VEHICLE THEFT SECURITY

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VEHICLE THEFT SECURITY

DESCRIPTION

DESCRIPTION

The Vehicle Theft/Security System (VTSS) is designed to protect against whole vehicle theft. The system monitors the vehicle doors and ignition for unauthorized operation.

The VTSS activates:
- Sounding of the horn
- Flashing of the park lamps
- Flashing of the head lamps

The Remote Keyless Entry (RKE) has 1 mode of operation, **CUSTOMER USAGE** mode. The customer usage mode provides full functionality of the module and is the mode in which the RKE module should be operating when used by the customer.

SENTRY KEY IMMOBILIZER SYSTEM (SKIS)

The Sentry Key Immobilizer System (SKIS) is designed to provide passive protection against unauthorized vehicle use by preventing the engine from operating while the system is armed. The primary components of this system are the Sentry Key Immobilizer Module (SKIM), the Sentry Key transponder, the Vehicle Theft/Security System (VTSS) indicator LED, and the Powertrain Control Module (PCM).

The SKIM is installed on the steering column near the ignition lock cylinder. The transponder is located under the molded rubber cap on the head of the igni-tion key. The VTSS indicator LED is located in the instrument cluster.

The SKIS includes two valid Sentry Key transponders from the factory. This is so the customer can self program new keys if one is lost. If the customer wishes, additional non-coded blank Sentry Keys are available. These blank keys can be cut to match a valid ignition key, but the engine will not start unless the key transponder is also programmed to the vehicle. The SKIS will recognize no more than eight valid Sentry Key transponders at any one time.

The SKIS performs a self-test each time the ignition switch is turned to the ON position, and will store Diagnostic Trouble Codes (DTC's) if a system malfunction is detected. The SKIS can be diagnosed, and any stored DTC can be retrieved using a DRBIII® scan tool as described in the proper Body Diagnostic Procedures Manual.

DESCRIPTION

The Sentry Key Immobilizer Module (SKIM) contains a Radio Frequency (RF) transceiver and a central processing unit, which includes the Sentry Key Immobilizer System (SKIS) program logic. The SKIS programming enables the SKIM to program and retain in memory the codes of at least two, but no more than eight electronically coded Sentry Key transponders. The SKIS programming also enables the SKIM to communicate over the Programmable Communication Interface (PCI) bus network with the Powertrain Control Module (PCM), and/or the DRBIII® scan tool.

VEHICLE THEFT SECURITY (Continued)

OPERATION

OPERATION

When in the **Customer Usage** mode of operation, the system is armed when the vehicle is locked using the:

- Power Door Lock Switches
- Remote Keyless Entry (RKE) Transmitter
- Key Cylinder Switches

After the vehicle is locked and the last door is closed, the VTSS indicator in the instrument cluster will flash quickly for 16 seconds, indicating that the arming is in process. After 16 seconds, the LED will continue to flash at a slower rate indicating that the system is armed.

VTSS disarming occurs upon normal vehicle entry by unlocking either door via the key cylinder or RKE transmitter, or by starting the vehicle with a valid Sentry Key. This disarming will also halt the alarm once it has been activated.

A tamper alert exists to notify the driver that the system has been activated. This alert consists of 3 horn pulses and the security telltail flashing for 30 seconds when the vehicle is disarmed. The tamper alert will not occur if disarmed while alarming.

The VTSS will not arm by mechanically locking the vehicle doors. This will manually override the system.

OPERATION

The SKIS includes two valid Sentry Key transponders from the factory. These two Sentry Keys can be used to program additional non-coded blank Sentry Keys. These blank keys can be cut to match a valid ignition key, but the engine will not start unless the key transponder is also programmed to the vehicle. The SKIS will recognize no more than eight valid Sentry Key transponders at any one time.

The SKIS performs a self-test each time the ignition switch is turned to the ON position, and will store Diagnostic Trouble Codes (DTC's) if a system malfunction is detected. The SKIS can be diagnosed, and any stored DTC can be retrieved using a DRBIII® scan tool as described in the proper Powertrain Diagnostic Procedures manual.

OPERATION

The SKIM transmits and receives RF signals through a tuned antenna enclosed within a molded plastic ring formation that is integral to the SKIM housing. When the SKIM is properly installed on the steering column, the antenna ring is oriented around the circumference of the ignition lock cylinder housing. This antenna ring must be located within eight millimeters (0.31 inches) of the Sentry Key in order to ensure proper RF communication between the SKIM and the Sentry Key transponder.

For added system security, each SKIM is programmed with a unique "Secret Key" code and a security code. The SKIM keeps the "Secret Key" code in memory. The SKIM also sends the "Secret Key" code to each of the programmed Sentry Key transponders. The security code is used by the assembly plant to access the SKIS for initialization, or by the dealer technician to access the system for service. The SKIM also stores in its memory the Vehicle Identification Number (VIN), which it learns through a PCI bus message from the PCM during initialization.

The SKIM and the PCM both use software that includes a rolling code algorithm strategy, which helps to reduce the possibility of unauthorized SKIS disarming. The rolling code algorithm ensures security by preventing an override of the SKIS through the unauthorized substitution of the SKIM or the PCM. However, the use of this strategy also means that replacement of either the SKIM or the PCM units will require a system initialization procedure to restore system operation.

When the ignition switch is turned to the ON or START positions, the SKIM transmits an RF signal to excite the Sentry Key transponder. The SKIM then listens for a return RF signal from the transponder of the Sentry Key that is inserted in the ignition lock cylinder. If the SKIM receives an RF signal with valid "Secret Key" and transponder identification codes, the SKIM sends a "valid key" message to the PCM over the PCI bus. If the SKIM receives an invalid RF signal or no response, it sends "invalid key" messages to the PCM. The PCM will enable or disable engine operation based upon the status of the SKIM messages.

The SKIM also sends messages to the Instrument Cluster which controls the VTSS indicator. The SKIM sends messages to the Instrument Cluster to turn the indicator on for about three seconds when the ignition switch is turned to the ON position as a "bulb" test. After completion of the "bulb" test, the SKIM sends bus messages to keep the indicator off for a duration of about one second. Then the SKIM sends messages to turn the indicator on or off based upon the results of the SKIS self-tests. If the VTSS indicator comes on and stays on after the "bulb test", it indicates that the SKIM has detected a system malfunction and/or that the SKIS has become inoperative.

If the SKIM detects an invalid key when the ignition switch is turned to the ON position, it sends messages to flash the VTSS indicator. The SKIM can also send messages to flash the indicator to serve as an indication to the customer that the SKIS has been

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placed in its "Customer Learn" programming mode. See Sentry Key Immobilizer System Transponder Programming in this section for more information on the "Customer Learn" programming mode.

For diagnosis or initialization of the SKIM and the PCM, a DRBIII® scan tool and the proper Powertrain Diagnostic Procedures manual are required. The SKIM cannot be repaired and, if faulty or damaged, the unit must be replaced.

DIAGNOSIS AND TESTING

VEHICLE THEFT SECURITY SYSTEM

WARNING: ON VEHICLES EQUIPPED WITH AIR-BAGS, REFER TO RESTRAINT SYSTEMS BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

NOTE: The most reliable, efficient, and accurate means to diagnose the Vehicle Theft Security System (VTSS) and Sentry Key Immobilizer System (SKIS) involves the use of a DRBIII® scan tool and the proper Powertrain Diagnostic Procedures manual.

The Vehicle Theft Security System (VTSS), Sentry Key Immobilizer System (SKIS) and the Programmable Communication Interface (PCI) bus network should be diagnosed using a DRBIII® scan tool. The DRBIII® will allow confirmation that the PCI bus is functional, that the Sentry Key Immobilizer Module (SKIM) is placing the proper messages on the PCI bus, and that the Powertrain Control Module (PCM) and the Instrument Cluster are receiving the PCI bus messages. Refer to the proper Powertrain or Body Diagnostic Procedures manual.

Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out or corroded terminals. If any of the conditions are present, repair as necessary. Refer to Wiring Diagrams for complete circuit descriptions and diagrams. Refer to (Refer to **8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/SENTRY KEY IMMOBILIZER MODULE - REMOVAL**) for SKIM replacement.

STANDARD PROCEDURE

CONFIGURING A NEW MODULE / SWITCH OPERATING MODES

To configure a new module or to switch operating modes, a DRBIII® scan tool must be used.

(1) Hook up the DRBIII® scan tool to the Data Link Connector (DLC).

(2) With the key in the ignition, turn the key to the RUN position.

(3) After the DRBIII® scan tool initialization, perform the following:

    (a) Select "Theft Alarm."

    (b) Select "VTSS."

    (c) Select "Miscellaneous."

(4) Once in the "Miscellaneous" screen:

    (a) If you wish to configure a new module, select "Configure Module."

    (b) If you wish to put the module into customer usage mode, select "Enable VTSS."

    (c) If you wish to put the module into dealer lot mode, select "Dealer Lot."

SENTRY KEY IMMOBILIZER SYSTEM INITIALIZATION

The Sentry Key Immobilizer System (SKIS) initialization should be performed following a Sentry Key Immobilizer Module (SKIM) replacement.

It can be summarized by the following:

(1) Obtain the vehicles unique PIN number assigned to it's original SKIM from the vehicle owner, the vehicle's invoice or from Chrysler's Customer Center.

(2) With the DRBIII® scan tool, select "Theft Alarm," "SKIM," Miscellaneous." Select "SKIM Module Replaced" function and the DRBIII® will prompt you through the following steps.

(3) Enter secured access mode using the unique four digit PIN number.

(4) Program the vehicle's VIN number into the SKIM's memory.

(5) Program the country code into the SKIM's memory (U.S.).

(6) Transfer the vehicle's unique Secret Key data from the PCM. This process will require the SKIM to be in **secured access mode**. The PIN number must be entered into the DRBIII® before the SKIM will enter **secured access mode**. Once **secured access mode** is active, the SKIM will remain in that mode for 60 seconds.

(7) Program all customer keys into the SKIM's memory. This required that the SKIM be in **secured access mode** The SKIM will immediately exit **secured access mode** after each key is programmed.

VEHICLE THEFT SECURITY (Continued)

NOTE: If a PCM is replaced, the unique "Secret Key" data must be transferred from the SKIM to the PCM. This procedure requires the SKIM to be placed in SECURED ACCESS MODE using the four digit PIN code.

SENTRY KEY IMMOBILIZER SYSTEM TRANSPONDER PROGRAMMING

Two programmed Sentry Key transponders are included with the Sentry Key Immobilizer System (SKIS) when it is shipped from the factory. The Sentry Key Immobilizer Module (SKIM) can be programmed to recognize up to six additional transponders, for a total of eight Sentry Keys. The following "Customer Learn" programming procedure for the programming of additional transponders requires access to at least two of the valid Sentry Keys. If two valid Sentry Keys are not available, Sentry Key programming will require the use of a DRBIII® scan tool.

CUSTOMER LEARN PROGRAMMING

(1) Obtain the additional Sentry Key transponder blank(s) that are to be programmed for the vehicle. Cut the additional Sentry Key transponder blanks to match the ignition lock cylinder mechanical key codes.

(2) Insert one of the two valid Sentry Key transponders into the ignition switch and turn the ignition switch to the ON position.

(3) After the ignition switch has been in the ON position for about three seconds, but no more than fifteen seconds, cycle the ignition switch back to the OFF position. Replace the first valid Sentry Key in the ignition lock cylinder with the second valid Sentry Key and turn the ignition switch back to the ON position. Both operations must be performed within 15 seconds.

(4) In approximately ten seconds the VTSS indicator LED will start to flash to indicate that the system has entered the "Customer Learn" programming mode.

(5) Within approximately sixty seconds of entering the "Customer Learn" programming mode, turn the ignition switch to the OFF position, replace the valid Sentry Key with a blank Sentry Key transponder, and turn the ignition switch back to the ON position.

(6) In approximately ten seconds, the VTSS indicator LED will stop flashing and stay on solid for approximately three seconds and then turn OFF to indicate that the blank Sentry Key transponder has been successfully programmed. The SKIS will immediately return to normal system operation following exit from the "Customer Learn" programming mode.

(7) Repeat this process for each additional Sentry Key transponder blank to be programmed.

If any of the above steps is not completed in the proper sequence, or within the allotted time, the SKIS will automatically exit the "Customer Learn" programming mode. The SKIS will also automatically exit the "Customer Learn" programming mode if it sees a non-blank Sentry Key transponder when it should see a blank, if it has already programmed eight valid Sentry Keys, or if the ignition switch is turned to the OFF position for more than about fifty seconds.

NOTE: While in Customer Learn mode (LED flashing), the engine will not START and RUN.

PROGRAMMING BLANK SENTRY KEY TRANSPONDERS WITH A DRBIII® SCAN TOOL

When programming a blank Sentry Key transponder, the key blank must first be cut to match the ignition lock cylinder. It will also be necessary to enter the vehicle's four digit PIN code into the DRBIII® scan tool to enter the Sentry Key Immobilizer Module's (SKIM's) secured access mode.

NOTE: Once a Sentry Key is programmed to a particular vehicle, it cannot be transferred to another vehicle.

Insert the blank key into the ignition and turn it to the RUN position. Using the DRBIII® scan tool, select "Theft Alarm," then "SKIM," then "Miscellaneous." Select "Program New Key." Enter the four digit PIN code using the DRBIII®. When programming is completed, the SKIM will exit secured access mode and the DRBIII® will display the status of the key. One of five different status messages may be displayed as follows:

• "Programming Successful" is displayed if SKIM Sentry Key programming succeeds.

• "Learned Key in Ignition" is displayed if the key in the ignition has already been programmed into that vehicle's SKIM.

• "8 Keys Already Learned (At The Maximum) Programming Not Done" is displayed if eight keys have already been programmed into the SKIM. In this case, if a new key needs to be added due to a lost or defective key, the "Erase All Keys" function (requires entering secured access mode) has to be performed. Then the customer's seven keys plus the new key MUST be reprogrammed into the SKIM.

• "Programming Not Attempted" is displayed after an "Erase All Keys" function is executed.

• "Programming Key Failed" is displayed if further diagnosis is required.

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• To learn additional keys, turn the ignition OFF, remove the learned key, and insert the next new blank key. Turn ignition to the RUN position and re-enter the secured access mode function and repeat the "Program New Key" procedure outlined above.

SENTRY KEY IMMOBILIZER SYSTEM INDICATOR LAMP

DESCRIPTION

The Sentry Key Immobilizer System (SKIS) uses the Vehicle Theft Security System (VTSS) indicator in the instrument cluster to give an indication when the SKIS is faulty or when the vehicle has been immobilized due to the use of an invalid key. The indicator is controlled by the instrument cluster based upon messages received from the Sentry Key Immobilizer Module (SKIM).

OPERATION

The SKIM sends PCI Bus messages to the instrument cluster, to turn on the 'Security" indicator for about 3 seconds when the ignition is turned to the ON position, as a "Bulb" test. After completion of the "Bulb" test, the SKIM sends a PCI bus messages to keep the LED off for 1 second. Then the SKIM sends messages to the instrument cluster to turn the LED off based upon the results if the SKIS self - test. If the indicator illuminates and remains illuminated after the "bulb test", it indicates that the SKIM has detected a system malfunction and/or the system has become inoperative. If the SKIM detects a invalid key when the ignition switch is turned on, it sends a message to the instrument cluster to flash the "Security" indicator.

The SKIM can also send messages to the cluster to flash the LED and generate a chime. These functions serve as an indication to the customer that the SKIM is in the **Customer Learn** programming mode. See Sentry Key Immobilizer System Transponder Programming in this group for more information on the "Customer Learn" programming Mode.

If the VTSS indicator remains on after the "Bulb" test, the system should be diagnosed using the DRBIII® scan tool and the proper Powertrain Diagnostic Procedures manual.