

Diagnosis and Testing

General Equipment

Ford diagnostic equipment

Refer to Wiring Diagram Section 131-1 for schematic and connector information.

Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of electrical damage.

VISUAL INSPECTION CHART

Electrical
• Fuse(s) • Wiring harness • Electrical connector(s) • Front parking aid sensor(s) • Rear parking aid sensor(s) • Rear parking aid camera • Parking aid switch • Front parking aid speaker • Rear parking aid speaker • Auto-dimming interior mirror • Auxiliary junction box (AJB) • Image processing module B (IPMB) • Body control module (BCM) • Parking assist control module (PAM)

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. If the cause is not visually evident, verify the symptom and refer to the Self-Diagnostic Mode.

Self-Diagnostic Mode

1. **NOTE: Self-Diagnostic Mode is always carried out when the parking aid system is activated.**
To enter the parking aid module Self-Diagnostic Mode, turn the ignition key to position 0 and make sure that the vehicle is in neutral gear.
2. Make sure that there are no obstacles within 2 meters of the front or rear of the vehicle.
3. Turn the ignition key to position II and select reverse gear.
4. If there is a concern, the Self-Diagnostic Mode will be indicated by an audible tone for 3 seconds from the parking aid system, and is paused for 1 second, otherwise the system proceeds with normal operation.
5. If a concern is detected, the 3 seconds prelude tone will be followed by a tone sequence indicating the highest priority error. After a 1 second delay, the concern is identified with a 1 to 8 beep tone.
6. To exit the Self-Diagnostic Mode, select neutral gear, turn the ignition key to position 0.
7. Carry out the Self-Diagnostic Mode again to confirm that there are no further errors present.

AUDIBLE TONE SEQUENCE FROM REAR SYSTEM

Audible Tone Sequence From Rear System	Description	Action
ON for 3 seconds, pause for 1 second	Opening sequence for concern diagnostics	-
3 second prelude tone + 1 beep tone	Rear left-hand outer sensor concern	REFER to the Component Test in this procedure.
3 second prelude tone + 2 beep tone	Rear left-hand inner sensor concern	REFER to the Component Test in this procedure.
3 second prelude tone + 3 beep tone	Rear right-hand inner sensor concern	REFER to the Component Test in this procedure.
3 second prelude tone + 4 beep tone	Rear right-hand outer sensor concern	REFER to the Component Test in this procedure.
3 second prelude tone + 5 beep tone from rear system	ECU errors	REFER to the Ford diagnostic equipment
3 second prelude tone + 6 beep tone from rear system	Common sensor VBatt circuit	REFER to the Wiring Diagrams and CHECK the VBatt circuit(s)
3 second prelude tone + 7 beep tone from rear system	All rear sensors	REFER to the Wiring Diagrams and CHECK S406 and S407 and associated circuit(s)

AUDIBLE TONE SEQUENCE FROM FRONT SYSTEM

Audible Tone Sequence From Front System	Description	Action
ON for 3 seconds, pause for 1 second	Opening sequence for concern diagnostics	-
3 second prelude tone + 1 beep tone	Front left-hand outer sensor concern	REFER to the Component Test in this procedure.
3 second prelude tone + 2 beep tone	Front left-hand inner sensor concern	REFER to the Component Test in this procedure.
3 second prelude tone + 3 beep tone	Front right-hand inner sensor concern	REFER to the Component Test in this procedure.
3 second prelude tone + 4 beep tone	Front right-hand outer sensor concern	REFER to the Component Test in this procedure.
3 second prelude tone + 5 beep tone from front system	Switch failure	REFER to the Ford diagnostic equipment
3 second prelude tone + 6 beep tone from front system	LED indicator failure	REFER to the Ford diagnostic equipment
3 second prelude tone + 7 beep tone from front system	All front sensors	REFER to the Wiring Diagrams and CHECK S195 and S196 and associated circuit(s)

Component Tests

Parking Aid Sensor Wiring Harness

NOTE: Refer to the Wiring Diagram, Section 131-1 for Schematic and Connector information.

NOTE: Check the parking aid wiring harness for short to ground, short to battery or damage.

1. Test the parking aid sensor wiring harness using the following table as a guide to meter lead placement as well as expected values.

REAR LEFT-HAND OUTER PARKING AID SENSOR

Rear Left-Hand Outer Parking Aid Sensor C4009	Parking Assist Control Module C9071C	Expected Value	Action
Pin 1	Pin 11	Less than 5 ohms	If the resistance is greater than 5 ohms,

Rear Left-Hand Outer Parking Aid Sensor C4009	Parking Assist Control Module C9071C	Expected Value	Action
			CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation
Pin 2	Pin 5	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation
Pin 3	Pin 8	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation

REAR LEFT-HAND INNER PARKING AID SENSOR

Rear Left-Hand Inner Parking Aid Sensor C4010	Parking Assist Control Module C9071C	Expected Value	Action
Pin 1	Pin 11	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation
Pin 2	Pin 3	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation
Pin 3	Pin 8	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation

REAR RIGHT-HAND INNER PARKING AID SENSOR

Rear Right-Hand Inner Parking Aid Sensor C4012	Parking Assist Control Module C9071C	Expected Value	Action
Pin 1	Pin 11	Less than 5 ohms	

Rear Right-Hand Inner Parking Aid Sensor C4012	Parking Assist Control Module C9071C	Expected Value	Action
			If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation
Pin 2	Pin 2	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation
Pin 3	Pin 8	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation

REAR RIGHT-HAND OUTER PARKING AID SENSOR

Rear Right-Hand Outer Parking Aid Sensor C4011	Parking Assist Control Module C9071C	Expected Value	Action
Pin 1	Pin 11	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation
Pin 2	Pin 4	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation
Pin 3	Pin 8	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation

- Test the parking aid system using the following table as a guide to meter lead placement as well as expected values.

FRONT LEFT-HAND OUTER PARKING AID SENSOR

Rear Left-Hand Outer Parking Aid Sensor C1428	Parking Assist Control Module C9071B	Expected Value	Action
Pin 1	Pin 2	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation
Pin 2	Pin 5	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation
Pin 3	Pin 1	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation

FRONT LEFT-HAND INNER PARKING AID SENSOR

Rear Left-Hand Inner Parking Aid Sensor C1429	Parking Assist Control Module C9071B	Expected Value	Action
Pin 1	Pin 2	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation
Pin 2	Pin 6	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation
Pin 3	Pin 1	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation

FRONT RIGHT-HAND INNER PARKING AID SENSOR

Rear Right-Hand Inner Parking Aid Sensor C1430	Parking Assist Control Module C9071B	Expected Value	Action
Pin 1	Pin 2	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation
Pin 2	Pin 7	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation
Pin 3	Pin 1	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation

FRONT RIGHT-HAND OUTER PARKING AID SENSOR

Rear Right-Hand Outer Parking Aid Sensor C1431	Parking Assist Control Module C9071B	Expected Value	Action
Pin 1	Pin 2	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation
Pin 2	Pin 8	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation
Pin 3	Pin 1	Less than 5 ohms	If the resistance is greater than 5 ohms, CHECK and REPAIR the circuit. If the circuit is OK, INSTALL a new parking aid sensor. TEST the system for normal operation

PARKING AID SPEAKER

Parking Aid Speaker (component side)	Parking Aid Speaker (component side)	Expected Value	Action

Parking Aid Speaker (component side)	Parking Aid Speaker (component side)	Expected Value	Action
Pin 1	Pin 2	50 ohms	If the resistance value is not approximately 50 ohms, INSTALL a new parking aid speaker. REFER to: (413-13 Parking Aid) Front Parking Aid Speaker (Removal and Installation), Rear Parking Aid Speaker (Removal and Installation). If the speaker is OK but no audible error output, INSTALL a new parking assist control module. REFER to: Parking Assist Control Module (PAM) (413-13 Parking Aid, Removal and Installation). TEST the system for normal operation