



# **Finding and Fixing Vacuum Leaks on the LT5 Engine**

**Marc Haibeck**

There is an accompanying technical article that provides the detailed information that not is not available in the presentation format. Go to the 'Articles' page of this web site to view the article.

# **There are Two Vacuum Systems. Manifold Vacuum and Servo Vacuum.**

- The manifold vacuum area runs from the throttle body to the intake valves
- The servo vacuum systems use manifold vacuum to run:
  - The secondary intake port throttles
  - The cruise control system
  - HVAC air guide doors
  - Power braking

# How Does One Know That There's a Manifold Vacuum Leak?

- A high idle
  - The programmed OE hot idle speed is 650 rpm. Tuners use other speeds, often 750 rpm.
- High coast down idle. For '90 – '92 it's normally 1200 rpm at 20 mph. For '93 – '95 it's normally 800 rpm. A vacuum leak will increase the coast down engine speed.
- A low Idle Air Control count. It's normally 10 to 20 at hot idle. It will go to zero if the idle speed is over the programmed idle speed.
- Is the tachometer correct? They often fail such that the displayed rpm is too high.
  - Display the digital engine rpm on the HVAC LCD display

# Checking the Accuracy of the Tachometer



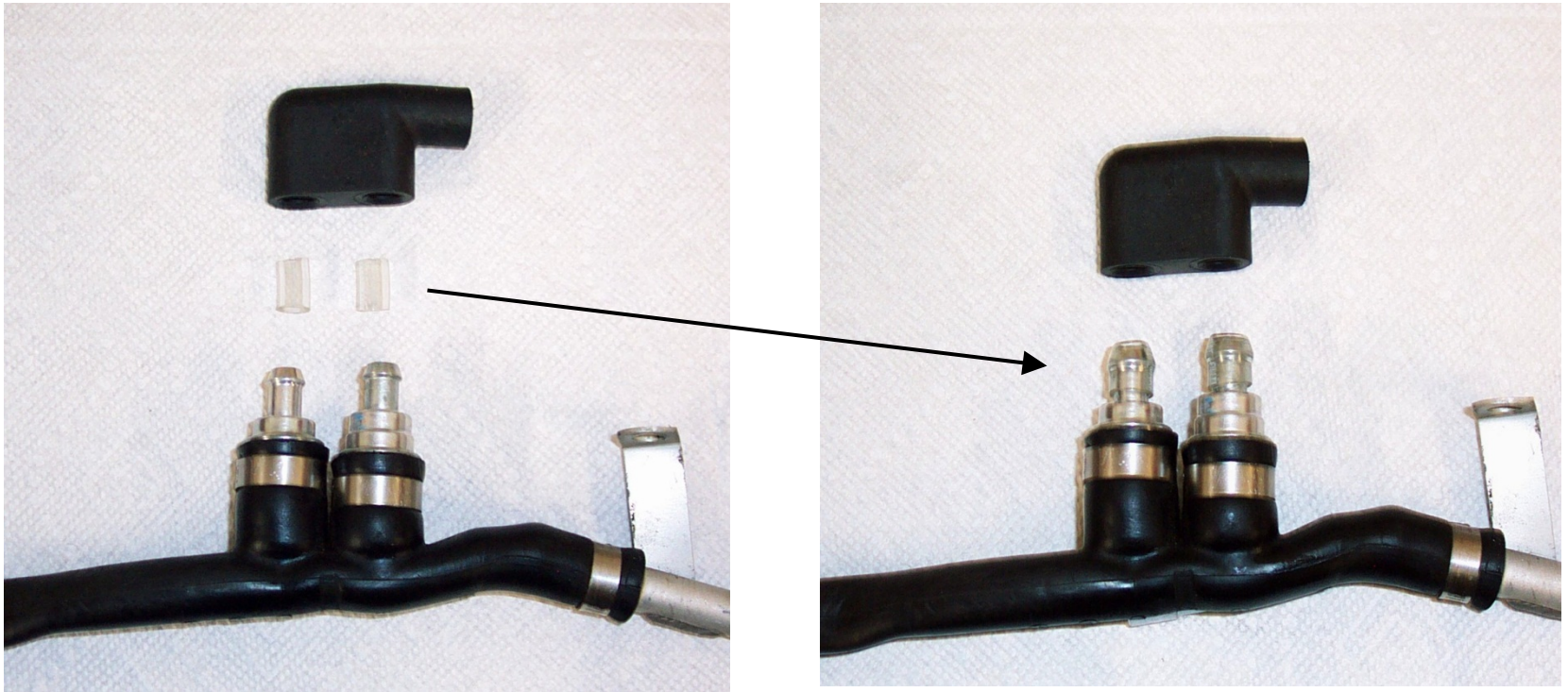
- The displayed value  $\times 25 =$  the idle speed.  $30 \times 25 = 750$ . In this case the idle speed is 750 rpm.

# Sources of Leaks

- The PCV valve grommet
- The dual vacuum fitting on a '90
- The Evaporative Emissions hose on '91 and up
- The throttle body
- Injector housing gasket
- MAP sensor hose



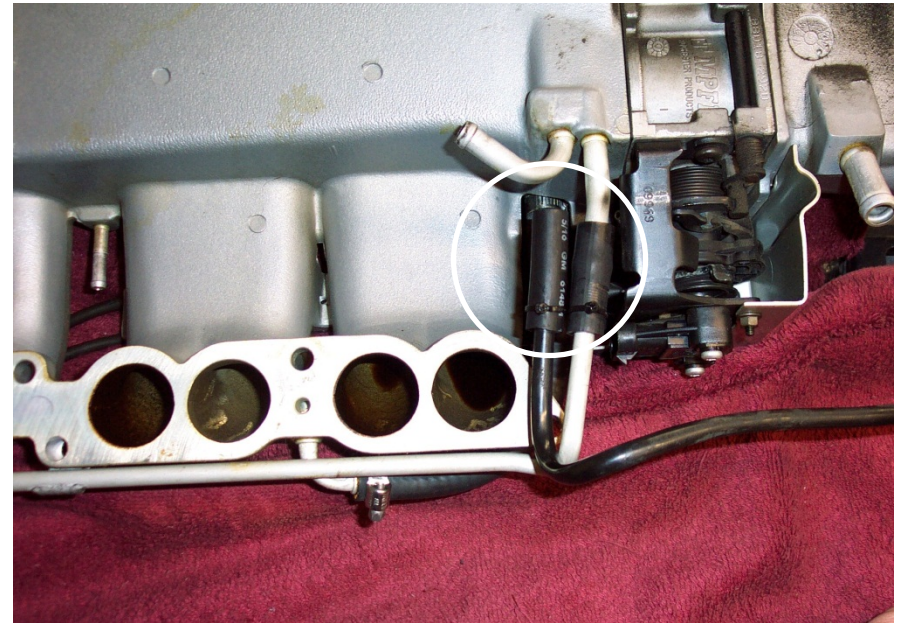
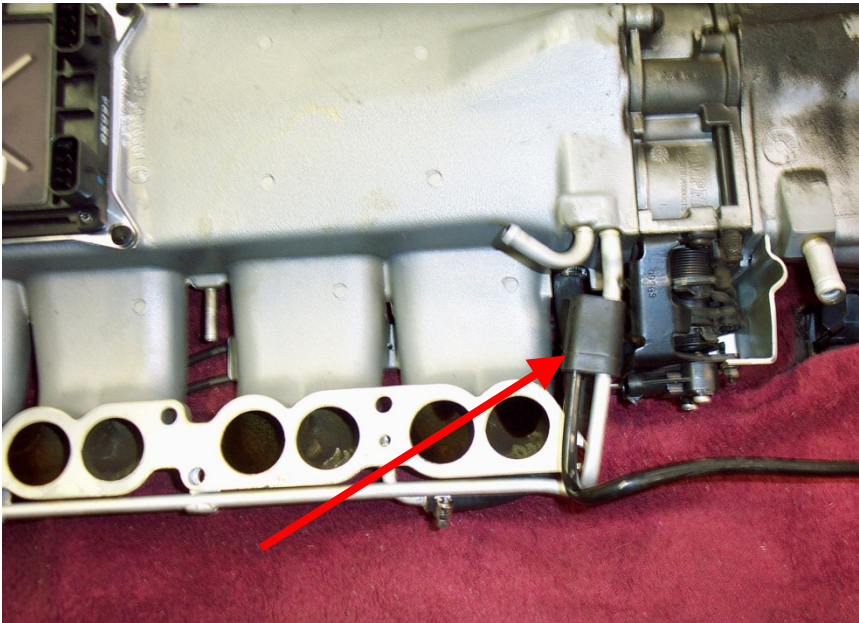
## Source: PVC Valve Grommet



Install vinyl sleeves to repair it.

# Source: Dual Vacuum Fitting

Only on a '90

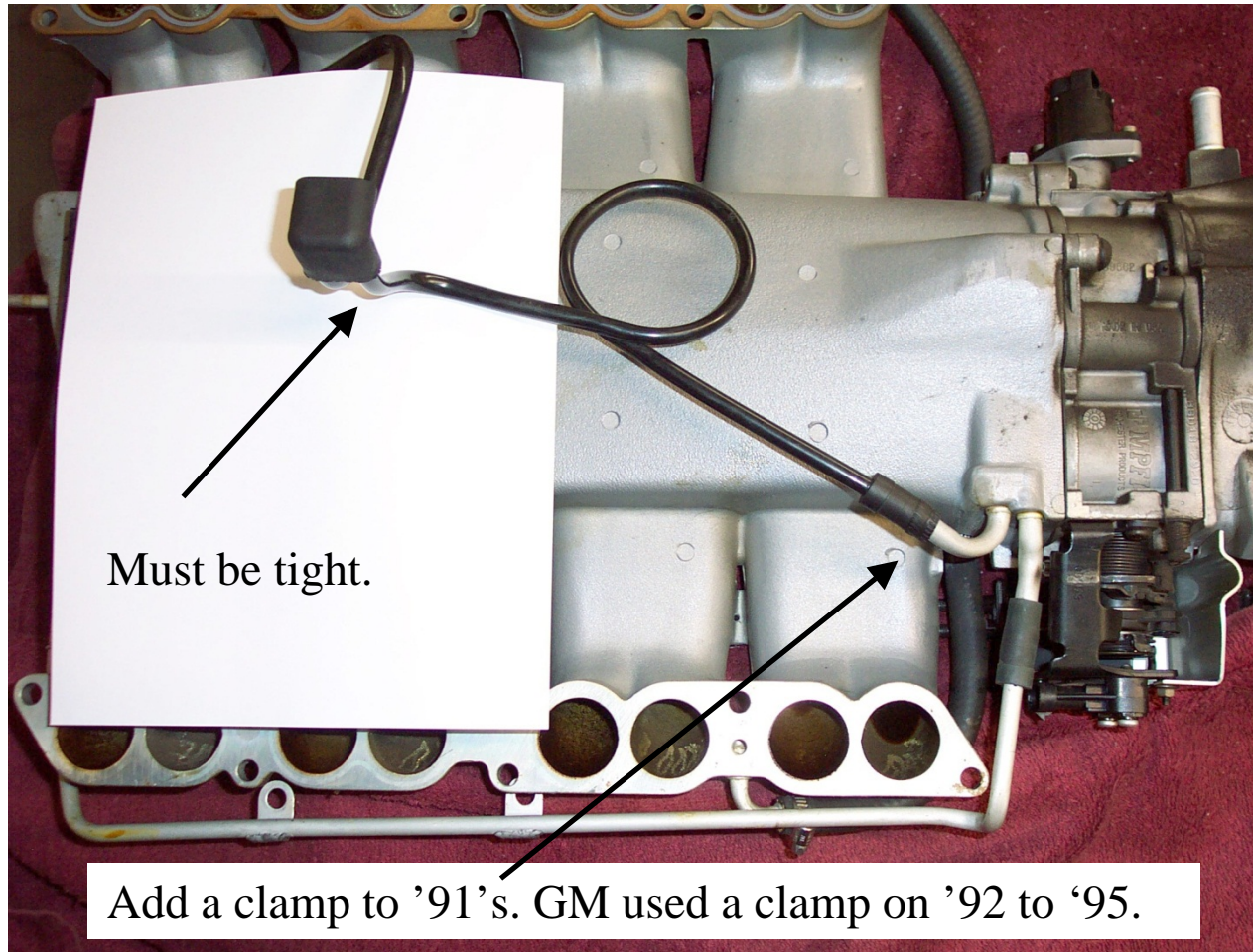


Repair it with two stubs of 5/16" fuel line.



# Source: Evaporative Emissions Hose

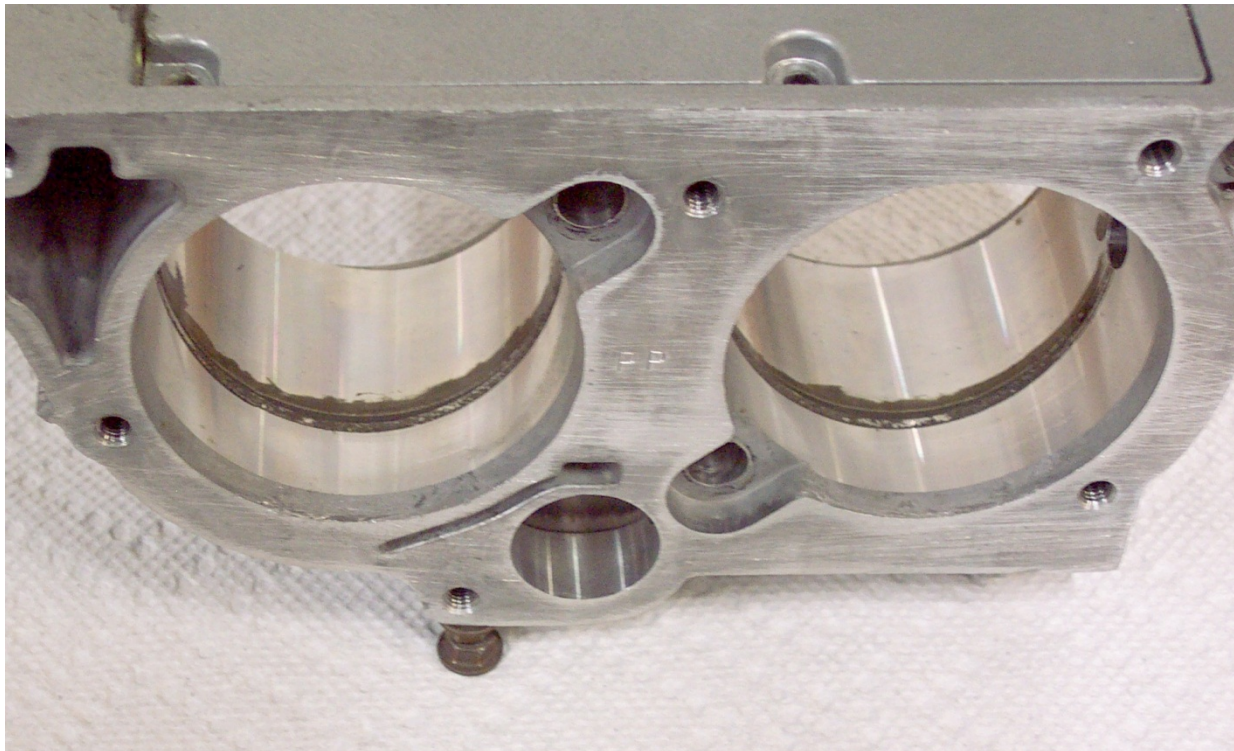
'91 to '95





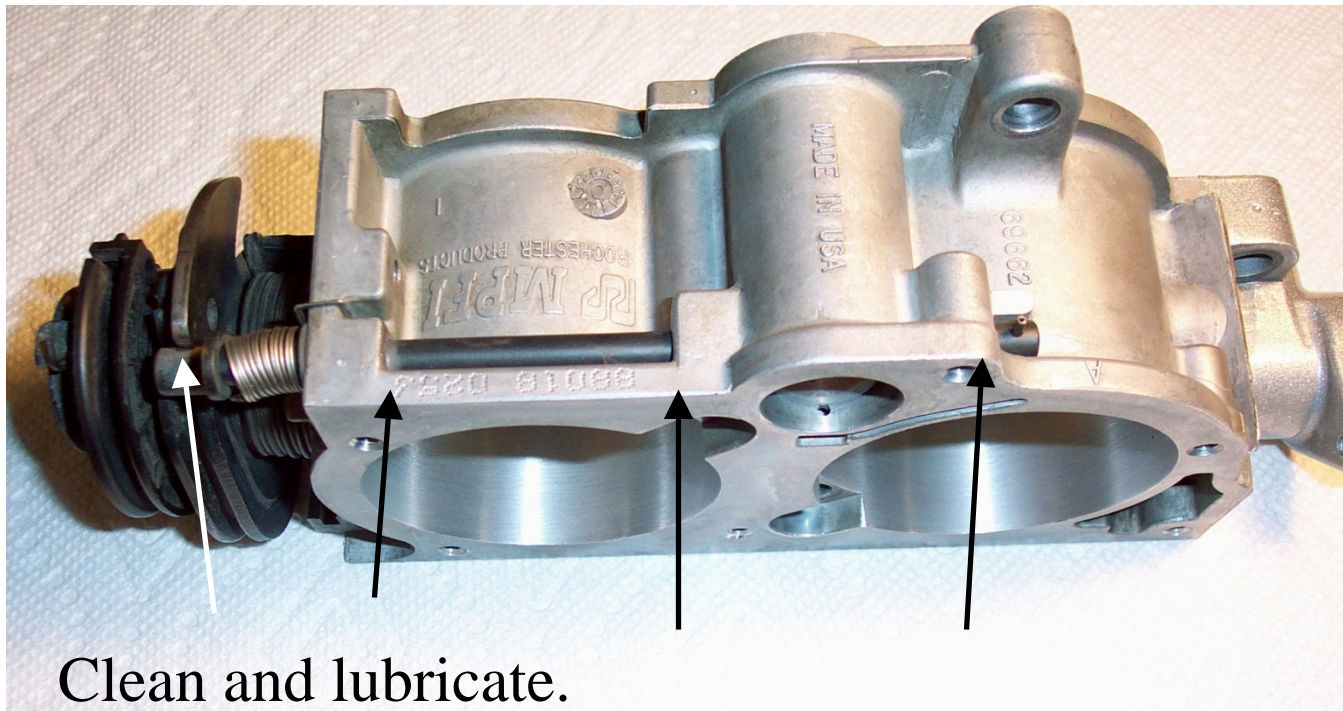
## Source: Throttle Body

- Secondary throttle plate sealer (DAG) could be missing
  - Removed by incorrect cleaning
  - Lost from wear and tear



## Source: Throttle Body

- Sticky secondary throttle plates
- Sticky primary throttle shaft

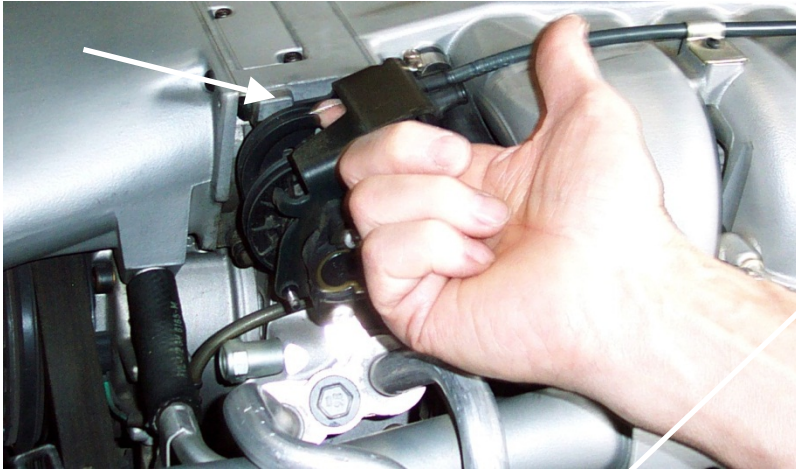


Clean and lubricate.

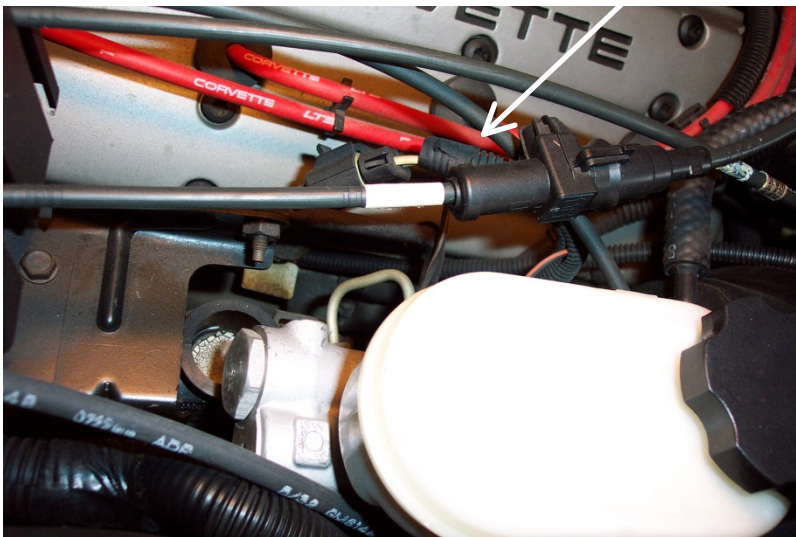
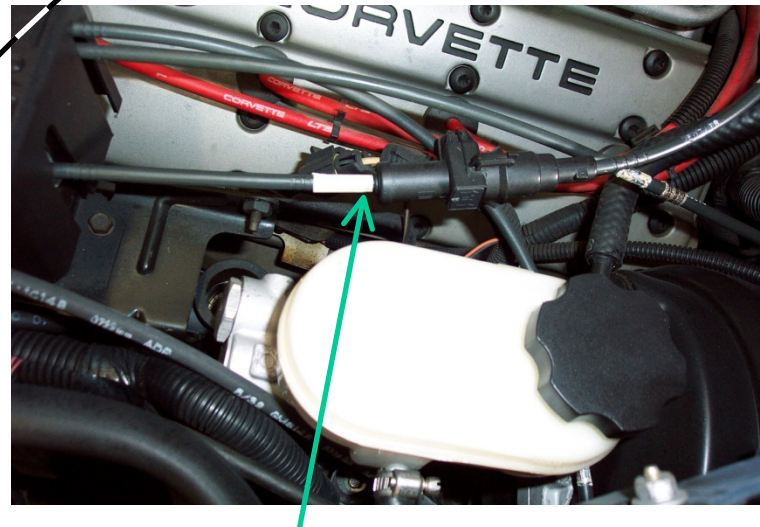


## Source: Throttle Body

- Tight ASR cable on '92 and up cars



Wrap tape 1/8" from the adjuster.



Press the button and shorten the cable one click. Note the smaller gap.

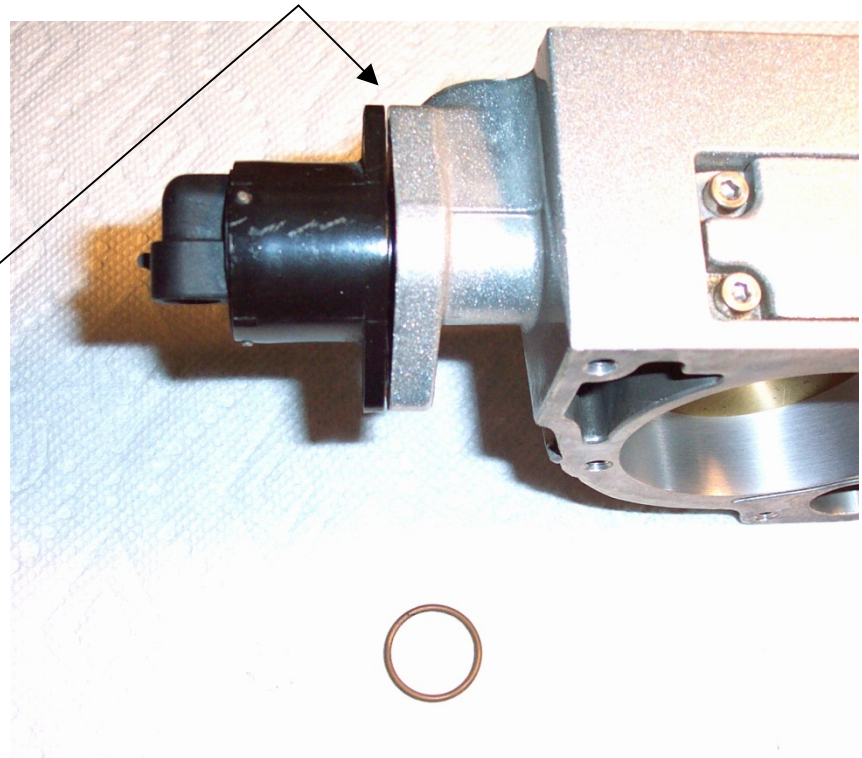


## Source: Throttle Body

- Idle Air Control valve problem
  - It auto calibrates
- Test it for full extension

Check for spring back.

.020"



# Source: Injector Housing Gasket

- More common on '93 and up cars



## Source: MAP Hose



The connector can be reattached or replaced with 3/16” vacuum hose.

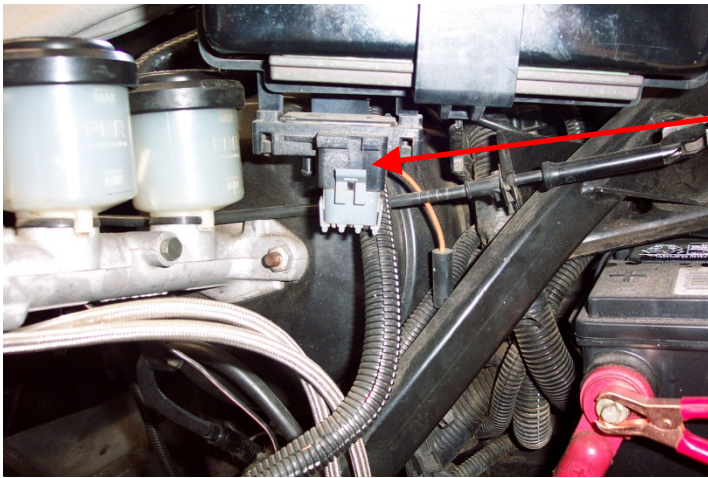


# Secondary Intake Port Throttle Servo System

- Error 56. Electrical problem with the diagnostic vacuum sensor.
- Error 61. Vacuum is low. The error must persist for three seconds.
  - Low on power over 4000 rpm
  - Won't rev over 6000 rpm
  - Secondary vacuum pump does not run
  - Secondary vacuum pump runs all of the time
- Sources of leaks:
  - The check valve
  - The secondary vacuum solenoid
  - Fitting on the vacuum reservoir
- Functional test of the system

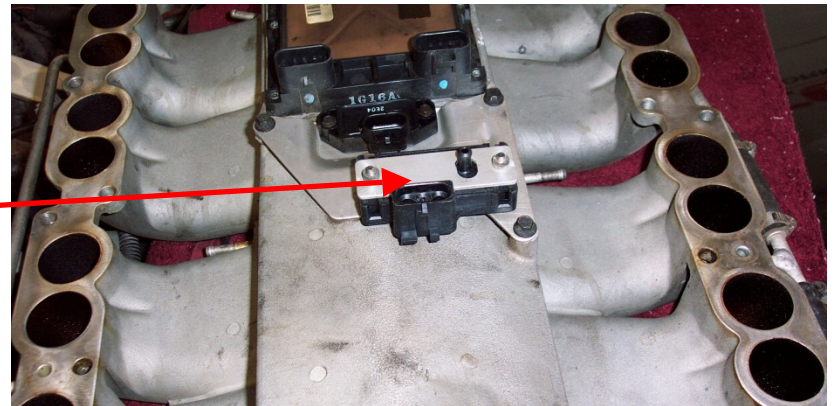
## Secondary Intake Port Throttle Servo System

- Error 56. Electrical problem with the diagnostic vacuum sensor. This is not a vacuum problem.



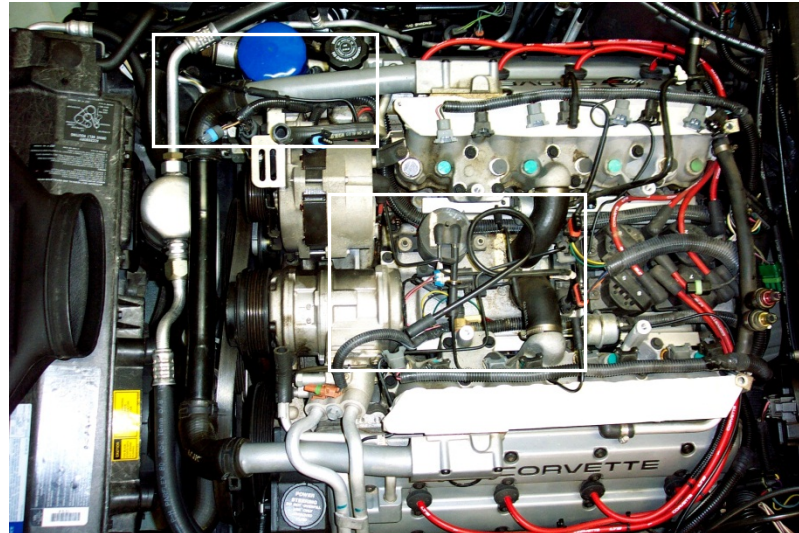
'90 - '92

'93 - '95



## Secondary Intake Port Throttle Servo System

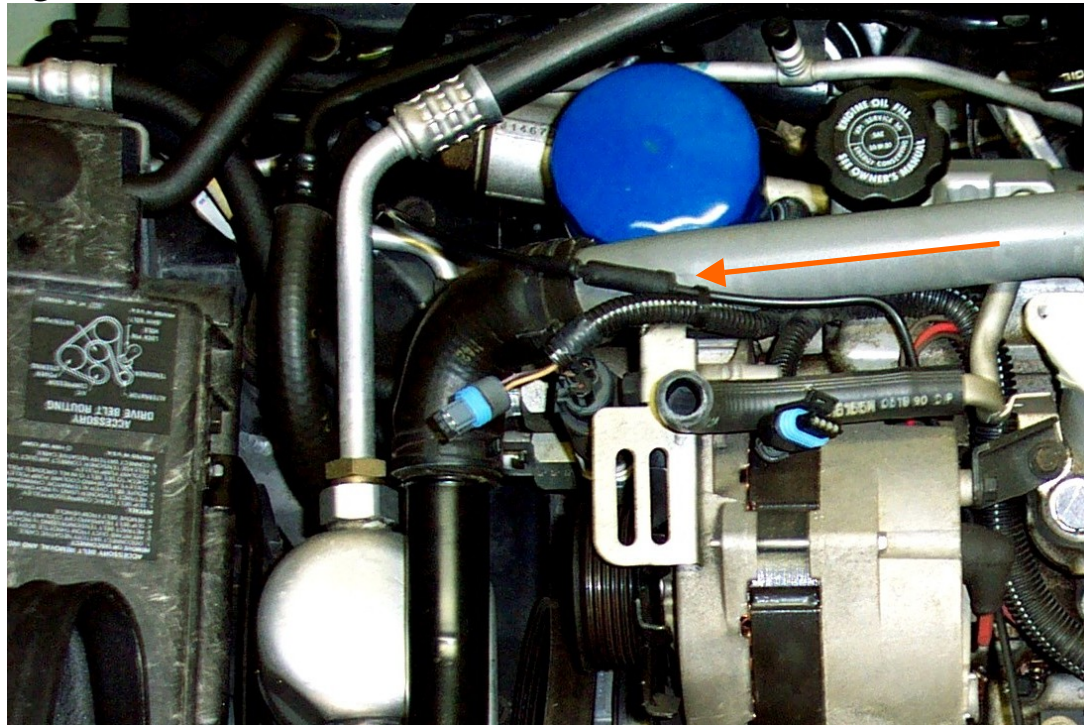
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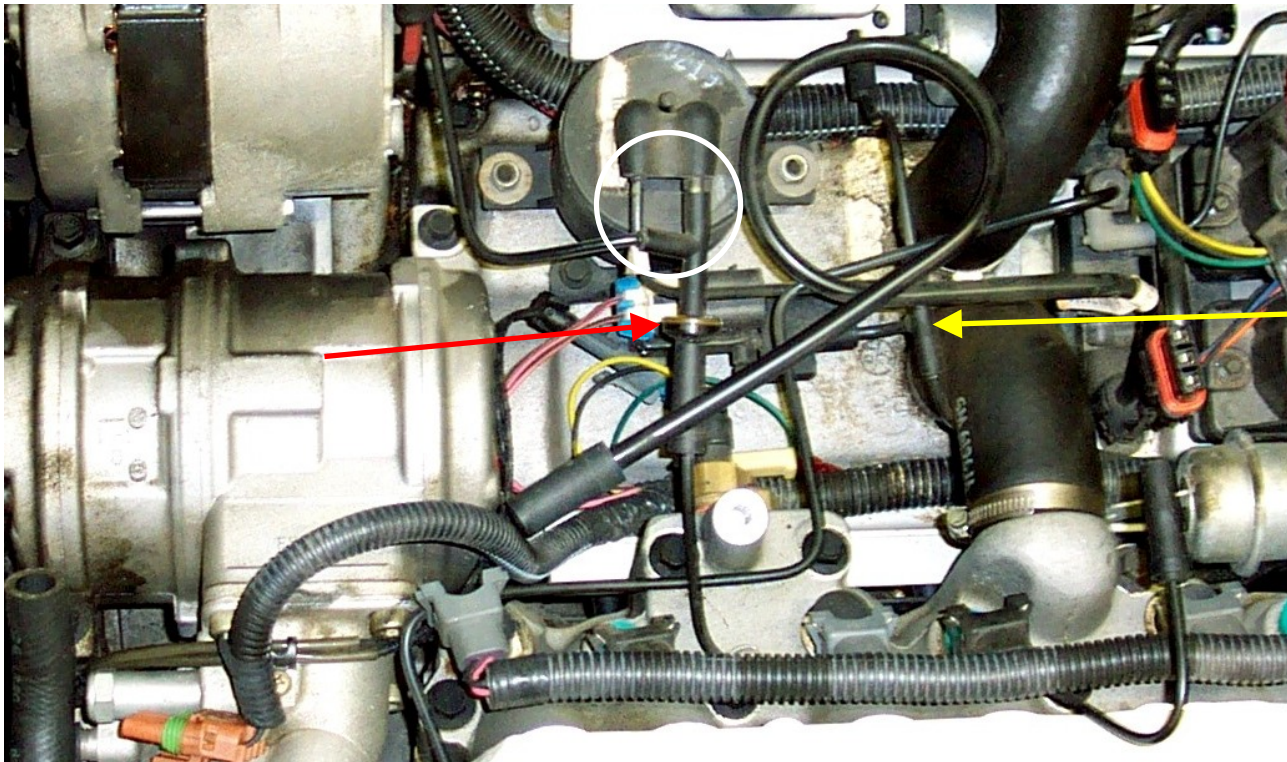
# Secondary Intake Port Throttle Servo System

- Sources of leaks
  - **Vacuum pump connector**
  - The check valve
  - The secondary vacuum solenoid
  - Fitting on the vacuum reservoir



## Secondary Intake Port Throttle Servo System

- Sources of leaks
  - Vacuum pump connector
  - **The check valve. Red arrow.**
  - **The secondary vacuum solenoid. Yellow arrow.**
  - **Fittings on the vacuum reservoir. White circle.**





## Secondary Intake Port Throttle Servo System

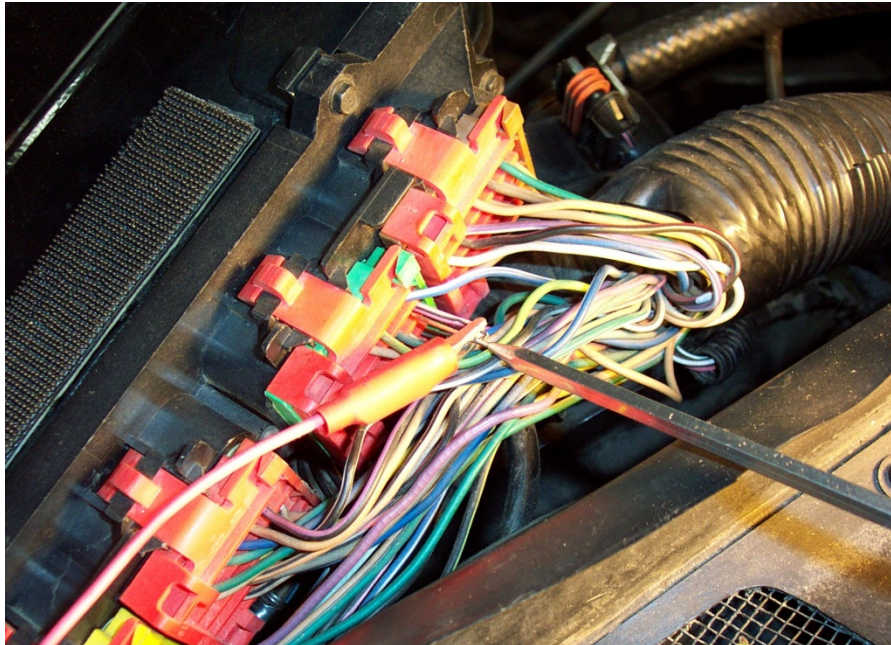
- Functional test of the system
  - The vacuum pump cycle time is your guide





# Secondary Intake Port Throttle Servo System

- Functional test of the system
  - The vacuum pump cycle time is your guide
  - Ground ECM pin C17 to open the secondary port vacuum solenoid which opens the secondary port throttles. The pump should be able to shut off for at least one second.



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This is the last slide.

