



V-MAC Advanced Diagnostic Screen – ASET AC | CEGR Engine Only



> Internal Content

Things to remember when viewing Advanced Parameter snapshots:

1. It is always a good idea to have the Tech take the first snapshot with the key on and the engine off. If the boost pressure exceeds 1 psi in this snapshot, the boost sensor is either the wrong type (AC vs AI), or is faulty. A faulty boost pressure sensor can cause EGR and Turbo codes.
2. If you find the snapshot has multiple sensor readings of 0 (zero) and 32, they will need to be redone. These readings indicate that the computer went into "time out", due to being connected to the truck for too long.
3. Exhaust manifold temperature is a calculated value. There is no sensor.
4. EGR valve position is not necessarily the actual position of the valve. There is no position sensor. The reading is determined by how much power is being supplied to the valve. Even if the valve is showing 100% position, if there is no oil pressure to the valve, or if it is stuck, it will be closed (unless it is stuck in the open position)
5. You may see " Torque Limited by ". There are several possible reasons you may see this phrase:

- a. High Coolant Temp

- i. When coolant temp exceeds 215F

- b. High Turbo Wheel Speed

- i. Above 110,000 RPM at Sea Level, 120,000 RPM at 5000ft

- c. High Exhaust Manifold Temp

- i. Estimated above 1200F

- d. High Compressor discharge Temp



*. File and altitude dependant....Generally when it exceeds 450-00F

e. Accelerator Pedal Control

i. Self explanatory....The pedal position is not at 100%

f. Road speed limit

i. Road speed has reached maximum (Max programmed into the module)

g. Smoke Control

i. Could be Turbo related, EGR related, injector related.....Basically, the computer is cutting the throttle back to avoid producing excessive smoke.

h. Maximum Power

i. That's all she's got.....

6. There are times when the EGR gas flow will be turned off:**a. Fuel Quantity Low**

i. No fuel conditions

b. Engine speed low

i. EGR gas is not needed to start the engine

c. Coolant Temp Low/High

i. EGR is not needed/wanted if the engine is not warmed up, or is overheating

d. High Transient Conditions

i. EGR gas flow is turned off during acceleration

e. Engine Load Special Case # 1

i. Generally, this will only occur when the engine is lugged below 1000 RPM's

f. Idle conditions/Condensation control

i. EGR flow during prolonged idling and in high humidity could

create acid condensation in the intake manifold

h. Engine load Special Case #2

i. Generally only occurs during certain light load conditions

7. Sensor Ranges:

Accelerator Position	0% to 100%
Engine Load	0% to 100%
Boost Pressure (AC)	-8 psi to 65 psi
Inlet Manifold Temp	-40 F to 250 F
Ambient Air Temp	-40 F to 158 F
Ambient Air Pressure	8.7 psia to 16.7 psia
Compressor Inlet Temp	-40 F to 131 F
Relative Humidity	0% to 100%
Turbo Wheel Speed	9,000 RPM to 130,000 RPM
Compressor Discharge Temp	-40 F to 250 F
Turbo Target/Actual Vane Position	0% to 100%
Aftercooler Outlet Temp.	-40 F to 250 F
Target EGR Flow	0lb/min to 18lb/min (may read as high as 26lb/min)
Fan Speed	~200 RPM to 3500 RPM

Troubleshooting Using Snapshots

Note: For proper analysis, snapshots should be taken at both idle, and then as close to 100% throttle and 100% engine load as possible. Multiple snapshots should be provided. One snapshot is not going to provide an accurate picture of how the truck is performing.

General info: When the target is not met (exp: Target is 6lb/min, Actual is 1 lb/min), the ECU will keep raising the target and opening the EGR further to try to attain the flow it wants. Multiple snapshots are helpful in this case, as you can watch the target and valve position over



time.

1. Indications of a "stuck" open EGR valve:

- i.** Engine runs rough/about to stall (to much inert gas causes a rich A/F ratio)
- ii.** Low turbo wheel speed (For example, 7000 rpm at idle)
- iii.** Low boost
- iv.** Black smoke
- v.** High measured EGR flow, even through target flow and valve position may be zero

b. Use the EGR valve tester to to actuate the valve. The shaft will only move approx 3/8 of an inch from closed to fully open. If it does not move, there may be dirt in the spool valve. (actuate several times to try " clean " the valve.

2. Indications of a " stuck " closed EGR valve:

- i.** High turbo wheel speed
- ii.** EGR valve position is high (~85%), even through the valve is closed.
- iii.** Target EGR flow is high (over 14 lb/min)
- iv.** Actual EGR flow is ~Zero

b. Use EGR valve tester to actuate the valve.

c. Check the oil pressure to the EGR valve. At least 25 psi at the valve is needed for proper operation.

3. Indications of a plugged EGR cooler:

- a.** Conditions at 100% throttle and load.
 - i.** High turbo wheel speed (Over 80,000 rpm at low engine rpm... exp: 85,000 rpm turbo wheel speed at 1450 rpm engine speed, or over 110,000 rpm repeatedly at upper engine rpm levels)



1. EGR flow is one way the EECU regulates turbo wheel speed.

When the EGR cooler is plugged, all the exhaust gas flows through the turbo, making the wheel spin faster.

ii. EGR valve position is high (~85%)

iii. Target EGR flow is high (over 14lb/min)

iv. Actual EGR flow is low (less than 4 lb/min)

4. Indications of a Mass Flow pipe reading incorrectly:

a. Mass Flow pipe is reading high:

i. The Mass Flow pipe is reading high.

1. High turbo wheel speed

2. EGR valve position is low to start, but continues to increase

a. The valve position is low compared to the flow (exp: readings are 6 lb/min of flow, but the valve is only open to 5%). The ECU does not code since it does not see a discrepancy between actual and target flow, but it will continue to command the EGR valve to open further in an attempt to bring the turbo wheel speed down.

b. Mass Flow Pipe reading low:

i. The Mass Flow Pipe is reading low.

1. Low turbo wheel speed

2. Low boost

3. Black smoke

a. EGR is a inert gas, meaning it doesn't burn. If there is more "non-burnable" air present that the EECU thinks there is, the A/F mixture will be off

Related links and attachments

No links or attachments available



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