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Title: **Ambient Air Temperature (AAT) senor faults**

Applies To: **2010 EPA MaxxForce® 11 and 13 ProStar® and WorkStar®**

DESCRIPTION

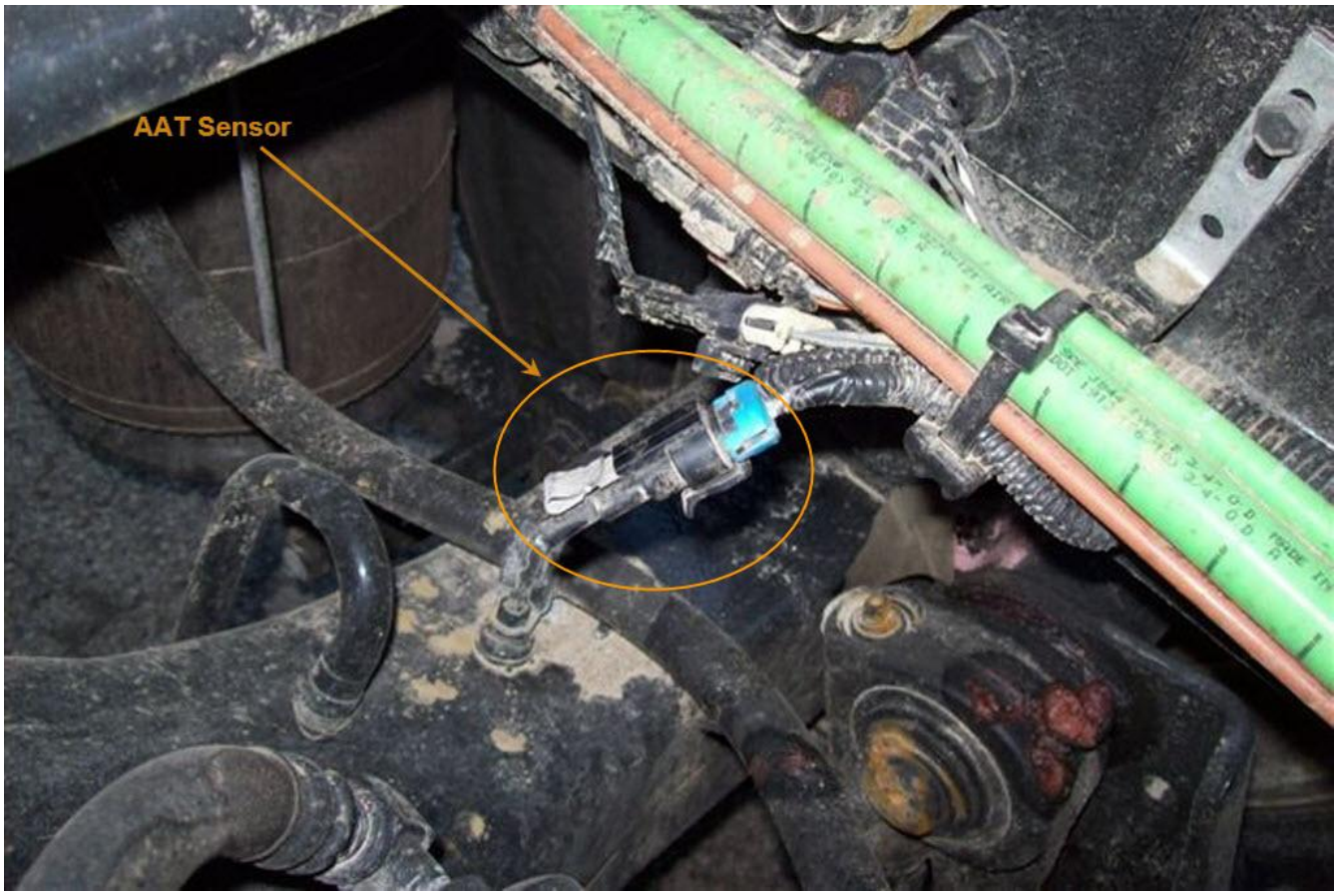
There are two ambient temperature sensors. The sensor located behind the cab along the left frame rail is the sensor the engine uses. There is also a sensor located at the front of the chassis that the gauge cluster uses for the temp display. This article discusses the Engine AAT Sensor first. Information on the Cab AAT can be found at the bottom of this article.

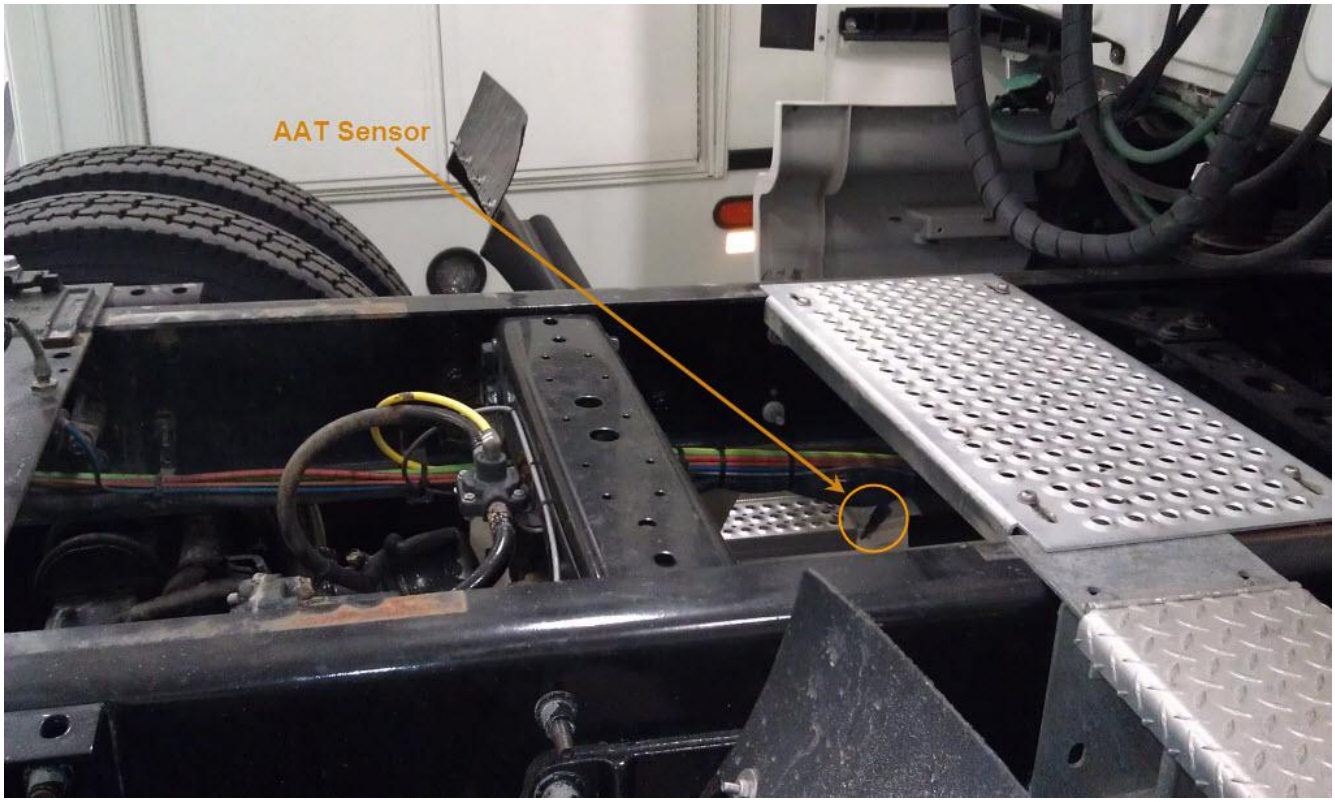
POSSIBLE DIAGNOSTIC TROUBLE CODES

SPN	FMI	MODULE	DESCRIPTION
171	4	Engine	AAT signal out of range LOW (Body mounted sensor)
171	3	Engine	AAT signal out of range HIGH (Body mounted sensor)
171	2	Engine	AAT signal does not agree with other sensors

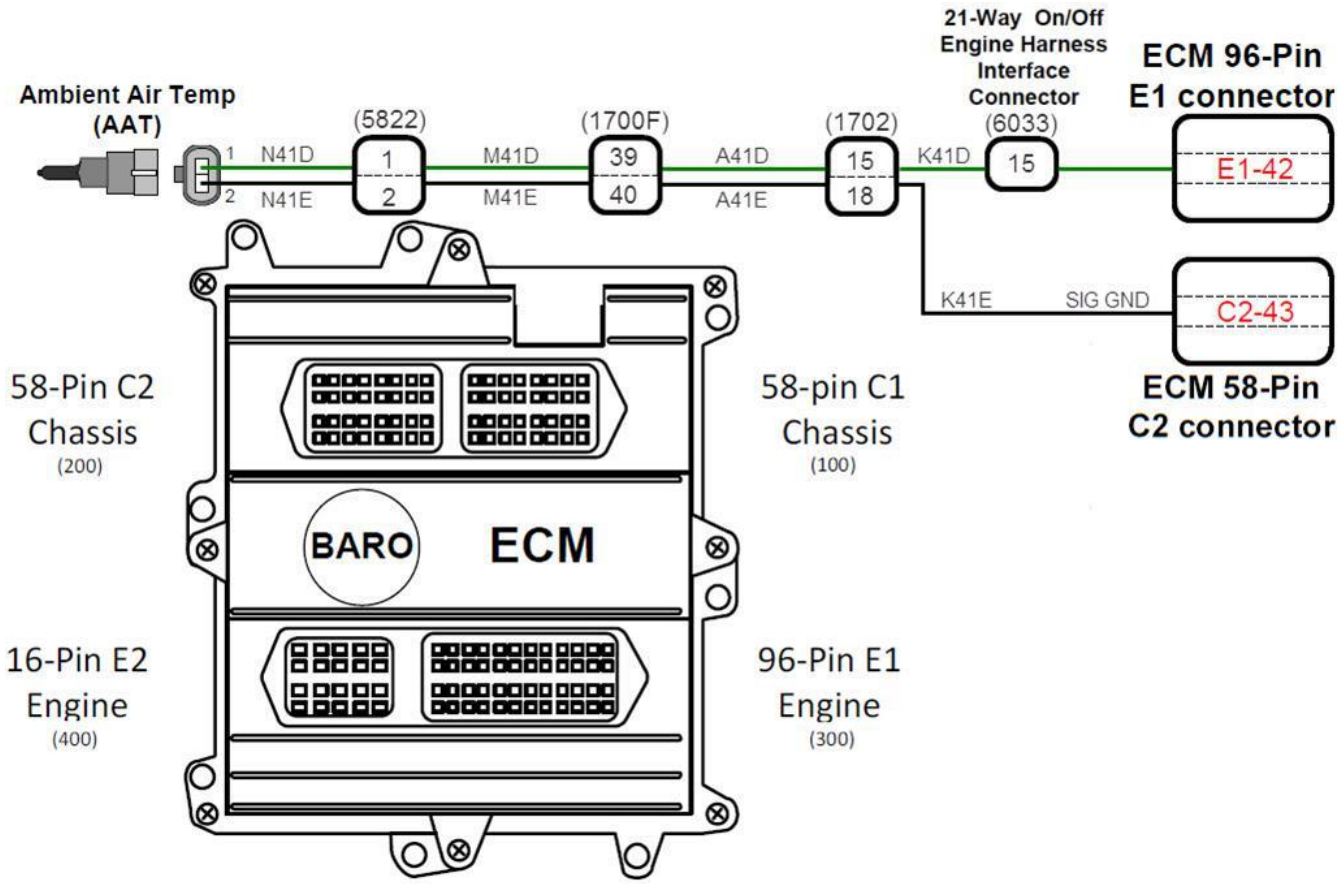
LOCATION

The *Engine* sensor is located on the left frame rail midway between the back of cab and front drive axle, or near the front drive axle. The two photos below show both possible mounting locations.





ENGINE CIRCUIT DIAGRAM



CAB AMBIENT TEMPERATURE SENSOR

The instrument cluster, connector 1501 pin 9, sends a 5-volt source to the temperature sensor. As the voltage goes across the temperature sensor it decreases, the amount of voltage drop depends on outside temperature. The reduced voltage then returns to the instrument cluster on pin 8 of connector 1500. The instrument cluster turns the received signal into to the temperature shown on the display.

CAB SENSOR TROUBLESHOOTING

Note: The Electronic Gage Cluster display will replace temperature reading with two dashes (- -) if a fault is present with the Ambient Temperature Sensor circuit.

Step	Test Points	Specification	In Spec	NOT In Spec
1	Measure voltage between ambient temperature sensor connector cavity A and GND	5 +/- 0.5 Vdc	Go to next step	Inspect wire from cluster 1501-9 to AAT sensor pin A for open or short
2	Measure voltage between ambient temperature sensor connecotr cavity A and cavity B	5 +/- 0.5 Vdc	Go to next step	Inspect ZVR wire from cluster 1500-8 to AAT sensor pin B for open or short

Actual Ambient Temperature	Resistance value for sensor
50˚C (122˚F)	3557.7 - 3648.2 Ω OHMS
25˚C (77˚F)	9862.5 - 10137.5 Ω OHMS
0˚C (32˚F)	32197 - 33111 Ω OHMS

CAB CIRCUIT DIAGRAMS

IMPORTANT: Due to variations during vehicle production, be sure to select the most current wiring schematic manual, specific to the year and model of the vehicle being serviced.

- ProStar / LoneStar wiring for Cab Sensor
- ProStar / LoneStar wiring for Cab Sensor with Front Axle Load Sensor

- HPV wiring for Cab Sensor
- HPV wiring for Cab Sensor with Front Axle Load Sensor
- TerraStar wiring for Cab Sensor

The Cab Temperature Sensor is typically mounted near the front bumper or on the cooling package. If the sensor cannot be found verify the wiring to the gauge cluster is present.

OTHER RESOURCES

- 2006-2009 Cummins Ambient Air Temperature Sensor Location
- 2006-2009 Cummins Active Fault 249 / 256 Ambient Air Temperature Sensor 1 Circuit

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