LH/WJ Electronic Vehicle Information Center Ò Module Description of Operation

The LH/WJ module consists of three basic sections: the Electronic Vehicle Information Center (EVIC) section, the Homelink® section, and the PSI section.

The EVIC section provides data to the user via a dot matrix Vacuum Fluorescent Display (VFD). There are seven switches on board, four of which allow the user to change EVIC modes of operation, and three others, which allow the user to select Homelink® operation. The EVIC microprocessor then powers up the Homelink® section, and communicates to the Homelink® microprocessor which channel has been selected.

The Homelink® transmitter is a radio frequency transceiver device whose primary function is to determine both frequency and bit code format of typical garage door remote control devices and identically re-transmit them to the original garage door opener receiver. The on-board microcontroller maintains the operational frequency band as 288Mhz to 418Mhz excluding forbidden bands of 240MHz to 285MHz, 322MHz to 335.4MHz and 399.9MHz to 410 MHz.

The “training” operation is performed by scanning the legal frequencies with a single conversion superheterodyne receiver, looking for valid garage door opener bit code formats.

In addition to being frequency and data format adaptive the Homelink® transmitter is also RF amplitude adaptive. During the training sequence, the duty factor of the incoming bit code format is evaluated by the microcontroller determining the greatest amount of on-time in a 100 mS window. The duty factor is then used to mathematically adjust the output power in a range of 80% (1.9dB) to an upper limit of 30% (10.5dB) duty cycle. A 9 bit attenuator is adjusted by a closed loop power control algorithm in the microcontroller.

After the training sequence the frequency bit code format and attenuator setting is stored in
Non Volatile Memory (NVM) and retrieved on subsequent power ups. The VCO is set on the desired RF carrier frequency stored in NVM. The antenna is fine-tuned by sweeping twice around the expected tuning point. The voltage-controlled oscillator (VCO) is then modulated with the appropriate bit code information from the NVM.

The basic function of the PSI system is to communicate the tire pressure information to the operator of the vehicle via the EVIC. The PSI system consists of two different sections. The first is a super heterodyne radio frequency receiver circuit built into the EVIC. This receiver interfaces with the EVIC to provide actual tire pressure data as well as tire pressure-related messages to the driver. These messages include low tire pressure, high tire pressure, training messages, and general messages to service system when the tire pressure sensor transmitters are faulted or have a low battery.

The second section is the tire air pressure transmitters that use a 433.92 MHz AM modulation radio frequency transmitter to communicate with the receiver in the EVIC. Each tire has one of these tire pressure sensor transmitters installed in the rims. The transmitters then communicate back to the receiver the pressure information and a unique id code from each tire.

In order to train the PSI system to recognize which pressure transducer relates to which tire, the operator must first place the system in training mode via the EVIC. The display in the EVIC will then prompt the operator which tire to go to first. The operator can then take either a magnet or a 125 kHz transponder within close proximity of the pressure sensor of the tire indicated on the display. These tire pressure sensor transmitters will then send the appropriate message to the EVIC receiver identifying which tire is being trained. This process then needs to be repeated for each of the tires as prompted by the EVIC display.