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2003 FORD Crown Victoria OEM Service and Repair Workshop Manual

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3	RH (right-hand) AAD (active air dam) Actuator
4	LH (left-hand) AAD (active air dam) Actuator

System Operation

Network Message Chart

PCM (powertrain control module) Network Input Messages

Broadcast Message	Originating Module	Message Purpose
Vehicle speed	ABS (anti-lock brake system) module	Vehicle speed is used to determine positioning of the active air dam.

Component Description

AAD (active air dam)

The AAD (active air dam) system consists of two AAD (active air dam) actuators, a AAD (active air dam) blade (plastic spoiler plate), and mechatronic linkage components connecting the actuators to the AAD (active air dam) blade. The position the AAD (active air dam) blade is determined by commands from the PCM (powertrain control module) . The AAD (active air dam) drive linkage mechanism connects the two AAD (active air dam) actuators and the AAD (active air dam) blade via individual screw-drives, which are fastened to the base of the bumper. The AAD (active air dam) blade moves in a vertical plane, from fully retracted (up) to fully extended (down) and, based on the position commanded by the PCM (powertrain control module) , is set in 1 of 11 positions, from 0 to 100 percent (approximately 10 percent of full movement range between positions).

After an engine starting event, a self-calibration of the AAD (active air dam) system commences with the AAD (active air dam) blade moving to the fully retracted or "home position" (0 percent) to learn its fully up position.

The AAD (active air dam) blade remains in the fully up position until the vehicle speed exceeds approximately 72 km/h (45 mph) continuously for approximately 15 seconds. When this condition is met, the AAD (active air dam) blade will extend fully down (100 percent) and if there are no system faults, the fully down position will be learned. If the end stop learning is successful, the AAD (active air dam) blade may be commanded to any one of the position steps, 0-100 percent. When the vehicle speed decreases below approximately 62 km/h (39 mph), the AAD (active air dam) blade will fully retract to the "home position".

Active Air Dam (AAD) - Electric

501-19 Bumpers	2022 F-150
Diagnosis and Testing	Procedure revision date: 03/28/2022

Active Air Dam (AAD) - Electric

Diagnostic Trouble Code (DTC) Chart

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

 REFER to: Diagnostic Methods

(100-00 General Information, Description and Operation).

Diagnostic Trouble Code Chart

Module	DTC (diagnostic trouble code)	Description	Action
PCM (powertrain control module)	C0601:00	Active Air Dam Control Circuit/Open: No Sub Type Information	GO to Pinpoint Test A
PCM (powertrain control module)	C0604:00	Active Air Dam Control Circuit Performance: No Sub Type Information	GO to Pinpoint Test A
PCM (powertrain control module)	C062E:00	Active Air Dam Supply Voltage Circuit Low: No Sub Type Information	GO to Pinpoint Test A
PCM (powertrain control module)	C062F:00	Active Air Dam Supply Voltage Circuit High: No Sub Type Information	GO to Pinpoint Test A

PCM (powertrain control module) C0604:00	Active Air Dam Control Circuit Performance: No Sub Type Information	This DTC (diagnostic trouble code) sets if the AAD (active air dam) actuators are unable to detect its end stops/overtravel. The PCM (powertrain control module) sets this DTC (diagnostic trouble code) when the condition is present for a predetermined amount of time.
PCM (powertrain control module) C062E:00	Active Air Dam Supply Voltage Circuit Low: No Sub Type Information	When the AAD (active air dam) actuator senses low system voltage, it sends a message to the PCM (powertrain control module) via the LIN (local interconnect network) . The PCM (powertrain control module) sets this DTC (diagnostic trouble code) when the fault is communicated for a predetermined amount of time.
PCM (powertrain control module) C062F:00	Active Air Dam Supply Voltage Circuit High: No Sub Type Information	When the AAD (active air dam) actuator senses high system voltage, it sends a message to the PCM (powertrain control module) via the LIN (local interconnect network) . The PCM (powertrain control module) sets this DTC (diagnostic trouble code) when the fault is communicated for a predetermined amount of time.
PCM (powertrain control module) C0630:00	Active Air Dam Stuck: No Sub Type Information	When the AAD (active air dam) actuator senses it is unable to move the AAD (active air dam) blade, it sends a message to the PCM (powertrain control module) via the LIN (local interconnect network) . The PCM (powertrain control module) sets this DTC (diagnostic trouble code) when the fault is communicated after a predetermined number of relearning attempts.
PCM (powertrain control module) U0645:00	Lost Communication With Active Air Dam Module: No Sub Type Information	When the PCM (powertrain control module) does not receive communication from the AAD (active air dam) actuator for a predetermined amount of time, the PCM (powertrain control module) sets this DTC (diagnostic trouble code) .

Possible Sources

- Fuse
- Wiring, terminals or connectors
- AAD (active air dam) actuators
- AAD (active air dam) blade
- PCM (powertrain control module)
- LIN (local interconnect network) circuit fault

A3 CHECK THE ACTIVE AIR DAM (AAD) DEVICE HIGH SYSTEM VOLTAGE (AAD_OVER_V) PID (PARAMETER IDENTIFICATION)

- Using a diagnostic scan tool, view PCM (powertrain control module) Parameter Identifications (PIDs).
- Using a diagnostic scan tool,
  Access the PCM (powertrain control module) and monitor the AAD_OVER_V (The Active Air Dam Device Is Indicating An Over Voltage Condition) PID (parameter identification)

Does the actuator indicate over voltage?

Yes	GO to A10

No	GO to A4

A4 CHECK THE ACTIVE AIR DAM (AAD) DEVICE ELECTRICAL FAULT (AAD_ELEC_F) PID (PARAMETER IDENTIFICATION)

- Using a diagnostic scan tool, view PCM (powertrain control module) Parameter Identifications (PIDs).
- Using a diagnostic scan tool,
  Access the PCM (powertrain control module) and monitor the AAD_ELEC_F (The Active Air Dam Device Is Indicating An Electrical Fault) PID (parameter identification)

Does the PID (parameter identification) test indicate an electrical fault in the actuator?

Yes	GO to A10

No	GO to A5

A5 PERFORM THE ACTIVE AIR DAM (AAD) DEVICE LEARNED UP AND DOWN POSITION

- Using a diagnostic scan tool, view PCM (powertrain control module) Parameter Identifications (PIDs).
- Using a diagnostic scan tool,
  Access the PCM (powertrain control module) and monitor the AAD_CALIB_UPDWN (Active Air Dam Calibrated Up And Down) PID (parameter identification)

Does the AAD (active air dam) device learned UP and DOWN sucessfully ?

Yes	GO to A9

No	GO to A8

A8 CHECK THE ACTIVE AIR DAM (AAD) DEVICE STUCK (AAD_STUCK) PID (PARAMETER IDENTIFICATION)

- Using a diagnostic scan tool, view PCM (powertrain control module) Parameter Identifications (PIDs).
- Using a diagnostic scan tool,
  Access the PCM (powertrain control module) and monitor the AAD_STUCK (The Active Air Dam Device Is Indicating A Blocked/Stuck Condition) PID (parameter identification)

Does the PID (parameter identification) test indicate a stuck AAD (active air dam) actuator?

Yes	Remove the device and make visual inspection for blockage. If blockages found, replace the complete AAD (active air dam) system. REFER to: Active Air Dam (AAD) Actuator (501-19 Bumpers, Removal and Installation). REFER to: Active Air Dam (AAD) Blade (501-19 Bumpers, Removal and Installation).

No	GO to A9

A9 VERIFY THE ACTIVE AIR DAM (AAD) OPERATION USING THE ACTIVE AIR DAM (AAD) POSITION - COMMANDED (AAD_CMD) PID (PARAMETER IDENTIFICATION)

- Perform visual inspection of AAD (active air dam) system.
- Make sure that the area under the front bumpers is free from obstruction.
- Use OSC (output state control)
  Access the PCM (powertrain control module) and monitor the AAD_CMD (Active Air Dam Position - Commanded) (%) PID (parameter identification)
  to command AAD (active air dam) actuators down (100%).
- Visual inspeciton of AAD (active air dam) actuators to ensure both sides actuated down.
- Use OSC (output state control)
  Access the PCM (powertrain control module) and monitor the AAD_CMD (Active Air Dam Position - Commanded) (%) PID (parameter identification)
  to command AAD (active air dam) actuators UP (0%)
- Visual inspeciton AAD (active air dam) actuators UP.

Does the AAD (active air dam) actuators cycle from DOWN to UP position when commanded by the diagnostic scan tool?

Is the resistance less than 3 ohms?

Yes	GO to A12

No	REPAIR the circuit.

A12 CHECK THE LOCAL INTERCONNECT NETWORK (LIN) CIRCUIT FOR AN OPEN

- Disconnect: RH (right-hand) AAD (active air dam) actuator C1968.
- Disconnect: PCM (powertrain control module) C1915B
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C1968-2	Ω	C1915B-34

Is the resistance less than 3 ohms?

Yes	GO to A13

No	REPAIR the circuit.

A13 CHECK THE LOCAL INTERCONNECT NETWORK (LIN) CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition ON.
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C1968-2	$\overline{\overline{V}}$	Ground

C1968-2	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to A17

No	GO to A16

A16 CHECK THE LOCAL INTERCONNECT NETWORK (LIN) CIRCUIT FOR A SHORT TO GROUND WITH THE ACTIVE GRILLE SHUTTER DISCONNECTED

- Disconnect Active grille shutter C1651.
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C1968-2	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	Check for Active grille shutter circuit. REFER to: Active Grille Shutter - Electric (501-02 Front End Body Panels, Diagnosis and Testing).

No	REPAIR the circuit.

A17 CHECK THE LH (LEFT-HAND) ACTIVE AIR DAM (AAD) CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect LH (left-hand) AAD (active air dam) C1967
- Measure:

- Ignition ON.
- Disconnect LH (left-hand) AAD (active air dam) C1967
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C1967-3	$\overline{\overline{V}}$	Ground
C1967-1	$\overline{\overline{V}}$	Ground

Is any voltage present?

Yes	REPAIR the affected circuit.

No	GO to A19

A19 CHECK THE RH (RIGHT-HAND) ACTIVE AIR DAM (AAD) AND THE LH (LEFT-HAND) ACTIVE AIR DAM (AAD) CIRCUITS FOR A SHORT TOGETHER

- Ignition OFF.
- Disconnect RH (right-hand) AAD (active air dam) C1968
- Disconnect LH (left-hand) AAD (active air dam) C1967
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C1968-5	Ω	C1968-4
C1967-3	Ω	C1967-1

Positive Lead	Measurement / Action	Negative Lead
C1967-1	Ω	C1967-3
C1968-4	Ω	C1968-5

- Note the readings:

Measuring Method	Follow Actuator (LH (left-hand) actuator)	Lead Actuator (RH (right-hand) actuator)
Lower Limit	7 Ω	100 kΩ
Upper Limit	30 Ω	n.a

Is the resistance is within the limit ?

Yes	GO to A22

No	INSTALL a new AAD (active air dam) actuator. REFER to: Active Air Dam (AAD) Actuator (501-19 Bumpers, Removal and Installation).

A22 CHECK FOR CORRECT ACTIVE AIR DAM (AAD) ACTUATORS OPERATION

- Disconnect: RH (right-hand) AAD (active air dam) actuator C1968 (if not previously disconnected).
- Disconnect: LH (left-hand) AAD (active air dam) actuator C1967 (if not previously disconnected).
- Inspect the AAD (active air dam) actuators electrical connector and jumper harness.
- Repair:
    - corrosion (install new connector or terminals - clean module pins)
    - damaged or bent pins - install new terminals/pins as necessary
    - pushed-out pins - install new pins as necessary
- Reconnect the AAD (active air dam) actuator connectors, jumper harness and all previously disconnected system connectors. Make sure they seat and latch correctly.