



GM Vehicles - CRANKSHAFT VARIATION RELEARN (CASE Learn)

“CASE” means: crankshaft angle sensor error.
A crankshaft variation relearn *must* be performed if:

- A diagnostic trouble code of P1336 is present.*
- The computer has been replaced or re-programmed.*
- The crankshaft position sensor has been replaced.*
- The engine, harmonic balancer, clutch, or flywheel have been: disassembled, removed, or replaced.*

The crankshaft position variation learning feature enables the computer to compensate for part manufacturing tolerances. This allows the computer to accurately detect an engine misfire throughout the engine RPM range. The learning process is stored in the computer's memory and does not have to be repeated unless one or more of the above conditions are present.

To perform the relearn, proceed as follows: Connect a scan tool to make sure there are no trouble codes stored in the computer's memory. If there is any power train trouble code other than P1336 (Crankshaft Position Variation not learned), the computer will disable the relearn function until the problem that caused the code has been eliminated. Also, make sure that the engine coolant (check it when the engine is cold) and oil levels are at an acceptable level.

1. 1. Set the parking brake and block the drive wheels. Make sure that the hood is closed.
2. 2. Start the engine and make sure that the engine coolant temperature is at least 158 degrees F. (70 degrees C.)
3. 3. Turn the engine off for at least 10 seconds.
4. 4. Select the crankshaft position variation learn procedure (CASE Learn) on your scan tool.
5. 5. Make sure that the transmission is in Park. Start the engine.
6. 6. Apply the brakes and hold the pedal firmly.
7. 7. Follow the scan tool instructions.

Remember: That you are going to increase the engine speed to approximately 3000 RPM, 4000 RPM, or 5150 RPM. That's the variation learn fuel cutoff RPM (depending upon the engine), and that it's important to release the throttle when the engine RPM starts to decrease as a result of the fuel cutoff going into effect. Failure to do such will result in over revving of the engine, causing possible engine damage.

Once the engine has returned to idle, check the status of Diagnostic trouble code **P1336**. If the scan tool indicates that the CASE has been learned, the relearn procedure is now complete. If CASE has not been learned, check for the presence of other power train codes. If any exist, correct the problem, then repeat this procedure.





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NOTE: *If the Crankshaft Variation Relearn is not accessible through your scan tool (some truck applications 1998 & later), perform the relearn in the following manner:*

1. Turn off all of the accessories. With the Air temperature sensor and Coolant temperature within 5 degrees (Centigrade) of each other, start the engine and let it idle in Park or Neutral for two minutes
2. Accelerate the vehicle to 55 mph at part throttle. Cruise at 55 mph for 8-10 minutes until the engine reaches operating temperature
3. Accelerate the vehicle to 55 mph at part throttle. Cruise at 55 mph for 8-10 minutes until the engine reaches operating temperature.
4. Cruise at 55 mph for another 5-6 minutes.
5. Decelerate to 45 mph without using the brakes, and maintain 45 mph for 1 minute
6. Perform 4 deceleration cycles, without using the brakes, of 25 seconds each where no specific speed is necessary. Returning to 45 mph for 15 seconds in between deceleration cycles.
7. Accelerate to 55 mph and cruise for 2 minutes. Stop the vehicle and idle for 2 minutes with the brake applied and the transmission in Drive (automatic trans.) or Neutral (manual trans.)

