

## **GENERAL**

This system provides the vehicle owner with compass, temperature, trip computer information, tire pressure information(PSI), and integrated Homelink. The Homelink and tire pressure portions of the circuit are separate from the compass section, except that the compass microprocessor controls the power to the Homelink section and the tire pressure section. The compass microprocessor also serially communicates to the Homelink/PSI microprocessor which switch has been pressed and the Homelink/PSI microprocessor communicates back the tire pressure information to the compass microprocessor for display to the driver. The following information refers to the Homelink part of the system and also to the PSI part of the system.

### **Homelink Operational Description**

This system gives the vehicle owner the ability to use a garage door opener (GDO) that is integral to the interior trim of the vehicle. The Homelink shall be capable of learning and remembering variables required to emulate three different GDO transmitters. In the learn mode of operation, the user selects one of three channels. The Homelink determines the frequency, data and, where applicable, the Rolling Code manufacturer of the original GDO transmitter (OT). The frequency and data stream or rolling algorithm parameters (created within the OT's Rolling Code guidelines) are then stored in non-volatile memory (NVM) for use in the transmit mode of operation. Once contained in memory, the Homelink shall activate the given receiver by repeating, at the proper frequency, either a fixed data stream or a hopping data stream created with the OT's Rolling Code algorithm.

### **Homelink Transmit Mode of Operation**

If a selected channel has been previously trained, the HomeLink shall operate in transmit mode. To operate the Homelink in the transmit mode, the user shall activate one of three transmit buttons. The Compass microprocessor shall determine which button has been activated and send the information serially to the Homelink microprocessor, which shall generate appropriate data at the proper frequency.

The VFD indicator shall be ON continually during transmit mode.

The VFD indicator shall rapidly blink ( $4\text{Hz} \pm 10\%$ ) for  $2 \pm 10\%$  seconds followed by continuous illumination during Rolling Code PWM transmissions.

The HomeLink will continue in the transmit mode for twenty ( $20 \pm 10\%$ ) seconds before proceeding to the learning mode of operation.

### **Homelink Default Mode of Operation**

If a selected channel has never been previously trained nor previously erased, the Homelink shall operate in default mode. To operate the Homelink in the default mode, the user shall activate one of three transmit buttons. The HomeLink shall determine which button has been activated, and using a pre-determined identification code and frequency (see Appendix B for details) shall transmit such data with the VFD indicator continually on. The HomeLink will continue in the default mode for twenty ( $20 \pm 10\%$ ) seconds before proceeding to the learning mode of operation.

### **Homelink Rolling Code Default Mode of Operation**

The user places the Homelink in rolling code default mode by simultaneously holding down buttons one, two, and three for  $30 \pm 10\%$  seconds.

If buttons one, two and three are released while the VFD is rapidly blinking (< 10 seconds), all three channels will be cleared of data. When one of these channels is subsequently activated, the device shall immediately enter the learn mode of operation.

To operate the Homelink unit in the rolling code default mode, the user shall activate one of the three transmit buttons. The Homelink unit shall determine which button has been activated and using a pre-determined code-hopping algorithm, bit period and frequency (see Appendix B for details) shall transmit such data with the VFD indicator rapidly blinking ( $4\text{Hz} \pm 10\%$ ) for  $2 \pm 10\%$  seconds followed by continuous illumination.

### **Homelink Learn Mode of Operation**

The Homelink system can learn up to three (3) separate garage door opener (GDO) systems. To train a GDO transmitter to the Homelink system, the user shall complete the following steps:

- \* select one of three channels by selecting 1 of three transmit buttons. If more than one channel is selected at one time, the Homelink shall give the lowest numbered channel highest priority. For example if channel 2 and 3 are selected, channel 2 shall have the higher priority.
- \* hold a transmit button for twenty ( $20 \pm 10\%$ ) seconds at which time the learn mode shall be indicated. The Homelink shall be in learn mode only if the VFD indicator is blinking at a rate of  $1\text{Hz} \pm 10\%$ . (The Homelink shall immediately enter learn mode if the selected channel is determined to be clear of data. See 1.2.4)
- \* hold the present GDO transmitter near the Homelink. The Homelink shall train when the OT is held within 1 inch, and shall not train if the OT is held more than 3 feet away from the unit. Once in learn mode, the training process will be complete in  $\leq 90$  seconds and shall be indicated by rapidly blinking the VFD ( $4\text{Hz} \pm 10\%$ ) 40 times. After completion the VFD indicator shall be off.
- \* the data containing the frequency of operation and security code information shall be stored in non-volatile memory (NVM).

### **Homelink Clear Mode of Operation**

The NVM of the Homelink can be completely erased by simultaneously holding down buttons one and three for  $20 \pm 10\%$  seconds. Successful erasure of the memory shall be indicated by rapidly blinking the VFD indicator ( $4\text{Hz} \pm 10\%$ ) 40 times.

- \* If buttons one and three are released while the VFD indicator is blinking rapidly (< 10 seconds), all three channels shall be cleared of data. When one of these channels is subsequently activated, the device shall immediately enter learn mode of operation.
- \* If buttons one and three are continually activated for more than 10 seconds at which the rapid blinking starts, the VFD indicator shall be off. When one of these channels is subsequently activated, the device shall immediately enter default mode of operation.
- \* If buttons one, two, and three are continually activated for more than 10 seconds after the rapid blinking starts, the VFD indicator shall be off. When one of these channels is subsequently activated, the device shall immediately enter rolling code default mode of operation.

## **PSI Operational Description**

This system monitors the tire pressure for each of the tires on the car. It provides basic tire pressure information and warning messages to the driver when the tire pressure is too high or too low. It also provides warning messages when the system is not functioning properly. A tire pressure sensor in each wheel will broadcast a radio frequency tire pressure signal with a unique ID and tire pressure status to the receiver in the EVIC. The PSI system analyzes this information based on the unique ID from the message, it determines which tire has sent the information. This tire pressure information is then displayed on the EVIC display in such a way as to indicate if a tire has a low or high pressure. Pertinent warning messages will be displayed if any of the tire pressures go too low or too high. In addition, if the tire pressure sensor transmitter battery voltage starts to go too low in the transducers or if they are not operating properly then messages displaying these warnings will be displayed on the EVIC display.

## **PSI Train Mode of Operation**

In order for the system to know which tire relates to which pressure transducer, it is necessary to train the system after installation of tires and after any tire rotation or change. To train the PSI system place the ignition in the RUN position and then press the MENU button on the EVIC until the display says "Retrain Tire Sensors", at this point press the STEP button until the option "YES" is displayed. The EVIC will display which tire needs to be trained first. Proceed to that tire and place either a magnet or a 125 kHz transponder within close proximity to the pressure transducer on that tire. When the tire is trained the PSI system will cause the vehicle to provide a single horn chirp. At this point, proceed to the next tire, which is indicated by the display on the EVIC. Repeat this process for each of the tires.

*This device complies with FCC rules part 15. Operation is subject to the following two conditions: (1)This device may not cause harmful interference, and (2)This device must accept any interference that may be received including interference that may cause undesired operation. WARNING: The device has been tested and complies with FCC and IC rules. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the device.*

*The term "IC:" before the certification/registration number only signifies that Industry Canada technical specifications were met.*

*NOTE: This equipment has been tested and found to comply with the limits for B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:*

- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help.*

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