

2009 ACCESSORIES AND EQUIPMENT**Vehicle Theft Security - Service Information - Journey****DESCRIPTION****DESCRIPTION**

The Vehicle Theft Security System (VTSS) is an available factory-installed option on this vehicle. The VTSS is comprised of two primary subsystems: Vehicle Theft Alarm (VTA) and Sentry Key Immobilizer System (SKIS). The VTA is an active system that provides visual and audible responses as deterrents to and warnings of unauthorized vehicle tampering. The SKIS is a passive system that effectively immobilizes the vehicle against unauthorized operation. Following are paragraphs, which describe these subsystems of the VTSS.

Certain functions and features of the VTSS rely upon resources shared with or controlled by other electronic modules in the vehicle over the Controller Area Network (CAN) data bus. Other modules that may affect VTSS operation are:

- **Totally Integrated Power Module (TIPM)** - The TIPM is located in the engine compartment, near the battery. The TIPM provides the VTA system logic, driver and front passenger door ajar switch status, and power lock switch status. Refer to **Electrical - Wiring/Power Distribution/MODULE, Totally Integrated Power (TIPM) - Description** .
- **ElectroMechanical Instrument Cluster** - The ElectroMechanical Instrument Cluster (EMIC) is also known as the Cab Compartment Node (CCN) in this vehicle. The EMIC/CCN is located in the instrument panel above the steering column opening, directly in front of the driver. The EMIC provides the security indicator. Refer to **Electrical - Instrument Cluster/Instrument Cluster - Description** .
- **Powertrain Control Module** - The Powertrain Control Module (PCM) provides the SKIS engine control logic. Refer to **Electrical - Electronic Control Modules/Electronic Control Modules/MODULE, Powertrain Control - Description** .
- **Wireless Ignition Node** - The Wireless Ignition Node (WIN) provides ignition switch status. Refer to **Electrical - Electronic Control Modules/Electronic Control Modules/RECEIVER, Wireless Ignition Node - Description** .

Except for the Sentry Key transponders integral to the FOB with Integrated Key (FOBIK), which rely upon Low Frequency (LF) 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 components through a combination of soldered splices, splice block connectors, and many different types of wire harness terminal connectors and insulators. Refer to **SYSTEM WIRING DIAGRAMS** . The wiring information includes wiring diagrams, procedures for proper wire and connector repair, 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.

VEHICLE THEFT ALARM

The VTA is available in two different configurations for this vehicle: One configuration is designed for vehicles

manufactured for sale in North America; while, the other configuration is designed for vehicles manufactured for sale in markets outside of North America, also referred to as export markets within the context of this service information. All vehicles equipped with VTA are also equipped with the Remote Keyless Entry (RKE) system and the Sentry Key Immobilizer System (SKIS), regardless of their market destination.

The North American and export base version of the VTA system provide perimeter vehicle protection by monitoring the vehicle doors, the ignition switch, the liftgate, and the hood for vehicles built for certain markets where it is required equipment. If unauthorized vehicle use or tampering is detected these systems respond by pulsing the vehicle horn as an audible deterrent and flashing certain exterior lamps as a visual deterrent.

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

- **Door Ajar Switches** - A door ajar switch is integral to the door latch mechanism of each front and rear door.
- **Hood Ajar Switch** - A hood ajar switch is located in a bracket on the right inner fender side shield of vehicles built for sale in certain export markets where it is required equipment.
- **Liftgate Ajar Switch** - A liftgate ajar switch is integral to the latch for the liftgate in the vehicle. Refer to **Body/Decklid/Hatch/Liftgate/Tailgate/LATCH - Removal** .
- **Security Indicator** - A security indicator is integral to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN). Refer to **Electrical - Instrument Cluster/Instrument Cluster - Description** .

SENTRY KEY IMMOBILIZER SYSTEM

The Sentry Key Immobilizer System (SKIS) is standard on all vehicles equipped with a Wireless Ignition Node (WIN). Vehicles equipped with the Vehicle Theft Alarm (VTA) are also equipped with SKIS. The SKIS provides passive vehicle protection by preventing the engine from operating unless a valid electronically encoded key is detected in the ignition lock cylinder.

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

- **Security Indicator** - A security indicator is integral to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN). Refer to **Electrical - Instrument Cluster/Instrument Cluster - Description** .
- **Sentry Key Transponder** - The Sentry Key transponder is integral to the FOB with Integrated Key (FOBIK), which also includes an integral Remote Keyless Entry (RKE) transmitter and an integral mechanical valet key. See **Description**.
- **Wireless Ignition Node** - The Wireless Ignition Node (WIN) is located behind the instrument panel, and is partially concealed by the ignition switch bezel. The remainder of the WIN including its mounting provisions and electrical connections are concealed within the instrument panel. The WIN contains the integral ignition switch and performs all of the same SKIS functions performed by a Sentry Key Immobilizer Module (SKIM) used on prior vehicles. See **Description** .

OPERATION

OPERATION

The Vehicle Theft Security System (VTSS) is divided into two basic subsystems: Vehicle Theft Alarm (VTA) and Sentry Key Immobilizer System (SKIS). Following are paragraphs that briefly describe the operation of each of these two subsystems.

VEHICLE THEFT ALARM

The Totally Integrated Power Module (TIPM) is used on this vehicle to control and integrate many of the functions and features included in the Vehicle Theft Alarm (VTA). In the VTA system, the TIPM receives inputs indicating the status of the door ajar switches, the ignition switch, the liftgate ajar switch, and the power lock switches. In vehicles built for certain export markets where it is required, the hood ajar switch provides a hard-wired input to the TIPM. The TIPM processes the information from all of these inputs and sends the appropriate electronic messages over the CAN data bus. The TIPM internally controls the output to the hazard warning lamps and sends a control output to energize or de-energize the horn relay as appropriate.

The hard-wired circuits between components related to the VTA system may be diagnosed using conventional diagnostic tools and procedures. Refer to **SYSTEM WIRING DIAGRAMS**. The wiring information includes wiring diagrams, procedures for proper wire and connector repair, 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 or 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. See the **Vehicle Theft Security System** menu item on the scan tool. Refer to the appropriate diagnostic service information.

Following are paragraphs that briefly describe the operation of each of the VTA features. See the owner's manual in the vehicle glove box for more information on the features, use, and operation of the VTA.

ENABLING

The TIPM must have the VTA function electronically enabled in order for the VTA to perform as designed. The logic in the TIPM keeps its VTA function dormant until it is enabled using a diagnostic scan tool. The VTA function of the TIPM is enabled on vehicles equipped with the VTA option at the factory, but a service replacement TIPM must be VTA-enabled by the dealer using a diagnostic scan tool. Refer to the appropriate diagnostic service information.

ARMING

Passive arming of the VTA occurs when the vehicle is exited with the FOB with Integrated Key (FOBIK) removed from the ignition switch, the headlamps are turned OFF, and the doors are locked while they are open using the power lock switch. Active arming occurs when the LOCK button on the Remote Keyless Entry (RKE) transmitter integral to the FOBIK is depressed to lock the vehicle. For active arming to occur, the doors, and the liftgate must be closed and the ignition switch must be in the OFF position when the FOBIK RKE transmitter LOCK button is depressed. The power lock switch will not function if the FOBIK is in the ignition switch or the headlamps are turned ON with the driver side front door open.

Pre-arming of the VTA is initiated when a door or the liftgate is open when the vehicle is locked using a power door lock switch or when the RKE transmitter LOCK button is depressed. Pre-arming will not occur if the FOBIC is in the ignition switch or the headlamps are turned ON with the driver side front door open. 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 passive or active arming sequence, the security indicator in the instrument cluster will flash rapidly for about 16 seconds. This indicates that VTA arming is in progress. If the ignition switch is turned to the ON position, if a door or the liftgate is unlocked and opened by any means, or the RKE PANIC button (if equipped) is depressed during the 16 second arming process, 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.

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 underhood area will not be protected unless the hood is closed when the VTA arming sequence 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 stop flashing and the VTA arming sequence will abort. Once the arming process is successfully completed, the security indicator will flash at a slower rate, indicating that the VTA is armed.

DISARMING

For vehicles built for the North American market, passive disarming of the VTA occurs by inserting a valid Sentry Key Immobilizer System (SKIS) FOBIC into the ignition switch. Active disarming of the VTA for all markets occurs when the vehicle is unlocked by depressing the UNLOCK button of the FOBIC RKE transmitter. Once the alarm has been activated, either disarming method will also deactivate the alarm. Depressing the PANIC button (if equipped) on the FOBIC RKE transmitter will **not** disarm the VTA.

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 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 actively or passively 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 actively or passively 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.

ALARM

The VTA alarm output varies by the version of the VTA with which the vehicle is equipped. In all cases, the alarm 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 lamps. For vehicles equipped with the North American or the export base version of the VTA, the audible output will be a pulsing of the horn. See the owner's manual in the vehicle glove box for details of the alarm output requirements of the specific market for which the vehicle was manufactured. The inputs that will trigger the alarm include the door ajar switches, the liftgate ajar switch, and

in vehicles built for certain markets where required, the hood ajar switch.

TAMPER ALERT

The VTA tamper alert feature will pulse the horn three times upon VTA disarming 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.

SENTRY KEY IMMOBILIZER SYSTEM

The Sentry Key Immobilizer System (SKIS) is designed to provide passive protection against unauthorized vehicle use by disabling the engine whenever any method other than a valid Sentry Key FOB with Integrated Key (FOBIK) is used to start the vehicle. The SKIS is considered a passive protection system, because it is always active when the ignition system is energized and it does not require any customer intervention. The SKIS uses Low Frequency (LF) communication to obtain confirmation that the FOBIK in the ignition switch is valid for operating the vehicle. The microprocessor-based SKIS hardware and software also uses electronic messages to communicate with other electronic modules in the vehicle over the Controller Area Network (CAN) data bus. Refer to **Electrical - Electronic Control Modules/Electronic Control Modules/COMMUNICATION - Operation** .

Pre-programmed Sentry Key FOBIK transponders are provided with the vehicle from the factory. Each Wireless Ignition Node (WIN) will recognize a maximum of eight Sentry Key FOBIK transponders. If the customer would like additional FOBIKs, other than those provided with the vehicle, they may be purchased from any authorized dealer. These additional FOBIKs must be programmed to the WIN in the vehicle in order for the system to recognize them as valid. This can be done by the dealer using a diagnostic scan tool, or if Customer Learn programming is an available SKIS feature in the market where the vehicle was purchased, the customer can program the additional FOBIKs, as long as at least two valid Sentry Key FOBIKs are already available. See **Standard Procedure** .

The WIN performs a self-test of the SKIS each time the ignition switch is turned to the ON position, and will store fault information in the form of a Diagnostic Trouble Code (DTC) if a system malfunction is detected. The WIN will also send an electronic message to the instrument cluster if a fault is detected, and the instrument cluster illuminates the security indicator.

The hard-wired circuits between components related to the SKIS may be diagnosed using conventional diagnostic tools and procedures. Refer to **SYSTEM WIRING DIAGRAMS** . The wiring information includes wiring diagrams, procedures for proper wire and connector repair, 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 or 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 service information.

DIAGNOSIS AND TESTING

VEHICLE THEFT SECURITY SYSTEM

The Vehicle Theft Security System (VTSS) is divided into two basic subsystems: Vehicle Theft Alarm (VTA) and Sentry Key Immobilizer System (SKIS). Following are the recommended procedures for diagnosis of each of these two subsystems.

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, airbag, 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 SRS. Failure to take the proper precautions could result in accidental airbag deployment.

VEHICLE THEFT ALARM

The hard-wired circuits between components related to the VTA system may be diagnosed using conventional diagnostic tools and procedures. Refer to **SYSTEM WIRING DIAGRAMS**. The wiring information includes wiring diagrams, procedures for proper wire and connector repair, 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 or communication between other 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. See the **Vehicle Theft Security System** menu item on the scan tool. Refer to the appropriate diagnostic service information.

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, airbag, 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 SRS. Failure to take the proper precautions could result in accidental airbag deployment.

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STANDARD PROCEDURE

WIN INITIALIZATION - EXPORT WITH COLUMN LOCK MODULE

CAUTION: On vehicles equipped with the optional export premium Vehicle Theft System, when either the Wireless Ignition Node (WIN) or the shaft lock module (also known as Elektrische LenksAulenverriegelung/ELV or electric steering column lock) is replaced with a new unit, the existing WIN or ELV **MUST** also be replaced with a new unit. In other words, any time either the WIN or the ELV is replaced with a new unit, **BOTH** the WIN and the ELV **MUST** be replaced with new units, **WITHOUT EXCEPTION**. Following replacement of **BOTH** the WIN and the column lock module/ELV, the two modules **MUST** be initialized using diagnostic scan tool routines in the **EXACT SEQUENCE** that follows. Failure to follow this sequence may result in **BOTH** the new WIN and the new ELV being rendered unusable, requiring **BOTH** units to be replaced a second time.

1. After both the WIN and the ELV have been replaced with new units, connect the diagnostic scan tool to the Data Link Connector (DLC) and turn the ignition key to the ON/RUN position.
2. Navigate to the WIN in the ECU View of the diagnostic scan tool.
3. Run the WIN Replaced routine found under the Miscellaneous Functions menu item of the scan tool.
4. Turn the ignition key to the OFF position, wait 30 seconds, then cycle the key back to the ON/RUN position.
5. Scan tool to program the ignition key(s) to the WIN. See Standard Procedure .
6. Run the ELV Replaced routine, also found under the Miscellaneous Functions menu item of the r WIN in the ECU View of the diagnostic scan tool.
7. Turn the ignition key to the OFF position, wait 30 seconds, then cycle the key back to the ON/RUN position.
8. Verify that the ELV Locks the steering column when the key is removed from the ignition lock cylinder, and Unlocks the steering column when the key is inserted into the ignition lock cylinder.

SPECIAL TOOLS

VEHICLE THEFT SECURITY SYSTEMS

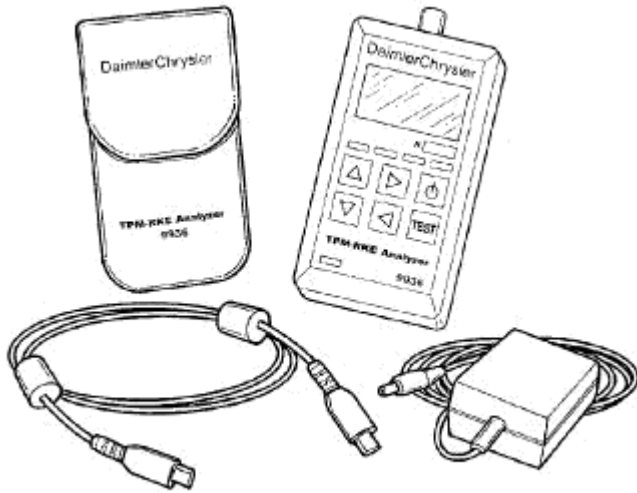
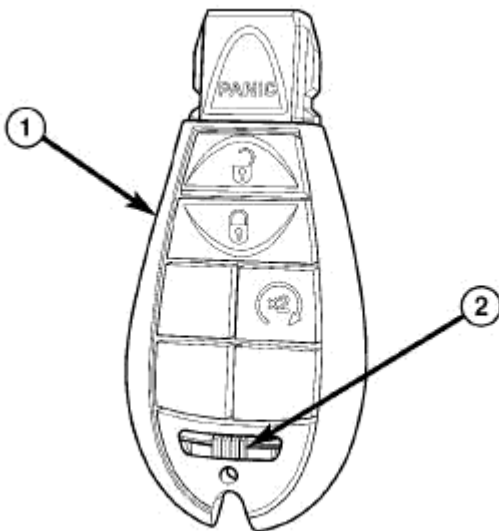


Fig. 1: TPM - RKE Analyzer No. 9936
Courtesy of CHRYSLER LLC

KEY, TRANSPONDER

DESCRIPTION

DESCRIPTION



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Fig. 2: Transponder Key
Courtesy of CHRYSLER LLC

The Sentry Key Immobilizer System (SKIS) has a transponder chip included on the circuit board beneath the

cover of each FOB with Integrated Key (FOBIK) (1) included with the vehicle. The FOBIK includes an integral mechanical valet key which is stored within the bottom of the FOBIK housing until it is released using the latch button (2). The valet key is cut to match the mechanical coding of the door and glove box lock cylinders. Each new replacement FOBIK must be programmed for operation of the Remote Keyless Entry (RKE) system and has a unique transponder identification code that is permanently programmed into it by the manufacturer. This identification code must be programmed into the Wireless Ignition Node (WIN) to be recognized by the SKIS as a valid key.

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

OPERATION

OPERATION

When the ignition switch is turned to the ON position, the Wireless Ignition Node (WIN) communicates through its antenna with the Sentry Key transponder within the FOB with Integrated Key (FOBIK) using a Low Frequency (LF) signal. The Sentry Key transponder chip is within the range of the WIN transceiver antenna ring when it is inserted into the ignition switch.

The WIN determines whether a valid FOBIK is present in the ignition switch based upon the signal from the transponder. If a valid FOBIK is detected, that fact is communicated by the WIN to the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus, and the PCM allows the engine to start. If the PCM receives an **invalid key** message, or receives no message from the WIN over the CAN data bus, the engine will be disabled. The ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) will also respond to the **invalid key** message on the CAN data bus by flashing the security indicator ON and OFF.

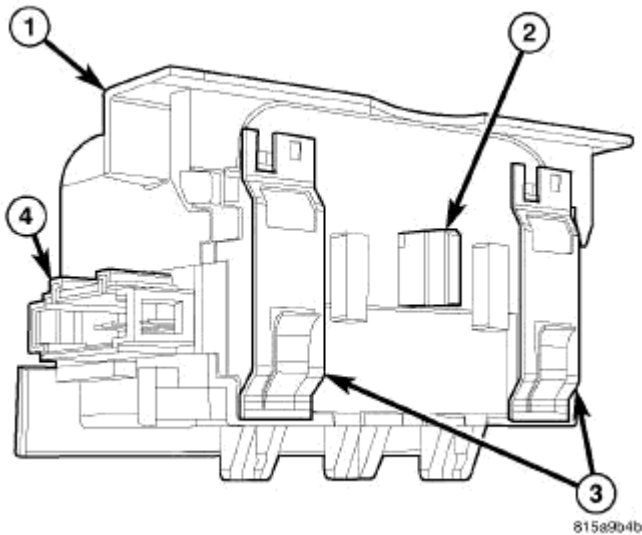
Each Sentry Key FOBIK has a unique transponder identification code permanently programmed into it by the manufacturer. Likewise, the WIN has a unique Secret Key code programmed into it by the manufacturer. When a Sentry Key FOBIK is programmed into the memory of the WIN, the WIN stores the transponder identification code from the Sentry Key FOBIK and the Sentry Key FOBIK learns the Secret Key code from the WIN. Once the Sentry Key FOBIK learns the Secret Key code of the WIN, it is permanently stored in the memory of the transponder. Therefore, once a FOBIK has been programmed to a particular vehicle, it cannot be used on any other vehicle. Refer to **RECEIVER, WIRELESS IGNITION NODE**.

The Sentry Key Immobilizer System (SKIS) performs a self-test each time the ignition switch is turned to the ON position, and will store key-related fault information in the form of a Diagnostic Trouble Code (DTC) in WIN memory if a Sentry Key FOBIK transponder problem is detected. The Sentry Key FOBIK transponder chip can be diagnosed, and any stored DTC can be retrieved using a diagnostic scan tool. Refer to the appropriate diagnostic service information.

MODULE, SHAFT LOCK

DESCRIPTION

DESCRIPTION

**Fig. 3: Shaft Lock Module**

Courtesy of CHRYSLER LLC

A shaft lock module (1) is part of the premium version of the Sentry Key Immobilizer System (SKIS) in the Vehicle Theft Security System (VTSS). The premium version of the SKIS is only available in vehicles built for certain markets, where the additional features offered by this system are required. The shaft lock module is located in a bracket integral to the lower end of the steering column housing casting below the instrument panel in the passenger compartment. This unit is designed to work in conjunction with the Wireless Ignition Node (WIN), sometimes referred to as the Sentry Key Remote Entry Module (SKREEM) to control a locking bolt (2) that engages a machined slot in the steering shaft to prevent shaft rotation whenever there is not a valid key present in the ignition lock cylinder on the instrument panel.

Concealed within the module is the electronic circuitry of the module, and a bi-directional electric motor that actuates the locking bolt. The module is connected to the vehicle electrical system through the instrument panel wire harness.

The mounting provisions for the shaft lock module are designed to resist unauthorized tampering. The module cannot be removed from the steering column while the locking bolt is in the locked position, or while the steering column is installed in the vehicle. The shaft lock module unit cannot be adjusted or repaired and, if ineffective or damaged, the entire steering column must be replaced.

OPERATION

OPERATION

The electronic circuitry within the shaft lock module contains all of the logic circuits and components to monitor and control the operation of the shaft locking bolt. The module uses a serial data bus for bi-directional communication with the Wireless Ignition Node (WIN), sometimes referred to as the Sentry Key Remote Entry Module (SKREEM). If the module detects a problem with the positioning or operation of the locking bolt, it sends an error message to the WIN. The WIN then stores a Diagnostic Trouble Code (DTC) and sends an

electronic error message to the Instrument Cluster, sometimes referred to as the Cab Compartment Node (CCN), over the Controller Area Network (CAN) data bus.

The shaft lock module continuously monitors inputs from the WIN and energizes the electric motor to move the locking bolt to the locked or unlocked position based upon that input. If the WIN indicates that the key present in the ignition lock cylinder is invalid, the locking bolt remains in the locked position. When the WIN indicates that a valid key is present in the ignition lock cylinder, the shaft lock module operates a motor to move the locking bolt to the unlocked position. However, to prevent inadvertent column locking due to a failure while the vehicle is being operated, the module cannot move the locking bolt from the unlocked position to the locked position as long as a key remains in the ignition lock cylinder.

The shaft lock module receives ground at all times through a hard wired remote ground point. The module receives battery voltage to operate and to move the locking bolt in the unlocked direction on a B(+) circuit, and receives battery voltage to operate the locking bolt in the locked direction only when the key is removed from the ignition switch. These connections allow the module to remain operational, regardless of the ignition switch position.

For added system security, the shaft lock module learns a unique Secret Key code from the WIN over the serial data bus upon initialization. This code is stored in the memory of the module and cannot be changed. Therefore, if the WIN requires service replacement, a new shaft lock module will also be required. Another security code, called a PIN, is used to gain access to the WIN Secured Access Mode. The Secured Access Mode is required during service to initialize a new shaft lock module. The shaft lock module is not available for separate service replacement. It is integral to the steering column so a complete column must be installed if the module is damaged or inoperative. Refer to **Steering/Column - Removal**.

REMOVAL

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, airbag, 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 SRS. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE: The shaft lock module cannot be removed from the steering column while the locking bolt is in the locked position without irreversibly damaging the column. Before attempting service, insert a valid FOB with Integrated Key (FOBIK) into the ignition switch, then rotate the steering wheel from side to side. If the steering wheel can be rotated, the locking bolt is in the unlocked position. Leave the FOBIK in the ignition switch until service has been completed. If the steering wheel cannot be rotated, test and repair the wiring circuits between the module and the ignition switch as required. If no problem is found in these circuits, the module has failed with the locking bolt in the locked position and

both the module and the steering column must be replaced with new units.

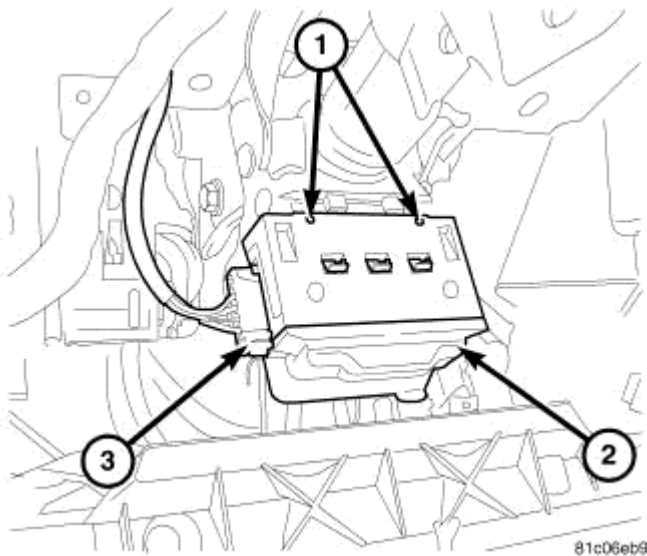


Fig. 4: Identifying Shaft Lock Module
Courtesy of CHRYSLER LLC

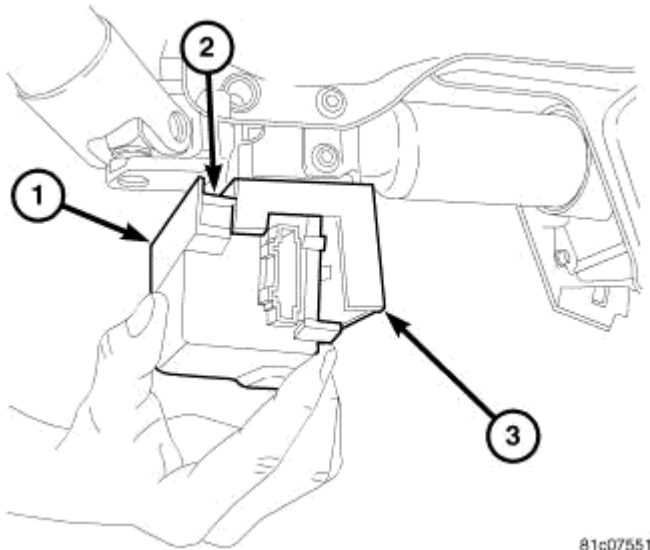
1. Insert a FOB with Integrated Key (FOBIK) into the ignition switch to move the shaft lock module locking bolt to the unlocked position. Leave the FOBIK in the ignition switch while the shaft lock module service is being completed.
2. Disconnect and isolate the battery negative cable.
3. Disconnect the instrument panel wire harness connector (3) from the shaft lock module (2) connector receptacle.
4. Remove the steering column from the vehicle. Refer to **Steering/Column - Removal** .
5. Depress the two spring clips that secure the shaft lock module to the mounting bracket on the steering column by inserting a suitable drift or punch into the release holes (1) on the upper surface of the bracket opposite the module.
6. While holding both of the spring clips depressed, slide the module toward the base of the column far enough to disengage the engagement tabs and slide tabs on the module from the slots and channels in the bracket.
7. Remove the module from the steering column bracket.

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, airbag, 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 SRS. Failure to take the proper precautions could result in accidental airbag deployment.



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Fig. 5: Shaft Lock Module Components
Courtesy of CHRYSLER LLC

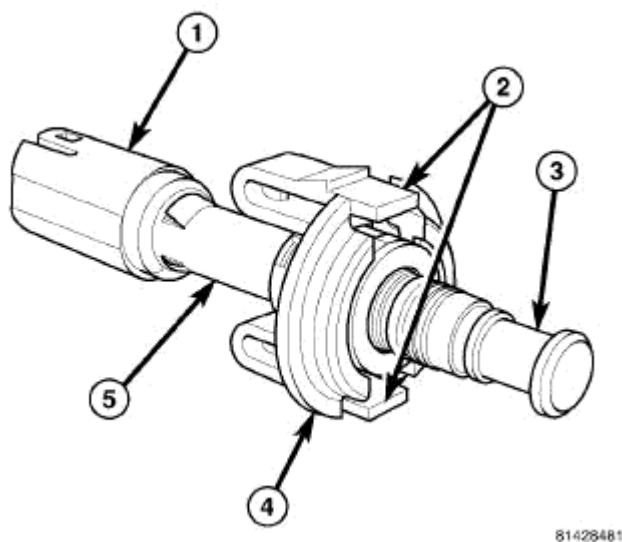
1. Be certain that a valid FOB with Integrated Key (FOBIK) is still present in the ignition switch. Leave the FOBIK in the ignition switch while the shaft lock module service is being completed.
2. Align the engagement and slide tabs integral to the housing of the shaft lock module (1) with the slots and channels in the mounting bracket (3) on the steering column.
3. Slide the module toward the top of the column far enough for the spring clips (2) on the module to engage the bracket.
4. Reinstall the steering column into the vehicle. Refer to Steering/Column - Installation .
5. Reconnect the instrument panel wire harness connector to the shaft lock module connector receptacle.
6. Reconnect the battery negative cable.

NOTE: If the shaft lock module has been replaced with a new unit, the Wireless Ignition Node (WIN) MUST also be replaced. Refer to Electrical - Electronic Control Modules/Electronic Control Modules/RECEIVER, Wireless Ignition Node - Removal . Also, a diagnostic scan tool MUST be used to initialize the new module before the vehicle can be operated. See Standard Procedure .

SWITCH, HOOD AJAR

DESCRIPTION

DESCRIPTION

**Fig. 6: Hood Ajar Switch**

Courtesy of CHRYSLER LLC

The hood ajar switch is a normally closed, single pole, spring-loaded plunger actuated switch. This switch has two unique versions that are used in two different applications. One switch is used only on vehicles equipped with the Vehicle Theft Security System (VTSS) for sale in certain export markets where protection of the underhood area is required equipment. The second switch is used only on domestic vehicles equipped with an optional remote starter system.

The molded plastic switch body (5) has an integral molded connector receptacle (1) on the lower end containing two terminal pins. The switch is connected to the vehicle electrical system through a dedicated take out of the headlamp and dash wire harness. Two integral latches (2) lock the switch into a keyed mounting hole in the stamped steel switch mounting bracket. The mounting bracket is secured with screws to the right inner fender shield near the fender ledge in the engine compartment. The underside of the hood panel inner reinforcement actuates the switch plunger as the hood panel is closed.

The switch plunger (3) extends through a mounting collar (4) and a sleeve-like retainer ring on the upper end of the switch body. The retainer ring has a one time, self-adjustment feature that is activated after the switch is installed by closing the hood. The retainer ring is also color-coded to aid in identifying the switch application. A dark brown retainer ring identifies the underhood security switch application, while a white retainer ring identifies the remote starter system application.

An installed hood ajar switch cannot be readjusted or repaired. If the switch is damaged, ineffective, or requires readjustment, it must be replaced with a new unit.

OPERATION

OPERATION

The hood ajar switches are interchangeable physically, but not functionally. In each case, the hood ajar switch is

a normally closed switch that is held open as the spring-loaded switch plunger is depressed by the inner hood panel reinforcement when the hood panel is closed and latched. When the hood is opened, the spring-loaded switch plunger extends from the switch body and the switch contacts are closed.

In the underhood security application (export vehicles only - dark brown retainer ring), the switch is connected in series between ground and the hood ajar switch sense input of the Totally Integrated Power Module (TIPM). The TIPM uses an internal resistor pull up to monitor the state of the hood ajar switch contacts.

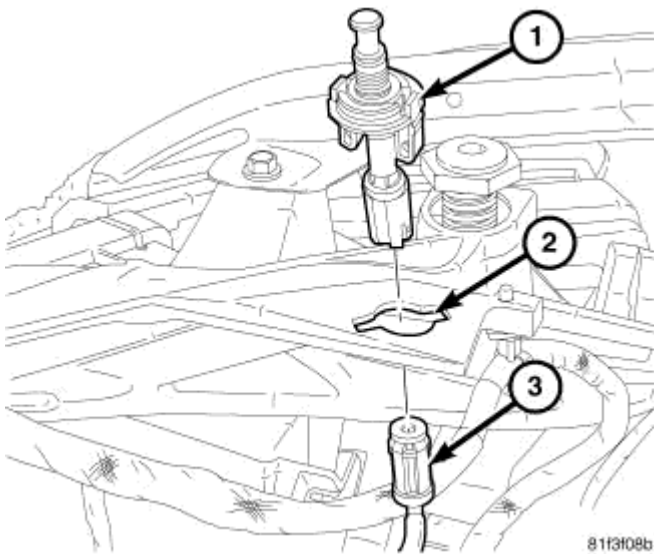
In the remote starter system application (domestic vehicles only - white retainer ring) the switch has a 1 kilohm diagnostic resistor connected in parallel to the switch contacts between the two switch terminals. The switch is connected in series between an output of the TIPM and the hood ajar switch sense input of the TIPM. The TIPM continually monitors this circuit and it will store a Diagnostic Trouble Code (DTC) for any fault that it detects.

The components of the switch self-adjustment feature include an integral stop on the shaft of the plunger and a ribbed, ratcheting sleeve-like retainer ring at the top of the switch body from which the plunger extends. With the switch mounting collar secured in its mounting bracket, the plunger is depressed by the hood inner reinforcement as the hood is closed. As the plunger is depressed, the plunger stop contacts the top of the retainer ring and it is driven downward, ratcheting through the switch mounting collar until the hood is fully closed and latched. The ribs on the retainer ring are engaged within the mounting collar to maintain this adjusted position.

The hood ajar switch as well as the hard-wired circuits between the switch and the TIPM may be diagnosed using conventional diagnostic tools and procedures. Refer to **SYSTEM WIRING DIAGRAMS** . However, conventional diagnostic methods will not prove conclusive in the diagnosis of the electronic controls or communication between modules and other devices related to hood ajar switch operation that provide some features of the export vehicle theft or domestic remote starter systems. The most reliable, efficient, and accurate means to diagnose the electronic controls and communication related to hood ajar switch operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic service information.

REMOVAL

SWITCH

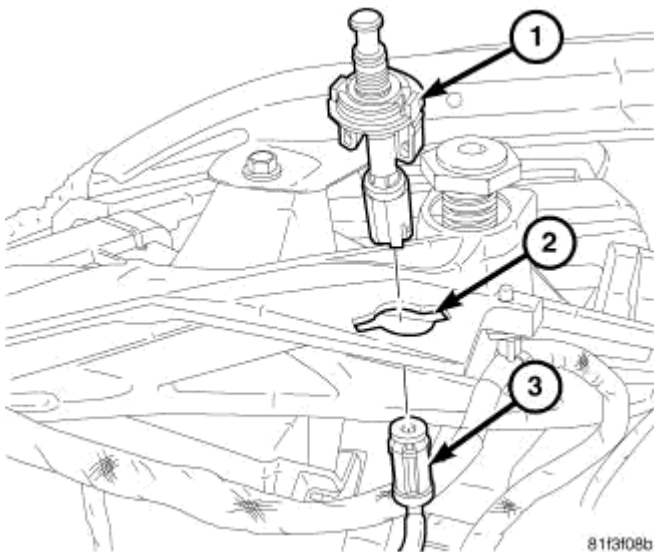
**Fig. 7: Switch Connector Receptacle**

Courtesy of CHRYSLER LLC

1. Unlatch and open the hood.
2. Disconnect and isolate the battery negative cable.
3. Disconnect the wire harness connector (3) from the switch connector receptacle.
4. From the top of the hood ajar switch mounting bracket (2), squeeze the two switch latch tabs together and pull the switch (1) upward through the hole in the mounting bracket.
5. Remove the hood ajar switch from the mounting bracket and discard.

INSTALLATION

SWITCH

**Fig. 8: Switch Connector Receptacle**

Courtesy of CHRYSLER LLC

NOTE: **Self-adjustment of the hood ajar switch is a one-time feature. If the switch is damaged, ineffective, removed or requires readjustment, it must be replaced with a new unit.**

1. Position the hood ajar switch (1) above the hole in the mounting bracket (2).
2. Press the switch into the mounting hole until the integral switch latch tabs lock it into place.
3. Connect the harness connector (3) to the switch connector receptacle.
4. Reconnect the battery negative cable.
5. Close and latch the hood.