



## Mack Models

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**Mack Model** CH , RB , DM , CHN , CL , CT , CV , CX , CXM , LE , MR , RD

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**\*\* SOLUTION \*\***

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**Title** Diagnosing Performance Complaints ASET Engine

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**Cause** General V-MAC information.

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**Solution** Performance Complaints can be difficult to diagnose, since they often are based on comparisons to other units, or from a “seat of the pants” feel of the truck. There are several types of Performance complaints, including Start ability (runs fine at higher rpm’s), Stumble/Hesitation (usually around 1300 rpm’s), and overall low power.

As a starting point, ALWAYS make sure that the Customer parameters are set correctly (Including Customer torque limit, and EUP calibration codes, etc).

There are several engine specific complaints that should be noted:

### **ASET AC ENGINES**

#### **• Boost Dropout**

o On Step 4 equipped chassis, if the engine oil pressure drops below 15 psi, the turbo vanes will open, and the truck will lose boost. This generally occurs during take-off with a load, and can be diagnosed by monitoring the turbo vane position, which will show a target AND actual value of zero. This condition will not throw a code because the turbo is being COMMANDED to go to zero. Files are available for SOME HP’s to correct this problem.

#### **• Throttle lag after using the Engine brake**

o This lag will occur on Step 3, 4 and 5 ASET AC equipped chassis’s when the engine brake is not set up correctly in EECU Customer Parameters. Keep in mind that on the newer trucks, there are two settings

Engine Brake installed

Powerleash Installed

#### **• Flat at the “top end”**

• Step 3 ASET AC engines were originally built with a 631GC5171 series turbocharger. That turbo is no longer available, and has been replaced by the 5176 series of turbo. When changing from the 5171 to the 5176 turbo, the EECU software and datafile must be changed to Step 3B or 3C. Failure to change the software may result in 4-5 codes, and the truck feeling “lazy” in the upper rpm range.

### **ASET AI ENGINES**

#### **• EUP BIP error**

o Prevalent on Phase 4 AI engines with the Production Data file. This phenomenon occurs when the EUP momentarily loses communication with the EECU, and can be described as though you lifted your foot off the throttle pedal, and immediately smashed it back to the floor. Generally happens around 1400-1600 rpm's. EECU Service files corrects this problem.

**NOTE:**

**These troubleshooting steps were written with the assumption that BASIC checks, such as monitoring fuel pressure, has already been done and ruled out as a possible cause.**

**1) How long has the Customer complained about power**

a. Since New:

- i. Is the EECU service file loaded?
  - o Under NO circumstances should NOx Levels be crossed
- ii. Is the VECU at Step 12B
  - Step 12 can only be installed in an M6 VECU module

**NOTE: If in doubt, reference the Software/Data file spreadsheet to determine the correct Service files for download**

iii. Does the Customer own more than one truck

- What is he comparing to

Many Performance complaints are based on comparisons of EGR to Non-EGR equipped trucks, or comparisons to a different OEM. These comparisons are unacceptable.

- If the Customer has the same complaint about multiple units from new, the DSM should be notified as this may be a spec issue.

iv. Is the truck being shifted correctly

- 1. Shifts being made at an rpm which keeps the truck within it's operating range

v. If the complaint persists with the latest files, have the Tech contact his DSM to further pursue the complaint, and possibly have the truck run on a dyno.

**b. Recent Complaint**

i. Are any codes logged

- 1. If Yes, Troubleshoot per the Published Service information

ii. Are there other symptoms

1. Does the truck smoke

a. If yes, what color is the smoke

i. Black smoke

- Has the Intake system been checked for leaks
- Have the injectors been tested/cleaned
- If so equipped, is the EGR system functioning properly

ii. White smoke

- Is there an EECU Service file available
- Is the Customer using good fuel

- Have the engine speed sensors been checked
  - iii. Bluish smoke
    - Is there oil in the intake
  - a. Possible turbo failure
    - Has the compression been checked (Manual test)
2. Does the truck backfire
    - a. Have the valves been adjusted
    - b. Does the truck have an engine brake
      - i. Is the brake sticking on
        1. Follow powerleash diagnostics
  3. Does the truck Hesitate/stumble
    - a. Is the EECU Service file loaded (AI Engines)
    - iii. Has the boost pressure been checked
      1. If the boost is low
        - a. Are there any restrictions in the intake or exhaust
          - i. Clogged air filter
          - ii. Intake hose “sucking” shut when hot
          - iii. Kinked exhaust/plugged muffler
  2. Is the hood boot sealing correctly
    - a. Spread grease around the rubber boot and close the hood.  
When the hood is raised, the grease should have transferred to the hood in a complete circle.
  3. Verify the correct Turbocharger is installed
  4. Is the Engine equipped with a boost pressure relief valve or an air cleaner scavenger
    - a. Have they been tested, and are they functioning properly
  5. Pressure test the entire intake system a. Fix any leaks found
  6. Inspect the exhaust manifold and the turbo center section for cracks
    - a. In most cases of a turbo whistle or whine, the noise is gasket related
  7. Inspect the compressor wheel for proper clearances with the housing
    - a. In rare cases, the wrong compressor wheel has been found installed in ASET AC turbo chargers
      - i. Easily noticeable, with a large gap around the compressor wheel
  8. Test the boost pressure sensor (Key on/Engine off reading should be under 1 psi)
  - iv. What is the Pyrometer reading
    1. High (Over 1100)
      - a. Have the valves been adjusted

- b. If available, use an IR temp gun to check each cylinder to isolate possible cylinder problems
- c. Test/clean the Injectors
- d. For AC engines, check the compressor discharge temperature and the hood boot seal
- e. Check the EGR system for proper operation

2. Low (Under 800)

- a. Test/clean the Injectors
- b. If available, use an IR temp gun to check each cylinder to isolate possible dead cylinder

v. Is the truck going into De-rate 1. Overheating

- 2. Out of range sensor value
  - a. Compressor discharge temp
  - b. Turbo wheel speed
  - c. Pyrometer

**Disclaimer:**

This outline does not take into account non-engine systems which may also cause low power complaints, such as the fan drive, the clutch slipping, Service brakes hanging up, etc. If nothing Mechanically wrong is found, The information should be forwarded to Reliability Engineering to determine if the truck qualifies for any further file advancements (determined on a case by case basis, taking into consideration each states emissions laws, and file availability based on HP). The Technician should also contact his DSM to verify the complaint, and determine if a Dyno run is required.

**NOTE:**

In order for a dyno run to be deemed acceptable, the truck must be run in direct (transmission gear = 1), the dyno report must denote if the fan was on or off, and at a minimum, must show rpm's and road speed for each HP reading.

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Solution visibility	<a href="#">Dealer distribution</a>
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**Administration**

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