALARM > OPERATING MODES - VEHICLE THEFT ALARM

Following are paragraphs that briefly describe the operation of each of the Vehicle Theft Alarm (VTA) operating modes.

- **Enabling** - The Body Control Module (BCM) and the Radio Frequency Hub Module (RFHM) must have the VTA function electronically enabled in order for the VTA to perform as designed. The BCM stores and compares vehicle configuration data with other Electronic Control Units (ECU) in the vehicle, including the RFHM. This process is referred to as PRogramming Of Configuration of Systems Integrated (PROCSI) (also known as PROXI). If a configuration mismatch is detected, the BCM sets a Diagnostic Trouble Code (DTC). A configuration mismatch will require the performance of a Restore BCM PROXI Configuration routine, or a PROXI Configuration Alignment routine using a diagnostic scan tool.
- **Alarm** - The VTA alarm output provides both visual and audible outputs; however, the time intervals of these outputs vary by the requirements of the market for which the vehicle is manufactured. In all cases, the visual output will be a flashing On and Off of the exterior turn signal lamps, while the audible output will be either a pulsing of the horn or, if the vehicle is so equipped, the siren. For vehicles with the base version of the VTA, the inputs that will trigger the alarm include a change in the status of the ignition, the door ajar switches, the liftgate ajar switch and, in vehicles built for certain markets where they are required, the hood ajar switch. In vehicles with the

premium version of the VTA, the inputs that will trigger the alarm also include any movement detected within the vehicle passenger compartment, or a change in the vehicle pitch or roll of greater than about 0.5 degrees.

- **Arming** - Arming of the VTA occurs when the vehicle is exited and the key is removed from the ignition switch (without Passive Entry - Keyless Go/PEKG) and the switch status is Off or the status of the KIN (with PEKG) is Off, the exterior lighting is turned Off, then the Lock button on the Remote Keyless Entry (RKE) transmitter is depressed or the Lock button on the Passive Entry (PE) is pressed to lock the vehicle. For active arming to occur, the doors and the liftgate must be closed and the status of the ignition switch or the KIN must be Off when the RKE transmitter or PE handle Lock button is depressed. Arming will not occur if a key is in the ignition switch lock cylinder or a FOB with Integrated Key (FOBIK) is within the vehicle interior.

  Pre-arming of the VTA is initiated when a door or the deck lid is open when the vehicle is locked using a power door lock switch or when the RKE Lock button is pressed. Pre-arming will not occur if a FOBIK is within the vehicle interior. When the VTA is pre-armed, the arming sequence is delayed until all of the doors and the liftgate have been closed. The VTA will remain in pre-armed mode for up to 16 seconds after all doors and the liftgate have been closed.

  Once the VTA begins the arming sequence, the security indicator in the Instrument Panel Cluster (IPC) will flash rapidly for about 16 seconds. This indicates that VTA arming is in progress. If the status of the ignition switch or KIN changes, if a door or the liftgate is unlocked or opened by any means, the security indicator will stop flashing and the arming process will abort. Once the arming sequence is successfully completed, the security indicator will flash at a slower rate, indicating that the VTA is armed.

  The VTA arming sequence will occur regardless of whether a door or the liftgate is open or closed, but the security indicator will illuminate solid and the open door or the liftgate will not be protected unless the door or the liftgate is closed when the VTA arming sequence first begins.

  On vehicles equipped with the hood ajar switch, the VTA arming sequence will occur regardless of whether the hood is open or closed, but the security indicator will illuminate solid and the engine compartment will not be protected unless the hood is closed when the VTA arming sequence first begins. Also, if the status of the hood ajar switch changes from open to closed during the 16 second arming process, the security indicator will switch from solid to flashing. Once the arming process is successfully completed, the security indicator will flash at a slower rate, indicating that the VTA is armed.

- **Disarming** - Passive disarming of the VTA occurs when the vehicle is unlocked by depressing the Unlock button of the RKE transmitter. Once the alarm has been activated, this disarming method will also deactivate the alarm. Unlocking a door with a key will **not** disarm the VTA or deactivate the alarm. On vehicles equipped with PE, if one of the valid FOBIK units is located outside the vehicle and within 1.5 meters (5 feet) of the driver or passenger front door handles, grab the Passive Entry (PE) handle and enter the vehicle, then press the Start/Stop/Button (SSB) to transition the ignition status to On. This requires at least one valid FOBIK be located within the passenger compartment of the vehicle.

- **Power-Up Mode** - When the armed VTA senses that the battery has been disconnected and reconnected, it enters its power-up mode. In the power-up mode the armed alarm system remains armed following a battery failure or disconnect. If the VTA was armed prior to a battery disconnect or failure, the technician or vehicle operator will have to disarm the alarm system after the battery is reconnected. The power-up mode will also apply if the battery goes dead while the system is armed, and battery jump-starting is attempted. The VTA will be armed until the technician or vehicle operator has disarmed the alarm system. If the VTA is in the disarmed mode prior to a battery

disconnect or failure, it will remain disarmed after the battery is reconnected or replaced, or if jump-starting is attempted.

- **Tamper Alert** - The VTA tamper alert feature will illuminate an icon in the IPC when the ignition first transitions to On if the alarm was triggered and has since timed out, or if the battery has been disconnected and reconnected. This feature alerts the vehicle operator that the VTA alarm was activated while the vehicle was unattended.

- **Antitilt And Intrusion Alarm Disabling** - The antitilt and intrusion alarm is an exclusive feature of the premium version of the VTA. When this version of the VTA is armed, the Ultrasonic and Antitilt Module (UAM) uses ultrasonic transmit and receive transducers to monitor the interior of the vehicle for movement and low gravity accelerometers to monitor vehicle pitch and roll. If interior motion or change in vehicle attitude are detected, the UAM sends an electronic message to the BCM over the Local Interface Network (LIN) data bus to invoke the audible and visual alarm features.

  The antitilt and intrusion alarm features of the premium VTA can be disabled by depressing a button on the roof lamp unit during VTA pre-arming, while the security indicator is still flashing rapidly. A Light Emitting Diode (LED) unit next to the button is illuminated as a visual confirmation that the antitilt and intrusion alarm features disable request has been received. The default for the UAM features is enabled; therefore, the disable procedure must be repeated each time the VTA is disarmed, then armed again to prevent the system from monitoring interior movement and vehicle pitch and roll.

DIAGNOSIS AND TESTING > VEHICLE THEFT SECURITY SYSTEM

The Vehicle Theft Security System (VTSS) is divided into two basic subsystems: Sentry Key Immobilizer System (SKIS) and Vehicle Theft Alarm (VTA). The recommended procedures for diagnosis and testing of each of these two VTSS subsystems can be found elsewhere within this service information.

DIAGNOSIS AND TESTING > SENTRY KEY IMMOBILIZER SYSTEM

WARNING:

To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbags, airbag curtains, knee blocker, seat belt tensioner, impact sensor or instrument panel component diagnosis or service. Disconnect the IBS/negative battery cable assembly from the negative battery post, 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 SRS. Failure to take the proper precautions could result in accidental airbag deployment.

The hard wired circuits between modules and components related to the Sentry Key Immobilizer System (SKIS) may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate SYSTEM WIRING DIAGRAMS article. 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 SKIS or the electronic controls and communication between other modules and devices that provide features of the SKIS. The most reliable, efficient and accurate means to diagnose the SKIS or the electronic controls and communication related to SKIS operation requires the use of a diagnostic scan tool. Refer to the appropriate Diagnostic & Testing article.

SENTRY KEY IMMOBILIZER SYSTEM DIAGNOSIS		
CONDITION	POSSIBLE CAUSES	CORRECTION
SECURITY INDICATOR FAILS TO LIGHT DURING BULB TEST	1. Ineffective Light-Emitting Diode (LED).	1. Use a diagnostic scan tool to perform the Instrument Panel Cluster (IPC) actuator test. Refer to the appropriate Diagnostic & Testing article.
	2. Ineffective fuse.	2. Check the Radio Frequency Hub Module (RFHM) fused B(+) fuse and the fused ignition output (run-start) fuse in the Power Distribution Center (PDC). Replace the fuses, if required.
	3. Ineffective ground circuit.	3. Test and repair the open ground circuit at the connector for the RFHM, if required.
	4. Ineffective battery feed circuit.	4. Test and repair the open battery feed circuit at the connector for the IPC, if required.
	5. Ineffective ignition feed circuit.	5. Test and repair the open ignition feed circuit at the connector for the IPC, if required.
SECURITY INDICATOR FLASHES FOLLOWING BULB TEST	1. Invalid key in the ignition switch lock cylinder or an invalid FOB with Integrated Key (FOBIK).	1. Remove the invalid key or FOBIK and try again with a known valid key or FOBIK.
	2. Key-related fault.	2. Use a diagnostic scan tool and the appropriate diagnostic information for further diagnosis.
SECURITY INDICATOR LIGHTS SOLID FOLLOWING BULB TEST	1. SKIS system malfunction/fault detected.	1. Use a diagnostic scan tool and the appropriate diagnostic information for further diagnosis.
	2. SKIS system ineffective.	2. Use a diagnostic scan tool and the appropriate diagnostic information for further diagnosis.

DIAGNOSIS AND TESTING > VEHICLE THEFT ALARM

WARNING:

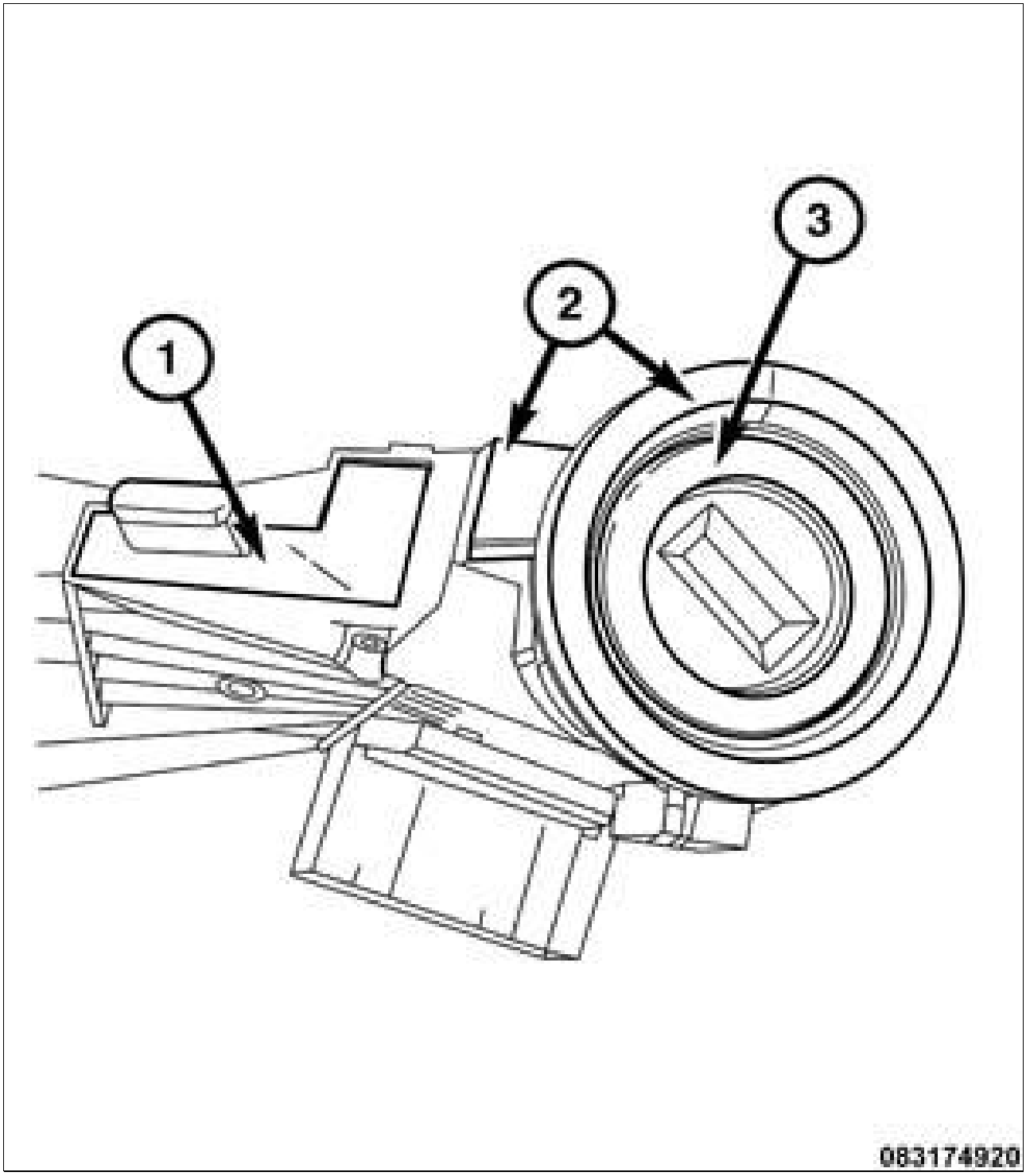
To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbags, airbag curtains, knee blocker, seat belt tensioner, impact sensor or instrument panel component diagnosis or service. Disconnect the IBS/negative battery cable assembly from the negative battery post, 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 SRS. Failure to take the proper precautions could result in accidental airbag deployment.

The hard wired circuits between modules and components related to the Vehicle Theft Alarm (VTA) system may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate SYSTEM WIRING DIAGRAMS article. 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 VTA or the electronic controls and communication between other modules and devices that provide features of the VTA. The most reliable, efficient and accurate means to diagnose the VTA or the electronic controls and communication related to VTA operation requires the use of a diagnostic scan tool. Refer to the appropriate Diagnostic & Testing article.

ANTENNA, SENTRY KEY > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

Fig 1: Ignition Switch, Sentry Key Antenna & Ignition Lock Cylinder



Courtesy of CHRYSLER GROUP, LLC

The Sentry Key antenna (2) is used only on vehicles that are not equipped with the optional Passive Entry - Keyless Go (PEKG) system. The antenna is located on the right side of the steering column adjacent to the ignition switch (1) and is concealed beneath the steering column shrouds. The housing for the antenna is a molded plastic halo-like ring. When the antenna ring is properly installed, it is secured around the circumference of the ignition lock cylinder (3) housing by three retainers integral to the antenna housing. A single connector receptacle is also integral to the antenna housing and is connected to the vehicle electrical system through a dedicated take out and connector of the steering

column wire harness.

The Sentry Key antenna cannot be adjusted or repaired. If ineffective or damaged, the entire antenna unit must be replaced.

ANTENNA, SENTRY KEY > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

In vehicles not equipped with the optional PEKG system, the Sentry Key Immobilizer Module (SKIM) control circuitry integral to the Body Control Module (BCM) includes a Radio Frequency (RF) transceiver. In vehicles equipped with the optional PEKG system, a Sentry Key antenna is not used and the Radio Frequency Hub Module (RFHM) includes the SKIM control circuitry.

In vehicles without PEKG, the SKIM circuitry transmits RF signals to, and receives RF signals from the Sentry Key transponder through the tuned Sentry Key antenna enclosed within the molded plastic antenna housing. If this antenna is not mounted properly around the ignition lock cylinder housing, communication problems between the SKIM control circuitry and the transponder may arise. These communication problems will result in Sentry Key transponder-related faults.

When the status of the ignition switch is On, the SKIM control circuitry transmits an RF signal to the transponder in the ignition key. The SKIM then waits for an RF signal response from the transponder. If the response received identifies the key as valid, the SKIM control circuitry sends a valid key message to the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus. If the response received identifies the key as invalid, or if no response is received from the key transponder, the SKIM sends an electronic **invalid key** message to the PCM.

The PCM will enable or disable engine operation based upon the status of the SKIM messages. It is important to note that the default condition in the PCM is an invalid key; therefore, if no message is received from the SKIM by the PCM, the engine will be disabled and the vehicle immobilized after two seconds of running.

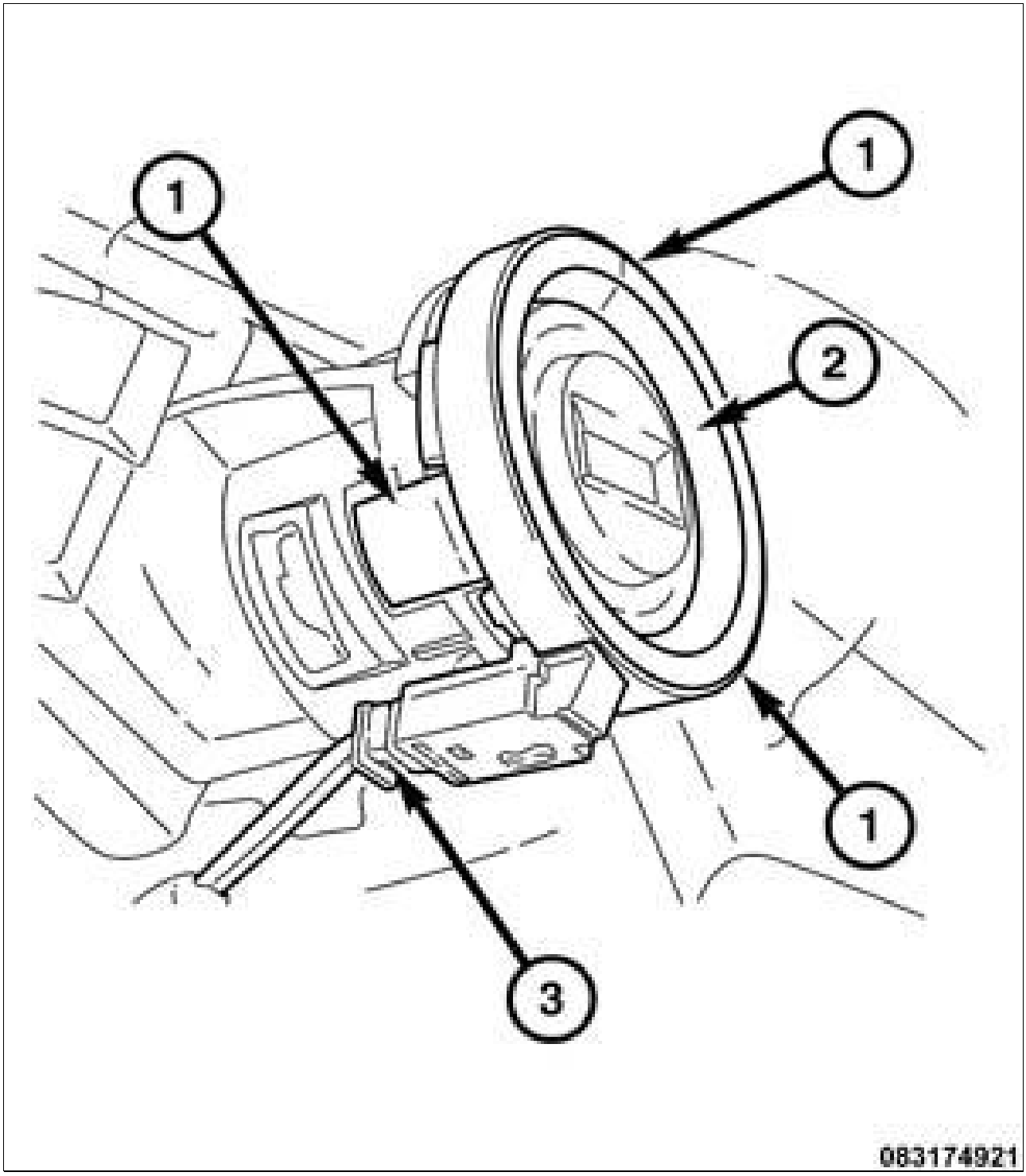
The SKIM performs a self-test each time the status of the ignition transitions to On, and will store fault information in the form of a Diagnostic Trouble Code (DTC) in BCM memory if a system malfunction is detected. The Sentry Key antenna can be diagnosed, and any stored DTC can be retrieved using a diagnostic scan tool. Refer to the appropriate Diagnostic & Testing article.

ANTENNA, SENTRY KEY > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

WARNING:

To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbags, airbag curtains, knee blocker, seat belt tensioner, impact sensor or instrument panel component diagnosis or service. Disconnect the IBS/negative battery cable assembly from the negative battery post, 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 SRS. Failure to take the proper precautions could result in accidental airbag deployment.

Fig 1: Retainers, Sentry Key Antenna & Steering Column Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable

2. Remove both the upper and lower shrouds from the steering column, but do not remove the steering column from the vehicle. Refer to SHROUD, STEERING COLUMN, REMOVAL AND INSTALLATION .

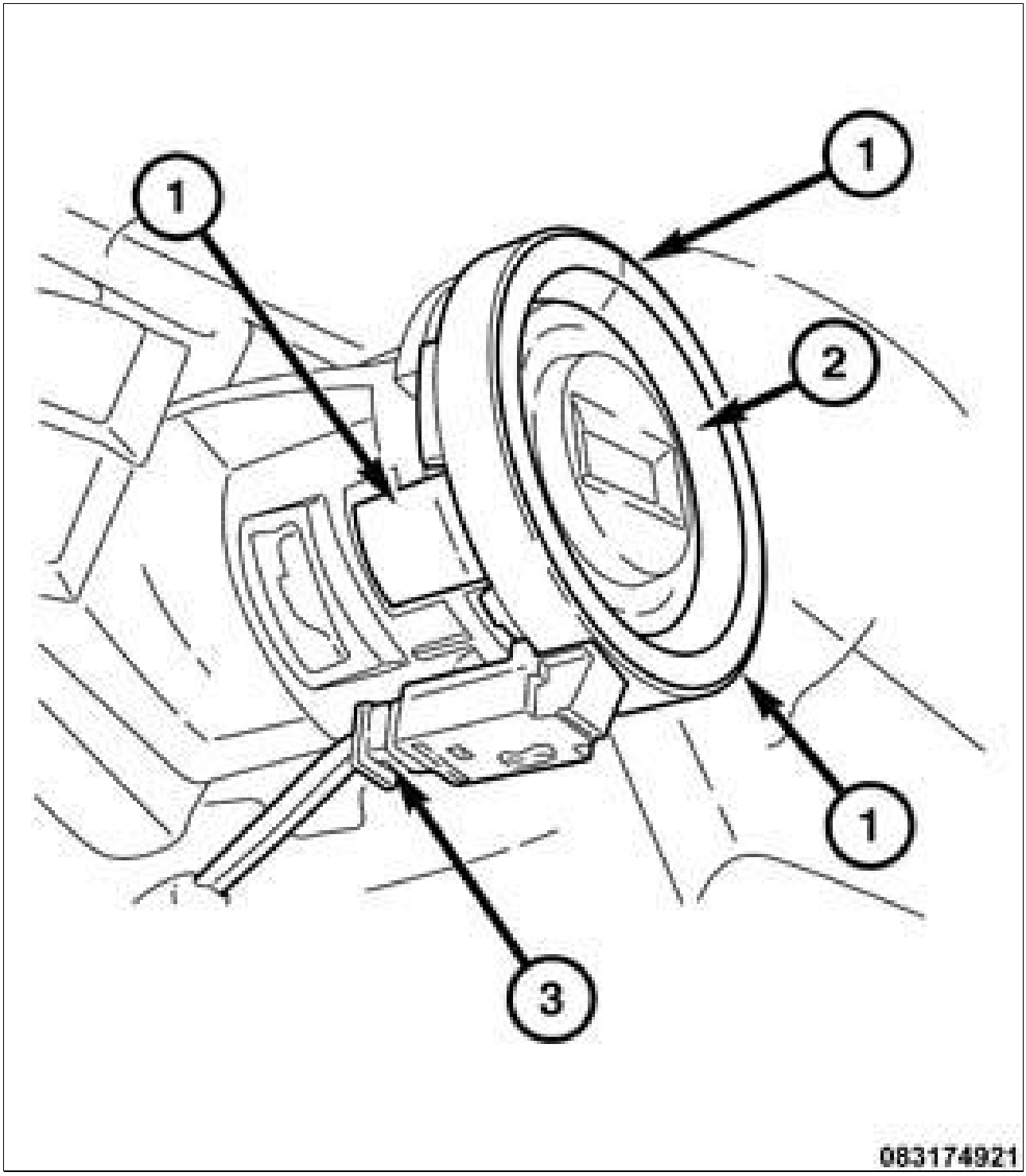
3. Disengage the three retainers (1) that secure the perimeter of the Sentry Key antenna (2) to the ignition lock cylinder housing.
4. Disconnect the steering column wire harness connector (3) from the antenna connector receptacle.
5. Remove the Sentry Key antenna from the ignition lock cylinder housing.

ANTENNA, SENTRY KEY > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION

WARNING:

To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbags, airbag curtains, knee blocker, seat belt tensioner, impact sensor or instrument panel component diagnosis or service. Disconnect the IBS/negative battery cable assembly from the negative battery post, 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 SRS. Failure to take the proper precautions could result in accidental airbag deployment.

Fig 1: Retainers, Sentry Key Antenna & Steering Column Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

1. Position the Sentry Key antenna (2) close enough to the ignition lock cylinder housing to access and connect the steering column wire harness connector (3) to the antenna connector receptacle.
2. Position the antenna over the end of the ignition lock cylinder and engage the three retainers (1) that secure the antenna to the lock cylinder housing.

3. Install the upper and lower shrouds onto the steering column. Refer to SHROUD, STEERING COLUMN, REMOVAL AND INSTALLATION .
4. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector.

KEY, TRANSPONDER > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

Fig 1: Remote Keyless Entry (RKE) & Passive Entry Keyless Go (PEKG) System Transponder Key

Courtesy of CHRYSLER GROUP, LLC

Two unique variations of a transponder key are available for this vehicle. They are:

- **Remote Keyless Entry System Transponder Key** - The Remote Keyless Entry (RKE) system transponder key (1) is used in combination with a rotary-type ignition switch. This transponder key is used for vehicles that are equipped with the RKE system, but not with the optional Passive Entry - Keyless Go (PEKG) system.

- **Passive Entry - Keyless Go System Transponder Key** - The PEKG system transponder key (2) is also known as a FOB with Integrated Key (FOBIK). However, unlike the RKE transponder key, the PEKG transponder key is used in combination with a Keyless Ignition Node (KIN) featuring a push button-type ignition switch. This transponder key is used only for vehicles that are equipped with the PEKG system.

Each transponder key used in the Sentry Key Immobilizer System (SKIS) has a transponder chip included on the circuit board beneath the cover of the integral RKE transmitter. In addition to having a blank key that must be cut to match the mechanical coding of the ignition and door lock cylinder (without PEKG) or only the door lock cylinder (with PEKG) and programmed for operation of the RKE system, each new Sentry Key has a unique transponder identification code that is permanently programmed into it by the manufacturer, and which must be programmed into the Sentry Key Immobilizer Module (SKIM) integral to the Body Control Module (BCM) (without PEKG) or the Radio Frequency Hub Module (RFHM) (with PEKG) to be recognized by the SKIS as a valid key.

The Sentry Key transponder cannot be adjusted or repaired. If ineffective or damaged, the entire key and RKE transmitter or FOBIK unit must be replaced.

KEY, TRANSPONDER > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

In vehicles not equipped with the optional Passive Entry - Keyless Go (PEKG) system, when the status of the ignition transitions to On, the Sentry Key Immobilizer Module (SKIM) integral to the Body Control Module (BCM) communicates through its antenna with the Sentry Key transponder using a Radio Frequency (RF) signal. The SKIM then listens for a RF response from the transponder through the same antenna. The Sentry Key transponder chip is within the range of the SKIM transceiver antenna ring when it is inserted into the ignition lock cylinder. The SKIM determines whether a valid key is present in the ignition lock cylinder based upon the response from the transponder.

In vehicles equipped with the optional PEKG system, when the status of the ignition (also known as the Keyless Ignition Node/KIN or the push button switch) transitions to On it provides a hard wired input to the BCM and an electronic message input to the Radio Frequency Hub Module (RFHM) over a dedicated Local Interface Network (LIN) data bus. The RFHM relies upon several Low Frequency (LF) antenna units to challenge the Sentry Key transponders using a LF signal, then monitors responses from the Sentry Key transponders received as Very High Frequency (VHF) signals. The RFHM determines whether a valid key is present based upon the response from the transponder.

If a valid key is detected, an electronic **valid key** message is broadcast by the BCM or the RFHM to the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus, and the PCM allows the engine to continue running. If the PCM receives an electronic **invalid key** message from the BCM or the RFHM, or receives no message from the SKIM or the RFHM over the CAN data bus, the engine will be disabled after about two seconds of operation. The Instrument Panel Cluster (IPC) will also respond to the electronic **invalid key** message on the CAN data bus by flashing the security indicator On and Off.

MODULE, SENTRY KEY IMMOBILIZER (SKIM) > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

The Body Control Module (BCM) is the central component of the immobilizer function. The Secret Key

Code is sorted in the following components: BCM, engine management module Powertrain Control Module (PCM), Electric Steering-column Lock (ESL) module, ignition keys and Radio Frequency Hub Module (RFHM).

The BCM or the RFHM cannot be adjusted or repaired. If ineffective or damaged the BCM or RFHM must be replaced. Refer to MODULE, BODY CONTROL, DESCRIPTION AND OPERATION or MODULE, RADIO FREQUENCY (RF HUB), DESCRIPTION AND OPERATION .

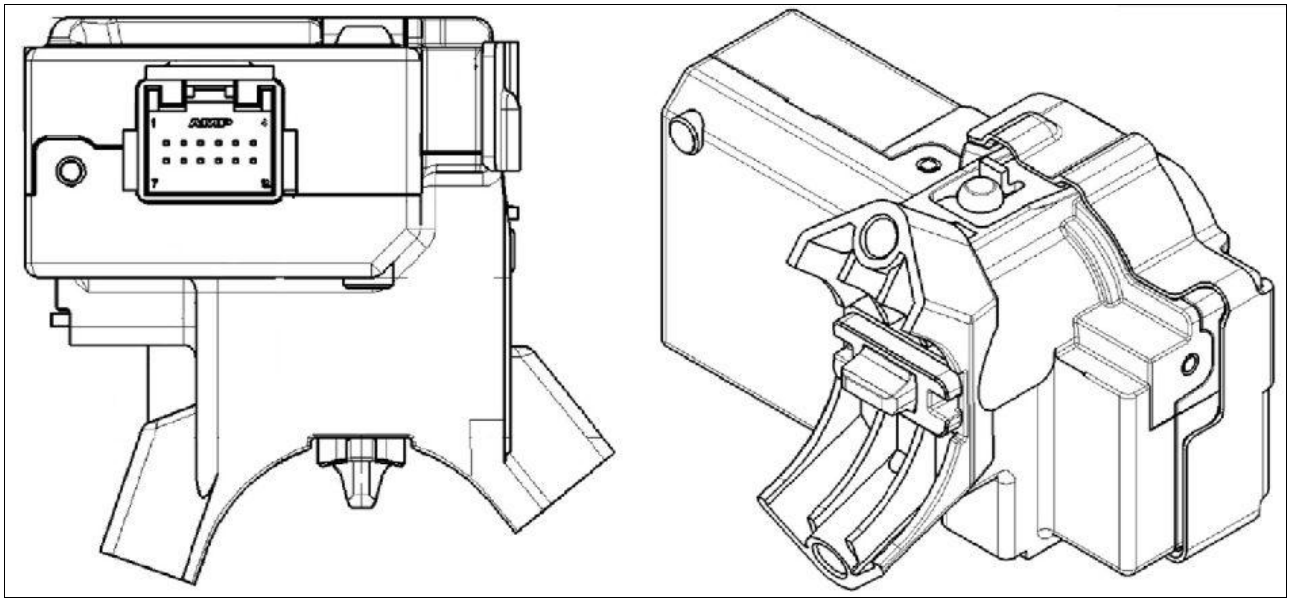
MODULE, SENTRY KEY IMMOBILIZER (SKIM) > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

If the car has keys with a mechanical groove, the key identifiers are stored in the Body Control Module (BCM). When the vehicle user turns the ignition switch to "ON", the relay that distributes the ignition-operated supplies is activated and the instrument panel switches on. At this point the secret code request (IMMO CODE REQUEST) leaves the Powertrain Control Module (PCM) for the BCM. This energizes the key transponder through the antenna in the ignition switch and reads the key ID information and the secret code. If the key is recognized as "valid", the BCM responds to the PCM's request (IMMO CODE RESPONSE), thus initiating the encrypted (mini-crypt) dialogue with the PCM. At the end of the dialogue between BCM and PCM, if the outcome is positive, the PCM will allow the engine to be started. If the outcome is negative, the PCM will not enable engine starting. In this case, the BCM will send a request to the Instrument Panel Cluster (IPC) to switch on the Code Immobilizer warning light.

If the vehicle has FOB with Integrated Key (FOBIK) keys, the key identifiers are stored in the Radio Frequency Hub Module (RFHM). When the vehicle user presses the Keyless Ignition Node (KIN) and Start/Stop module, this sends the RFHM (via the Local Interface Network (LIN) data bus and the analogue "redundant run" signal) the information that the button has been pressed. At this point, the RFHM advises the BCM that the button has been pressed. The BCM, in turn, will send a request to the RFHM to read and identify the FOBIK identifier. If the RFHM recognizes the FOBIK (inside the car) as a "valid FOBIK", it sends this information to the BCM, which in turn sends a request to the Electric Steering-column Lock (ESL) module to release the steering column. After release, the ESL will send confirmation to the BCM, which will activate the relay that distributes the +15 supplies (the panel switches on). With the +15, the encrypted (mini-crypt) dialogue between BCM and PCM is triggered: the PCM sends a secret code request (IMMO CODE REQUEST) to the +15 for the BCM, which will respond to the request (IMMO CODE RESPONSE). If the outcome of the dialogue is positive, the PCM will permit the engine to be started. If the outcome is negative, the PCM will not enable engine starting. In this case, the BCM will send a request to the IPC to switch on the Code Immobilizer warning light.

MODULE, SHAFT LOCK > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

Fig 1: Electric Steering Lock (ESL)



Courtesy of CHRYSLER GROUP, LLC

Vehicles manufactured for Europe-Middle East-Africa (EMEA) markets only have an electromechanical device called an Electric Steering Lock (ESL) that locks (key OFF) and unlocks (key ON) the steering upon request by the Body Control Module (BCM). The steering lock module is located on the steering column in the same position where the ignition switch would be found. The electric steering lock is only present on cars with Fobik-type key and the KIN module (Start/Stop button). Cars with a key with groove have the classic mechanical steering lock.

The ESL module transmits data and communicates with the other modules involved in the immobilizer system via CAN-C2.

In normal operating conditions the ESL module unlocks the steering column if, and only if, the key in the vehicle is identified by the immobilizer system as a "valid key".

MODULE, SHAFT LOCK > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

NOTE:

The Radio Frequency Hub Module (RFHM) and the Electric Steering Lock (ESL) module are no longer linked electronically. During servicing, one can be replaced independently of the other.

Steering column locking

Before sending the steering locking request to the ESL module, the Body Control Module (BCM) checks the following parameters:

- Ignition status: the transition from "ON" or "ON" with engine running statuses to the "OFF" status

must be detected.

- Driver side door status: the transition from "driver side door closed" status to "driver side door open" status must be detected.
- For versions with automatic transmission only. Automatic transmission status: the transmission must be in Park ("P") status.

If one of the three conditions is not satisfied, the BCM will not send the steering column locking request to the ESL module.

Obviously, if the vehicle has a manual gearbox, the BCM will only check the first two parameters (ignition status and driver side door status). If they are satisfied, the ESL module will lock the steering column when the vehicle speed is below a minimum threshold.

The electric steering lock detects the vehicle speed through a VSO signal from the Antilock Brake System (ABS) module. The acquisition of the VSO signal continues even after the ignition switch is turned to "OFF".

Steering column unlocking

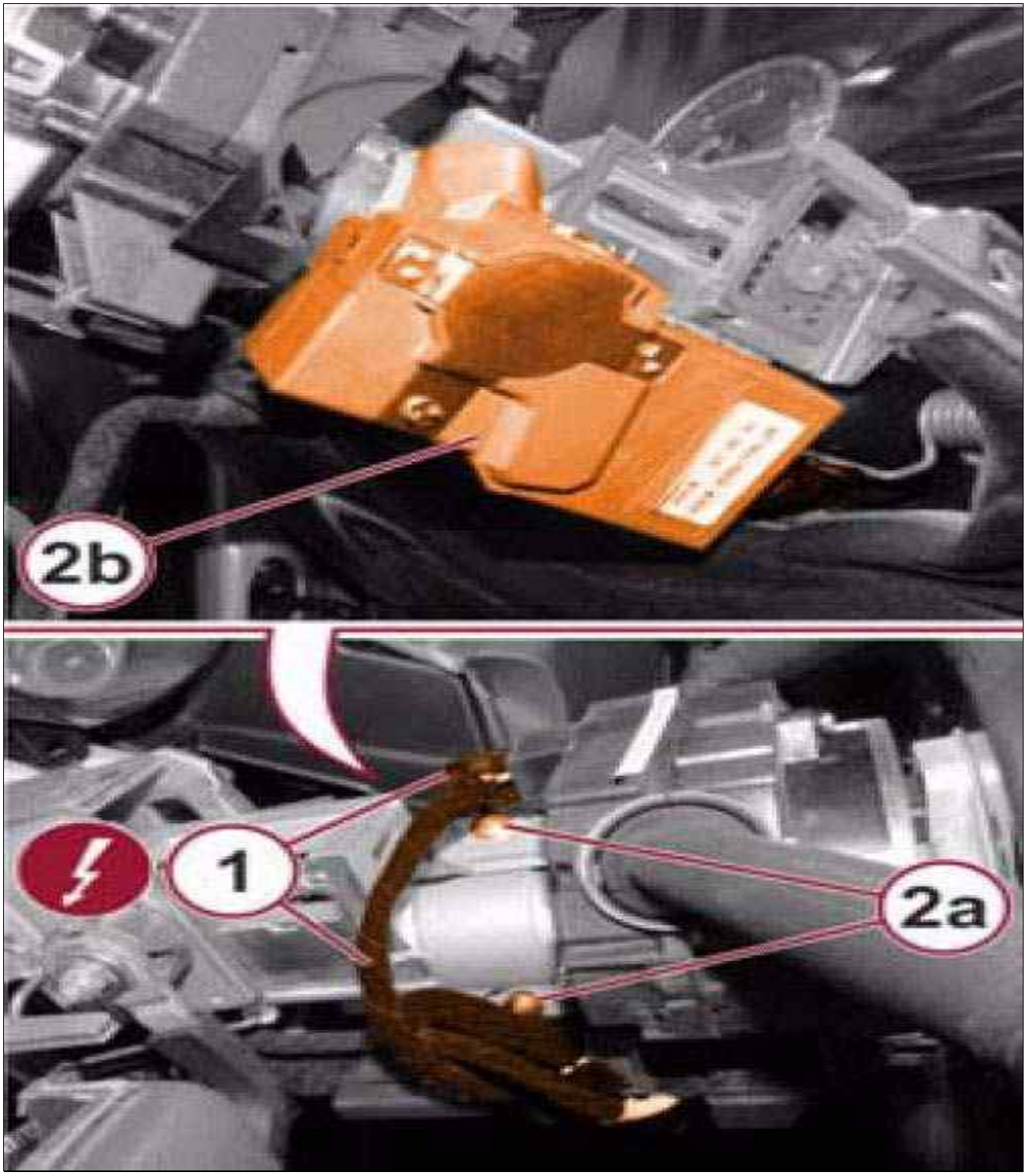
When the BCM receives the information that the "Stop & Start" button has been pressed from the RFHM, it requests that the RFH carries out key recognition. If the key is identified as a "valid key", the BCM will send a steering column unlocking request to the ESL module. If instead the key is identified as an "invalid key" or "missing key", the BCM will not send any steering column unlocking request.

MODULE, SHAFT LOCK > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

WARNING:

To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbags, airbag curtains, knee blocker, seat belt tensioner, impact sensor or instrument panel component diagnosis or service. Disconnect the IBS/negative battery cable assembly from the negative battery post, 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 SRS. Failure to take the proper precautions could result in accidental airbag deployment.

Fig 1: Electric Steering Lock (ESL) Module, Tamper-Resistant Screws & Wire Connector



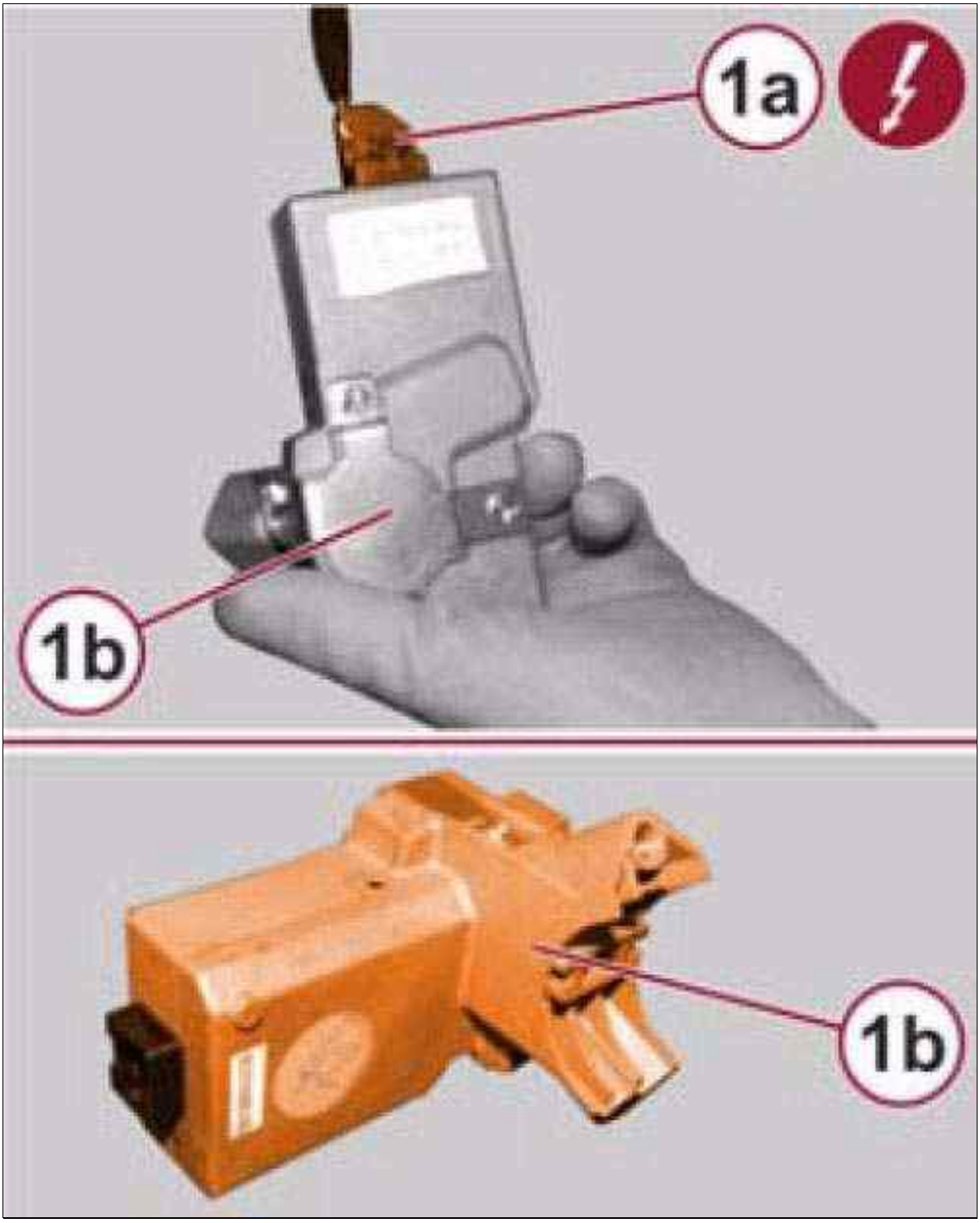
Courtesy of CHRYSLER GROUP, LLC

1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.

2. Remove the instrument cluster bezel. Refer to BEZEL, INSTRUMENT CLUSTER, REMOVAL AND INSTALLATION .

3. Remove the steering column upper and lower shrouds. Refer to SHROUD, STEERING COLUMN, REMOVAL AND INSTALLATION .
4. Disconnect the steering column multifunction switch wire harness connector (1) and move the wiring aside.
5. Use a hammer and chisel to remove the tamper-resistant screws (2a) and extract the Electronic Steering Lock (ESL) module (2b) from its housing.

Fig 2: Electronic Steering Lock (ESL) Module & Wire Connector



Courtesy of CHRYSLER GROUP, LLC

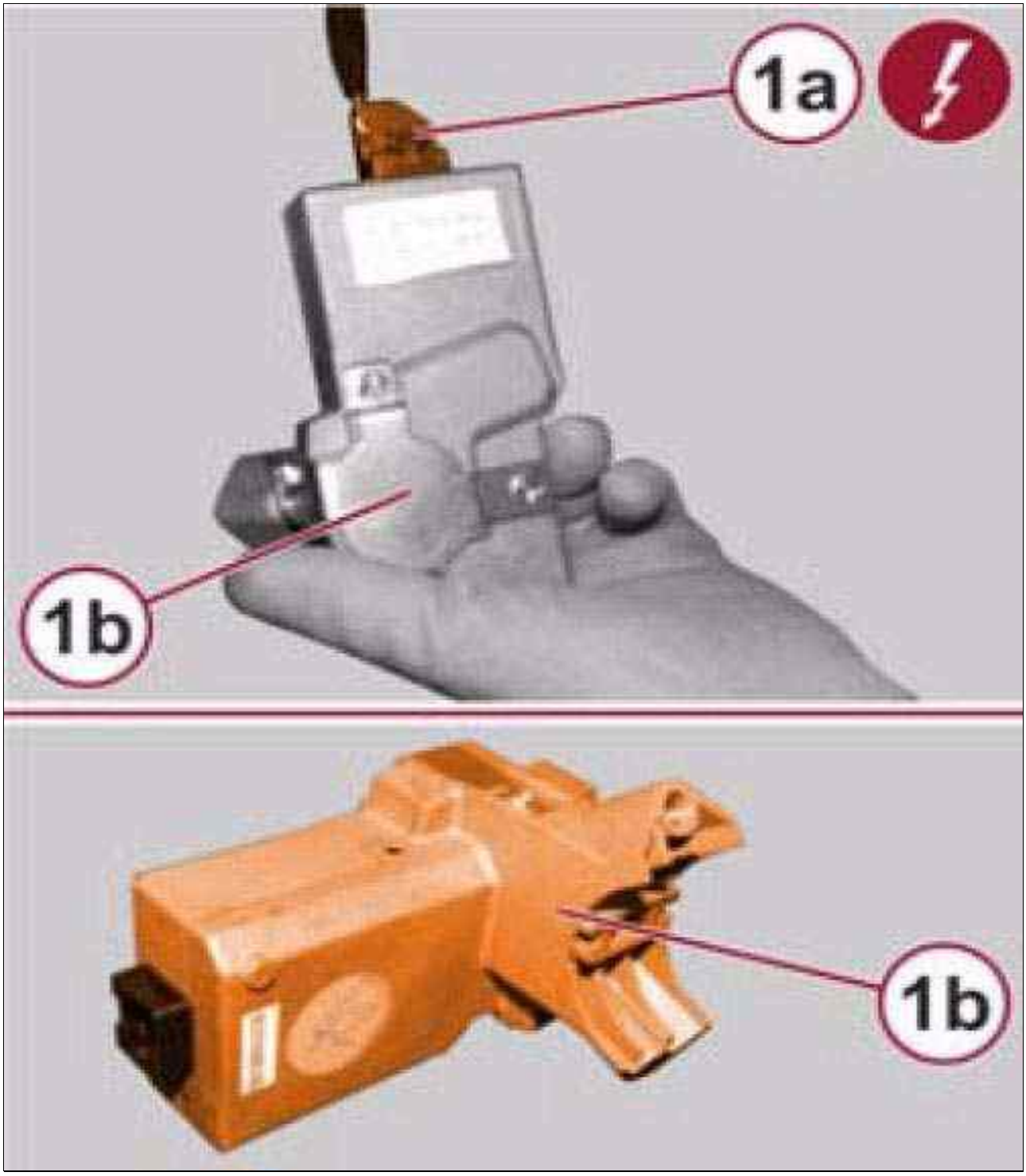
6. Disconnect the steering column wire harness connector (1a) and remove the ESL module (1b) from the vehicle.

MODULE, SHAFT LOCK > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION

WARNING:

To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbags, airbag curtains, knee blocker, seat belt tensioner, impact sensor or instrument panel component diagnosis or service. Disconnect the IBS/negative battery cable assembly from the negative battery post, 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 SRS. Failure to take the proper precautions could result in accidental airbag deployment.

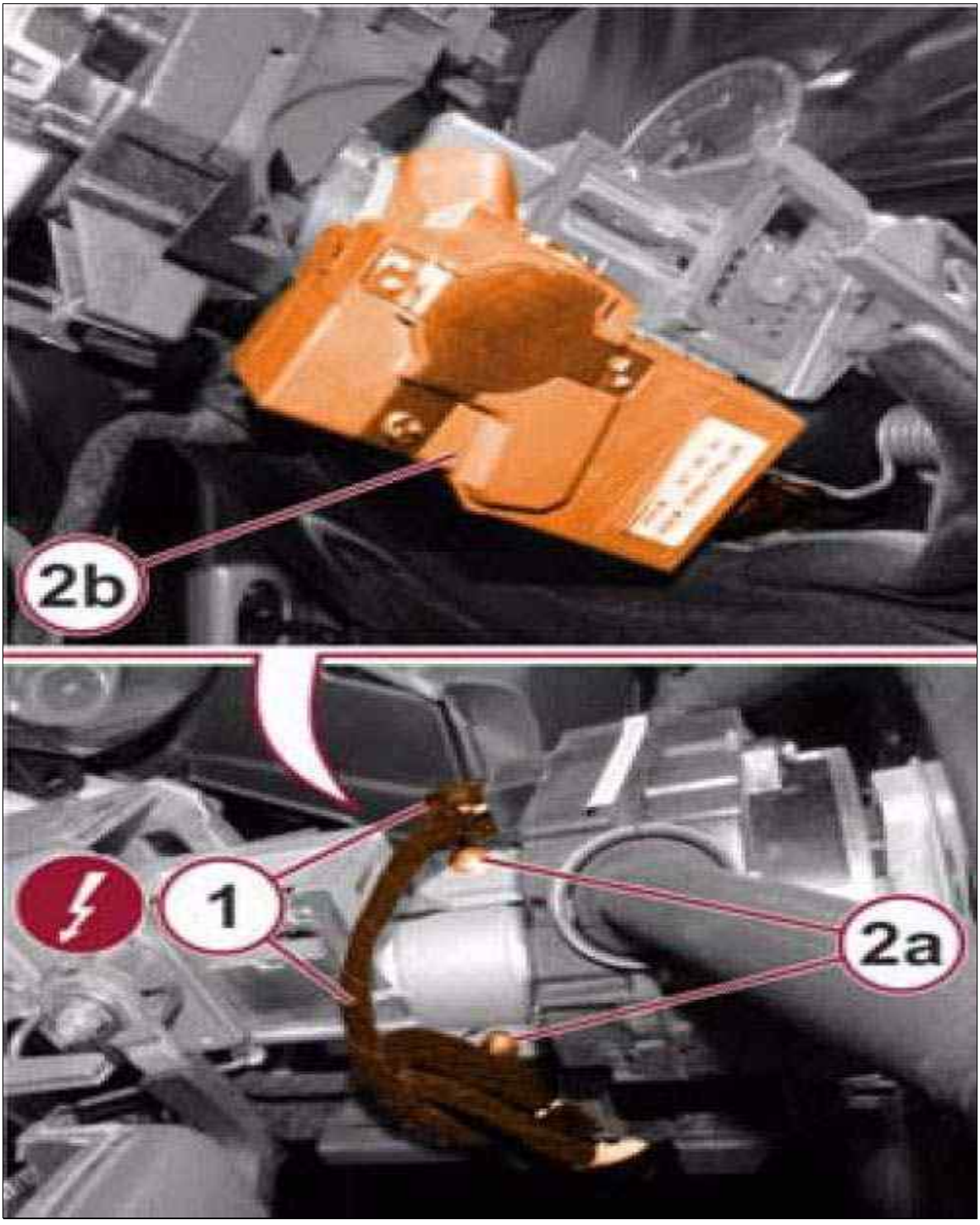
Fig 1: Electronic Steering Lock (ESL) Module & Wire Connector



Courtesy of CHRYSLER GROUP, LLC

1. Connect the steering column wire harness connector (1a) to the Electronic Steering Lock (ESL) module (1b).

Fig 2: Electric Steering Lock (ESL) Module, Tamper-Resistant Screws & Wire Connector



Courtesy of CHRYSLER GROUP, LLC

2. Position the ESL module to the steering column and install new tamper-resistant screws (2a). Tighten the screws until the heads break off.
3. Connect the steering column multifunction switch wire harness connector (1) to the multifunction switch.
4. Install the steering column upper and lower shrouds. Refer to SHROUD, STEERING COLUMN,

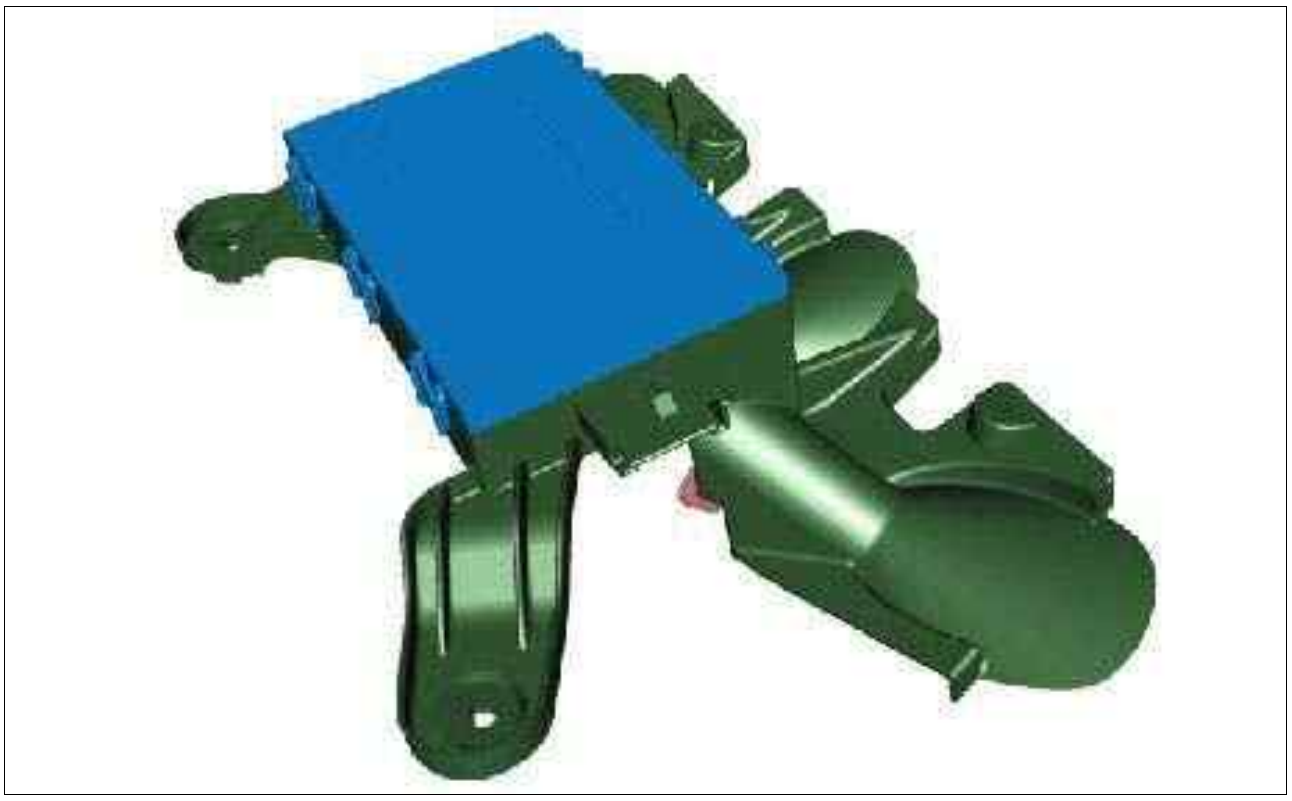
REMOVAL AND INSTALLATION .

5. Install the instrument cluster bezel. Refer to BEZEL, INSTRUMENT CLUSTER, REMOVAL AND INSTALLATION .
6. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector.

> *NOTE:*
>
> *If the electronic steering lock module is replaced, connect the diagnosis scan tool to the vehicle DLC, go to "BCM" in the "Miscellaneous functions" menu and start the "Secret key transfer to the ECM/ESL" procedure.*

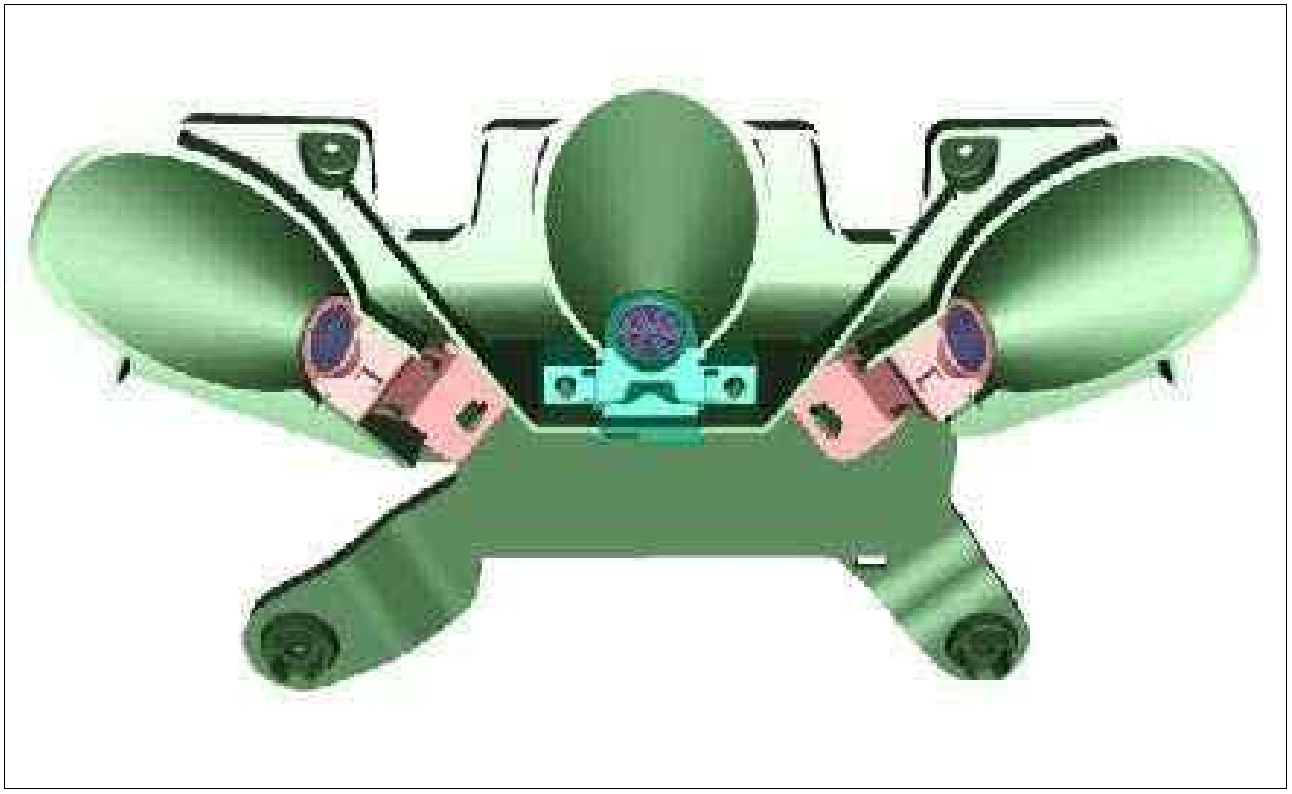
MODULE, ULTRASONIC AND ANTI-TILT > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

Fig 1: Ultrasonic Anti-Tilt Module (UAM) (1 of 2)



Courtesy of CHRYSLER GROUP, LLC

Fig 2: Ultrasonic Anti-Tilt Module (UAM) (2 of 2)



Courtesy of CHRYSLER GROUP, LLC

An ultrasonic and anti-tilt security system uses ultrasonic waves to detect motion in the cab when the vehicle is locked by remote control.

Should the vehicle be tilted to remove a wheel or towed, the vehicle's alarm will sound.

The alarm activates in the following cases:

- When an attempt is made to force open a door, the hood or the liftgate (perimeter protection)
- When the ignition system is activated outside of the security system on the vehicle
- Cutting of battery cables

The module for the system is supplied power by the battery. The module and sensors are located inside the roof light cover.

The UAM and the two ultrasonic transducers cannot be adjusted or repaired. If ineffective or damaged, the entire roof lamp unit must be replaced.

MODULE, ULTRASONIC AND ANTI-TILT > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

The Ultrasonic Anti-tilt Module (UAM) communicates with the Body Control Module (BCM) via the Local Interface Network (LIN) serial data bus.

The BCM controls the activation of the anti-lift system and ultrasonic sensors and provides the

configuration and calibration parameters that are used by the sensors for correct operation. In the other direction, the UAM sends the BCM information on its status.

Fig 1: Anti-Lift Button

Courtesy of CHRYSLER GROUP, LLC

Disabling anti-lift and volumetric sensors

With the vehicle stationary and key off, the user can press the dedicated button to manually disable the volumetric and anti-lift function.

When the UAM detects a press of the dedicated button, it informs the BCM via the LIN data bus and provides the user with a visual indication through the LED on the button.

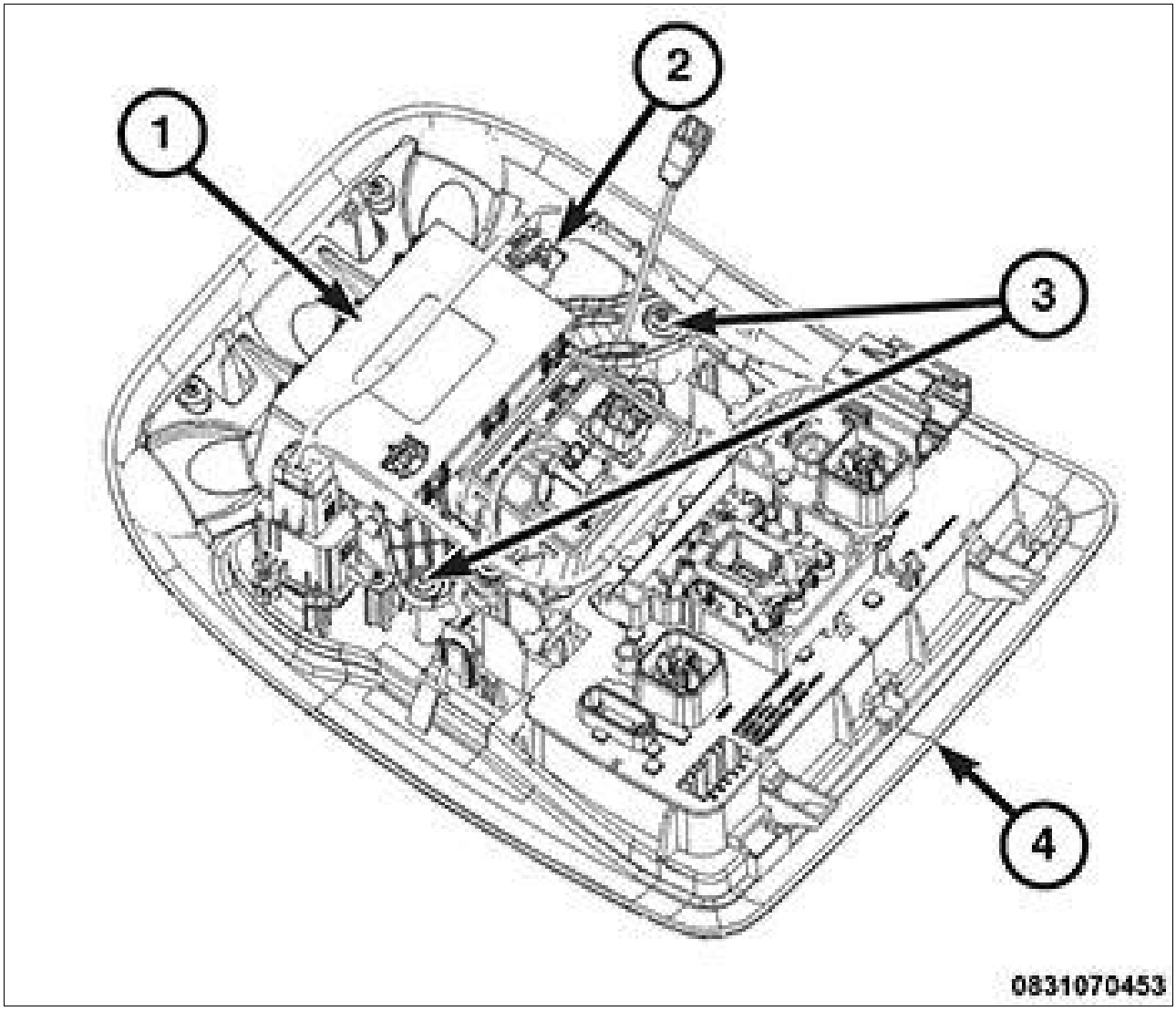
MODULE, ULTRASONIC AND ANTI-TILT > DIAGNOSIS AND TESTING > DIAGNOSIS AND TESTING - ULTRASONIC AND ANTI-TILT MODULE

The hard wired circuits between the Ultrasonic and Anti-tilt Module (UAM) (also known as the Ultrasonic Alarm Module/UAM or the Intrusion Transceiver Module/ITM) and the Body Control Module (BCM) may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate SYSTEM WIRING DIAGRAMS article. 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 UAM or the electronic controls and communication between other modules and devices that provide some features of the Vehicle Theft Alarm (VTA) system. The most reliable, efficient and accurate means to diagnose the UAM or the electronic controls and communication related to VTA system operation requires the use of a diagnostic scan tool. Refer to the appropriate Diagnostic & Testing article.

MODULE, ULTRASONIC AND ANTI-TILT > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

Fig 1: Ultrasonic Anti-Tilt Module (UAM), Wire Connector, Roof Lamp Unit & Screws

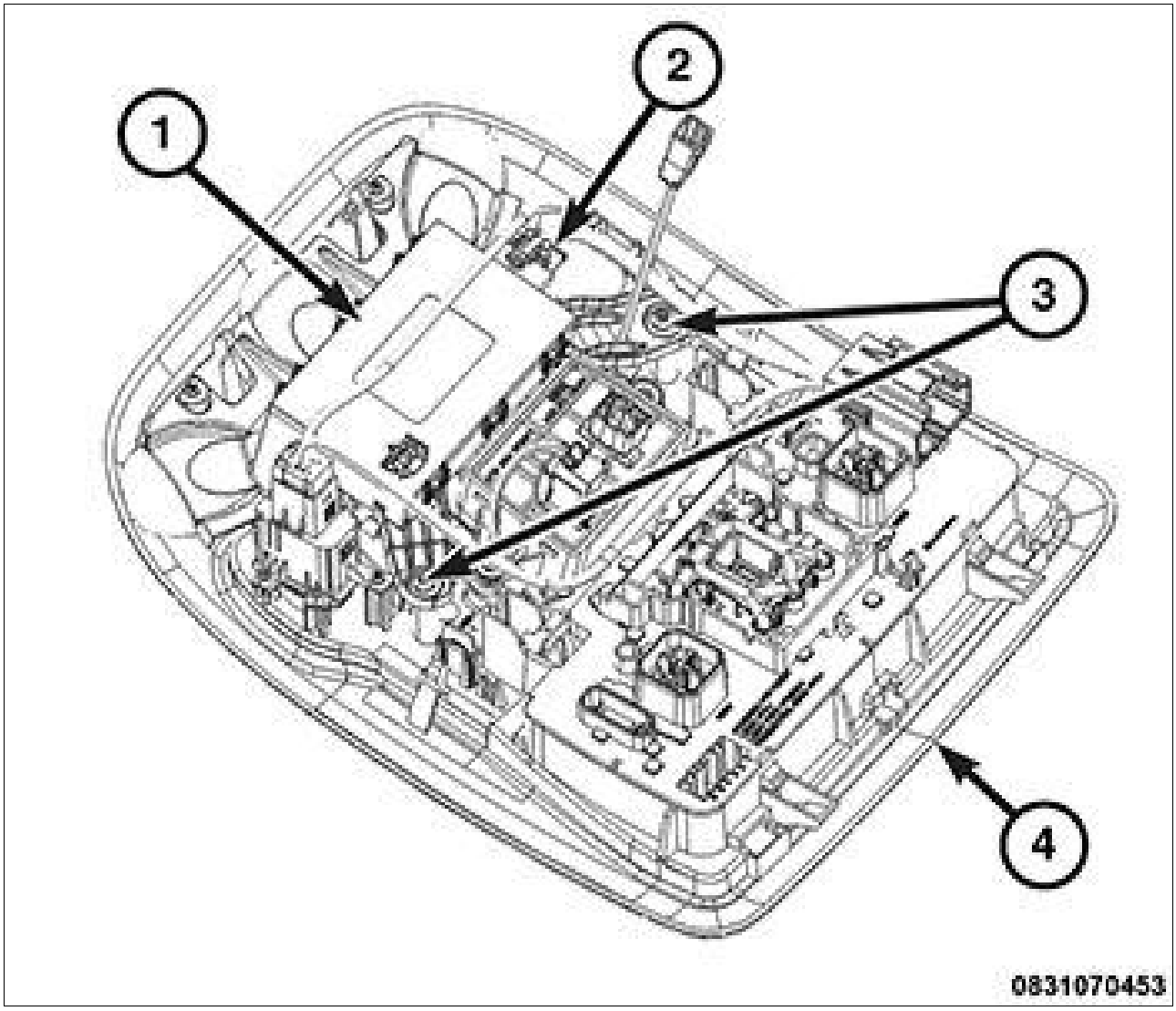


Courtesy of CHRYSLER GROUP, LLC

1. Disconnect and isolate the negative cable from the battery. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector before disconnecting the negative cable from the battery.
2. Remove the roof lamp unit (4) from the headliner. Refer to CONSOLE, OVERHEAD, FRONT, REMOVAL AND INSTALLATION .
3. Disconnect the roof lamp unit wire harness connector (2) from the Ultrasonic and Anti-tilt Module (UAM) (1) (also known as the Ultrasonic Alarm Module/UAM or the Intrusion Transceiver Module/ITM).
4. Remove the two screws (3) that secure the mounting tabs of the UAM to the roof lamp unit housing.
5. Disengage and remove the UAM from the roof lamp unit housing.

MODULE, ULTRASONIC AND ANTI-TILT > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION

Fig 1: Ultrasonic Anti-Tilt Module (UAM), Wire Connector, Roof Lamp Unit & Screws

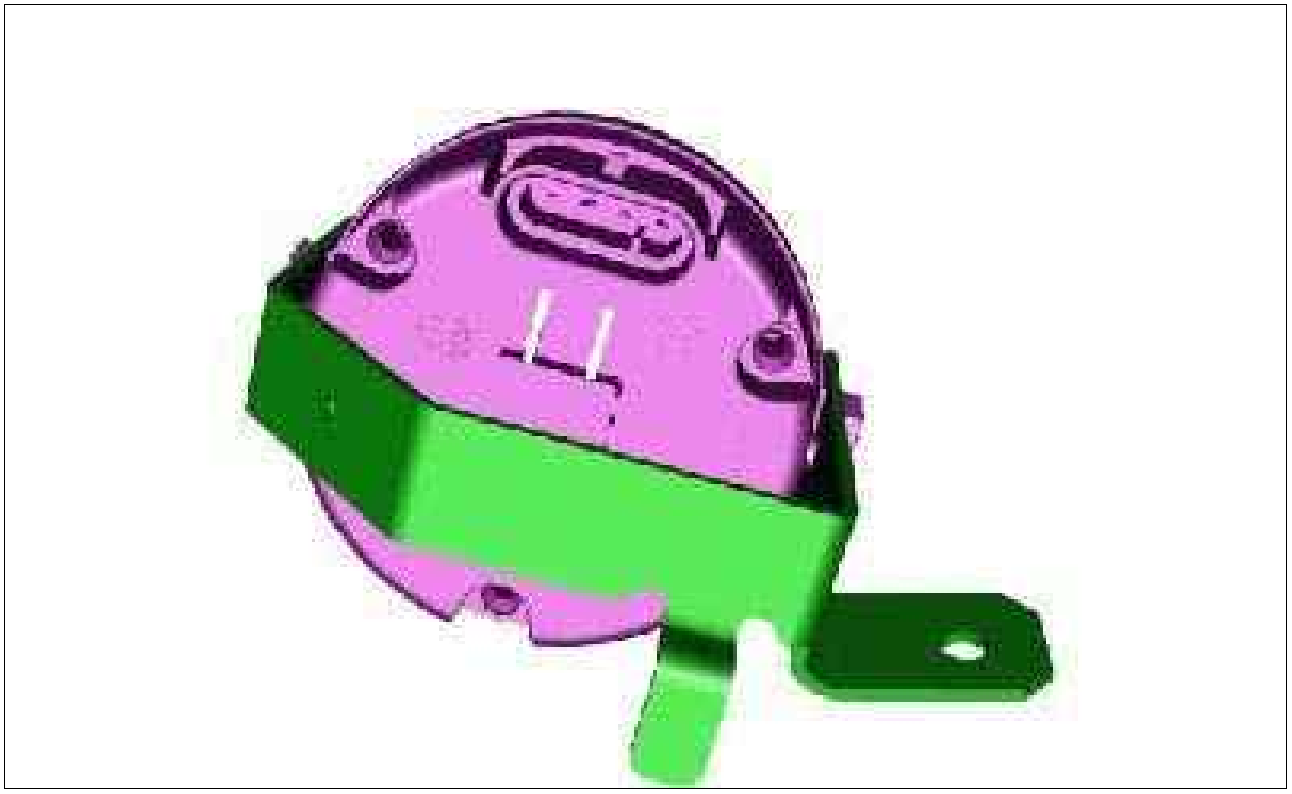


Courtesy of CHRYSLER GROUP, LLC

1. Position the Ultrasonic and Anti-tilt Module (UAM) (1) (also known as the Ultrasonic Alarm Module/UAM or the Intrusion Transceiver Module/ITM) to the roof lamp unit housing (4).
2. Install and tighten the two screws (3) that secure the mounting tabs of the UAM to the roof lamp unit housing.
3. Connect the roof lamp unit wire harness connector (2) to the UAM.
4. Install the roof lamp unit to the headliner. Refer to CONSOLE, OVERHEAD, FRONT, REMOVAL AND INSTALLATION .
5. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector.

SIREN > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

Fig 1: Alarm Siren Unit (ASU) (1 of 2)



Courtesy of CHRYSLER GROUP, LLC

Fig 2: Alarm Siren Unit (ASU) (2 of 2)

Courtesy of CHRYSLER GROUP, LLC

The Alarm Siren Unit (ASU) module communicates with the Body Control Module BCM via the Local INterface Network (LIN) serial data bus.

The BCM controls the activation of the siren and supplies the configuration of the parameters that are used by the ASU to operate correctly (e.g. sound levels, number of alarm cycles per execution, etc.).

In the other direction, the ASU sends the BCM the information on its status.

The LIN data bus is also used to send and receive the messages regarding the "Heart Beat" function, which monitors the integrity of the connections between the BCM and the siren module.

The alarm siren module cannot be repaired or adjusted and, if ineffective or damaged, it must be replaced.

SIREN > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

The microcontroller within the alarm siren module provides the siren unit features and functions based upon internal programming and electronic **arm** and **disarm** messages received from the Body Control Module (BCM) over a Local Interface Network (LIN) data bus connection. The BCM monitors inputs from the Ultrasonic and Anti-tilt Module (UAM) (also known as the Ultrasonic Alarm Module/UAM or the Intrusion Transceiver Module/ITM) to control the output to the alarm siren module. The siren module receives battery voltage on a fused B(+) circuit through a fuse in the BCM and receives a path to ground through a ground circuit in the headlamp and dash wire harness. These connections allow the siren to remain operational, regardless of the status of the ignition.

When the premium version of the Vehicle Theft Alarm (VTA) is armed, the siren module continuously monitors electronic message inputs from the BCM to sound its internal siren. While armed, the siren also enters its auto-detect mode. While in the auto-detect mode, if the siren module detects that its power supply or communication circuits are being tampered with or have been sabotaged, it will sound an audible alarm and continue to operate through an on-board backup battery. If the siren module is in its disarmed mode when its power supply or communication circuits are interrupted, the siren will not sound.

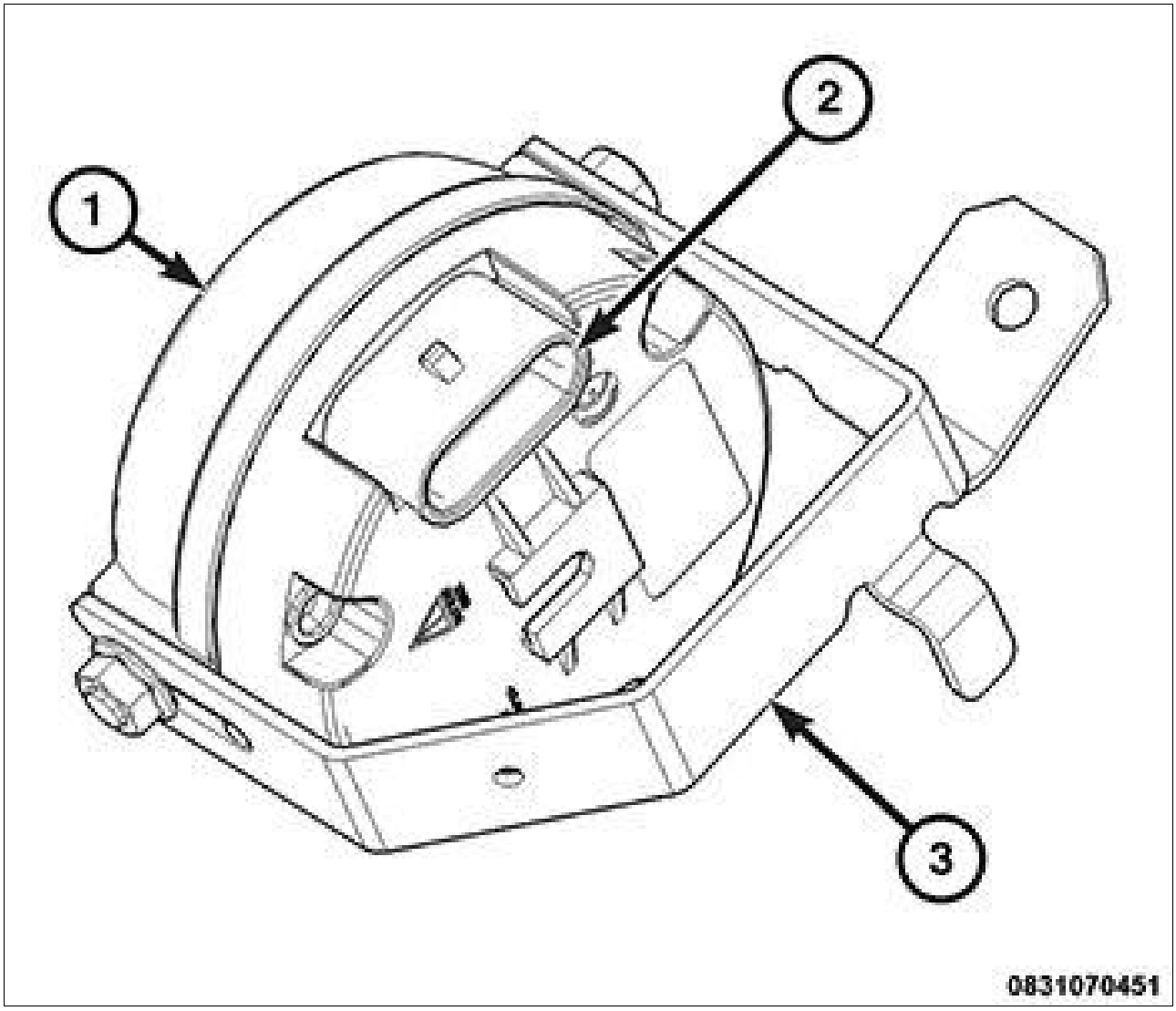
The alarm siren module will also notify the BCM when the backup battery requires charging, and the BCM will send electronic messages that will allow the backup battery to be recharged through the battery voltage and ground circuits to the alarm siren module only while the status of the ignition is On and the engine is running. This prevents the potential discharge of the main battery while the vehicle is not being operated.

The alarm siren module will self-detect problems with its internal and external power supply and communication circuits, then send electronic messages indicating the problem to the BCM upon receiving an **arm** or **disarm** request message. The BCM will store a Diagnostic Trouble Code (DTC) for any detected alarm siren module fault. The DTC can then be retrieved with a diagnostic scan tool through the 16-way Data Link Connector (DLC) located under the driver side lower edge of the instrument panel over the Controller Area Network (CAN) data bus.

The hard wired inputs and outputs for the alarm siren module may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate SYSTEM WIRING DIAGRAMS article. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the alarm siren module or the electronic controls and communication between other modules and devices that provide some features of the VTA system. The most reliable, efficient and accurate means to diagnose the alarm siren module or the electronic controls and communication related to alarm siren module operation requires the use of a diagnostic scan tool. Refer to the appropriate Diagnostic & Testing article.

SIREN > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

Fig 1: Alarm Siren Module, Connector Receptacle & Mounting Bracket

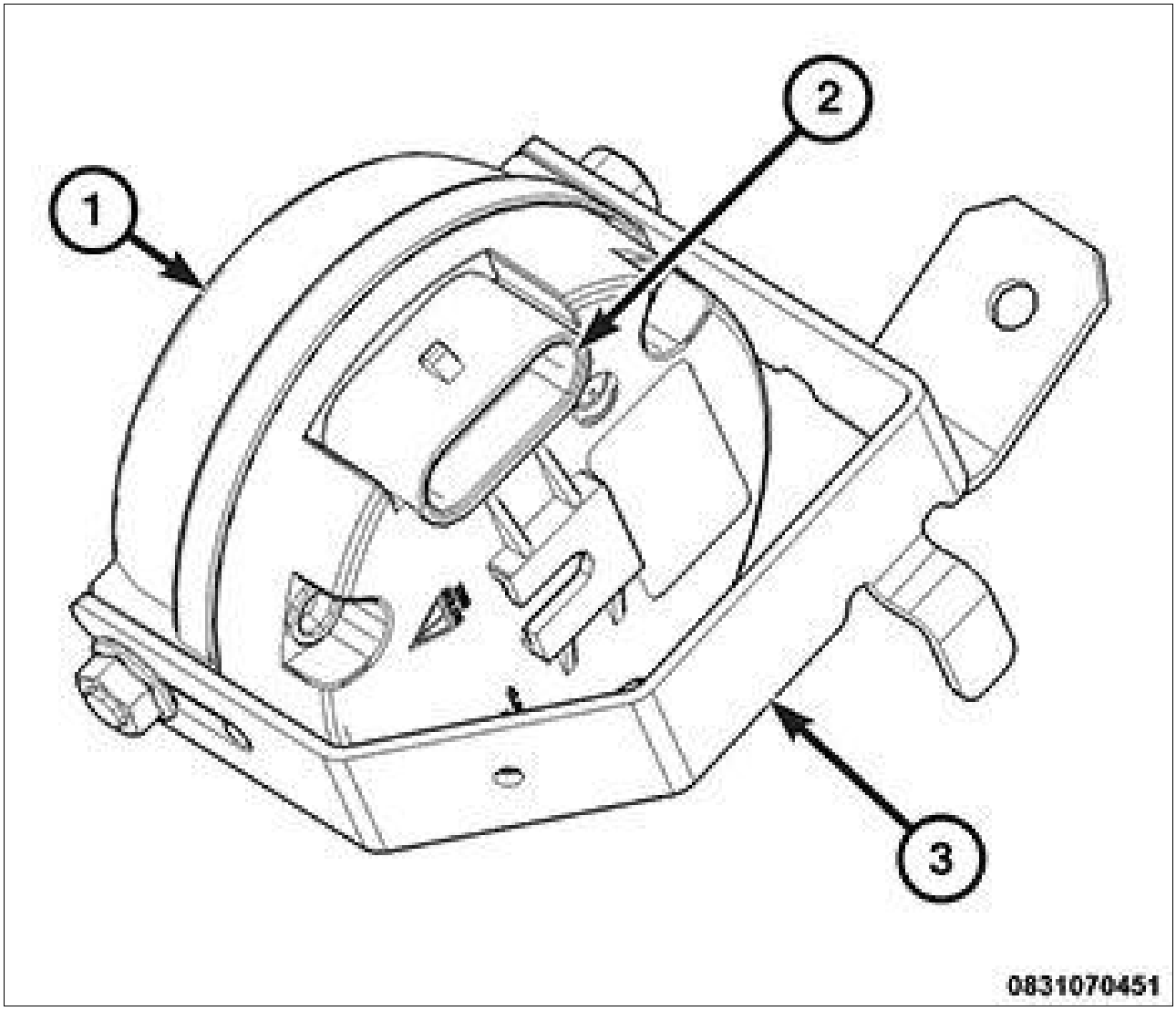


Courtesy of CHRYSLER GROUP, LLC

1. Disconnect and isolate the negative cable from the battery. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector before disconnecting the negative cable from the battery.
2. Locate the alarm siren module (1) on the engine compartment side of the dash panel, below the driver side windshield.
3. Disconnect the headlamp and dash wire harness connector from the connector receptacle (2) for the siren.
4. Remove the fastener that secures the siren mounting bracket (3) to the dash panel.
5. Remove the siren and mounting bracket from the engine compartment as a unit.

SIREN > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION

Fig 1: Alarm Siren Module, Connector Receptacle & Mounting Bracket



Courtesy of CHRYSLER GROUP, LLC

NOTE:

If the alarm siren module has been replaced with a new unit, a diagnostic scan tool MUST be used to initialize and configure the new unit in the Body Control Module (BCM) before the Vehicle Theft Security System (VTSS) can operate as designed. Follow the programming steps outlined in the diagnostic scan tool for ***INITIALIZE SIREN*** *under* ***MISCELLANEOUS FUNCTIONS*** *for the* ***BODY CONTROL MODULE/BCM*** *menu item as appropriate.*

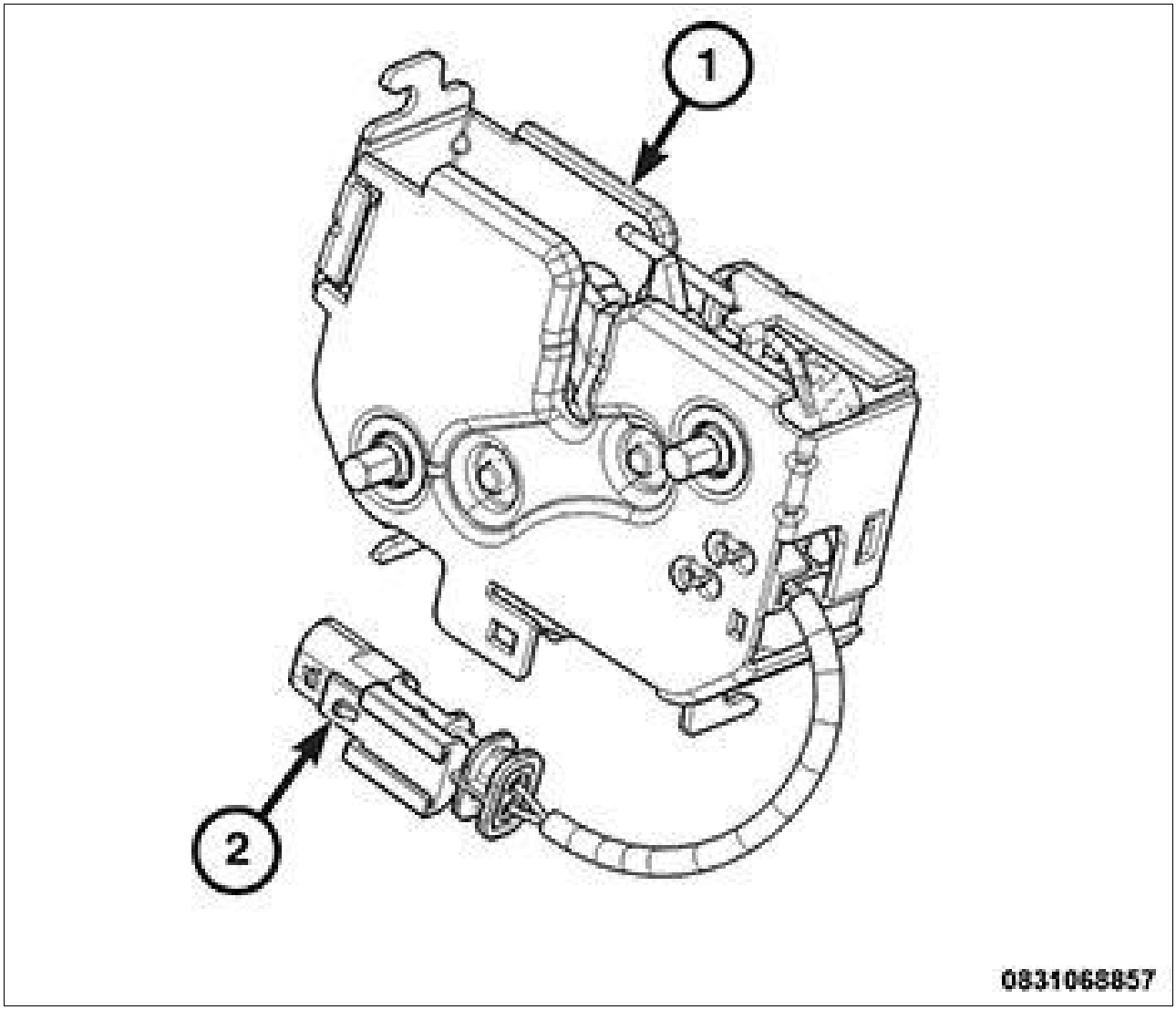
1. Position the alarm siren module (1) and mounting bracket (3) as a unit to the engine compartment side of the dash panel, below the driver side windshield.
2. Install and tighten the fastener that secures the mounting bracket to the dash panel. Tighten the fastener securely.
3. Connect the headlamp and dash wire harness connector to the connector receptacle (2) of the

siren.

4. Connect the negative cable to the battery. If equipped with an Intelligent Battery Sensor (IBS), reconnect the IBS connector.

SWITCH, HOOD AJAR > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

Fig 1: Left Hood Latch Mechanism & Wire Connector



Courtesy of CHRYSLER GROUP, LLC

The hood ajar switch is a normally closed, single pole, spring-loaded plunger, leaf actuated switch that is integral to the left hood latch mechanism (1) located on the left front fender load beam near the fender ledge in the engine compartment. In vehicles manufactured for Europe-Middle East-Africa (EMEA) markets the hood ajar switch is a feature of the Vehicle Theft Alarm (VTA) system. The hood ajar switch in vehicles manufactured for North America Free Trade Agreement (NAFTA) markets is a feature of the optional Remote Start System and not of the Vehicle Theft Alarm (VTA) system.

The molded plastic switch body has an integral pigtail wire harness and connector (2) on one end

containing two terminal pins. The switch is connected to the vehicle electrical system through a dedicated take out and connector of the headlamp and dash wire harness.

The hood ajar switch can not be adjusted or repaired. If damaged or ineffective, the entire left hood latch and hood ajar switch unit must be replaced.

SWITCH, HOOD AJAR > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

The hood ajar switch is actuated by the hood latch mechanism and the hood latch striker. When the hood is closed and properly latched, the hood ajar switch is an open circuit. When the hood is open or only partially latched, the hood ajar switch is a closed circuit. The hood ajar switch is hard wired in series between ground and a signal circuit of the Body Control Module (BCM).

The BCM reads the hard wired hood ajar switch input through an internal pull-up resistor, then uses this input to control other electronic functions and features of the vehicle. The BCM may also send electronic **hood ajar switch status** messages to other electronic modules in the vehicle over the Controller Area Network (CAN) data bus.

The hood ajar 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 SYSTEM WIRING DIAGRAMS article.

SWITCH, HOOD AJAR > DIAGNOSIS AND TESTING > DIAGNOSIS AND TESTING - HOOD AJAR SWITCH

1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable
2. Disconnect the pigtail wire harness connector for the hood ajar switch at the left hood latch.
3. Check for continuity between the two terminals of the hood ajar switch pigtail connector. There should be continuity with the hood latch open, and no continuity with the hood latch closed. If not OK, replace the left hood latch with the ineffective hood ajar switch. If OK, go to Step 4.
4. Test the ground circuit between ground and the hood ajar switch for continuity. If not OK, repair the open ground circuit as required. If OK, go to Step 5.
5. Test the circuit between the hood ajar switch and the Body Control Module (BCM) for continuity to ground. There should be no continuity. If not OK, repair the shorted circuit as required. If OK, go to Step 6.
6. Test the circuit between the hood ajar switch and the BCM for continuity. There should be continuity. If not OK, repair the open circuit as required. If OK, go to Step 7.
7. Use a diagnostic scan tool and the appropriate diagnostic procedure to complete testing of the BCM.

SWITCH, HOOD AJAR > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

The hood ajar switch used in this vehicle is integral to the left hood latch mechanism. Refer to LATCH, HOOD, REMOVAL AND INSTALLATION .

SWITCH, HOOD AJAR > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION

The hood ajar switch used in this vehicle is integral to the left hood latch mechanism. Refer to LATCH, HOOD, REMOVAL AND INSTALLATION .