CHILTON LIBRARY

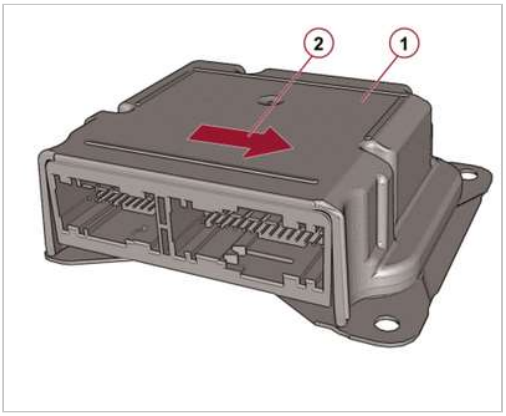
YOUR CURRENT VEHICLE

2018 Chrysler Pacifica

Description & Operation

DESCRIPTION AND OPERATION

DESCRIPTION



The Occupant Restraint Controller (ORC) (1) is secured by three nuts to weld studs on the top of the floor panel transmission tunnel under the center floor console near the instrument panel in the passenger compartment of the vehicle. Concealed within a hollow in the center of the ORC housing is the electronic circuitry of the ORC which includes a microcontroller, an electronic impact sensor, an electronic safing sensor and an energy storage capacitor. A stamped metal cover plate is secured to the bottom of the ORC housing to enclose and protect the internal electronic circuitry and components.

An arrow (2) printed on the label on the top of the ORC housing provides a visual verification of the proper orientation of the unit, and should always be pointed toward the front of the vehicle. The ORC cover plate has integral mounting flanges on the right rearward and both forward corners. Two molded plastic electrical connector receptacles exit the rearward facing side of the ORC housing. These receptacles connect the ORC to the vehicle electrical system through two dedicated take outs and connectors, one from the instrument panel wire harness and the second from the body wire harness.

The impact sensor and safing sensor internal to the ORC are calibrated for the specific vehicle, and are only serviced as a unit with the ORC. In addition, there are unique versions of the ORC for vehicles with or without certain optional Supplemental Restraint System (SRS) components. The ORC cannot be repaired or adjusted and, if damaged or ineffective, it must be replaced.

OPERATION

The microcontroller within the Occupant Restraint Controller (ORC) contains the Supplemental Restraint System (SRS) logic circuits and controls all of the SRS components. The ORC uses On-Board Diagnostics (OBD) and can communicate with other electronic modules in the vehicle as well as with the diagnostic scan tool using the Controller Area Network (CAN) data bus. This method of communication is used for control of the airbag indicator in the Instrument Panel Cluster (IPC) and for SRS diagnosis and testing through the 16-way data link connector located on the driver side lower edge of the instrument panel.

The ORC microcontroller continuously monitors all of the SRS electrical circuits to determine the system readiness. If the ORC detects a monitored system fault, it sets an active and stored Diagnostic Trouble Code (DTC) and sends electronic messages to the IPC over the CAN data bus to turn On the airbag indicator. An active fault only remains for the duration of the fault, or in some cases for the duration of the current ignition cycle, while a stored fault causes a DTC to be stored in memory by the ORC. For some DTCs, if a fault does not recur for a number of ignition cycles, the ORC will automatically erase the stored DTC. For other internal faults, the stored DTC is latched forever.

The ORC receives battery current through two circuits; a fused ignition switch output (run) circuit through a fuse in the Power Distribution Center (PDC) and a fused ignition switch output (run-start) circuit through a second fuse in the BCM. The ORC receives ground through a ground circuit and take out of the instrument panel wire harness that is secured by a nut to a weld stud on the floor panel transmission tunnel. These connections allow the ORC to be operational whenever the ignition switch is in the Start or On positions.

The ORC also contains an energy-storage capacitor. When the ignition switch is in the Start or On positions, this capacitor is continually being charged with enough electrical energy to deploy the SRS components for up to one second following a battery disconnect or failure. The purpose of the capacitor is to provide backup SRS protection in case there is a loss of battery current supply to the ORC during an impact.

Various sensors within the ORC are continuously monitored by the ORC logic. These internal sensors, along with several external impact sensor inputs allow the ORC to determine both the severity of an impact and to verify the necessity for deployment of any SRS components. Two remote front impact sensors are located on the back of the front cross member near the front of the vehicle. The electronic impact sensors are accelerometers that sense the rate of vehicle deceleration, which provides verification of the direction and severity of an impact.

The ORC also monitors inputs from seat belt switches and two additional remote side impact sensors located within the left and right lower B-pillars to control deployment of the side curtain airbag units and seat airbags. The ORC also uses the seat belt switch inputs along with inputs from the Occupant Detection Sensor (ODS) in the passenger front seat cushion to support the seat belt alert feature, and will send electronic messages to the IPC to illuminate the seat belt indicator when appropriate.

The impact sensors within the ORC are electronic accelerometer sensors that provide an additional logic input to the ORC microcontroller. These sensors are used to verify the need for a SRS component deployment by detecting impact energy of a lesser magnitude than that of the primary electronic impact

sensors, and must exceed a safing threshold in order for the SRS components to deploy. A separate impact sensor within the ORC provides confirmation to the ORC microcontroller of side impact forces. This separate sensor is a bi-directional unit that detects impact forces from either side of the vehicle.

Pre-programmed decision algorithms in the ORC microcontroller determine when the deceleration rate as signaled by the impact sensors indicate an impact that is severe enough to require SRS protection and, based upon the severity of the monitored impact, determines the level of front airbag deployment force required for each front seating position. When the programmed conditions are met, the ORC sends the proper electrical signals to deploy the dual multistage front airbags at the programmed force levels, the front seat belt tensioners and either side curtain and seat airbag unit.

The hard wired inputs and outputs for the ORC may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the ORC or the electronic controls and communication between other modules and devices that provide some features of the SRS. The most reliable, efficient and accurate means to diagnose the ORC or the electronic controls and communication related to SRS operation requires the use of a diagnostic scan tool and may also require the use of the SRS Load Tool special tool along with the appropriate Load Tool Jumpers and Adapters. Refer to the appropriate diagnostic information.