SIEMENS

Re: Confidential Certification of Siemens VDO Automotive SKREES (Sentry Key REmote Entry System)
SKREEM FCC ID: "FCC ID: M3N5WY7078"
SKREEM Canada ID: "IC: 267F-5WY7078"
SKREEK FCC ID: "FCC ID: M3N5WY72XX"
SKREEK Canada ID: "IC: 267F-5WY72XX"

GENERAL PRODUCT INFORMATION: DaimlerChrysler SKREES

The SKREES (Sentry Key REmote Entry System) being certified for the DaimlerChrysler Corporation has been designed by:

Siemens VDO Automotive
4685 Investment Drive
Troy, MI 48098
FCC Grantee Code: M3N

The SKREES will be manufactured by:

Siemens VDO S.A. de C.V.
Camino a la Tijera # 3
Km 3.5 Carretera Guadalajara-Morelia
C.P. 45640 Mpio. Tlajomulco de Zúñiga, Jalisco
Mexico

The SKREES will be distributed by the DaimlerChrysler Corporation and will be serviced by its authorized automobile dealers and service shops in the United States of America, Canada and other countries.

FUNCTIONAL DESCRIPTION OF THE DaimlerChrysler SKREES

System Components
The DaimlerChrysler SKREES (Sentry Key REmote Entry System) is a vehicle immobilization and Remote Keyless Entry (RKE) system. This system consists of a module or base station called the SKREEM (Sentry Key REmote Entry Module) and the fob or combi-key called a SKREEK (Sentry Key REmote Entry Key).

The SKREEM is located near the vehicle's ignition cylinder. The Transponder is located within the SKREEK which is attached to the ignition key. This Transponder is energized via low frequency magnetic coupling with the SKREEM. The SKREEM (control module or base station) is connected via a wire harness to vehicle power, vehicle ground, vehicle ignition, and the vehicle communications bus. The communications bus is a single line digital interface. This bus allows communications between the SKREEM and other vehicle controllers such as the Engine Control Module and Body Controller.

System Operation
The DaimlerChrysler Sentry Key Remote Entry System (SKREES) combines an Immobilizer Module and a Remote Keyless Entry Module into one system that performs functions of both modules. Therefore, SKREES can be in fact divided into two major sub-systems: a Sentry Key Immobilizer and a Remote Keyless Entry.

Immobilizer: SKREEM Transmits VPWM encoded 125kHz ASK data to the SKREEK
SKREEM Receives Manchester encoded 125kHz ISK data from SKREEK
Philips HITAG2+ protocol and encryption algorithm

Remote keyless Entry: SKREEK transmits 315 MHz ASK Manchester data to the SKREEM
Philips HITAG2+ protocol and encryption algorithm

The Sentry Key Immobilizer sub-system authenticates an electronically coded Sentry Key Remote Entry Key (SKREEK) placed into the ignition and sends a valid/invalid key message to the engine controller based on the results. The authentication of the SKREEK is performed using Philips HITAG2 protoco and Philips HITAG2 encryption algorithm. The "valid/invalid key" message communication is performed using a DaimlerChrysler proprietary rolling code algorithm via a J1850 bus. A "valid key" message must be sent to the engine controller within 2 seconds of ignition ON to free the engine from immobilization.

The Sentry Key Remote Keyless Entry sub-system of SKREEM receives an encrypted RF signal from a SKREEK. SKREEM then decrypts the signal and broadcasts the requested remote commands to the appropriate control modules in the vehicle through J1850 bus. The RF data is encrypted using Philips HITAG2 encryption algorithm. A valid SKREEK ID must be incorporated into the RF signal in order for the SKREEM to pass the message to the control modules.

Automatic SKREEK synchronization is done by SKREEM if valid SKREEK is detected when it is inserted into the ignition cylinder and ignition is turned on. This provides a maximum operation window for RKE functions.

Each DaimlerChrysler SKREES consists of a SKREEM and a SKREEK. Each system has a secret key code unique to that system. The secret key is electronically coded in the SKREEM and in all programmed SKREEKs. It is used for immobilizer and RKE functions for data security. In addition, each SKREEK will have a unique identification (IDE). A system block diagram is given in Figure 1.

RKE Receiver
The purpose of the RF link is to provide remote vehicle access. The RF link is comprised of the base station's (SKREEM) RF receiver and the fob's (SKREEK) RF transmitter.
The SKREEM contains a stand-alone, daughter board, superheterodyne 315 MHz receiver for remote keyless entry operation. **This device has been tested to comply with FCC standards for automotive use and is certified in Canada under 267 1032 336A.**