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2002 JEEP Grand Cherokee OEM Service and Repair Workshop Manual

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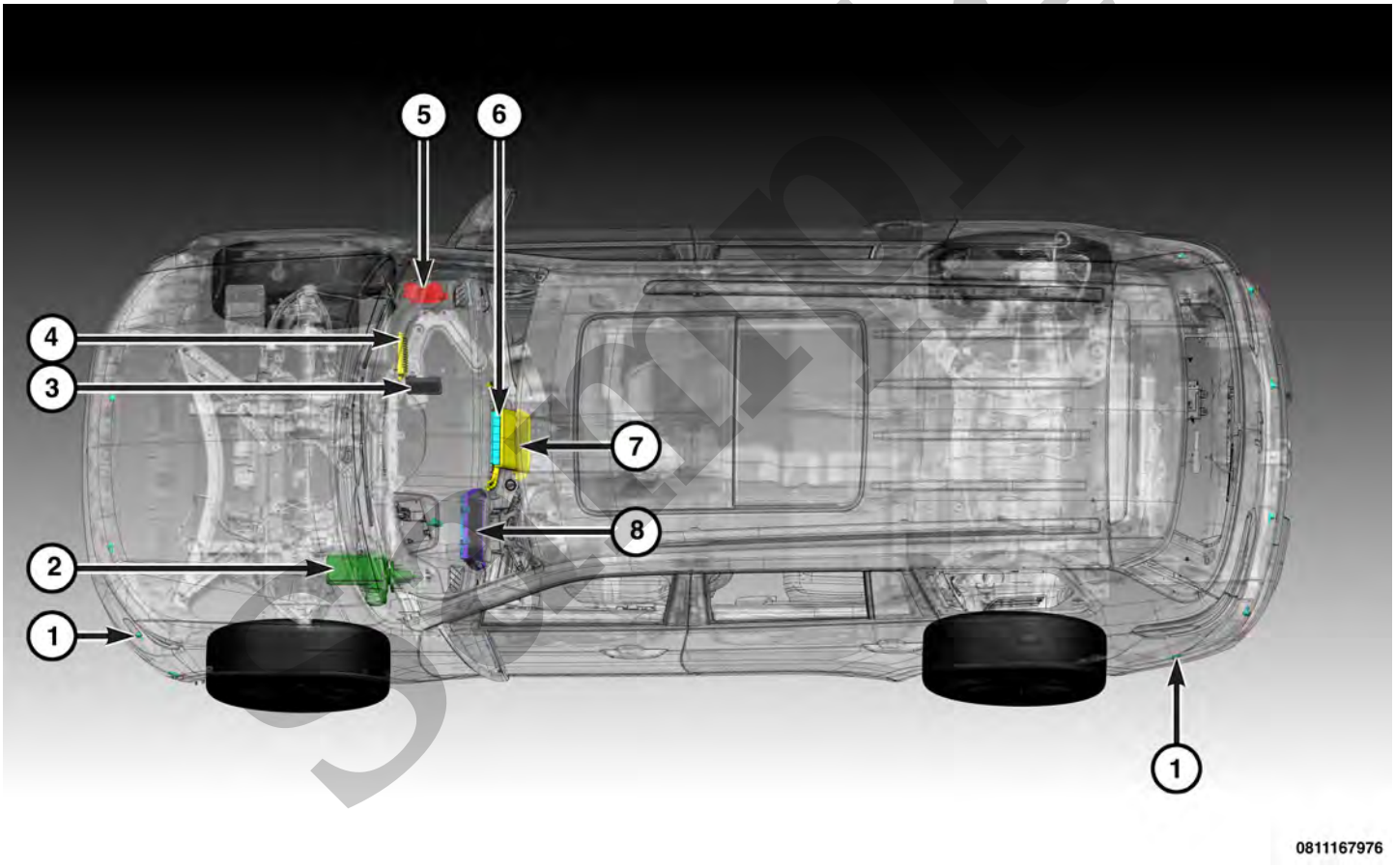
YOUR CURRENT VEHICLE

Park Assist - Parallel And Perpendicular System

PARK ASSIST - PARALLEL AND PERPENDICULAR SYSTEM

DESCRIPTION



Component Index

1.	Front and Rear Park Assist Sensors
2.	Brake System Control Module (BSCM)
3.	Security Gateway (SGW) Module

torque.

Front and Rear Park Assist Sensors

Component Index

The front and rear park assist sensors are hardwired to the PAM and provide radar feedback to the PAM for the purposes of object detection.

Instrument Panel Cluster (IPC)

Component Index

The IPC receives a signal from the PAM with the intent of displaying pop-up textual messages indicating the park assist system instructions and park assist system warnings to the customer.

Park Assist Display

Component Index

When the vehicle is in REVERSE, the IPC display will show the park assist ready system status.

The system will indicate a detected obstacle by showing a arc in one or more regions based on the obstacles distance and location relative to the vehicle.

Park Assist Module (PAM)

Component Index

The PAM signals from the EPS system to determine if the vehicle is travelling in a straight or a curved path and signals from the BSCM to determine the radius of the trajectory travelled by the vehicle.

The PAM manages the steering wheel angle by interfacing with the EPS module control of the Torque Overlay Interface (TOI). When the PAM sends a request for TOI, the steering control and the strategies to perform a parking maneuver are activated. During maneuvering, the PAM continues to check that all conditions are satisfied for PPPA operation and monitors the vehicles lateral displacement. This check is a correlation between X-and-Y coordinates of the planned vehicle position on trajectory and the calculated position of the vehicle based on wheel signal pulses and vehicle angle.

When the reverse gear is engaged the PAM sends a torque overlay request to the EPS module. Once the PAM receives a confirmation response from the EPS module, the EPS module will enable a switching process that allows the steering column torque to be applied. When an increase or decrease in steering wheel angle is being requested by the PAM the steering wheel angle will increase or decrease as a result of torque applied by the EPS.

Dynamic Grid Overlay and Virtual Wall

The RVC is responsible to overlay the dynamic grid line and the dynamic center line. The RVC utilizes a steering angle signal from the DSM via the Electronic Power Steering (EPS) module to calculate the angle of the lines. The RVC does not overlay the lines while the system is in the backup zoomed view. The Top View in the DSM will show in the Uconnect system with Rear View or Front View in a split screen display. There are integrated ParkSense arcs in the image at the front and rear of the vehicle. The arcs will change color from yellow to red corresponding the distance zones to the oncoming object.

The DSM sends a signal to the RVC to enable or disable the virtual wall. When the request is to enable the RVC overlays a virtual wall on the backup camera view. The RVC will not overlay a virtual wall in the backup zoomed mode. The RVCM stores the last known Dynamic Grid Line and Center Line status when the power down status signal is received and then recalls the stored virtual wall status during wake up.

<table>
<tr><th>SIGNAL</th><th>ARC 1</th><th>ARC 2</th><th>ARC 3</th><th>ARC 4</th><th>ARC 5</th><th>ARC 6</th><th>NO OBJECT DETECTED</th><th>SNA</th></tr>
<tr><td>Inner Left</td><td rowspan="4">Red Indicator for object in the detection zone</td><td rowspan="4">Orange Indicator for object in the detection zone</td><td rowspan="4">Orange Indicator for object in the detection zone</td><td>Yellow Indicator for object in the detection zone</td><td>Yellow Indicator for object in the detection zone</td><td>Yellow Indicator for object in the detection zone</td><td rowspan="4">None</td><td rowspan="4">None</td></tr>
<tr><td>Outer Left</td><td>None</td><td>None</td><td>None</td></tr>
<tr><td>Inner Right</td><td>Yellow Indicator for object in the detection zone</td><td>Yellow Indicator for object in the detection zone</td><td>Yellow Indicator for object in the detection zone</td></tr>
<tr><td>Outer Right</td><td>None</td><td>None</td><td>None</td></tr>
</table>

SYSTEM SIGNALS

NOTE

Component Index

1.	Long Range Radar Front (LRRF)
2.	Powertrain Control Module (PCM)
3.	Body Control Module (BCM)
4.	Long Range Camera Front (LRCF)
5.	Central ADAS Decision Module (CADM)
6.	Cruise Control Switch
7.	Instrument Panel Cluster (IPC)
8.	Brake System Control Module (BSCM)

The CADM controlled ACC system is a convenience feature (not a safety system) that allows the driver to keep cruise control engaged while driving without having to constantly reset the system when approaching slower moving vehicles.

A moving vehicle is defined a vehicle that the system determines has a speed greater than zero (vehicle is in motion).

A stopped vehicle is defined as a vehicle that the system initially determined had a speed greater than zero, then came to a standstill (vehicle was in motion, then came to a stop/standstill).

A stationary vehicle is defined as a vehicle that the system has never determined to have a speed greater than zero (always at standstill).

The ACC system uses the sensor data fusion from RADAR and a LRCF to detect vehicle(s) in the forward path of the host vehicle that are moving, stopped and stationary.

If the ACC system detects a slower moving target vehicle in the path of the host vehicle, it will automatically decrease the speed of the host vehicle by sending torque, desired speed and gear requests to the PCM and TCM via the BSCM or a brake torque request directly to the BSCM.

The system decelerates the speed of the vehicle to the speed of the target vehicle, while maintaining a driver selected time-gap (distance) from the target vehicle. When the slower moving vehicle is no longer present, the system will accelerate the host vehicle back to the original set speed.

The ACC system is available above vehicle speeds of 0 mph.

The ACC system can also bring the vehicle to a standstill. The ACC system has an Electronic Park Brake (EPB), to keep the host vehicle at a stand-still for an period of time. After the vehicle is brought to a stand-still, the

Component Index

The ACC system uses the sensor data fusion from LRRF and the LRCF to detect vehicle(s) in the forward path of the host vehicle that are moving, stopped and stationary. the LRCF provides direct input to the CADM using LVDS.

Long Range Radar Front (LRRF)

Component Index

The LRRF is a component that is used along with the LRCF in providing vehicle detection to the CADM for data fusion. The LRRF communicates its information to the CADM using the CAN-FD bus.

Powertrain Control Module (PCM)

Component Index

The PCM interfaces with several nodes on the bus network to support ACC/NCC system. The PCM provides information regarding the engine speed, accelerator pedal position, speed limiter status and other performance data for the CADM to use during operation. The PCM receives several torque requests during ACC NCC operation that require it to vary velocity and acceleration of the vehicle. It is the PCM that provides the CADM with torque conditions and availability for the CADM to use in its decision process when deciding torque demands.

CVPM transmits the rear camera view from the liftgate handle to the radio display screen on vehicles that are equipped with the Cargo and CHMSL Lamp (sales code LPE) and **not** equipped with the Center High Mounted Stop Lamp (CHMSL) cargo view camera (sales code LPD). The CVPM receives:

- Signals from all four cameras.
- The reverse gear status.
- The steering angle signal.
- The vehicle speed signal.
- The door ajar switch status for all 4 doors and the liftgate.

The CVPM uses these signals to process and determine dynamic grid line images. The CVPM uses the CAN-IHS network to send each of the images to the radio for display.

CVPM AND THE INTERACTION WITH THE PARK ASSIST SYSTEM AND SIDE DISTANCE WARNING

The CVPM displays the park assist and Side Distance Warning (SDW) on the surround view top display. The CVPM receives inputs from the Park Assist Module (PAM) with the active state of the park assist detections. If there is an object detected within the respective radar range or area; the PAM will alert the BCM by sending the appropriate message. The BCM gates the message and sends the message to the CVPM. The CVPM receives this message and then outputs the appropriate arc display request to the radio display screen.

For further information on park assist (Refer to Electrical/8B - Driver Assistance/Standard Driver Assistance System/Description and Operation).

SVC Front Camera Wash - The CVPM will emit a signal to the DSM when the front camera needs to be cleaned due to detection issues from debris and dirt. When the customer selects the highlighted “Clean Camera” soft button, the CVPM starts a 20 second wash timer. During this time, the forward camera view is not made available.

Inputs

- Acquisition on the CAN-IHS bus of the driver door ajar signal.
- Acquisition on the CAN-IHS bus of the passenger door ajar signal.
- Acquisition on the CAN-IHS bus of the left rear door ajar signal.
- Acquisition on the CAN-IHS bus of the right rear door ajar signal.
- Acquisition on the CAN-IHS bus of the trunk/liftgate ajar signal.
- Acquisition on the CAN-IHS bus of the front left park assist alert signal.
- Acquisition on the CAN-IHS bus of the front center park assist alert signal.
- Acquisition on the CAN-IHS bus of the front right park assist alert signal.
- Acquisition on internal signal Top+Rear when user select Top + Rear soft button.
- Acquisition on internal signal Top+Front when user select Top + Front soft button.
- Acquisition on internal signal Rear Crosspath when user select Rear Crosspath soft button.

5.	Instrument Panel Cluster (IPC)
6.	Security Gateway (SGW) Module

The Traffic Sign Recognition (TSR) system uses camera traffic sign information and map data information to determine the unconditioned speed limit for the current driving scenario and displaying this speed limit information to the customer. In certain use-case scenarios, the TSR system provides supplementary information relative to conditioned speed limits (e.g., speed limit under specific weather conditions, time, etc.). In addition, the TSR system will provide indications to the customer regarding the presence of overtaking ban (i.e., no passing) signs.

The TSR system provides a visual warning indication when the customers vehicle speed exceeds the unconditioned speed limit. The customer is capable of enabling and disabling the TSR system through the customer settings menu in the DSM.

The TSR system performs the following:

- Correctly operate in any country or region specified by the product grid.
- Provide the correct sign information in the case of either a fixed or variable speed limit.
- Provide the correct information in the case of either a permanent or temporary speed limit.
- If there is lane-specific speed limits, the system will only provide the traffic sign information relative to the lane in which the host vehicle is traveling.

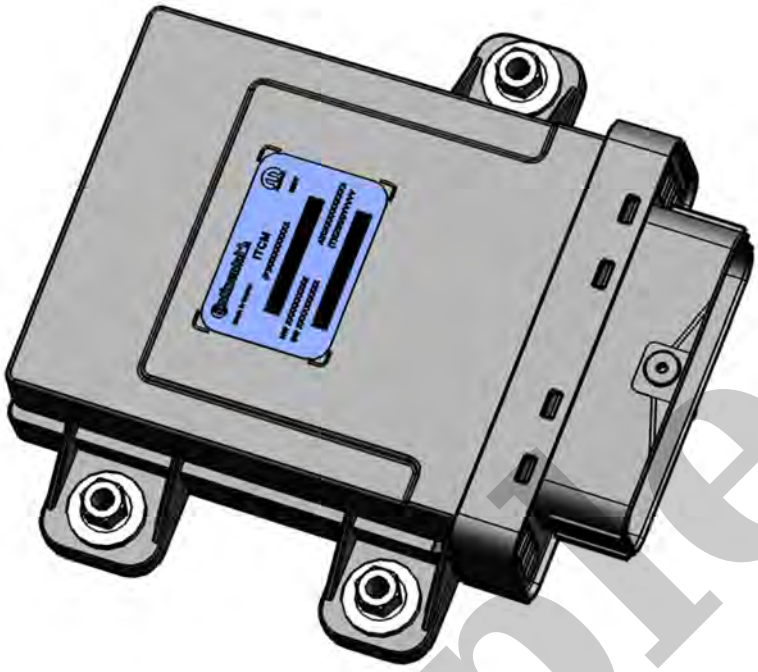
The TSR system will ignore the following:

- Lane-specific speed limits that do not apply to the lane in which the host vehicle is traveling.
- Radar speed displays which reflect the current speed of the host vehicle or other vehicles.
- Advisory (i.e. recommended) speed signs.
- Minimum speed limit signs.
- Traffic signs not related to the path of the host vehicle (e.g. traffic sign posted on exit or parallel roads).
- Traffic signs embedded into a non-relevant traffic sign.

The LRCF is used to perform the following functions in the TSR system:

- Detect the following primary traffic signs, defined as signs whose meaning and validity are exhaustively described by the sign itself:
  - Speed limits (i.e. both unconditioned and supplementary).
  - End of speed limit.
  - No passing zone.
  - End of no passing zone.

		The conditional road sign of vehicle speed limit.
		The fused speed limit data.
		Speed Units.
		Shape of Speed Sign.
		The Traffic Sign Recognition status.
	IPC	The total odometer value.
		The road sign of vehicle speed limit displayed by IPC.
		Traffic sign information setting.
	TBM	Country code.
		Driving side.
		Speed units.
		Segment built-up area status.
		Effective speed limit type and value.
		Form of way.
		Functional road class.
		Validity of Available Nav Data.
		Path index.
		GPS latitude (south) and longitude (west).
CAN-FD-8	TBM	Country Code.
		Driving Side.
		Speed Units.



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The TTM controls and monitors the lighting for the trailers that are properly connected to the vehicle. The TTM on this vehicle controls the lights of a trailer only. It does not control the trailer brakes.

The TTM outputs:

- Instrument Panel Cluster (IPC) display requests
- Trailer connection status and information signal
- Chime requests

The TTM monitors the Controller Area Network – Interior High Speed (CAN-IHS) bus network for lighting requests from the Body Control Module (BCM) and other inputs. The TTM is responsible for its own logic, actuation and sensing.

The TTM CAN signals:

CAN-IHS Inputs

- Vehicle speed
- Ignition status
- Parking light status – left and right
- Backup light status
- Turn signal light status – left and right