

**TECHNICIAN TRAINING**  
BY DORMAN PRODUCTS

**DORMAN®**

Training Center  
*Presents:*  
*"PCM Diagnosis"*

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**DORMAN®**

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## *Your Instructor For This Webinar*

**"G" Jerry Truglia**  
[gtruglia@dormanproducts.com](mailto:gtruglia@dormanproducts.com)

- National Trainer, ASE World Class, Master Auto, Truck, School Bus, L1, L3, CNG and...
- **ATTP Master Instructor, New York State, CT and New Jersey**
- STS (Service Technician Society) 2003 President
- **TST (Technicians Service Training) Founder and President**
- Author / Co Author/ Technical adviser on 25 plus books including OBD II and Mode 6, and Understanding and Diagnosing Hybrid Vehicles
- **Published articles for multiple newsletters, and magazines**
- Picked as one of the Top Instructors in the country by EPA & SAE
- **Numerous Radio, TV, Internet, and SAE Video appearances**
- PTEN, MotorAge and TST Webcast Instructor - Dorman Training Director
- **Motor Magazine Top 20 award winner**
- Provider of OBD II Training for 14 states, Ontario Canada and the US EPA
- **Guest speaker at SAE Congress, IM Solutions and Clean Air Conference**

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## **This Webinar Will Cover:**

- **Using A Scan Tool To Select PIDs**
- **Diagnosing PID Data**
- **Interpreting Powertrain Data**
- **Help Build Your Diagnostic Skills**
- **Case Studies**

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## Ford Mustang 4.6L Lean DTCs

The screenshot displays the eScan Elite software interface. The main window features a large logo for "ATS AUTOMOTIVE Test Solutions eSCAN ELITE Intelligent Power Scan Patented". Below the logo, there are several control panels and data fields:

- Left Panel:** A vertical stack of buttons for "Bank 1" and "Bank 2" diagnostics, including RICH, LEAN, CENTER, CONTROL PROBLEM, FUEL TRIM, TOTAL FUEL TRIM, Bank to Bank Fuel Trim, Time to Engine Temp Calculating, Engine Vacuum, Battery Voltage High, ML ON (Check DTCs), and Monitors Not Complete.
- Center Panel:** A "VIN Decoded Information Read at Startup" table with columns for Make, Model, Year, Engine Name, Cam Type, Max HP, Lifter Size, Cam Timing, Max Torque, Engine Aspiration, and Fuel Injection. The data for the Ford Mustang 4.6L is populated.
- Right Panel:** A "Detected Comm Type" section with fields for CAN, Loop Read Speed (ms), Speed Per PID (ms), Demo Mode (OFF), and Enable Voice Status (ON).

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## Ford Mustang 4.6L Lean DTCs

This screenshot shows the "DTCs" tab in the eScan Elite software. It displays a list of Diagnostic Trouble Codes (DTCs) and a table of supported PIDs.

**DTC Codes:**

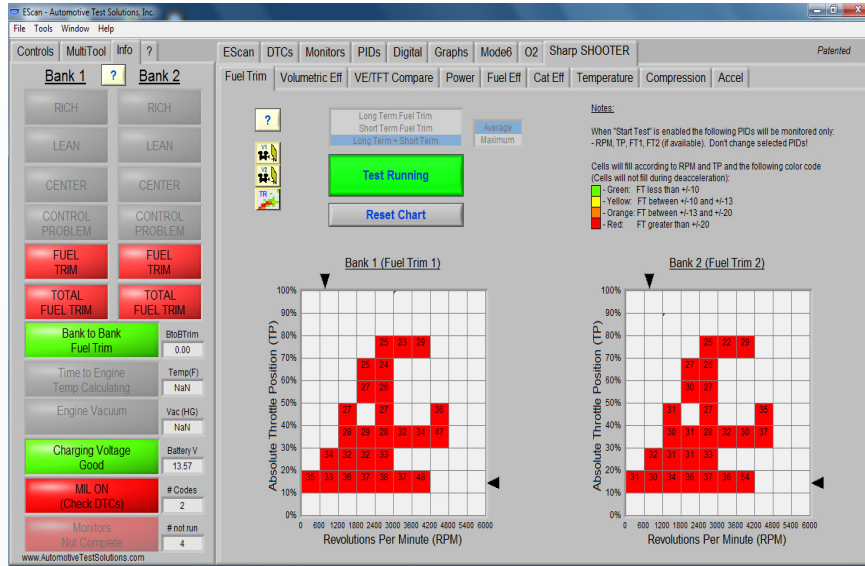
Code	Description
P0171	System Too Lean Bank 1
P0174	System Too Lean Bank 2

**Supported PIDs:**

PID	Description	Abbrev	Data	Units
P0171	DTC caused Freeze Frame Storage #0			
	Calculated Load	LOAD_PCT	45.4902	%
	Engine Coolant Temperature	ECT	197.6000	Deg F
	Short Term Fuel Trim Bank 1	SHRFTF1	0.0000	%
	Long Term Fuel Trim Bank 1	LONGFT1	17.1875	%
	Short Term Fuel Trim Bank 2	SHRFTF2	0.0000	%
	Long Term Fuel Trim Bank 2	LONGFT2	16.4062	%
	Engine RPM	RPM	895.0000	RPM
	Vehicle Speed Sensor	VSS	0.0000	mph
	Ignition Timing Advance for #1 Cylinder	SPARKADV	19.0000	deg
	Intake Air Temperature	IAT	71.6000	Deg F
	Air Flow Rate from Mass Air Flow Sensor	MAF_gls	5.5200	gls
	Air Flow Rate from Mass Air Flow Sensor	MAF_lbm	0.7286	lbm
	Absolute Throttle Position	TP	14.9020	%
	O2 Bank 1 - Sensor 1	O2B1S1	0.0450	V
	O2 Bank 1 - Sensor 1	FTB1S1	0.0000	%
	O2 Bank 1 - Sensor 2	O2B1S2	0.0000	V
	O2 Bank 1 - Sensor 2	FTB1S2	99.2187	%
	O2 Bank 2 - Sensor 1	O2B2S1	0.0250	V
	O2 Bank 2 - Sensor 1	FTB2S1	0.0000	%
	O2 Bank 2 - Sensor 2	O2B2S2	0.0000	V
	O2 Bank 2 - Sensor 2	FTB2S2	0.0000	%

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# Ford Mustang 4.6L Lean DTCs

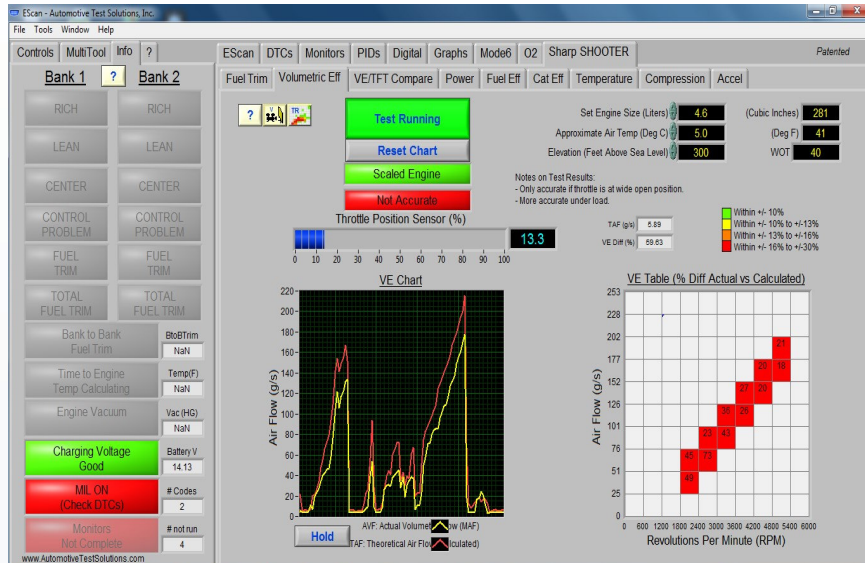


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# Ford Mustang 4.6L Lean DTCs



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## Audi 2.7L Cam DTCs

**Code Scan - Systems Analyzed : 5**

- 01-Engine Management - Codes : 2**
  - 17748 | Camshaft Position Sensor (G40) / Engine Speed Sensor (G28) Incorrect Correlation P1340 [DIAGNOSE >](#)
  - 17755 | Camshaft Position Sensor 2 (G163) / Engine Speed Sensor (G28) Incorrect Correlation P1347 [DIAGNOSE >](#)
- 03-Brake Electronics - Codes : 0**
- 08-Airco - Codes : 1**
  - 01273 | Fresh Air Blower (V2) Deviation From Desired Value [DIAGNOSE >](#)
- 15-Airbag - SRS - Codes : 3**
  - 65535 | Checksum Error - ECU Defective - Intermittent [DIAGNOSE >](#)

2001 Audi A4/S4 2.7L MPI | 11.7 V

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## Ford P0308 DTC

**Select Option**

- All CMDTCs
  - Pass - ABS
  - Pass - IC
  - Pass - RCM
  - C1979-2F-4X4
  - P0308-FF-PCM**
  - P0316-FF-PCM
  - P1000-FF-PCM
- Freeze Frame - Mode 2
  - P0308-00-PCM
- Pending DTC
  - P0308-00-PCM
- Optional equipment Modules
  - Fail - EATC
  - Fail - DSM
  - Fail - PAM
  - Fail - VSM

**Powertrain Control Module**

**Description - P0308**

- Cylinder #8 Misfire Detected.
- Possible Causes-
  - Ignition system fault.
  - Fuel delivery fault.
  - Misaligned/Damaged CKP sensor trigger wheel.
  - Engine mechanical fault.
  - Running out of fuel.
  - Evaporative Emission System.
  - Fuel Quality.
- Note: The Misfire Detection monitor is an on-board strategy designed to monitor engine misfire and identify the specific cylinder in which the misfire has occurred. Misfire is defined as lack of combustion in a cylinder due to absence of spark, poor fuel metering, poor compression, or any other cause.
- Status - FF**
  - No Status Available for this DTC
- Diagnostic Protocol - CAN**
  - Select I button help for additional information on CAN DTC structure

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# Ford P0316 DTC

The screenshot shows a diagnostic software window titled "Ford P0316 DTC". The window is split into two main sections: "Select Option" on the left and "Powertrain Control Module" on the right. The "Select Option" section lists various diagnostic categories, with "P0316-FF-PCM" highlighted. The "Powertrain Control Module" section displays the following information:

- Description - P0316**
  - Misfire Detected on Startup (First 1000 revolutions).
  - This DTC may be caused by :
    - Ignition System
    - Fuel System
    - Low Fuel Warning
    - Blocked kinked or crushed fuel lines
    - Fuel contaminated
    - Evaporative emission control system malfunction
    - EGR system fault.
    - Base engine fault
    - Check for any other codes that may cause a misfire.
- Status - FF**
  - No Status Available for this DTC
- Diagnostic Protocol - CAN**
  - Select I button help for additional information on CAN DTC structure

A "Screenshot Added" notification is visible in the bottom right corner of the software window.

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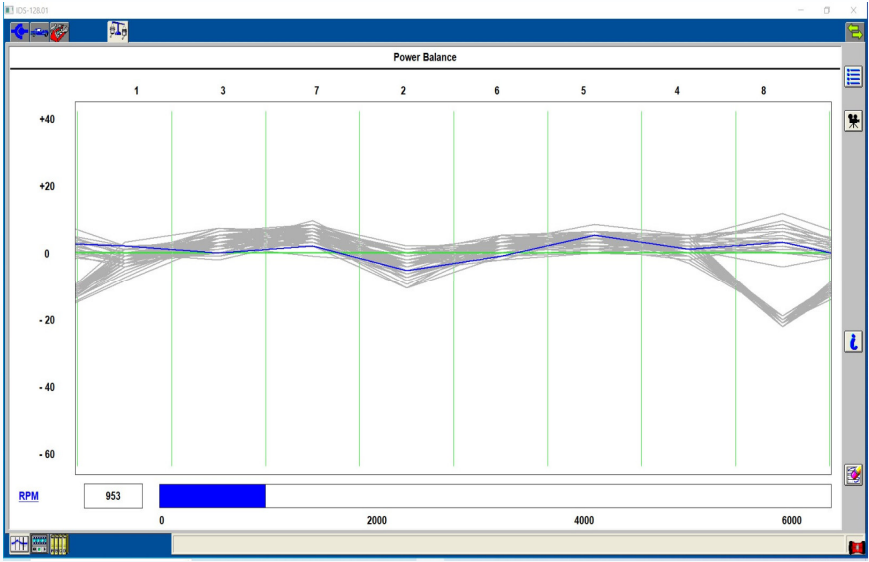
# Ford Power Balance Test

The screenshot shows a diagnostic software window titled "Ford Power Balance Test". The window displays a "Power Balance" graph with the following characteristics:

- Graph:** A line graph showing power balance over time. The y-axis ranges from -60 to +40. The x-axis represents RPM, with markers at 0, 2000, 4000, and 6000. The graph shows multiple data series (grey lines) and a central blue line. Vertical green lines are present at 1, 3, 7, 2, 6, 5, 4, and 8 RPM.
- Instructions:** A dialog box titled "Power Balance" is overlaid on the graph, containing the text: "Set the ignition switch to ON. Start Engine. Press lock to continue. Press X to cancel." It includes a red 'X' button and a green checkmark button.
- RPM Display:** A digital display at the bottom left shows "RPM 883".

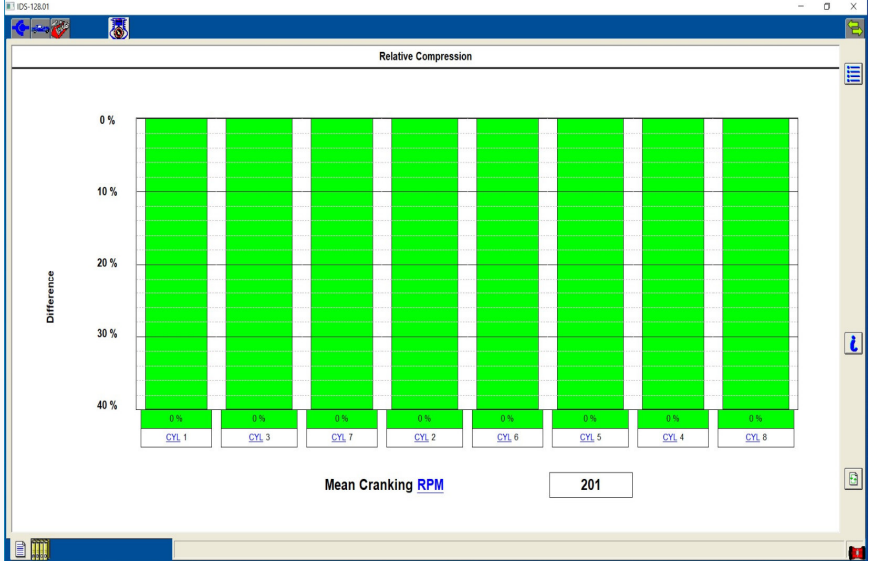
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# Ford Power Balance Test



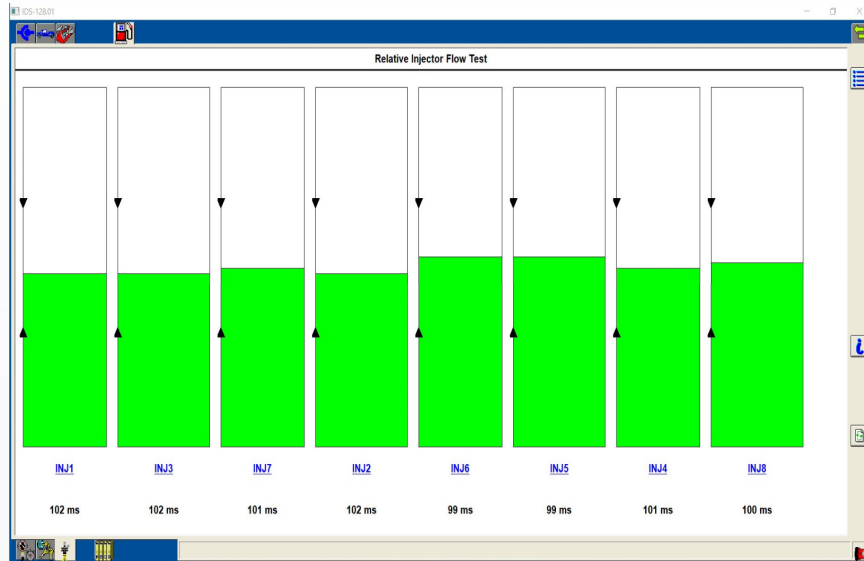
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# Ford Relative Compression



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## Ford Relative Injection Flow Test



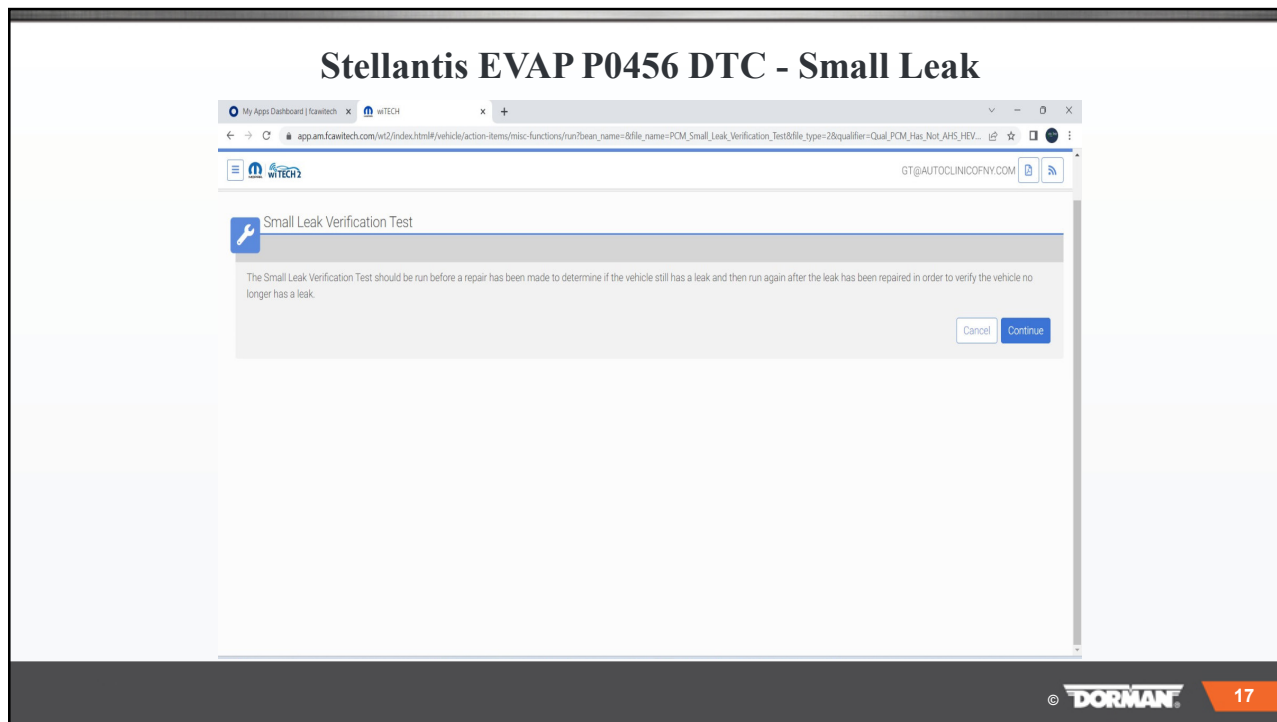
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## Stellantis EVAP P0456 DTC

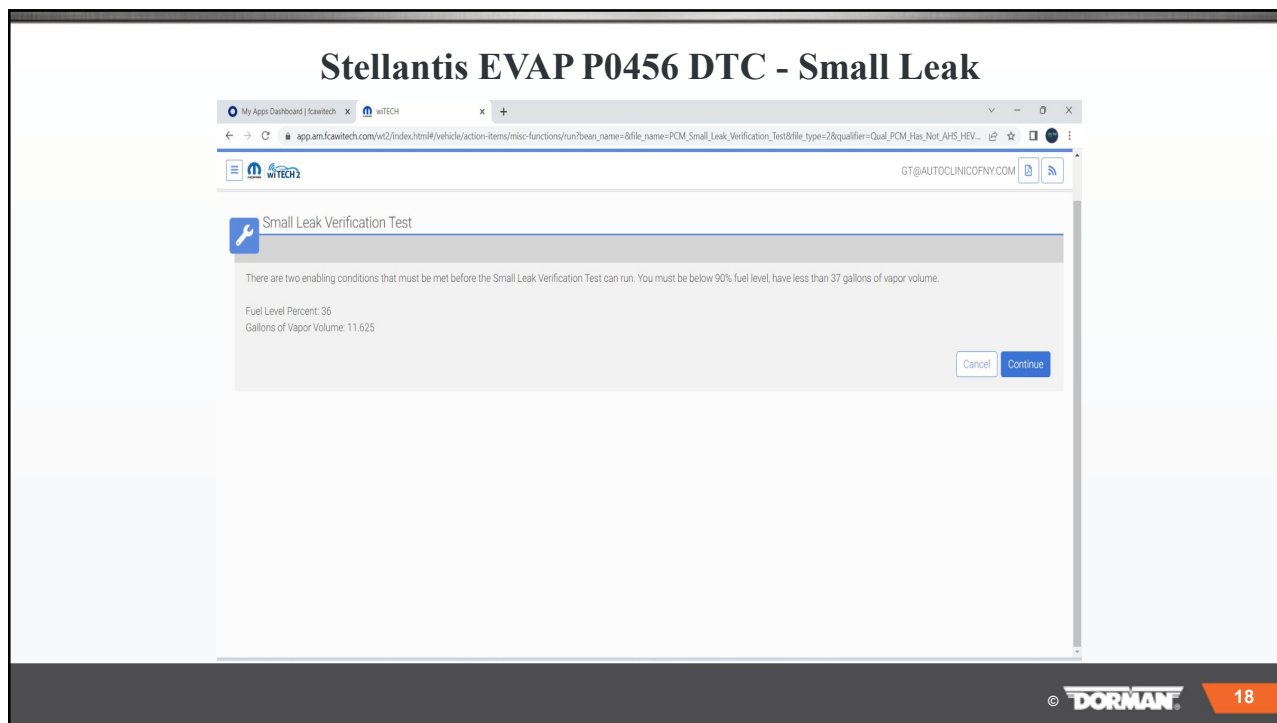
ECU	CODE	DESCRIPTION	STATUS
PCM	P0456	Evap System Small Leak	Stored
WCM	C1502	Tire Pressure Sensor 2 Internal	Stored
TIPMCGW	B1820	Hood Ajar Input Circuit High	Stored

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## Stellantis EVAP P0456 DTC - Small Leak

Small Leak Verification Test

Test Phase 1 - Checks Stability of System

The systems vapor pressure must be stable enough to run the test. The fuel tank vapor stability is measured by removing the gas cap or installing the refueling funnel, then the purge solenoid is actuated for 30 seconds. If after 30 seconds the tank pressure is above 125 Pa or below -125 Pa then the tank pressure is not stable and the test cannot continue.

Tank Pressure: 37 Pa

64%

Cancel

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## Stellantis EVAP P0456 DTC - Small Leak

Small Leak Verification Test

Phase 3 - Checks for a Leak in the Purge Solenoid

With the Purge Solenoid off the engine is started. The fuel tank pressure is measured and then 10 seconds later the fuel tank pressure is measured again. If the difference in the two readings is greater than 200 Pa then the Purge Solenoid is leaking.

**200 Pascals = 0.002 Bar or 0.029 psi**

Cancel Continue

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## Stellantis EVAP P0456 DTC - Small Leak

Small Leak Verification Test

Phase 5 - Intrusive Small Leak Test

The fuel tank pressure is now being monitored for 180 seconds. Tank Pressure: -466 Pa  
If the pressure stays below -200 Pa then the test will pass. If the pressure goes above -200 Pa then the test will fail for a small leak. ESIM Status: Closed

11%

**- 200 Pascals = - 0.002 Bar or - 0.029 psi**

Cancel

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## Stellantis EVAP P0456 DTC - Small Leak

Small Leak Verification Test

Phase 5 - Intrusive Small Leak Test

The fuel tank pressure is now being monitored for 180 seconds. Tank Pressure: -292 Pa  
If the pressure stays below -200 Pa then the test will pass. If the pressure goes above -200 Pa then the test will fail for a small leak. ESIM Status: Closed

99%

Cancel

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## 2002 Toyota Sienna Misfire P0300 - 301 & 303 DTCs

The screenshot shows the EScan software interface for a 2002 Toyota Sienna. The main window displays the following information:

- Bank 1 & 2:** Both banks show "RICH" fuel trim.
- Controls:** Buttons for "Read DTC & Pending Codes", "Clear DTCs", "Read Permanent Codes", and "Read Freeze Frame Data".
- DTCs:** P0300 (Random/Multiple Cylinder Misfire Detected), P0301 (Cylinder 1 Misfire Detected), and P0303 (Cylinder 3 Misfire Detected).
- Supported PIDs:**

Code	Description	Abbrev	Data	Units
<b>P0172 DTC caused Freeze Frame Storage #0:</b>				
LOAD_PCT	Calculated Load	LOAD_PCT	18.8235	%
ECT	Engine Coolant Temperature	ECT	161.6000	Deg F
SHRTFT1	Short Term Fuel Trim Bank 1	SHRTFT1	-20.3125	%
LONGFT1	Long Term Fuel Trim Bank 1	LONGFT1	-18.7500	%
SHRTFT2	Short Term Fuel Trim Bank 2	SHRTFT2	-2.3437	%
LONGFT2	Long Term Fuel Trim Bank 2	LONGFT2	-9.3750	%
RPM	Engine RPM	RPM	1080.2500	RPM
VSS	Vehicle Speed Sensor	VSS	32.9130	mph
IAT	Intake Air Temperature	IAT	48.2000	Deg F
<b>P0300 DTC caused Freeze Frame Storage #1:</b>				
LOAD_PCT	Calculated Load	LOAD_PCT	30.5882	%
ECT	Engine Coolant Temperature	ECT	60.8000	Deg F
SHRTFT1	Short Term Fuel Trim Bank 1	SHRTFT1	16.4062	%
LONGFT1	Long Term Fuel Trim Bank 1	LONGFT1	-40.6250	%
SHRTFT2	Short Term Fuel Trim Bank 2	SHRTFT2	-16.2062	%
LONGFT2	Long Term Fuel Trim Bank 2	LONGFT2	-5.4687	%
RPM	Engine RPM	RPM	1311.5000	RPM
VSS	Vehicle Speed Sensor	VSS	0.0000	mph
IAT	Intake Air Temperature	IAT	55.4000	Deg F

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## 2002 Toyota Sienna Misfire P0300 - 301 & 303 DTCs

The screenshot shows the EScan software interface for a 2002 Toyota Sienna. The main window displays the following information:

- Bank 1 & 2:** Both banks show "RICH" fuel trim.
- Controls:** Buttons for "Read DTC & Pending Codes", "Clear DTCs", "Read Permanent Codes", and "Read Freeze Frame Data".
- DTCs:** P0300 (Random/Multiple Cylinder Misfire Detected), P0301 (Cylinder 1 Misfire Detected), and P0303 (Cylinder 3 Misfire Detected).
- Supported PIDs:**

Code	Description	Abbrev	Data	Units
<b>P0300 DTC caused Freeze Frame Storage #1:</b>				
LONGFT2	Long Term Fuel Trim Bank 2	LONGFT2	-9.3750	%
RPM	Engine RPM	RPM	1080.2500	RPM
VSS	Vehicle Speed Sensor	VSS	32.9130	mph
IAT	Intake Air Temperature	IAT	48.2000	Deg F
<b>P0300 DTC caused Freeze Frame Storage #1:</b>				
LOAD_PCT	Calculated Load	LOAD_PCT	30.5882	%
ECT	Engine Coolant Temperature	ECT	60.8000	Deg F
SHRTFT1	Short Term Fuel Trim Bank 1	SHRTFT1	16.4062	%
LONGFT1	Long Term Fuel Trim Bank 1	LONGFT1	-40.6250	%
SHRTFT2	Short Term Fuel Trim Bank 2	SHRTFT2	-16.2062	%
LONGFT2	Long Term Fuel Trim Bank 2	LONGFT2	-5.4687	%
RPM	Engine RPM	RPM	1311.5000	RPM
VSS	Vehicle Speed Sensor	VSS	0.0000	mph
IAT	Intake Air Temperature	IAT	55.4000	Deg F


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## 2008 Chevy Suburban 5.3L Scan Data

ENGINE DATA	
Engine Speed (RPM)	585
COOLANT (°F)	201
AMB AIR TEMP (°F)	39
MAF (gm/Sec)	5.66
ENGINE LOAD (%)	19
TPS (%)	14
INT MAN PRESS (inHg)	18.6
LOOP STATUS	CLOSED
INJECTOR PWM BANK 2 (ms)	2.3
HO2S BANK 1 SENSOR 2 (mV)	781
HO2S BANK 2 SENSOR 2 (mV)	729
DESIRED IDLE	600
INTAKE AIR (°F)	109
COLD STARTUP	NO
AIRFLOW (gm/Sec)	5.59
APP (%)	0
MAP (inHg)	10.6
BARO (inHg)	29.2
INJECTOR PWM BANK 1 (ms)	2.4
HO2S BANK 1 SENSOR 1 (mV)	87
HO2S BANK 2 SENSOR 1 (mV)	773
ST Trim-1 (%)	2

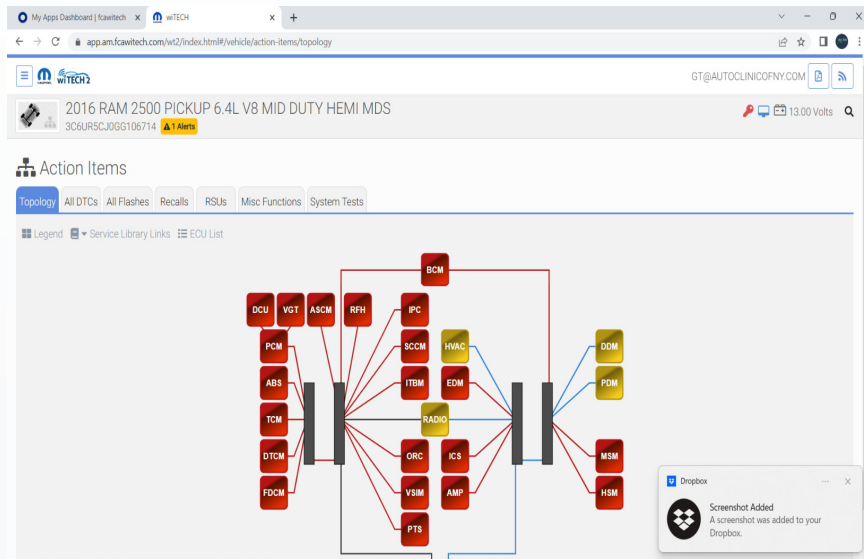
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## 2016 Ram 2500 6.4L No Start

Vehicle Selection		Sort By: Connection Time	
List refreshes automatically as devices are connected or removed.			
 2016 RAM 2500 PICKUP 6.4L V8 MID DUTY HEMI MDS VIN: 3C6URSCJ0GG106714 Device Serial Number: MDP-016050 License Expiration: Jan 4, 2024, 2:31:00 PM	Device Name Connection Time 08:48:39 AM	<b>15</b> DTCs <b>0</b> Flashes <b>1</b> Recalls <b>0</b> RSUs	GT@AUTOCLINICOFNY.COM

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## 2016 Ram 2500 6.4L No Start



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## 2004 VW Jetta 2.0

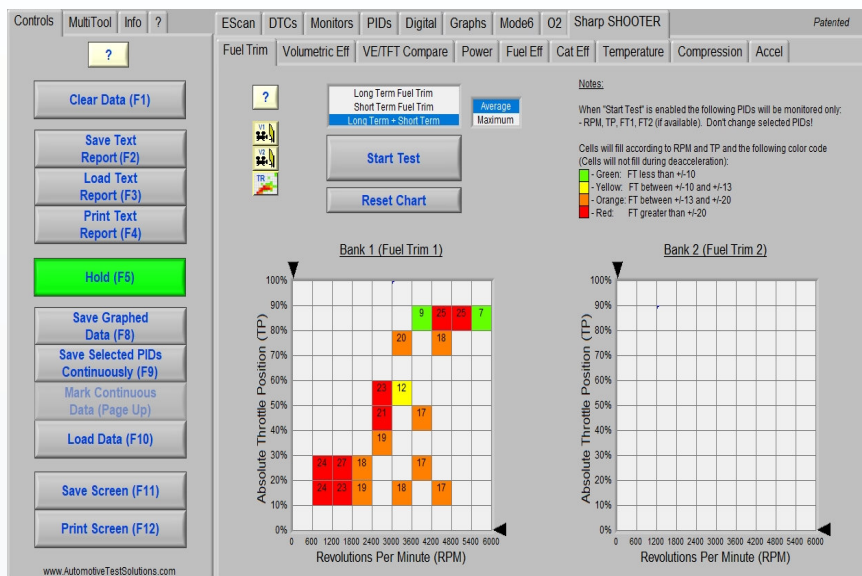
The screenshot shows a diagnostic software interface for a 2004 VW Jetta 2.0. The interface is divided into several sections:

- Controls:** Bank 1 and Bank 2 fuel trim controls (RICH, LEAN, CENTER, Stoichiometric, FUEL TRIM, TOTAL FUEL TRIM).
- Bank 1 Data:**
  - Bank to Bank Fuel Trim: NaN
  - Time to Engine Temp Calculating: 168.80
  - Engine Vacuum: Vac (HG) NaN
  - Battery Voltage: Low 11.81
  - MIL ON (Check DTCs): # Codes 1
  - Monitors Complete: # not run 0
- Bank 2 Data:**
  - Bank to Bank Fuel Trim: NaN
  - Time to Engine Temp Calculating: 168.80
  - Engine Vacuum: Vac (HG) NaN
  - Battery Voltage: Low 11.81
  - MIL ON (Check DTCs): # Codes 1
  - Monitors Complete: # not run 0
- DTCs:**
  - Select Make: Unknown
  - Read DTC & Pending Codes
  - Clear DTCs
  - DTC that Caused Freeze Frame Storage #0: P2177
  - Read Permanent Codes
  - Read Freeze Frame Data
  - VIN: Not Available
- Supported PIDs Table:**

Code	Description	Abbrev	Data	Units
P2177	DTC Codes: System Too Lean Off Idle			
	No Pending Codes Present			
Supported PIDs				
P2177	DTC caused Freeze Frame Storage #0:			
Calculated Load	LOAD_PCT	39.6079	%	
Engine Coolant Temperature	ECT	150.8000	Deg F	
Short Term Fuel Trim Bank 1	SHRTFT1	7.0312	%	
Long Term Fuel Trim Bank 1	LONGFT1	18.7500	%	
Engine RPM	RPM	2200.0000	RPM	
Vehicle Speed Sensor	VSS	41.6070	mph	

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## 2004 VW Jetta 2.0

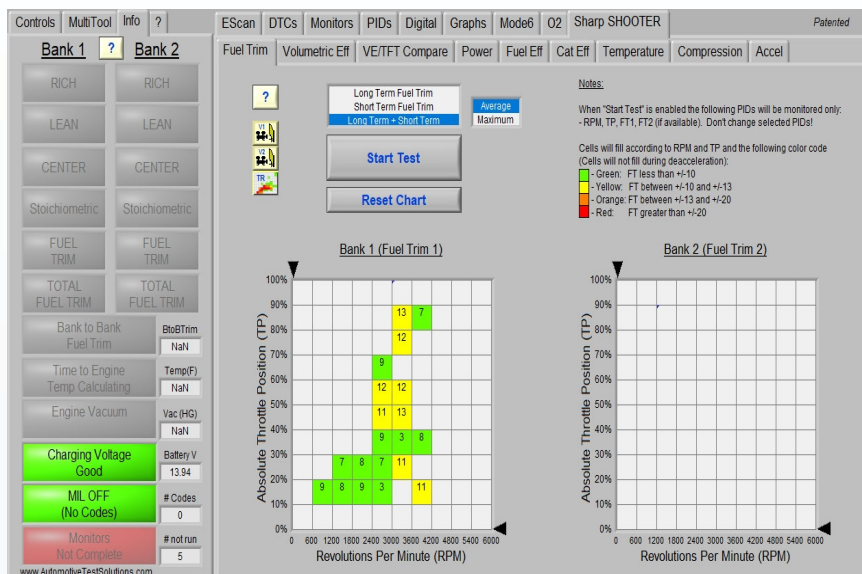


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## 2004 VW Jetta 2.0



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## 2004 VW Jetta 2.0

Controls | MultiTool | Info | ?

Clear Data (F1)

Save Text Report (F2)

Load Text Report (F3)

Print Text Report (F4)

Hold (F5)

Save Graphed Data (F8)

Save Selected PIDs Continuously (F9)

Mark Continuous Data (Page Up)

Load Data (F10)

Save Screen (F11)

Print Screen (F12)

www.AutomotiveTestSolutions.com

EScan | DTCs | Monitors | PIDs | Digital | Graphs | Mode6 | O2 | Sharp SHOOTER | Patented

Fuel Trim | Volumetric Eff | VE/TF/ Compare | Power | Fuel Eff | Cat Eff | Temperature | Compression | Accel

Start Test

Reset Chart

Generic or "Set Engine"

Not Accurate

Notes on Test Results:  
- Only accurate if throttle is at wide open position.  
- More accurate under load.

Set Engine Size (Liters) 2.0 (Cubic Inches) 122  
Approximate Air Temp (Deg C) 0.0 (Deg F) 32  
Elevation (Feet Above Sea Level) 300 WOT 40

Throttle Position Sensor (%) 0.0

VE Chart

VE Table (% Diff Actual vs Calculated)

RPM	% Diff
2400	-12
2800	16
3200	15
3600	14
4000	3
4400	8
4800	13
5200	15

Legend:  
■ Within +/- 10%  
■ Within +/- 10% to +/-13%  
■ Within +/- 13% to +/-16%  
■ Within +/- 16% to +/-30%

Legend:  
■ Within +/- 10%  
■ Within +/- 10% to +/-13%  
■ Within +/- 13% to +/-16%  
■ Within +/- 16% to +/-30%

Legend:  
■ Within +/- 10%  
■ Within +/- 10% to +/-13%  
■ Within +/- 13% to +/-16%  
■ Within +/- 16% to +/-30%

Legend:  
■ Within +/- 10%  
■ Within +/- 10% to +/-13%  
■ Within +/- 13% to +/-16%  
■ Within +/- 16% to +/-30%

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## TST Webinar Thursday May 16<sup>th</sup> 2024

**TST Thurs. May 16th, 2024, PART 2**  
**"Understanding and Measuring Current"**  
 w/ Adam Robertson

**Time & Location**  
 May 16, 2024, 9:00 AM - 11:00 AM EDT  
 Webinar

**About the Event**  
**Understanding and Measuring Current**  
 The Magic to Electrical Diagnostics Part 2  
 In electrical system diagnostics there are several parts, pieces and tests that dictate how the electrical system functions. The measurement of current can tell an incredible story about the things that operate in circuits and components. Before we start, it is really a simple measurement. "Look over" the key electrical diagnostic steps. If you want to see the electrical diagnostic process in detail, properly measuring and understanding current flow. With the use of "current probes" and lab scopes we can see beyond the measurements to increase our diagnostic efficiency and accuracy. Topics of this class will include:

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# Hands-On Computer Diagnostic Class

3 Day / 24 Hours Time: 8:00am to 4:30pm

May 17<sup>th</sup> Friday to 19<sup>th</sup> Sunday

Cost: \$1200.00



Friday, May 17, 2024, 8:00 AM –  
Sunday, May 19, 2024, 4:30 PM  
ATTS Training Center  
11 Lupi Court, Mahopac, NY, 10541 (map)

**Real World  
Automotive  
Computers Diagnosis  
- Hands-On**

Useful for technicians of all skill levels, this hands-on course provides an overview of vehicle computer system operation. The class will also cover the computer system's role in common drivability issues and diagnostics. Topics covered will include computer relationships, component descriptions, scan tool troubleshooting, updates on advanced technologies such as CAN, vehicle networking strategies, data protocols, and sensors/actuators. A helpful course book is included with registration.

Instructor: [Jerry G. Truglia](#)

**Location: 10 Lupi Plaza, Mahopac, NY 10541**

**#845 628-1062**

[drestucci@dormantraining.com](mailto:drestucci@dormantraining.com) or [gtruglia@dormantraining.com](mailto:gtruglia@dormantraining.com)



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## Advanced Driveability Diagnostics - In-Person

Monday, May 20, 2024

5:00 PM – 9:00 PM

Hyatt Place Wilmington Riverfront (map)

This class presents effective strategies for driveability diagnosis and repairs and is intended for advanced technicians with experience using scan tools, lab scopes, amp clamps, gas analyzers and related tools.

[View Event →](#)



## DTC Second Annual Training Event - In-Person

Saturday, September 21, 2024

7:30 AM – 8:00 PM

ATC/Automotive Training Center (map)

This in-person training is a value-packed, full-day event for advancing your technical skills. Learn from some of the automotive aftermarket industry's top instructors as they present classes and answer questions on key topics including air-fuel sensor testing, electrical troubleshooting and diagnosing problem vehicles.

[View Event →](#)



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## ***Understanding and Diagnosing Air Conditioning***

This course goes beyond minimum certification requirements for recovery, evacuating, recharging, and recycling by offering actual hands-on training in diagnosing and repairing A/C electrical, computer / BCMs, Climate control and electronic components. Many of today's trucks & vehicles come equipped with electronically controlled A/C systems.

**Includes books, safety glasses & MACS Certification in R134a and R1234yf**

Class Limit 20 technicians

**Safety Glasses MUST be worn during the hands on vehicle training**

**2 Days / 16 hours - \$575.00**

**Book, Safety Glasses and Lunch Included**

**Instructors: Swede Oun & "G" Jerry Truglia**

**Dates: June 19th & 20th, 2024**

**Time: 8:00 AM to 4:30 PM**

**Location: O&K Truck Repairs Ltd.**

**350 Grand Island Blvd.**

**Tonawanda, NY 14150**

Technicians MUST Register & Pre Pay

[www.dormantrainingcenter.com](http://www.dormantrainingcenter.com)

Phone: 845 628-1062 or 716.874.5450

[drestucci@dormanproducts.com](mailto:drestucci@dormanproducts.com)



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We offer greater freedom to fix cars and trucks  
by engineering exclusive, labor-saving  
and cost-effective repair solutions.



*Thank You !*