CHIME/BUZZER

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CHIME WARNING SYSTEM

DESCRIPTION

A chime warning system is standard factory-installed equipment on this model. The chime warning system uses a single chime tone generator that is integral to the Central Timer Module (CTM) to provide an audible indication of various vehicle conditions that may require the attention of the vehicle operator. The chime warning system includes the following major components, which are described in further detail elsewhere in this service manual:

- **Central Timer Module** - The Central Timer Module (CTM) is located under the driver side end of the instrument panel, inboard of the instrument panel steering column opening. The CTM contains an integral chime tone generator to provide all of the proper chime warning system features based upon the monitored inputs.
- **Door Ajar Switch** - A door ajar switch is integral to the driver side front door latch. This switch provides an input to the chime warning system indicating whether the driver side front door is open or closed.
- **Headlamp Switch** - The headlamp switch is located on the instrument panel outboard of the steering column. The headlamp switch provides an input to the chime warning system indicating when the exterior lamps are turned On or Off.
- **Ignition Switch** - A key-in ignition switch is integral to the ignition switch. The key-in ignition switch provides an input to the chime warning system indicating whether a key is present in the ignition lock cylinder.
- **Seat Belt Switch** - A seat belt switch is integral to the driver side front seat belt buckle unit. The seat belt switch provides an input to the chime warning system indicating whether the driver side front seat belt is fastened.

Hard wired circuitry connects many of the chime warning system components to each other through the electrical system of the vehicle. These hard wired circuits are integral to several wire harnesses, which are routed throughout the vehicle and retained by many different methods. These circuits may be connected to each other, to the vehicle electrical system and to the chime warning system components through the use of a combination of soldered splices, splice block connectors, and many different types of wire harness terminal connectors and insulators. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

The CTM chime warning system circuitry and the integral chime tone generator cannot be adjusted or repaired. If the CTM or the chime tone generator are damaged or faulty, the CTM unit must be replaced.

OPERATION

The chime warning system is designed to provide an audible output as an indication of various conditions that may require the attention or awareness of the vehicle operator. The chime warning system components operate on battery current received through a fused B(+) fuse in the Junction Block (JB) on a non-switched fused B(+) circuit so that the system may operate regardless of the ignition switch position.

The chime warning system provides an audible indication to the vehicle operator under the following conditions:

- **Fasten Seat Belt Warning** - The Central Timer Module (CTM) chime tone generator will generate repetitive chime tones at a slow rate to announce that a hard wired input from the seat belt switch to the Electro-Mechanical Instrument Cluster (EMIC) indicates that the driver side front seat belt is not fastened with the ignition switch in the On position. Unless the driver side front seat belt is fastened, the chimes will continue to sound for a duration of about seven seconds each time the ignition switch is turned to the On position or until the driver side front seat belt is fastened, whichever occurs first. This chime tone is based upon a hard wired chime request input to the CTM from the EMIC, but is not related to the operation of the EMIC “Seatbelt” indicator.

CHIME WARNING SYSTEM (Continued)

- **Head/Park Lights-On Warning** - The CTM chime tone generator will generate repetitive chime tones at a fast rate to announce that hard wired inputs from the driver door ajar switch, headlamp switch, and ignition switch indicate that the exterior lamps are turned On with the driver side front door opened and the ignition switch in the Off position. The chimes will continue to sound until the exterior lamps are turned Off, the driver side front door is closed, or the ignition switch is turned to the On position, whichever occurs first.
- **Key-In-Ignition Warning** - The CTM chime tone generator will generate repetitive chime tones at a fast rate to announce that hard wired inputs from the driver door ajar switch, headlamp switch, and ignition switch indicate that the key is in the ignition lock cylinder with the driver side front door opened and the ignition switch in the Off position. The chimes will continue to sound until the key is removed from the ignition lock cylinder, the driver side front door is closed, or the ignition switch is turned to the On position, whichever occurs first.
- **Warning Chime Support** - The CTM chime tone generator will generate repetitive chime tones at a slow rate to announce that a hard wired chime request input has been received from the EMIC. These chime tones provide an audible alert to the vehicle operator that supplements certain visual indications displayed by the EMIC. Supplemented indications include the following:
- The "Airbag" indicator is illuminated. The chimes will continue to sound for a duration of about four seconds each time the indicator is illuminated or until the ignition switch is turned to the Off position, whichever occurs first.
- The "Check Gages" indicator is illuminated. The chimes will continue to sound for a duration of about two seconds each time the indicator is illuminated or until the ignition switch is turned to the Off position, whichever occurs first.
- The "Low Fuel" indicator is illuminated. The chimes will continue to sound for a duration of about two seconds each time the indicator is illuminated or until the ignition switch is turned to the Off position, whichever occurs first.
- The "Low Wash" indicator is illuminated. The chimes will continue to sound for a duration of about two seconds each time the indicator is illuminated or until the ignition switch is turned to the Off position, whichever occurs first.
- The "Trans Temp" indicator is illuminated (automatic transmission only). The chimes will continue to sound for a duration of about two seconds each time the indicator is illuminated or until the ignition switch is turned to the Off position, whichever occurs first.
- The vehicle is over a programmed speed value (Middle East Gulf Coast Country (GCC) only). The CTM chime tone generator will generate repetitive chime tones at a slow rate to announce that the vehicle speed exceeds a programmed value. The chimes will continue to sound until the vehicle speed is below the programmed value.
- The "Water-In-Fuel" indicator is illuminated (diesel engine only). The chimes will continue to sound for a duration of about two seconds each time the indicator is illuminated or until the ignition switch is turned to the Off position, whichever occurs first.

The CTM provides chime service for all available features in the chime warning system. The CTM relies upon hard wired inputs from the driver door ajar switch, the EMIC, the headlamp switch, and the key-in ignition switch (ignition switch) to provide chime service for all of the chime warning system features. Upon receiving the proper inputs, the CTM activates the integral chime tone generator to provide the audible chime tone to the vehicle operator. The chime tone generator in the CTM is capable of producing repeated chime tones at two different rates, slow or fast. The slow chime rate is about fifty chime tones per minute, while the fast chime rate is about 180 chime tones per minute. The internal programming of the CTM and the EMIC determines the priority of each chime tone request input that is received, as well as the rate and duration of each chime tone that is to be generated.

The hard wired chime warning system inputs to the CTM and the EMIC, as well as other hard wired circuits for this system may be diagnosed and tested using conventional diagnostic tools and procedures. See the owner's manual in the vehicle glove box for more information on the features provided by the chime warning system.

DIAGNOSIS AND TESTING - CHIME WARNING SYSTEM

Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds. The hard wired chime warning system inputs to the Central Timer Module (CTM) and the Electro-Mechanical Instrument Cluster (EMIC), as well as other hard wired circuits for this system may be diagnosed and tested using conventional diagnostic tools and procedures.

CHIME WARNING SYSTEM (Continued)

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE, THEN WAIT TWO MINUTES FOR THE AIRBAG SYSTEM CAPACITOR TO DISCHARGE BEFORE PERFORMING FURTHER DIAGNOSIS OR SERVICE. THIS IS THE ONLY SURE WAY TO DISABLE THE AIRBAG SYSTEM. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

CHIME WARNING SYSTEM DIAGNOSIS		
CONDITION	POSSIBLE CAUSES	CORRECTION
SEAT BELT WARNING CHIME WITH SEAT BELT BUCKLED	1. Seat belt switch sense circuit shorted.	1. Disconnect the body wire harness connector for the seat belt switch and the instrument panel wire harness connector (Connector C2) for the EMIC. Check for continuity between the seat belt switch sense circuit cavity and a good ground. There should be no continuity. Repair the seat belt switch sense circuit, if required.
	2. Faulty seat belt switch.	2. Check for continuity between the ground circuit cavity and the seat belt switch sense circuit cavity of the seat belt switch connector receptacle. There should be no continuity with the seat belt buckled. Replace the faulty seat belt, if required.
NO SEAT BELT WARNING CHIME WITH SEAT BELT UNBUCKLED, BUT OTHER CHIME FEATURES OK	1. Seat belt switch ground circuit open.	1. Disconnect the body wire harness connector for the seat belt switch. Check for continuity between the ground circuit cavity of the connector for the seat belt switch and a good ground. There should be continuity. If not OK, repair the open ground circuit to ground as required.
	2. Seat belt switch sense circuit open.	2. With the body wire harness connector for the seat belt switch and the instrument panel wire harness connector (Connector C2) for the EMIC disconnected, there should be continuity between the seat belt switch sense circuit cavities of the two connectors. Repair the seat belt switch sense circuit, if required.
	3. Faulty seat belt switch.	3. Check for continuity between the ground circuit cavity and the seat belt switch sense circuit cavity of the seat belt switch connector receptacle. There should be continuity with the seat belt unbuckled. Replace the faulty seat belt, if required.

CHIME WARNING SYSTEM (Continued)

CHIME WARNING SYSTEM DIAGNOSIS		
CONDITION	POSSIBLE CAUSES	CORRECTION
NO KEY-IN IGNITION WARNING CHIME, BUT OTHER CHIME FEATURES OK	1. Driver door ajar switch sense circuit open.	1. Check for continuity between the driver door ajar switch sense circuit cavities of the connector for the driver side front door ajar switch and the instrument panel wire harness connector (Connector C2) for the ignition switch. Repair the driver door ajar switch sense circuit, if required.
	2. Key-in ignition switch sense circuit open.	2. Check for continuity between the key-in ignition switch sense circuit cavities of the instrument panel wire harness connector (Connector C2) for the ignition switch and the instrument panel wire harness connector for the CTM. Repair the key-in ignition switch sense circuit, if required.
	3. Faulty ignition switch.	3. Check for continuity between the two terminals in the ignition switch C2 connector receptacle. There should be continuity with a key in the ignition lock cylinder. Replace the faulty ignition switch, if required.
NO HEADLAMPS-ON WARNING CHIME, BUT OTHER CHIME FEATURES OK	1. Driver door ajar switch sense circuit open.	1. Check for continuity between the driver door ajar switch sense circuit cavities of the connector for the driver side front door ajar switch and the instrument panel wire harness connector (Connector C1) for the headlamp switch. Repair the driver door ajar switch sense circuit, if required.
	2. Key-in ignition switch sense circuit open.	2. Check for continuity between the key-in ignition switch sense circuit cavities of the instrument panel wire harness connector (Connector C1) for the headlamp switch and the instrument panel wire harness connector for the CTM. Repair the key-in ignition switch sense circuit, if required.
	3. Faulty headlamp switch.	3. Check for continuity between the driver door ajar switch sense terminal and the key-in ignition switch sense terminal in the headlamp switch C1 connector receptacle. There should be continuity with the headlamp switch in the On position. Replace the faulty headlamp switch, if required.
CONTINUOUS CHIME WITH HEADLAMP SWITCH IN OFF POSITION AND KEY REMOVED FROM IGNITION LOCK CYLINDER	1. Key-in ignition switch sense circuit shorted.	1. With the instrument panel wire harness connector (Connector C1) for the headlamp switch, the instrument panel wire harness connector (Connector C2) for the ignition switch, and the instrument panel wire harness connector for the CTM all disconnected, there should be no continuity between the key-in ignition switch sense circuit and a good ground. Repair the key-in ignition switch sense circuit, if required.
	2. Faulty CTM.	2. Replace the faulty CTM, if required.

CHIME WARNING SYSTEM (Continued)

CHIME WARNING SYSTEM DIAGNOSIS		
CONDITION	POSSIBLE CAUSES	CORRECTION
NO CHIMES AND OTHER CTM FEATURES ERRATIC OR DISABLED	1. CTM ground circuit(s) open.	1. Check for continuity between the ground circuit cavities of the instrument panel wire harness connector(s) for the CTM and a good ground. Repair the ground circuit(s), if required.
	2. CTM fused B(+) circuit open.	2. Check for battery voltage at the fused B(+) circuit cavity of the instrument panel wire harness connector for the CTM. Repair the fused B(+) circuit, if required.
	3. CTM fused ignition switch output (start-run) circuit open.	3. With the ignition switch in the On position, check for battery voltage at the fused ignition switch output circuit cavity of the instrument panel wire harness connector for the CTM. Repair the fused ignition switch output circuit, if required.
	4. Faulty CTM.	4. Replace the faulty CTM, if required.
NO WARNING CHIME SUPPORT FEATURES FOR EMIC, BUT HARD WIRED CHIMES OK	1. Tone request signal circuit open.	1. Check for continuity between the tone request signal circuit cavities of the instrument panel wire harness connectors for the EMIC and the CTM. Repair the open tone request signal circuit, if required.
	2. Tone request signal circuit shorted.	2. With the instrument panel wire harness connectors for the EMIC and the CTM both disconnected, there should be no continuity between the tone request signal circuit and a good ground. Repair the shorted tone request signal circuit, if required.
	3. Faulty CTM.	3. Replace the faulty CTM, if required.
	4. Faulty EMIC.	4. Replace the faulty EMIC, if required.
NO CHIMES, BUT ALL OTHER CTM FEATURES OK	1. Faulty CTM.	1. Replace the faulty CTM, if required.