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Re: Certification for Lear Corporation
TPM Wheel Electronic
FCC ID: KOBHT05TPM
IC: 3521A-HT05TPM

DESCRIPTION OF OPERATION

GENERAL DESCRIPTION OF LOW-LINE SENSOR

The product for which certification is pursued will be manufactured for Hyundai / Kia Motor Company by Lear Corporation for automotive applications. The module is intended to report Tire information like pressure and temperature, along with battery information to a central receiving module. This device is called a wheel electronic (WE).

There are two versions of the WE; high-line and low-line. The high-line transmits four words per transmission event while the vehicle is moving. There are not transmissions while the vehicle is stationary.

The other version, low-line, will transmit three words per transmission event – where a transmission event is typically each 180 seconds. Each word is 10.1ms nominally. There is 100ms up to 275ms of “space” between words.

The transmitter section of the design is identical between the two different versions. The 315 MHz transmitter works in conjunction with a receiver that is mounted in the vehicle’s passenger compartment. The transmitter is a 3-volt, single cell battery operated module which is fixed to a special valve stem and is mounted to the rim inside each tire. The WE transmits tire environmental information, such as pressure, temperature, and acceleration to the receiver.

Differences between these versions are as follows: different software controlling the period of transmission, the Hyundai / Kia / Lear part number laser etched on the housing. The PCB, microprocessor and RF circuitry on all versions are identical.

The WE transmitter contains one 3 volt battery and a printed circuit board assembly. The one piece exterior housing is a molded plastic with an air valve attached, however flexible, with the Hyundai / Kia / Lear #, FCC ID #, and IC # laser etched into the plastic. The PCB is inserted to the housing and is potted to keep all foreign materials out.

TECHNICAL DESCRIPTION

The microprocessor makes interval measurements of pressure, temperature, and acceleration (high-line only). The data is then transmitted by RF to the receiver at certain intervals. The code is carried by a 315 MHz carrier with FSK modulation and radiated by an on board antenna. The data code is conditional diphas modulation format to express bits “0” and “1”. The clock out from the RF PLL (Phase Lock Loop) is used to stabilize the data. The antenna is a PCB loop trace and a rigid wire combination. The 315 MHz transmit frequency is generated by a PLL, stabilized by a crystal.

Frequency tolerance is better than 315 MHz, +/- 65 kHz.

The WE is capable of forced communication through a 125 kHz interface.