# CHIME WARNING/REMINDER SYSTEM

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## GENERAL INFORMATION

### INTRODUCTION

**WARNING: ON VEHICLES EQUIPPED WITH AN AIRBAG, REFER TO GROUP 8M, RESTRAINT SYSTEMS FOR SAFETY PRECAUTIONS AND WARNINGS TO OBSERVE WHEN SERVICING AIRBAG RELATED COMPONENTS.**

The chime system provides the driver with warning chimes for:

- Seat Belt
- Exterior Lamps ON
- Key-In Ignition
- Engine Temperature Critical
- Turn Signals ON
- Dome Lamp ON
- Low Oil Pressure
- High Speed Warning
- Warning Lamp Announcement
- Catalyst Overheating

The Chime Warning/Reminder System is diagnosed using a scan tool (DRB). Refer to the proper Body Diagnostic Procedures manual for testing procedures and scan tool usage instructions.

## DIAGNOSIS AND TESTING

### CATALYST OVERHEAT WARNING CHIME

The Catalyst Overheat Warning Chime will act as a warning to the driver that the vehicle's catalyst has entered an overheat condition. The Powertrain Control Module (PCM) will enable or disable this feature for the appropriate vehicles. Right hand drive gas vehicles only. The Body Control Module (BCM) will monitor the CCD bus for status and signal a catalyst overheat condition with continuous warning chime when the following conditions are met:

- Ignition switch in the ON position
- Engine running at 420 to 480 rpm for 10 seconds
- CCD status and with a chime rate of one chime per second.

### CHIME SYSTEM DIAGNOSIS

*NO TONE WHEN IGNITION SWITCH IS TURNED ON AND DRIVER'S SEAT BELT IS NOT BUCKLED.*

(1) Using a scan tool (DRB), check for tone in any other function.

(2) Using a voltmeter, check for voltage:

(a) Pin 9 of the internal 32 way connector of the BCM for battery feed.

(b) Pin 8 of the internal 32 way connector of the BCM for ignition feed.

(c) If voltage OK, go to step Step 3

(d) If NO voltage repair as necessary. Refer to Group 8W, Wiring Diagrams for component locations and circuit information.

(3) Check driver's seat belt buckle switch input for a closed circuit when not buckled. If input not seen, look for open in wiring or switch. The switch is grounded when belt is not buckled.

(4) Repair as necessary.

*NO FASTEN SEAT BELT LAMP WHEN IGNITION SWITCH IS TURNED ON.*

(1) Check for burned out lamp.

(2) Using a voltmeter check for voltage:

(a) Pin 2 of the mechanical instrument cluster for battery feed.

(b) Pin 11 of the mechanical instrument cluster for ignition voltage.

(3) Repair as necessary.

DIAGNOSIS AND TESTING (Continued)

*FASTEN SEAT BELT LAMP OR TONE CONTINUES FOR MORE THAN 10 SECONDS AFTER SEAT BELTS ARE FASTENED AND DRIVER'S DOOR IS CLOSED.*

(1) Check left door ajar switch for no ground when switch is depressed.

(a) If continuity replace door ajar switch.

(b) If NO continuity replace BCM for tone condition, or replace mechanical instrument panel for lamp condition.

(c) Replace BCM for tone condition.

(d) Replace mechanical instrument cluster for lamp condition.

*NO TONE WHEN PARK OR HEADLAMPS ARE ON AND DRIVER'S DOOR IS OPEN.*

(1) Check left door ajar switch for good ground when driver's door is open. Repair as necessary.

(2) Inspect BCM connectors and wires for proper connection. If OK, replace BCM for tone condition.

## DOME LAMP ON CHIME

The dome lamp on chime will warn the driver that the dome lamps have been left on.

With the ignition is OFF:

- Driver's door OPEN (door ajar switch is closed to ground)
- Dome lamps are ON (dome lamp switch is closed to ground),

The chime will sound continuously until driver's door is closed, dome lamps tuned OFF or until the battery protection time out of 15 minutes has expired. Refer Group 8L, Lamps proper procedures. Chime rate: 168 to 192 chimes per minute.

## ENGINE TEMPERATURE CRITICAL CHIME

The engine temperature critical chime will warn the driver that the vehicle's engine is overheating. While monitoring the coolant temperature, the Powertrain Control Module (PCM) will send on the CCD bus as engine temperature every 1.376 seconds to the Body Control Module (BCM). The BCM calculates engine temperature and determines if a warning should occur. This feature is functional only with the Ignition Switch in the Run/Start position. On the Diesel vehicles, the coolant temperature sensor is read directly by the BCM.

When the engine temperature reaches 122°C (252°F) or the diesel engine 112°C (234°F), the BCM will chime one tone and the engine temperature lamp comes ON. The BCM turns OFF the lamp when the engine temperature reaches 117°C (242°F) or the diesel engine 108°C (226°F). The BCM will chime continuously when the engine temperature reaches 125°C (257°F) or diesel engine 116°C (241°F). The chime will turn OFF after four minutes or when the temperature reaches 117°C (242°F) or diesel engine 108°C (226°F), which ever occurs first.

## EXTERIOR LAMPS ON CHIME

The exterior lamp on chime will warn the driver that the exterior lights have been left on.

With the ignition switch OFF:

- Driver's door is open (door ajar switch is closed to ground)
- Parking lamps or headlamps ON (parking lamp switch is closed to ground)

The chime will sound until lights are turned OFF, driver's door closed or until the battery protection time out of 3 minutes has expired.

Refer to Group 8L, Lamps, for proper service procedures. Chime rate: 168 to 192 chimes per minute.

To test the exterior lamps left on function:

- Turn ignition off
- Remove ignition key
- Turn exterior lamps on with driver's door open.

Chime should sound until lamps are turned off or driver's door is closed.

## KEY-IN IGNITION CHIME

The key-in ignition chime will act as a warning to the driver that the ignition key has been left in the ignition switch.

With the ignition switch is in OFF position ONLY:

- Driver's door is open/ajar (door ajar switch is closed to ground)
- Key is in the ignition switch (key-in ignition switch is closed to ground)

The chime will sound until one of the above conditions is removed. Chime rate: 168 to 192 chimes per minute.

To test the key-in ignition function, insert key into the ignition and open driver's door. Do not turn ignition ON. Chime should sound until key is removed from ignition or driver's door is closed.

## LOW OIL PRESSURE CHIME OPERATION

The low oil pressure chime will warn the driver that the engine oil pressure is low. The oil pressure switch, will close to ground during a low oil pressure condition. The oil pressure lamp will illuminate in the message center. The body control module will monitor the oil pressure switch and signal a low oil pressure condition. A continuous four minute warning chime will sound and the oil pressure lamp will come ON when the following conditions are met:

- Ignition on and engine not cranking
- Engine running at 420 to 480 rpm for 10 seconds
- Oil pressure switch closed to ground for (1 second minimum, 2 seconds maximum)

Chime rate: 168 to 192 chimes per minute.

DIAGNOSIS AND TESTING (Continued)

### SEAT BELT CHIME

The seat belt chime will sound for 4 to 8 seconds, when the ignition is turned on and the driver's seat belt is not buckled (seat belt switch is closed to ground). This is a reminder to the driver to buckle the seat belt. The seat belt lamp is controlled by the mechanical instrument cluster. The cluster will also illuminate the seat belt warning lamp for 6 seconds. Buckling the driver's seat belt before the time out has expired will cause the chime to stop immediately. Chime rate: 38 to 62 chimes per minute.

To test the seat belt warning system, the ignition switch must be in the OFF position for 1 minute before starting the test. Turn the ignition switch to the on position with the driver's seat belt not buckled. The seat belt warning lamp should light and the chime should sound 4 to 8 seconds.

### SEAT BELT LAMP

The seat belt lamp in the instrument cluster signals the vehicle passengers to fasten their seat belts. The seat belt lamp is illuminated directly by the instrument cluster for 6 seconds after the instrument cluster receives the message from the Body Control Module. The seat belt lamp is therefore illuminated for 6 seconds whenever the ignition switch is moved to run/start position.

(1) While ignition is off, the seat belt lamp will not be illuminated.

(2) The ignition power feed status will be updated every 250 milliseconds or on change.

(3) This lamp will be checked by the instrument cluster for 6 seconds with every run/start cycle of the ignition switch.

### TURN SIGNAL ON CHIME

The turn signal on chime will warn the driver that the turn signals have been left on. When the Body Control Module receives a turn signal input for 1.6 km (1.0 miles), vehicle speed is greater than 24 km/h (15 mph), the chime will sound continuously until the turn signal is turned OFF. If vehicle speed drops below 24 km/h (15 mph) prior to the warning being activated, the accumulated distance traveled will be reset. The turn signal chime is not activated when the emergency flashers are turned on. This feature can also be disabled in EEPROM. Chime rate: 38 to 62 chimes per minute.

For the turn signal warning system to operate:

- Must have input from either the right or left turn signal lamps. Creates a voltage change between 0 and battery voltage.
- The vehicle speed sensor sends a message to the Powertrain Control Module that vehicle has exceeded 24 km/h (15 mph) for 1.6 km (1.0 miles).
- When the above two conditions are met, the chime will sound. The chime will stop when no further voltage change is detected.
- If hazard warning signals are pulsing, no chime will sound.
- If speed drops below 24 km/h (15 mph) before the warning is issued, the warning will not be issued and the distance counter will be reset.
- If turn signal lamps are not working properly, the chime will not sound.
- When using the scan tool, refer to the proper Body Diagnostic Manual for the procedure.

### WARNING LAMP ANNOUNCEMENT CHIME

The warning lamp announcement chime will warn the driver to scan the instrument cluster to observe which warning lamp is illuminated. Whenever the volts, low fuel, low washer fluid, coolant level (gas/diesel), low coolant level, engine temperature high (diesel only), door ajar or gate ajar lamps are first illuminated, the chime will sound one tone. The door/liftgate ajar warning lamp announcement chime sounds only if the vehicle speed is above 2 m.p.h.

Two seconds after ignition switch is turned ON or until the seat belt warning chime ends, all warning announcement chimes will be consolidated into one warning announcement. This will occur 2 seconds after the seat belt warning chime ends. If a warning announcement should occur while another warning chime in progress (turn signal, low oil pressure or high speed warnings), no additional chimes will sound after the chime in progress ends. All associated lamps will be illuminated, and the active chime will be the warning announcement.