

**Dorman Training Center
Presents:**

"REAL PROBLEMS FROM THE BAY"

Your Instructor For This Seminar

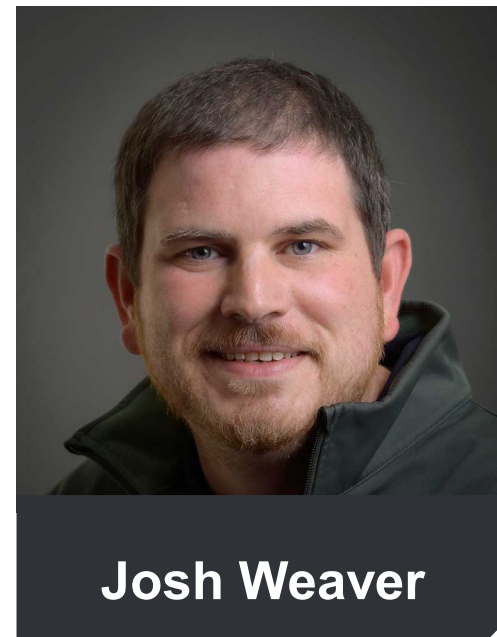
Josh has always been driven to learn new techniques to become a better technician, traveling around the USA to absorb all the training he could from the best instructors and professionals in the country. His focus now is on applying what he learned by sharing his knowledge both in the shop and in the training classroom.

Josh earned an associate degree in applied science in Automotive Technology in a program backed by Chrysler and General Motors. Josh is a certified Pennsylvania emissions and safety inspector, and also holds certifications for EPA 609, ASE L1 and L3.

While in college he worked for a Ford dealership, rounding out his exposure to all of the domestic manufacturers. After receiving his degree, he earned his ASE and Master Technician certifications at a Kia dealership. He was the lead technician at the dealership, which allowed him to see some of the most difficult and challenging vehicle issues that came through the shop. This allowed Josh to hone his diagnostic skills and share that expertise with fellow technicians.

After being in the dealership for many years, Josh became the service manager for a six-bay independent service center, which owned a six-bay collision center as well. Running shops of this size allowed him to see many different driveability issues, along with many electrical and programming issues.

Josh's passion for diagnostics led him to launch his own part-time mobile diagnostic business and develop and instruct some training classes for some of his local automotive technician association chapters. His goal is to help keep moving the industry forward and improving for the better, by helping technicians learn and grow.



Josh Weaver

jweaver2@dormanproducts.com

What Will Be Covered:

Instructions for this seminar:

- This seminar will be approx. 1 hour long
- All slides that are presented are in your handout and are numbered
- Have a pen or pencil and paper for notes
- Questions can be asked at anytime

- 01 2013 Ford Fusion DTC P2196
- 02 2011 Chevy Silverado 2500 DTC P0103
- 03 2006 Saab 9-2x Misfire Issue
- 04 2010 Hyundai Elantra DTC P0014
- 05 2010 Chevy Silverado DTC P0300
- 06 2011 Ford Escape HVAC Inoperative
- 07 2013 Ford E-250 CAN BUS Fault

2013 Ford Fusion

Customer Concern: Check engine light is illuminated.

Vehicle: 2013 Ford Fusion

Note: Having a strong diagnostic plan that you perform on every vehicle is key to a successful diagnostics. A proper test drive can cut your time down and drive you halfway down the funnel before you are back in the bay. Before we get to far, we need to look at freeze frame data. This is a window of the conditions the vehicle was driving under, when the problem occurred.



2013 Ford Fusion

Controls

MultiTool

Info

?

Bank 1

?

Bank 2

RICH

RICH

LEAN

LEAN

CENTER

CENTER

Stoichiometric

Stoichiometric

FUEL TRIM

FUEL TRIM

TOTAL FUEL TRIM

TOTAL FUEL TRIM

Bank to Bank Fuel Trim

BtoBTrim

NaN

Time to Engine Temperature

Temp(F)

138.20

Engine Vacuum OK

Vac (HG)

19.58

Charging Voltage Good

Battery V

14.32

MIL ON (Check DTCs)

Codes

1

Monitors Complete

not run

0

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EScan

DTCs

Monitors

PIDs

Digital

Graphs

Mode6

O2

Sharp SHOOTER

Patented

ATS | AUTOMOTIVE Test Solutions

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Detected Comm Type

CAN

Loop Read Speed (ms)

452

Speed Per PID (ms)

66

Demo Mode

OFF

Enable Voice Status

OFF

Enter VIN Manually

Get Veh.Inf.

VIN: 3FA6P0K99DR115709

Change

BARO at Shop Location (kPa)

101.32

Restart Communications

Change Options

?

TR

No Error

VIN Decoded Information Read at Startup

2013 Ford Fusion

Digital
Graphs
Mode6
O2
Sharp SHOOTER
Patented

Code	Description
	DTC Codes:
P2196	O2 Sensor Signal Stuck Rich Bank 1 Sensor 1
	Pending Codes:

Supported PIDs	Abbrev	Data	Units
Short Term Fuel Trim Bank 1	SHRTFT1	0.0000	%
Long Term Fuel Trim Bank 1	LONGFT1	4.6875	%
Intake Manifold Absolute Pressure	MAP	8.8590	HG
Engine RPM	RPM	1372.2500	RPM
Vehicle Speed Sensor	VSS	0.0000	mph
Ignition Timing Advance for #1 Cylinder	SPARKADV	9.0000	deg
Intake Air Temperature	IAT	109.4000	Deg F
Absolute Throttle Position	TP	11.7647	%
O2 Bank 1 - Sensor 2	O2B1S2	0.3750	V
O2 Bank 1 - Sensor 2	FTB1S2	99.2187	%
Time Since Engine Start	RUNTIME	49.0000	s
Fuel Rail Pressure	FRP	623.0824	HG
Commanded Evaporative Purge	EVAP_PCT	0.0000	%
Fuel Level Input	FLI	47.8432	%
Number of Warm-ups Since DTCs Cleared	WARM_UPS	255.0000	
Distance Since DTCs Cleared	CLR_DIST	13453.9648	miles
Evap System Vapor Pressure	EVAP_VP	-369.2500	Pa
Barometric Pressure	BARO	29.5300	HG
Bank 1 - Sensor 1 (Wide Range O2S) (mA)	LAMDA11mA	0.8563	Ratio
Bank 1 - Sensor 1 (Wide Range O2S) (mA)	O2S11mA	-0.6797	mA

2013 Ford Fusion

- **Diagnostic Trouble Codes**
 - **Electrical circuit condition:**
 - **These are tests for opens and short circuits.**
 - **Example: P0102 - Mass or Volume Air Flow Sensor A Circuit Low**
 - **Rationality tests:**
 - **These are ECM comparisons between two sensors' output to see if they agree with one another, based on expected outputs under the test conditions.**
 - **Example: P0101 - Mass or Volume Air Flow "A" Circuit Range/Performance**

2013 Ford Fusion

Controls MultiTool Info ? EScan DTCs Monitors PIDs Digital Graphs Mode6 O2 Sharp SHOOTER Patented

Bank 1 ? Bank 2

RICH RICH

LEAN LEAN

CENTER CENTER

Stoichiometric Stoichiometric

FUEL TRIM FUEL TRIM

TOTAL FUEL TRIM TOTAL FUEL TRIM

Bank to Bank Fuel Trim BtoBTrim

Time to Engine Temperature Temp(F)

Engine Vacuum OK Vac (HG)

Monitors Complete # not run 0

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Select Make Ford 2003-2016

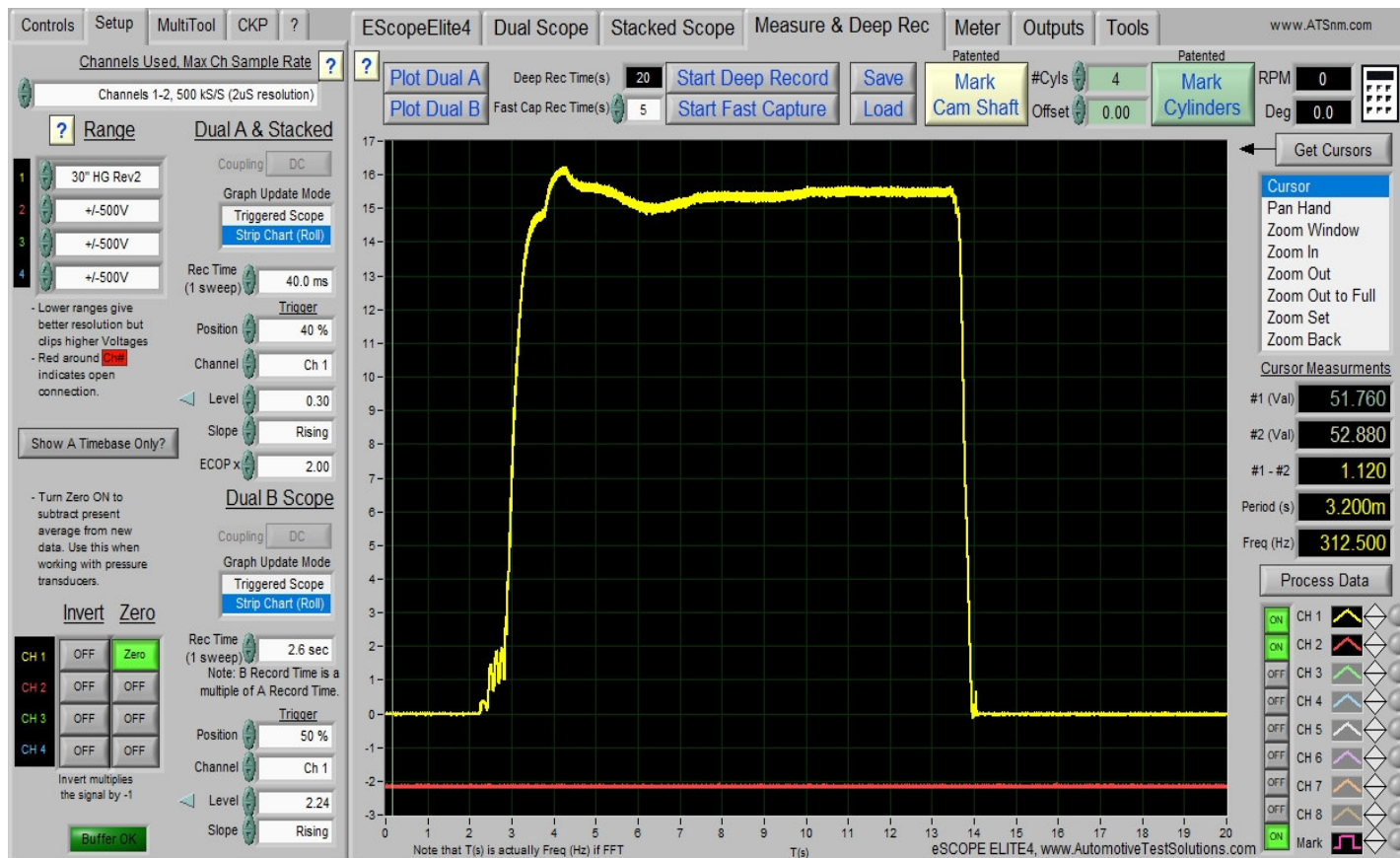
Test Value background color: Red if outside of limit, Yellow if close to limit Reading

OBD Monitor ID (OBDMID)	Test ID (TID)	Test Value	Min Limit	Max Limit	Units
\$01: Front UEGO Monitor	\$87: B2S1 Rich to Lean Response Time	0.016	0.000	0.400	sec
\$01: Front UEGO Monitor	\$88: B1S1 Lean to Rich Response Time	0.003	0.000	0.400	sec
\$02: Rear O2 DFSO Response Rate	\$85: B1S2 Fuel Shut off Rich to Lean Res	124484.000	101072.000	580.000	mV/s
\$02: Rear O2 DFSO Response Rate	\$86: B1S2 Fuel Shut off Rich to Lean Time	1.649	0.000	6.000	sec
\$21: Catalyst Efficiency Monitor	\$81: Description Unavailable	0.090	0.000	0.766	Ratio
\$35: VCT Monitor	\$82: Description Unavailable	0.020	0.000	21.210	Deg
\$35: VCT Monitor	\$83: Description Unavailable	0.000	0.000	10.000	Deg
\$35: VCT Monitor	\$84: Description Unavailable	0.000	0.000	14.140	Deg
\$35: VCT Monitor	\$85: Description Unavailable	0.100	0.000	14.140	Deg
\$3A: EVAP System 0.020 Leak Check	\$80: Phase 0 Initial Tank Vacuum	-112.500	-996.250	8191.750	Pa
\$3A: EVAP System 0.020 Leak Check	\$82: Phase 0 Initial Gross Leak	-1992.500	-8192.000	-1992.500	Pa
\$3B: EVAP System 0.020 Leak Check	\$80: Phase 2 .040 Cruise Leak Check	0.000	-8192.000	1191.000	Pa
\$3C: EONV EVAP System Monitor	\$81: Positive Pressure Test	181.500	108.500	8191.750	Pa
\$3C: EONV EVAP System Monitor	\$82: Negative Pressure Test	0.000	0.000	0.000	Pa
\$3C: EONV EVAP System Monitor	\$83: Average of 4 EONV Tests	0.100	0.000	0.400	Pa
\$3D: Evaporative System	\$80: Blocked Evap Sys Line-Screening tes	-2011.750	-2490.750	8191.750	Pa/sec
\$3D: EVAPSV Monitor	\$81: Blocked Evap Sys Line-Fault Confirm	0.000	0.000	0.000	Pa
\$3D: EVAP System Monitor	\$82: Vapor blocking valve performance	0.000	0.000	0.000	Pa
\$42: O2 Heater Monitor	\$81: B1S2 Heater Current	0.573	0.230	3.000	A
\$81: AFIMN Monitor	\$80: Bank 1 imbalance-ratio and max. lim	0.000	0.000	0.750	Ratio

\$35: VCT Monitor	\$85: Description Unavailable	0.100	0.000	14.140	Deg
\$3A: EVAP System 0.020 Leak Check	\$80: Phase 0 Initial Tank Vacuum	-112.500	-996.250	8191.750	Pa
\$3A: EVAP System 0.020 Leak Check	\$82: Phase 0 Initial Gross Leak	-1992.500	-8192.000	-1992.500	Pa
\$3B: EVAP System 0.020 Leak Check	\$80: Phase 2 .040 Cruise Leak Check	0.000	-8192.000	1191.000	Pa

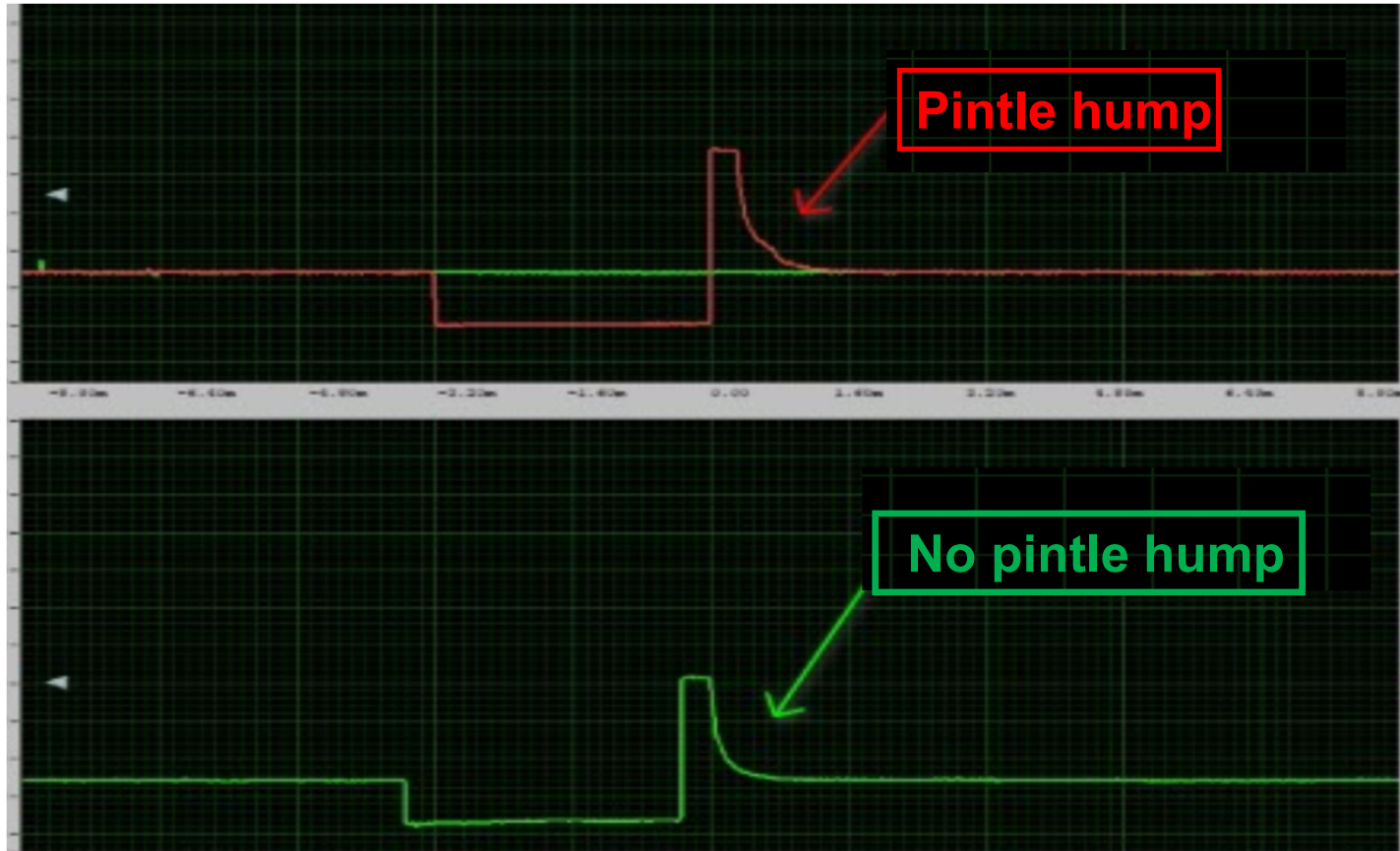
Click on above row of interest to get Related DTC and explanation if available.

Purge Valve Testing



Vacuum transducer installed on to the purge valve and connector is unplugged

Example Of Actuator Working / Not Worked - Pintle Hump



2011 Chevy Silverado

Customer Concern: MIL is illuminated

Vehicle: Chevy Silverado 2500

Notes: Middle school science taught us a lot about being automotive diagnostician. We learn what a basic circuit was. What a hypothesis was and how to test it. Don't we do that in diagnostics? We gather data to pinpoint us to an area of failure then we perform test to prove our theory of the failure.



2011 Chevy Silverado

Controls MultiTool Info ? EScan DTCs Monitors PIDs Digital Graphs Mode6 O2 Sharp SHOOTER Patented

Bank 1 ? Bank 2

RICH RICH

LEAN LEAN

CENTER CENTER

CONTROL PROBLEM Stoichiometric

FUEL TRIM FUEL TRIM

TOTAL FUEL TRIM TOTAL FUEL TRIM

Bank to Bank Fuel Trim BtoBTrim NaN

Time to Engine Temp Calculating Temp(F) 168.80

BARO Misreading Vac (HG) NaN

Battery Voltage Good Battery V 12.60

MIL ON (Check DTCs) # Codes 1

Monitors Complete # not run 0

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Patented

Detected Comm Type CAN

Loop Read Speed (ms) 361

Speed Per PID (ms) 75

Demo Mode OFF

Enable Voice Status OFF

Enter VIN Manually Get Veh.Inf.

VIN: 1GC1KXC89BF264441

Change

BARO at Shop Location (kPa) 101.32

Restart Communications

Change Options

No Error

VIN Decoded Information Read at Startup

Make	Model	Year
Chevrolet	Silverado 2500HD	2011
Engine Name	Cam Type	Max HP
Duramax 6.6L Diesel Turbo V8 397hp 765 ft. lbs.	OHV	397.0
Liter Size	Cam Timing	Max Torque
6.6	None	765.0
Engine Aspiration	Fuel Injection	Fuel Type
Turbocharged	CRDI	D

2011 Chevy Silverado

The screenshot shows the ATS software interface with the following components:

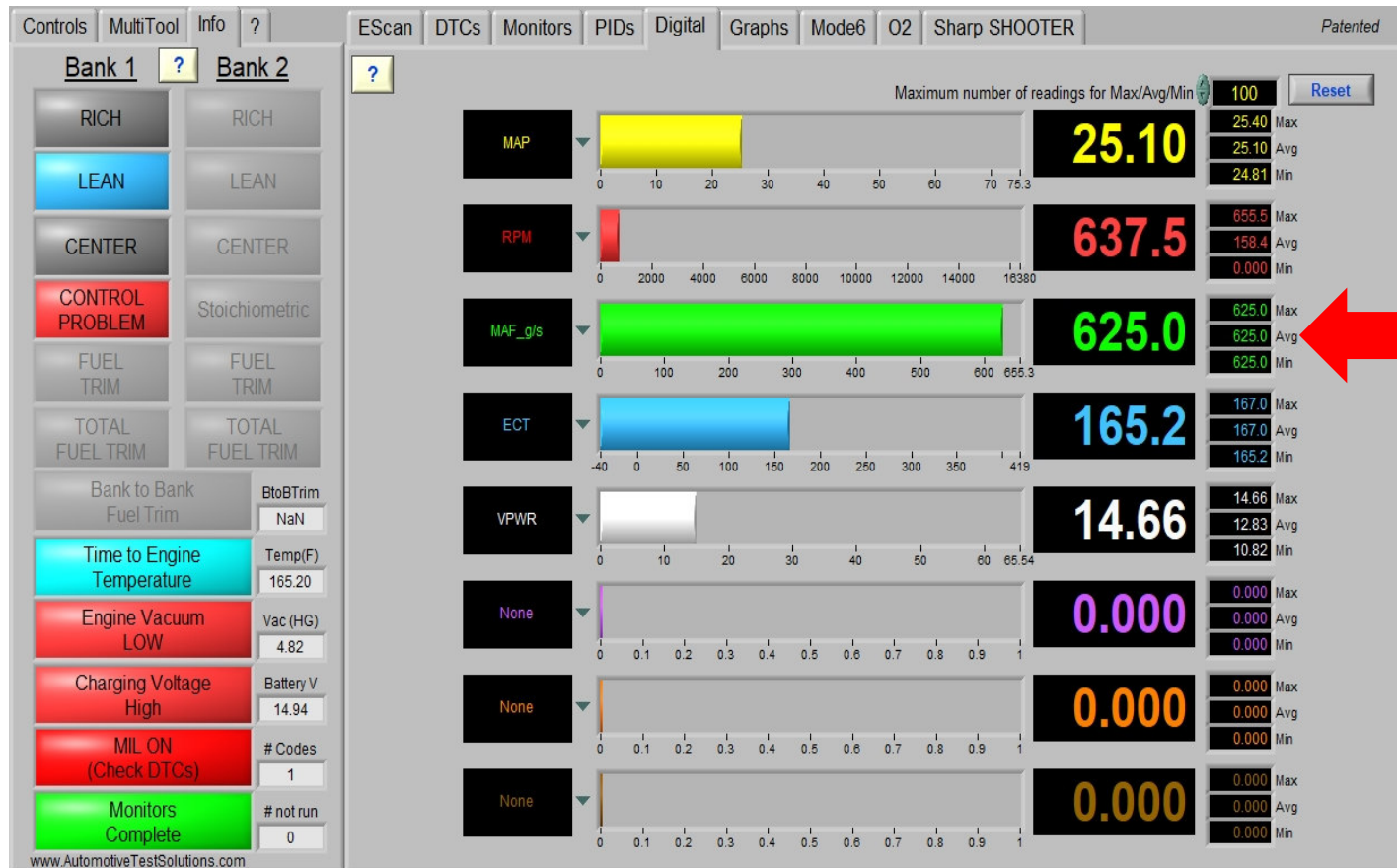
- Top Menu:** Controls, MultiTool, Info, ?, EScan, DTCs, Monitors, PIDs, Digital, Graphs, Mode6, O2, Sharp SHOOTER, Patented.
- Bank Selection:** Bank 1 (selected), Bank 2.
- Bank 1 Controls:** RICH, LEAN, CENTER, CONTROL PROBLEM, FUEL TRIM, TOTAL FUEL TRIM, Bank to Bank Fuel Trim (NaN), Time to Engine Temp Calculating (168.80), BARO Misreading (NaN), Battery Voltage Good (12.58), MIL ON (Check DTCs) (1), Monitors Complete (0).
- DTCs Section:** Select Make (GM), Read DTC & Pending Codes, Clear DTCs, DTC that Caused Freeze Frame Storage #0 (P0103), Read Permanent Codes, Read Freeze Frame Data.
- DTC List:**

Code	Description
P0103	Mass or Volume Air Flow Circuit High Input
- PIDs Table:**

Supported PIDs	Abbrev	Data	Units
P0103 DTC caused Freeze Frame Storage #0:			
Calculated Load	LOAD_PCT	27.8431	%
Engine Coolant Temperature	ECT	75.2000	Deg F
Intake Manifold Absolute Pressure	MAP	25.1005	HG
Engine RPM	RPM	659.0000	RPM
Vehicle Speed Sensor	VSS	0.0000	mph
Air Flow Rate from Mass Air Flow Sensor	MAF_g/s	625.0200	g/s
Air Flow Rate from Mass Air Flow Sensor	MAF_lb/m	82.5026	lb/m
Time Since Engine Start	RUNTIME	3.0000	s
Bank 1 - Sensor 1 (Wide Range O2S) (V)	LAMDA11	1.9988	Ratio
Bank 1 - Sensor 1 (Wide Range O2S) (V)	O2S11	0.0000	V
Bank 1 - Sensor 2 (Wide Range O2S) (V)	LAMDA12	0.0620	Ratio
Bank 1 - Sensor 2 (Wide Range O2S) (V)	O2S12	0.5996	V
Fuel Level Input	FLI	94.9020	%
Number of Warm-ups Since DTCs Cleared	WARM_UPS	174.0000	
Distance Since DTCs Cleared	CLR_DIST	8046.9180	miles
Barometric Pressure	BARO	29.5300	HG
Control Module Voltage	VPWR	0.0030	V
Ambient Air Temperature	AAT	69.8000	Deg F
Accelerator Pedal Position D	APP_D	18.4314	%
- VIN:** 1GC1KXC89BF264441

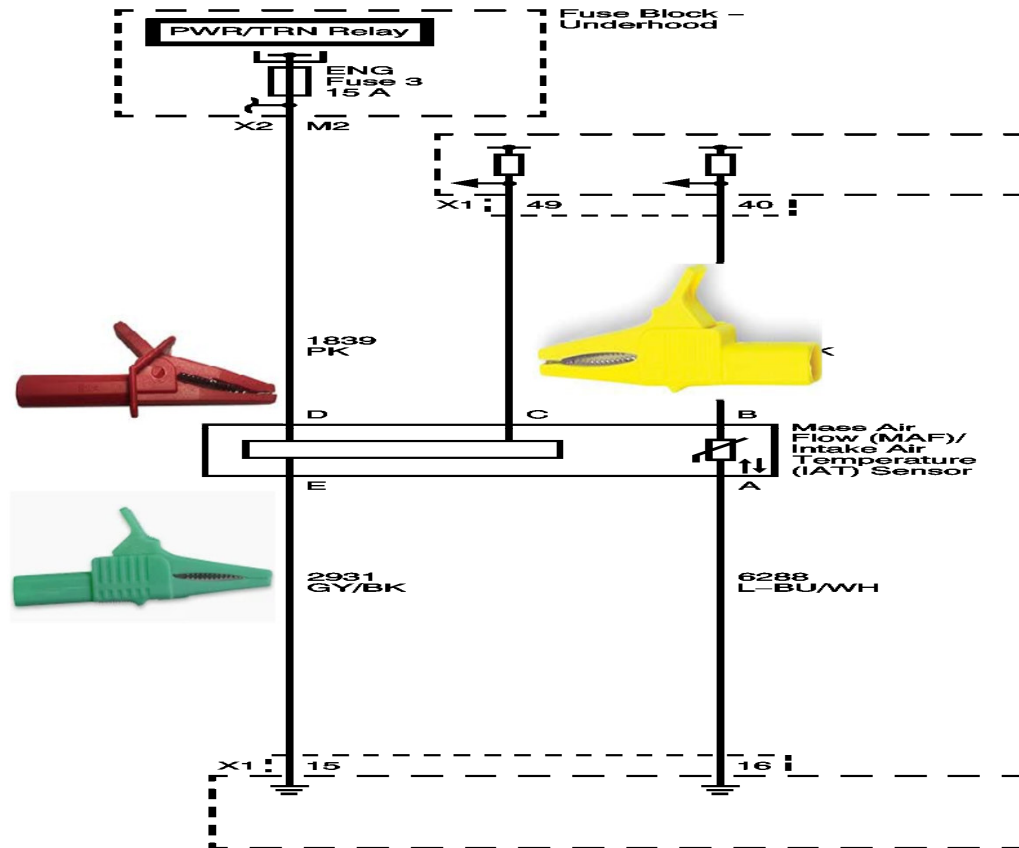
Freeze Frame shows that the Mass Airflow sensor is reading 625 G/S at 659 RPM

2011 Chevy Silverado

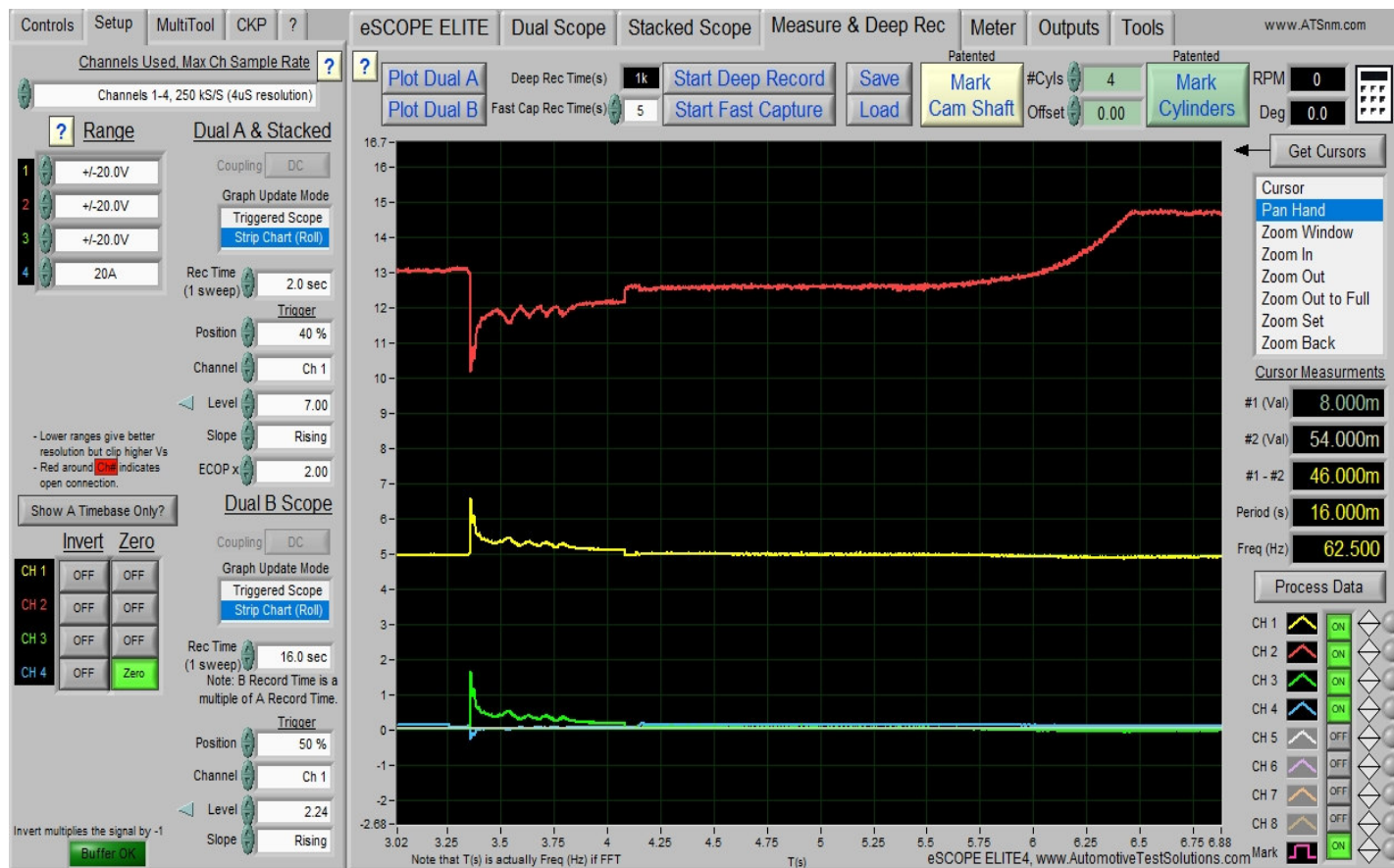


Data at Idle

2011 Chevy Silverado



2011 Chevy Silverado



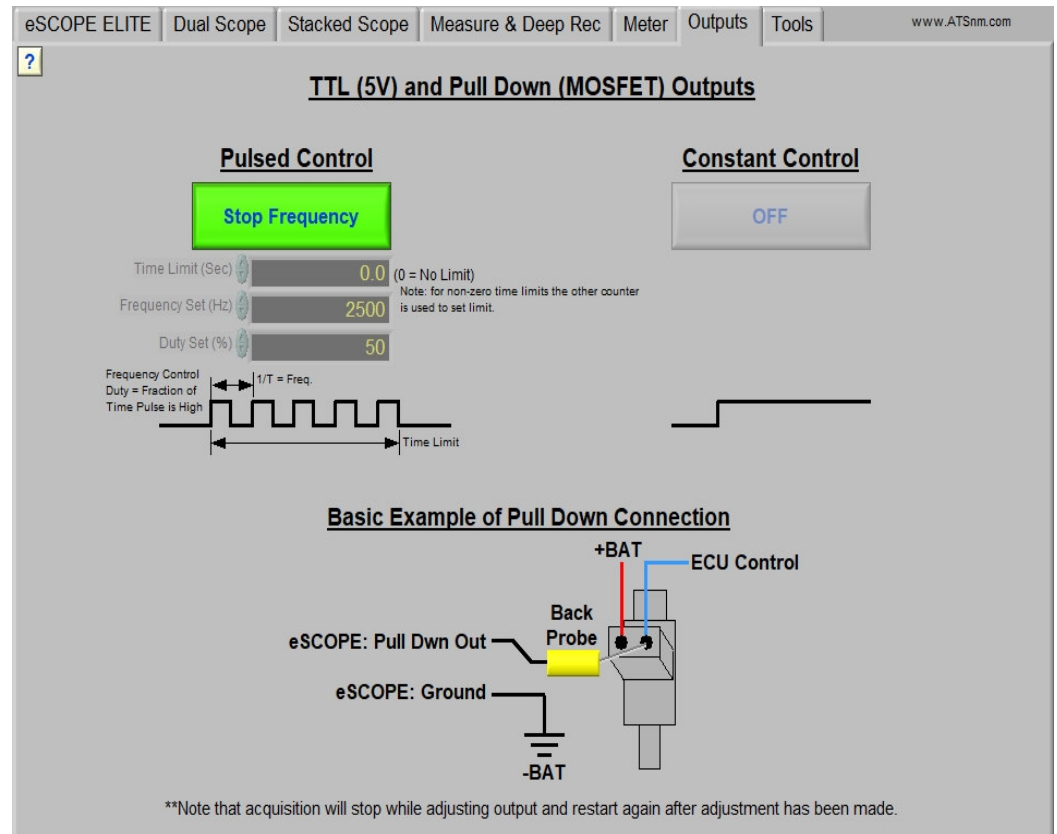
Checking **12 volts**, **signal wire** and **ground** at the MAF sensor plugged in.

2011 Chevy Silverado

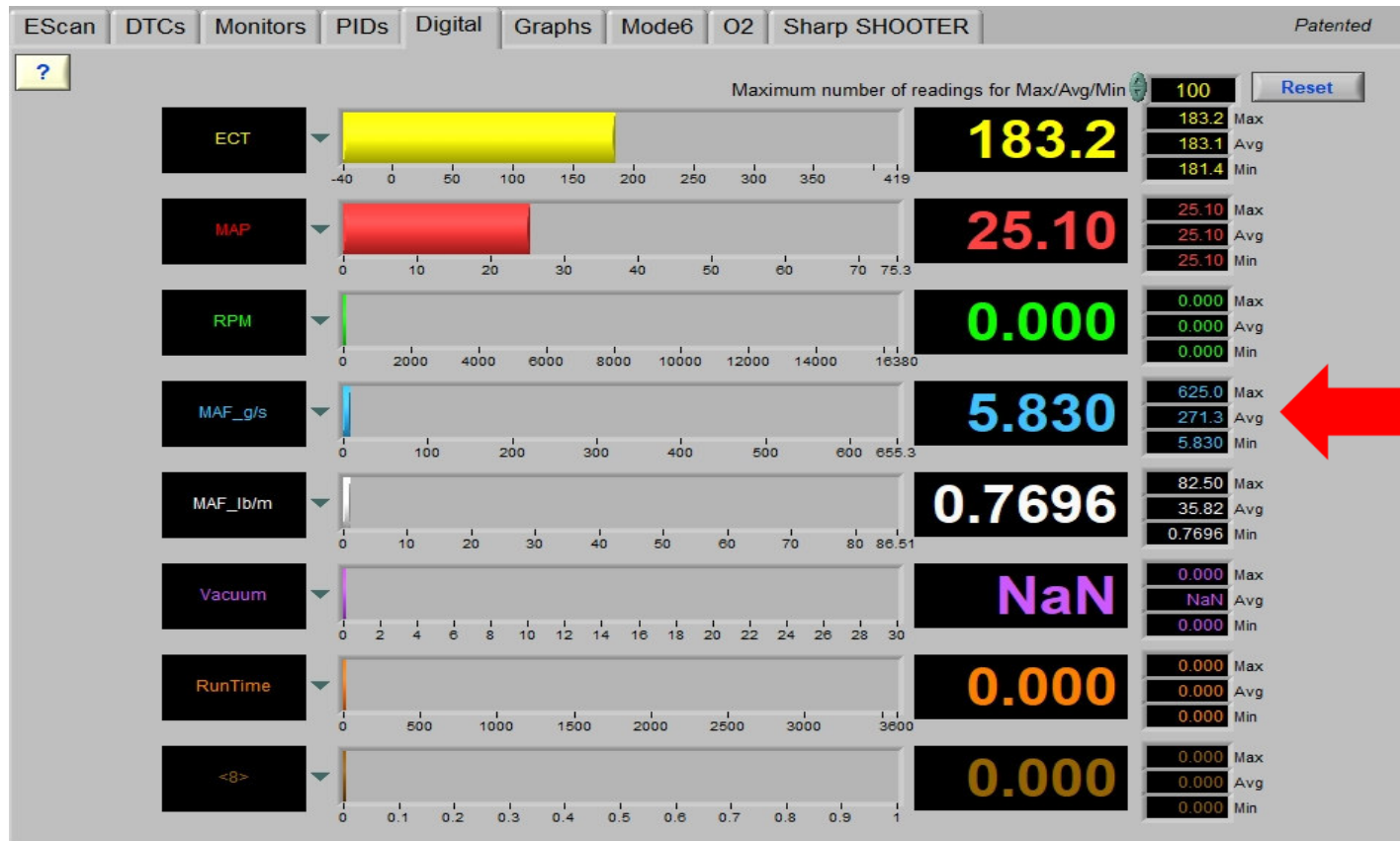
Going through service information I found some useful data in the flow chart:

MAF sensor should read **6 - 8** GPS at idle

The frequency of the sensor is **2300 Hz** at idle and **9,000 Hz** max engine load



2011 Chevy Silverado



Data now shows **5.83 GPS** with the signal generator sending a **2500Hz** signal on the MAF signal circuit

2011 Chevy Silverado

Conclusion: A new MAF sensor fixed the vehicle. By using **service information** and **understanding how the circuit worked**, we were able to think outside the box. Using a signal generator to rule out any wiring issue and that the PCM was working correctly and could process the data.

2006 Saab 9-2x

Customer Concern: Check Engine light is on and hesitates under load

Vehicle: 2009 Saab 9-2x

Story behind the story: Good customer, does all recommended work and tune up has been done recently.



2006 Saab 9-2x

Controls MultiTool Info ?

Bank 1 ? Bank 2

RICH	RICH
LEAN	LEAN
CENTER	CENTER
Stoichiometric	Stoichiometric
FUEL TRIM	FUEL TRIM
TOTAL FUEL TRIM	TOTAL FUEL TRIM

Bank to Bank Fuel Trim BtoBTrim NaN

Time to Engine Temp Calculating Temp(F) 174.20

BARO Good Vac (HG) NaN

Battery Voltage Low Battery V 11.83

MIL ON (Check DTCs) # Codes 3

Monitors Not Complete # not run 1

EScan DTCs Monitors PIDs Digital Graphs Mode6 O2 Sharp SHOOTER Patented

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Detected Comm Type KWP2000

Loop Read Speed (ms) 1003

Speed Per PID (ms) 762

Demo Mode OFF

Enable Voice Status OFF

Enter VIN Manually Get Veh. Inf.

VIN: JF4GG72656G051572

Change

BARO at Shop Location (kPa) 101.32

Restart Communications

Change Options

No Error

VIN Decoded Information Read at Startup

Make	Model	Year
Saab	9-2X	2006
Engine Name	Cam Type	Max HP
2L TC H4 double overhead cam (DOHC) 16V	DOHC	230.0
Liter Size	Cam Timing	Max Torque
2.5	None	235.0
Engine Aspiration	Fuel Injection	Fuel Type
Turbocharged	FI	G

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2006 Saab 9-2x

Controls MultiTool Info ?

Bank 1 ? Bank 2

RICH RICH

LEAN LEAN

CENTER CENTER

Stoichiometric Stoichiometric

FUEL TRIM FUEL TRIM

TOTAL FUEL TRIM TOTAL FUEL TRIM

Bank to Bank Fuel Trim BtoBTrim NaN

Time to Engine Temp Calculating Temp(F) 174.20

BARO Good Vac (HG) NaN

Battery Voltage Low Battery V 11.74

MIL ON (Check DTCs) # Codes 3

Monitors Not Complete # not run 1

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EScan DTCs Monitors PIDs Digital Graphs Mode6 O2 Sharp SHOOTER Patented

? Reading

Select Make Unknown

Read DTC & Pending Codes

Clear DTCs

DTC that Caused Freeze Frame Storage #0 P0037

Read Permanent Codes

Reading

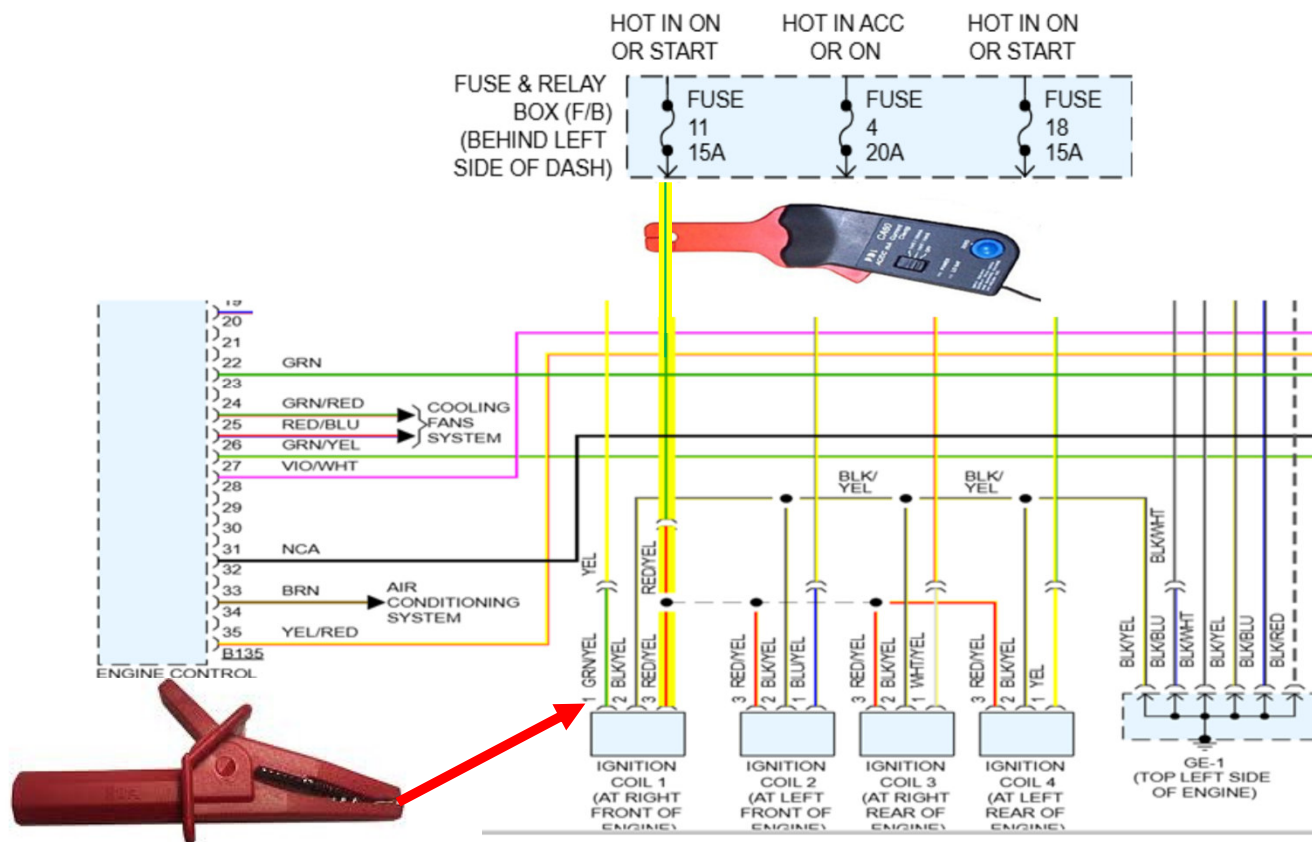
Read Freeze Frame Data

VIN JF4GG72656G051572

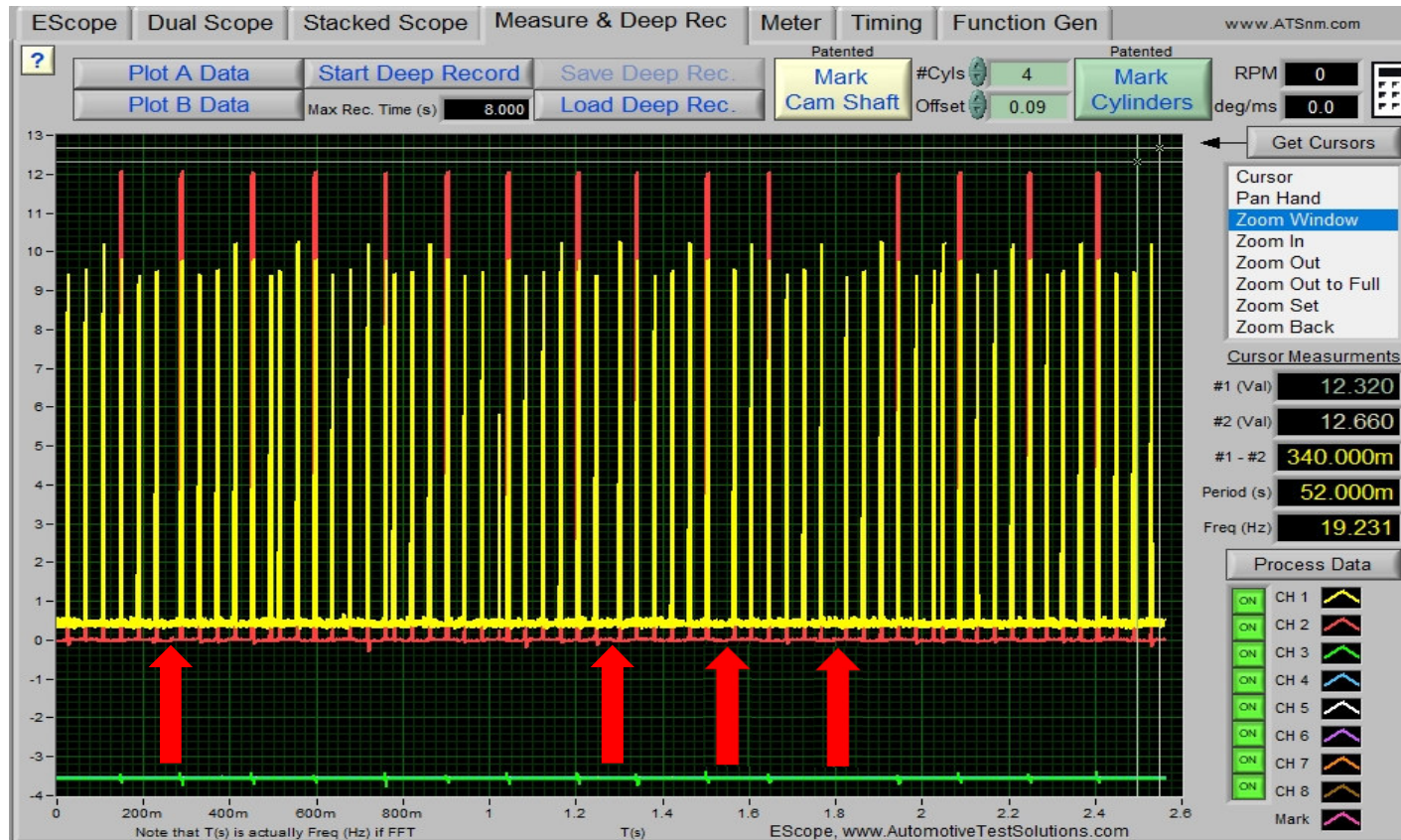
Code	Description
DTC Codes:	
P0037	HO2S Heater Control Circuit Low Bank 1 Sensor 2
Pending Codes:	
P0301	Cylinder 1 Misfire Detected
P0303	Cylinder 3 Misfire Detected

Supported PIDs	Abbrev	Data	Units
P0037 DTC caused Freeze Frame Storage #0:			
Calculated Load	LOAD_PCT	26.2745	%
Engine Coolant Temperature	ECT	16.0000	Deg C
Short Term Fuel Trim Bank 1	SHRTFT1	0.0000	%
Long Term Fuel Trim Bank 1	LONGFT1	0.0000	%
Intake Manifold Absolute Pressure	MAP	36.0000	kPa
Engine RPM	RPM	1343.5000	RPM
Vehicle Speed Sensor	VSS	2.0000	km/h
Ignition Timing Advance for #1 Cylinder	SPARKADV	10.5000	deg
Intake Air Temperature	IAT	16.0000	Deg C
Air Flow Rate from Mass Air Flow Sensor	MAF_g/s	7.9600	g/s
Air Flow Rate from Mass Air Flow Sensor	MAF_lb/m	1.0507	lb/m
Absolute Throttle Position	TP	16.8628	%
O2 Bank 1 - Sensor 2	O2B1S2	0.0000	V
O2 Bank 1 - Sensor 2	FTB1S2	0.0000	%
P1700 DTC caused Freeze Frame Storage #1:			
Calculated Load	LOAD_PCT		%
Short Term Fuel Trim Bank 1	SHRTFT1		%
Long Term Fuel Trim Bank 1	LONGFT1		%
Short Term Fuel Trim Bank 2	SHRTFT2		%

2006 Saab 9-2x



2006 Saab 9-2x



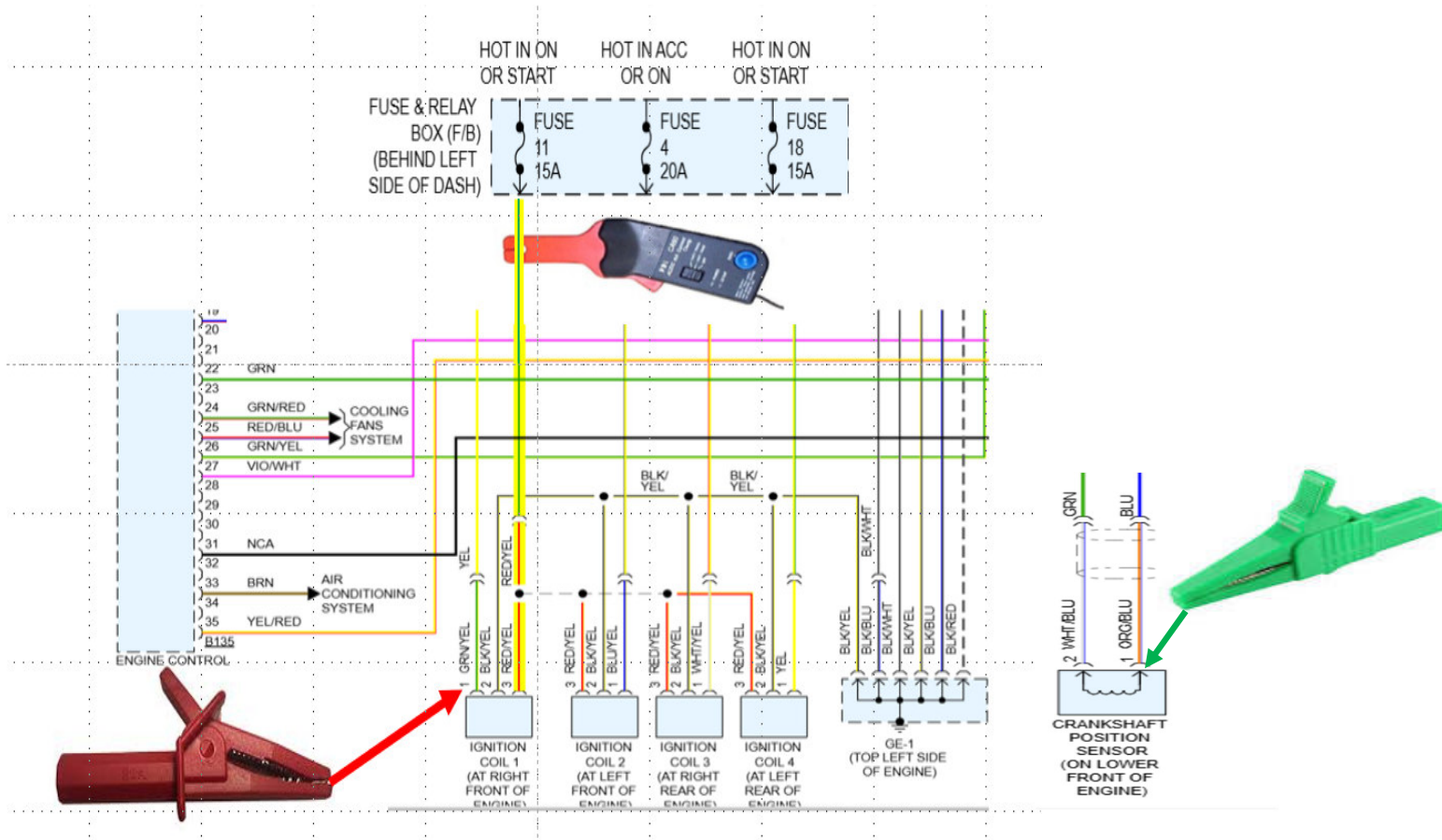
Birds eye view - it appears we are missing firing events

Coil Current Ramping

We noticed that the coil firing events were either missing, not equally spaced or more than 4 firing events happened in 1 cycle

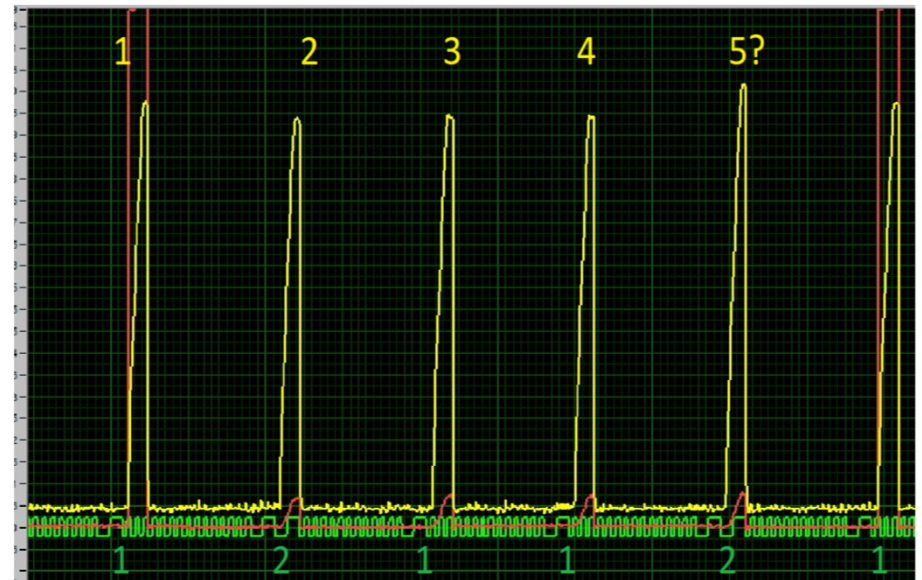
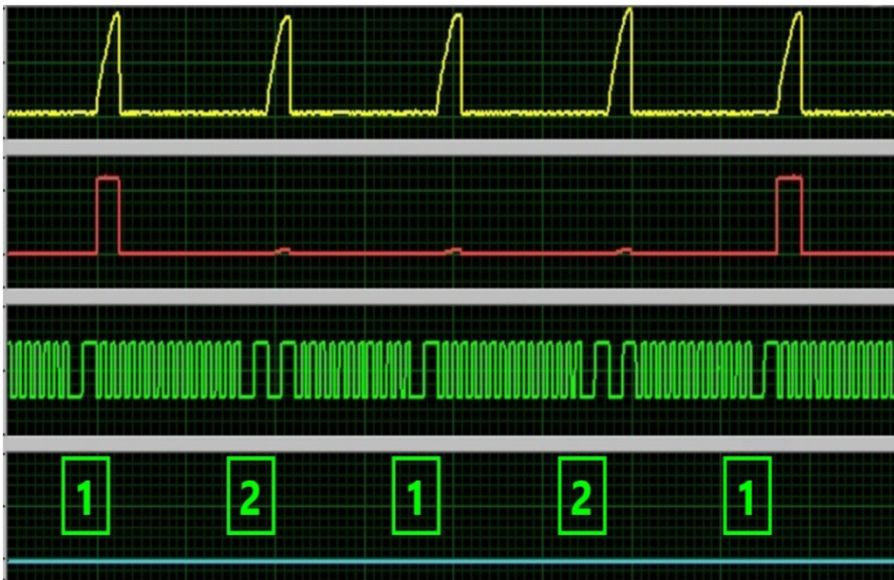


2006 Saab 9-2x



Crank Sensor Breaking Down

The crankshaft pattern has both a 1 and 2 teeth missing index. The pattern goes as follow 1-2-1-2. The firing events should happen at each missing index. When the PCM see the pattern breakdown it believes it's a missing index and fires the coil.

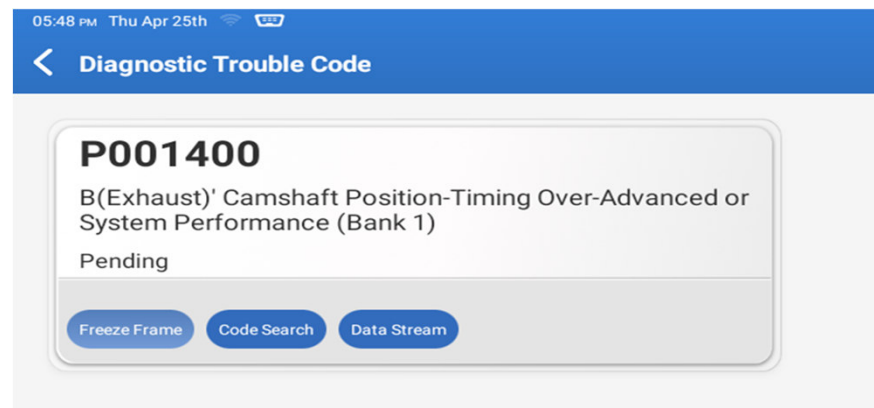


2017 Hyundai Elantra

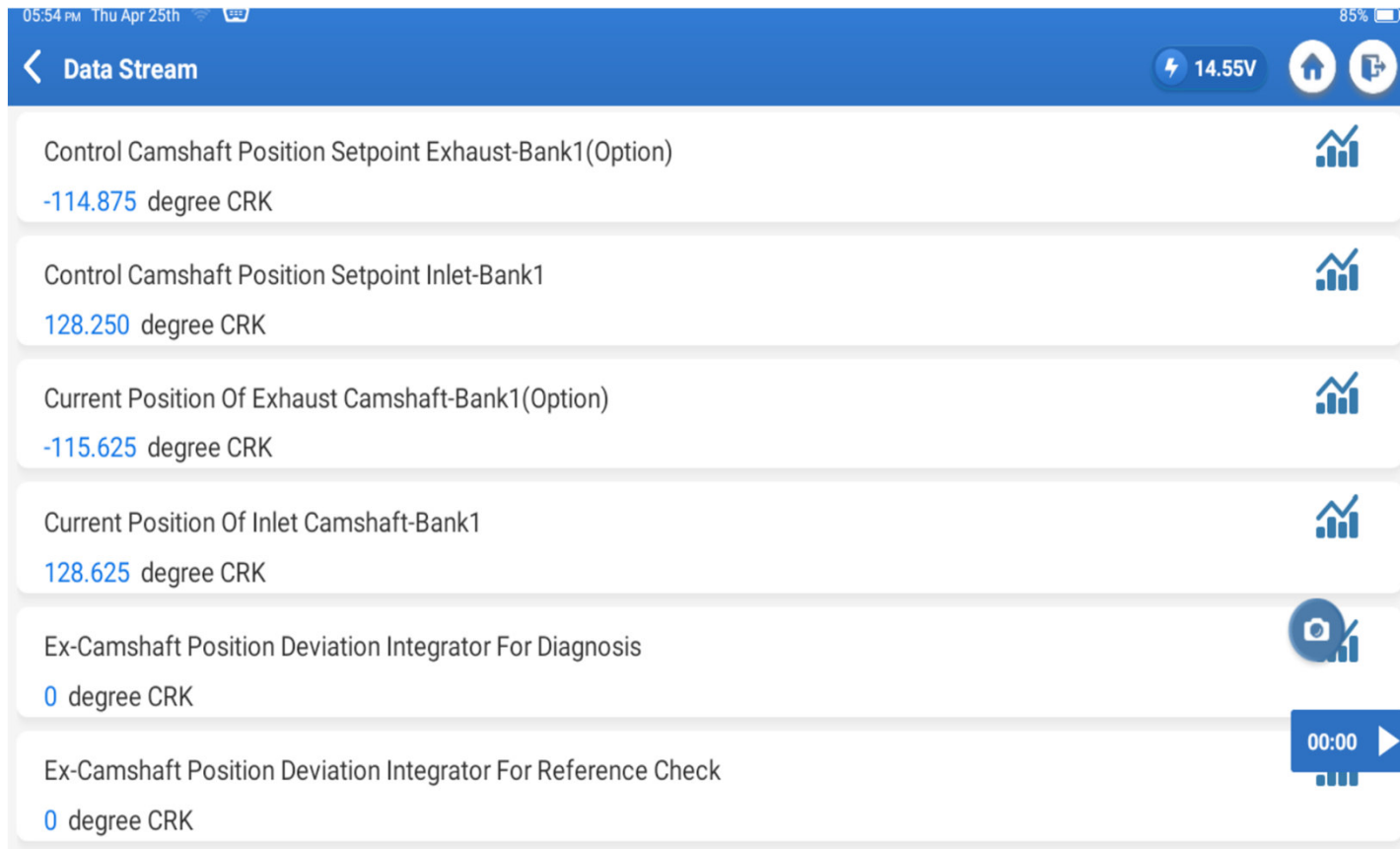
Customer Concern: Check Engine light DTC P0014

Vehicle: 2017 Hyundai Elantra with a 2.0L

Story behind the story: The shop install a short block for what was determined as a rod knock. A long block was not available. Afterward sets a **P0014 once it is hot. New **CKP** and **CMP** sensors have been installed along with a used head new **solenoid** and **cam gear**.**



2017 Hyundai Elantra

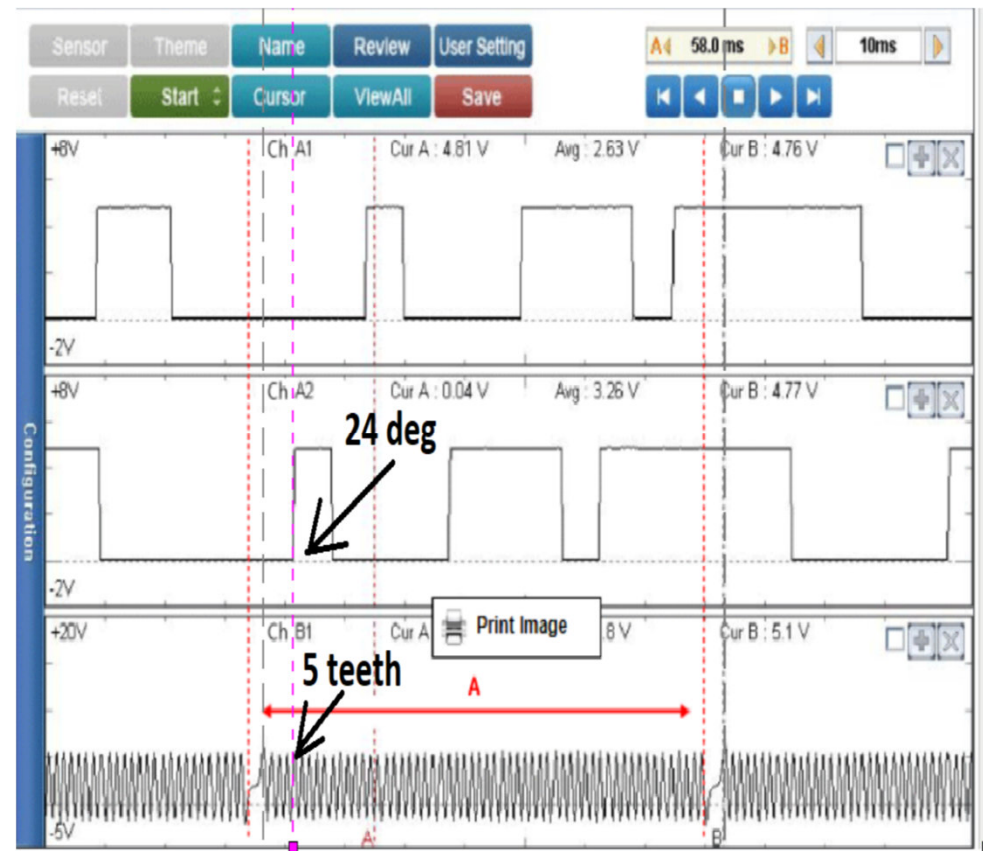


At idle camshaft data for actual and desired match

2017 Hyundai Elantra

A known good waveform was found from factory information.

Known good shows that the edge of the exhaust camshaft is 24 degrees from missing index and lines up on the 5th tooth.



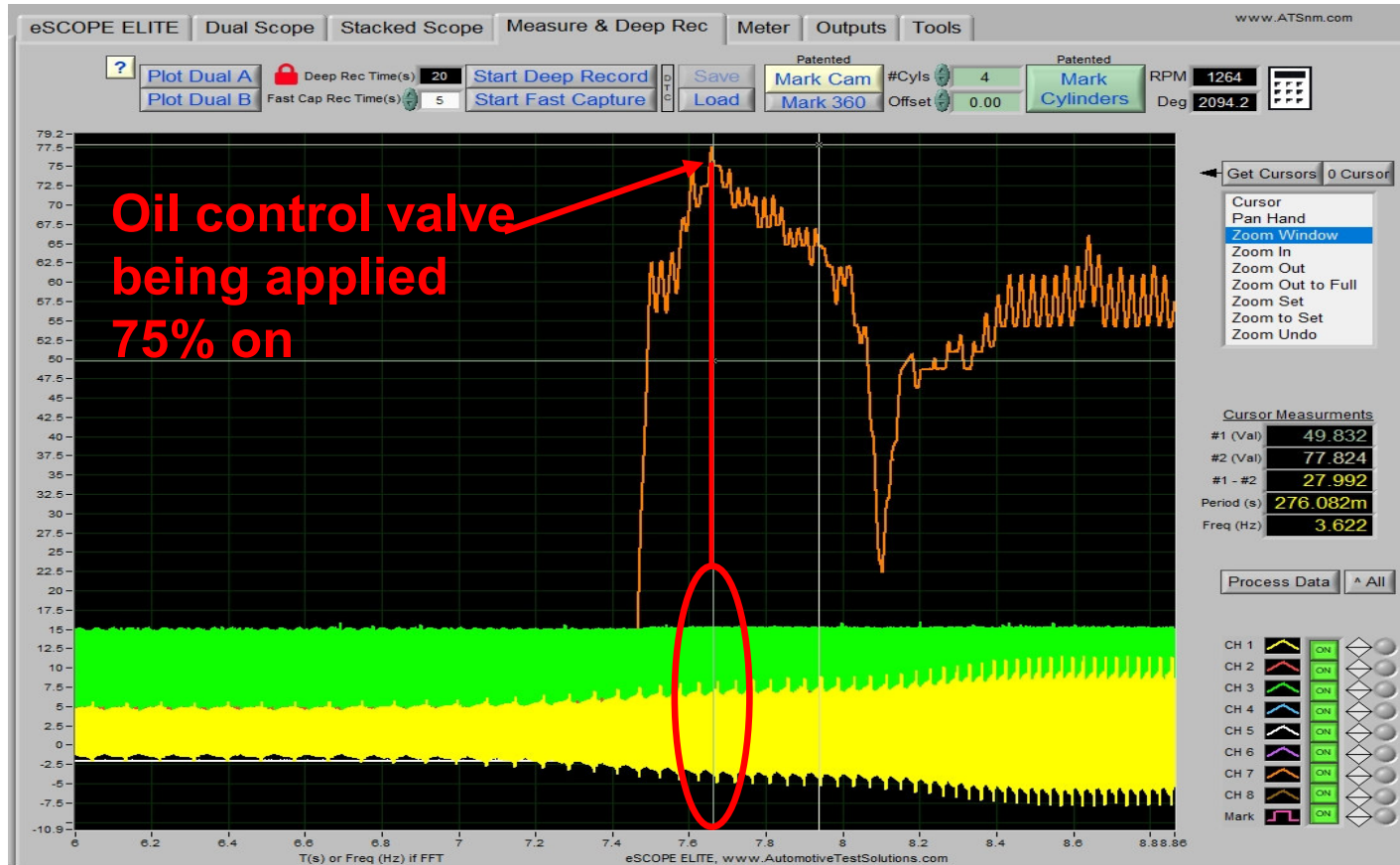
2017 Hyundai Elantra

At idle cam timing is on,
about 5 teeth and 24 deg
from missing index

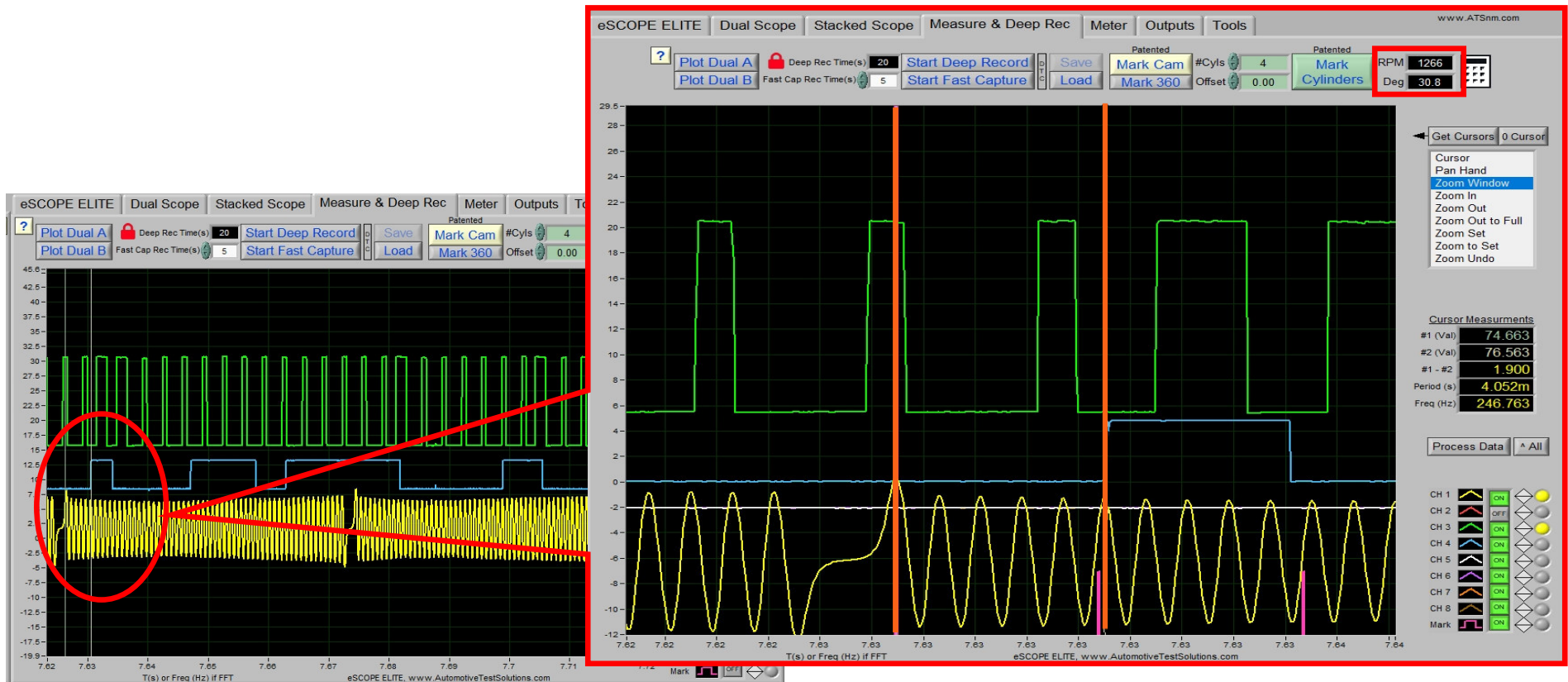


Solenoid is only being
applied about 5% on

2017 Hyundai Elantra

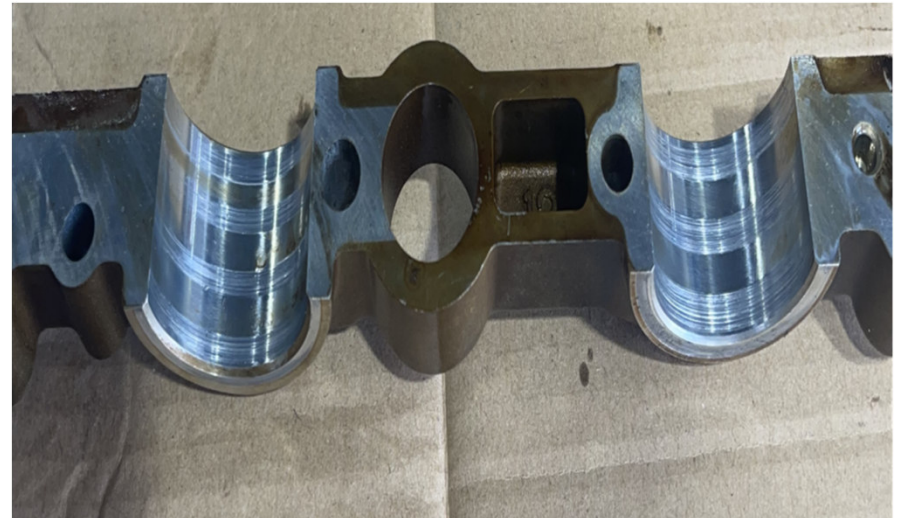


2017 Hyundai Elantra



At **1200 RPM** the PCM commanded the actuator on about **75%** and we only move **8 degrees**

2017 Hyundai Elantra



The main cam bearing cap was so scored oil was bleeding off, not allowing the actuator to move. New head and camshafts were installed and solved the issue.

2010 Chevy Silverado

Customer Concern: Vehicle exhibits a slight misfire at idle and sets P0300

Vehicle: 2010 Chevy Silverado with a 5.3L originally equipped with displacement on demand

Story behind the story: This was brought to me by another shop for this concern after replacing the engine 2 times from a creditable remanufacturer. The original engine had a rod knock. The reman engine came with the DOD deleted, and a new tune was provided to them. The Valve Lifter Oil Manifold Assembly is unplugged. All new ignition components and injectors have been replaced.



2010 Chevy Silverado

Controls MultiTool Info ?

Bank 1 ? Bank 2

RICH	RICH
LEAN	LEAN
CENTER	CENTER
CONTROL PROBLEM	CONTROL PROBLEM
FUEL TRIM	FUEL TRIM
TOTAL FUEL TRIM	TOTAL FUEL TRIM
Bank to Bank Fuel Trim	BtoBTrim -3.91
Time to Engine Temp Calculating	Temp(F) 152.60
BARO Good	Vac (HG) NaN
Battery Voltage Low	Battery V 12.07
MIL OFF (No Codes)	# Codes 0
Monitors Not Complete	# not run 5

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Detected Comm Type	CAN	Restart Communications Change Options 	No Error
Loop Read Speed (ms)	401		
Speed Per PID (ms)	48		
Demo Mode	OFF	Enter VIN Manually Get Veh. Inf.	VIN Decoded Information Read at Startup
Enable Voice Status	OFF		
VIN: 1GCSKSE34AZ110502		Make: Chevrolet Engine Name: Vortec 5.3L Flex Fuel V8 315hp 335ft. lbs. Liter Size: 5.3 Engine Aspiration: Natural	Model: Silverado 1500 Cam Type: OHV Cam Timing: VVT Fuel Injection: SPFI
BARO at Shop Location (kPa)	101.32		Year: 2010 Max HP: 315.0 Max Torque: 335.0 Fuel Type: F

2010 Chevy Silverado

[illegible]

2010 Chevy Silverado

Controls MultiTool Info ? EScan DTCs Monitors PIDs Digital Graphs Mode6 O2 Sharp SHOOTER

Bank 1 ? Bank 2

RICH RICH

LEAN LEAN

CENTER CENTER

Select Make
GM 1996-2016

Test Value background color: Red if outside of limit, Yellow if close to limit

OBD Monitor ID (OBDMID)	Test ID (TID)	Test Value	Min Limit	Max Limit	Units
\$3C: EVAP Monitor 0.020	\$CA: EONV Fuel Level Rationality Test	0.000	0.000	0.000	Counts
\$3C: EVAP Monitor 0.020	\$CB: EONV Vacuum Rationality Test	0.000	0.000	0.000	Counts
\$3D: Purge Flow Monitor	\$C4: EVPD NV Purge Pass Test	0.000	0.000	0.000	sec
\$3D: Purge Flow Monitor	\$C5: EVPD Purge Vacuum Fail Test	0.000	0.000	0.000	Pa

\$A2: Misfire Cylinder 1 Data	\$0B: Cyl. 1 EWMA Misfire Counts	5.000	0.000	65535.000	Counts
\$A2: Misfire Cylinder 1 Data	\$0C: Cyl. 1 Misfire Current Drive Cycle	2.000	0.000	65535.000	Counts
\$A5: Misfire Cylinder 4 Data	\$0B: Cyl. 4 EWMA Misfire Counts	2.000	0.000	65535.000	Counts
\$A5: Misfire Cylinder 4 Data	\$0C: Cyl. 4 Misfire Current Drive Cycle	11.000	0.000	65535.000	Counts
\$A7: Misfire Cylinder 6 Data	\$0B: Cyl. 6 EWMA Misfire Counts	2.000	0.000	65535.000	Counts
\$A7: Misfire Cylinder 6 Data	\$0C: Cyl. 6 Misfire Current Drive Cycle	3.000	0.000	65535.000	Counts
\$A8: Misfire Cylinder 7 Data	\$0B: Cyl. 7 Misfire Current Drive Cycle	21.000	0.000	65535.000	Counts
\$A8: Misfire Cylinder 7 Data	\$0C: Cyl. 8 EWMA Misfire Counts	10.000	0.000	65535.000	Counts

Time to Engine Temp Calculating Temp(F) 53.60

BARO Good Vac (HG) NaN

Battery Voltage Low Battery V 12.00

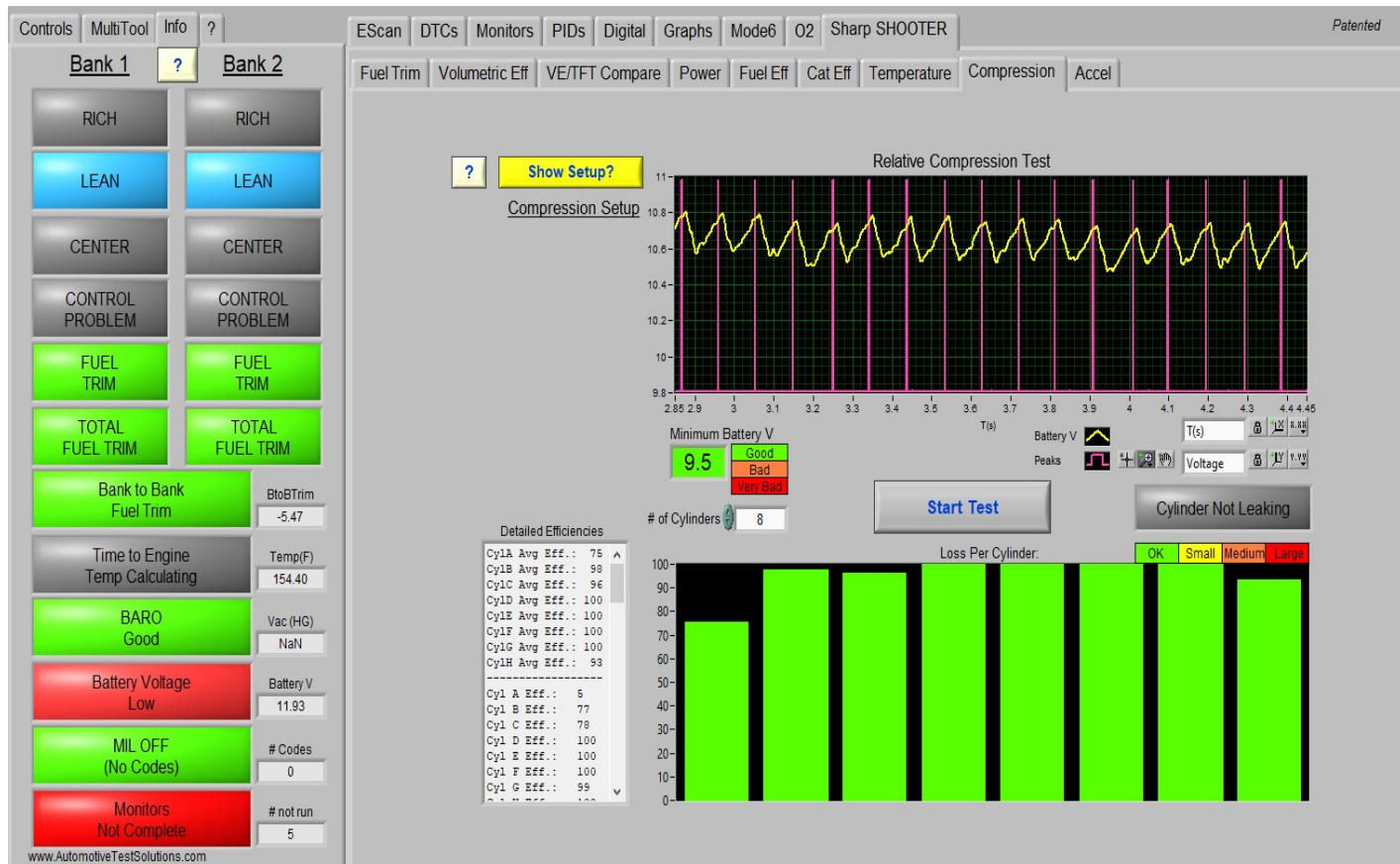
MIL OFF (No Codes) # Codes 0

Monitors Not Complete # not run 2

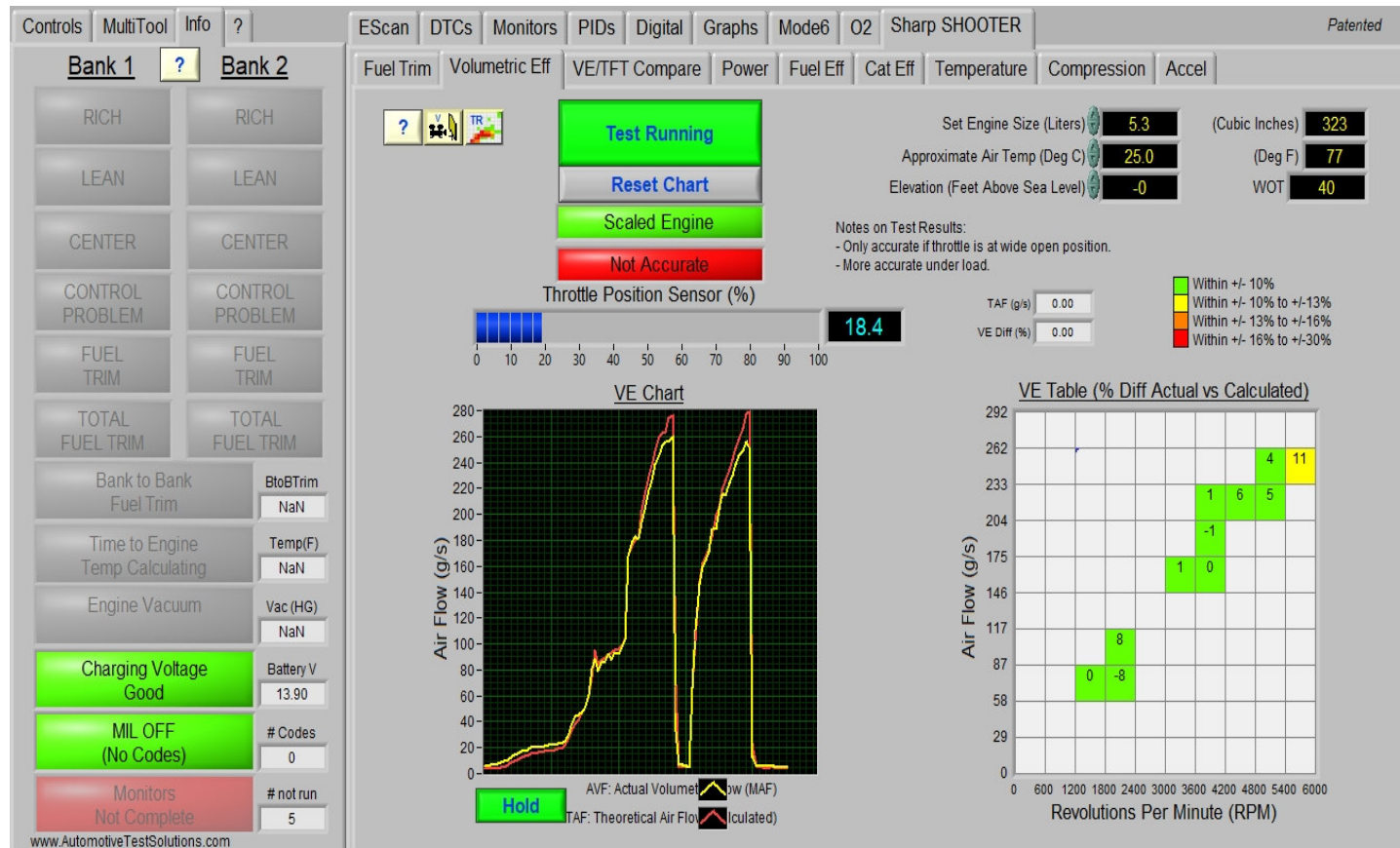
www.AutomotiveTestSolutions.com

Related DTC: Unavailable
Explanation: EWMA (Exponential Weighted Moving Average) misfire counts for the last 10 driving cycles

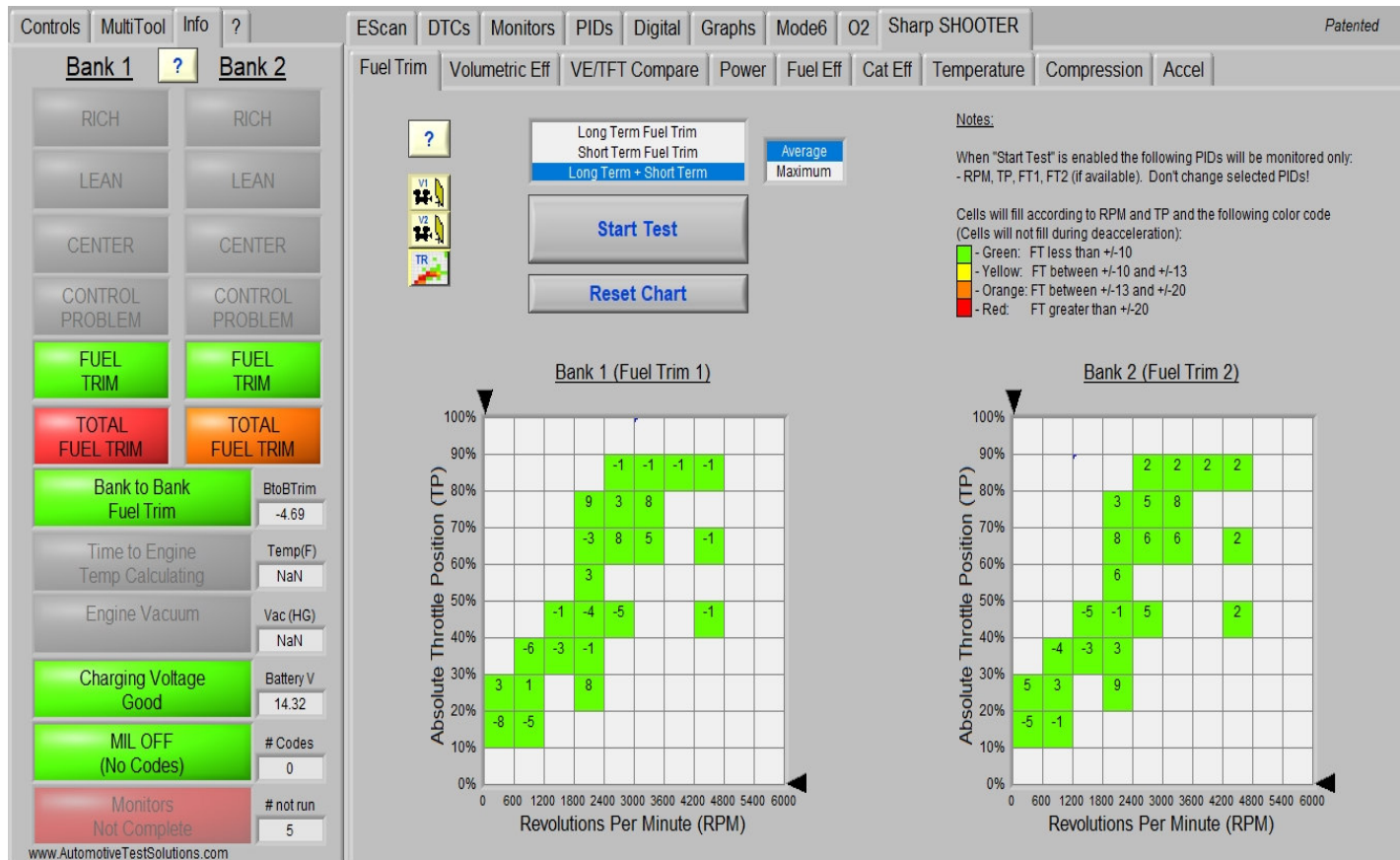
2010 Chevy Silverado



2010 Chevy Silverado



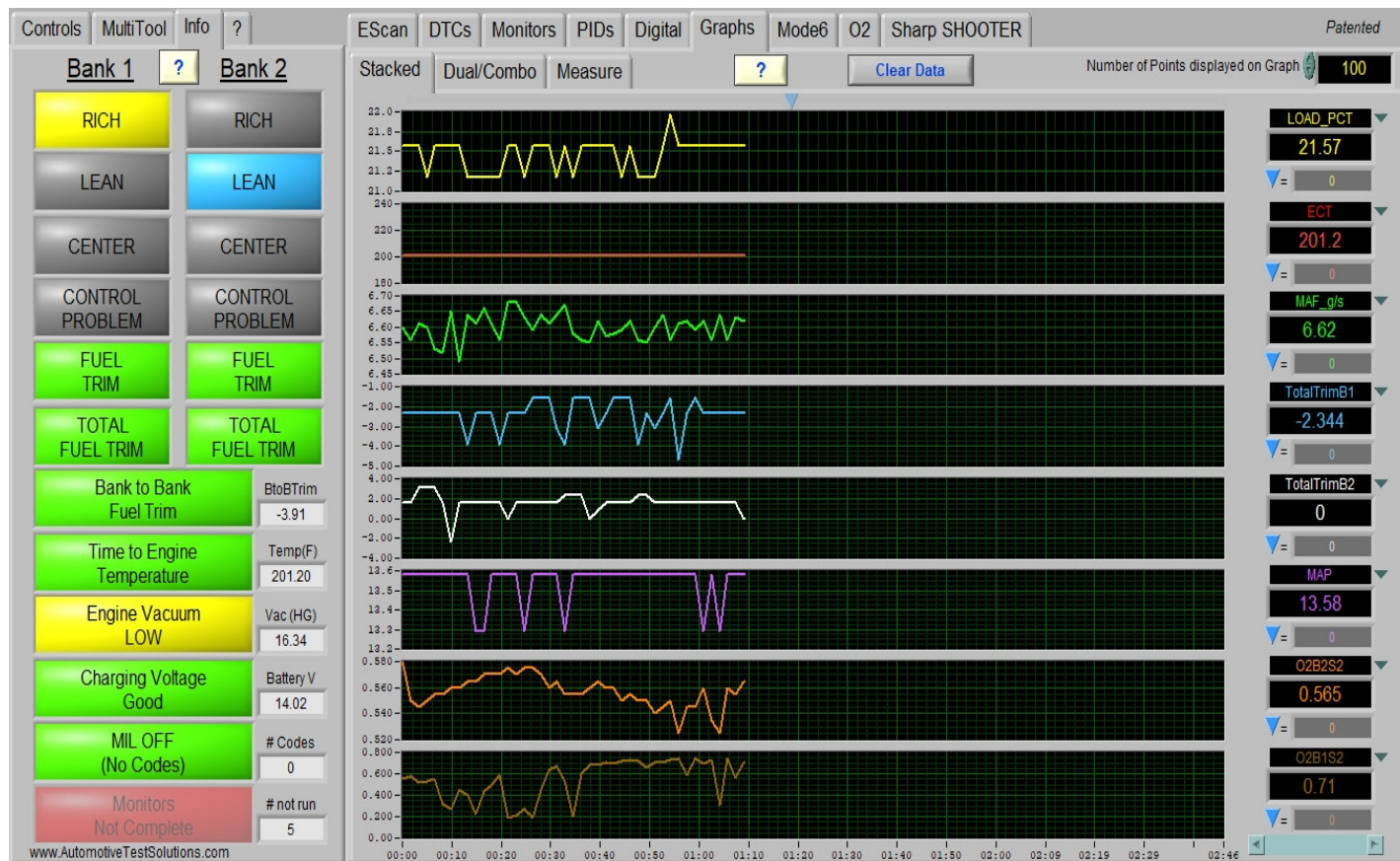
2010 Chevy Silverado



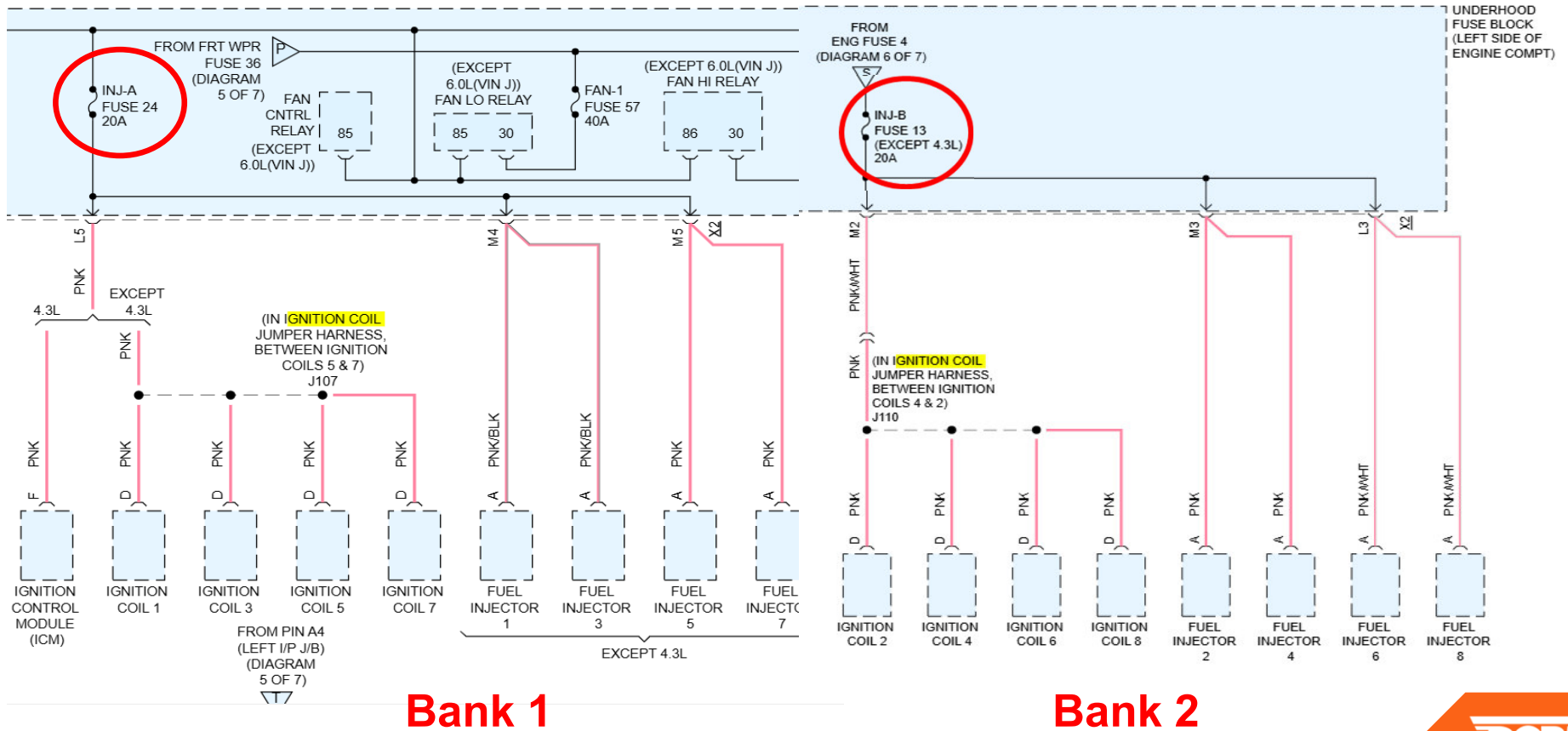
2010 Chevy Silverado



2010 Chevy Silverado



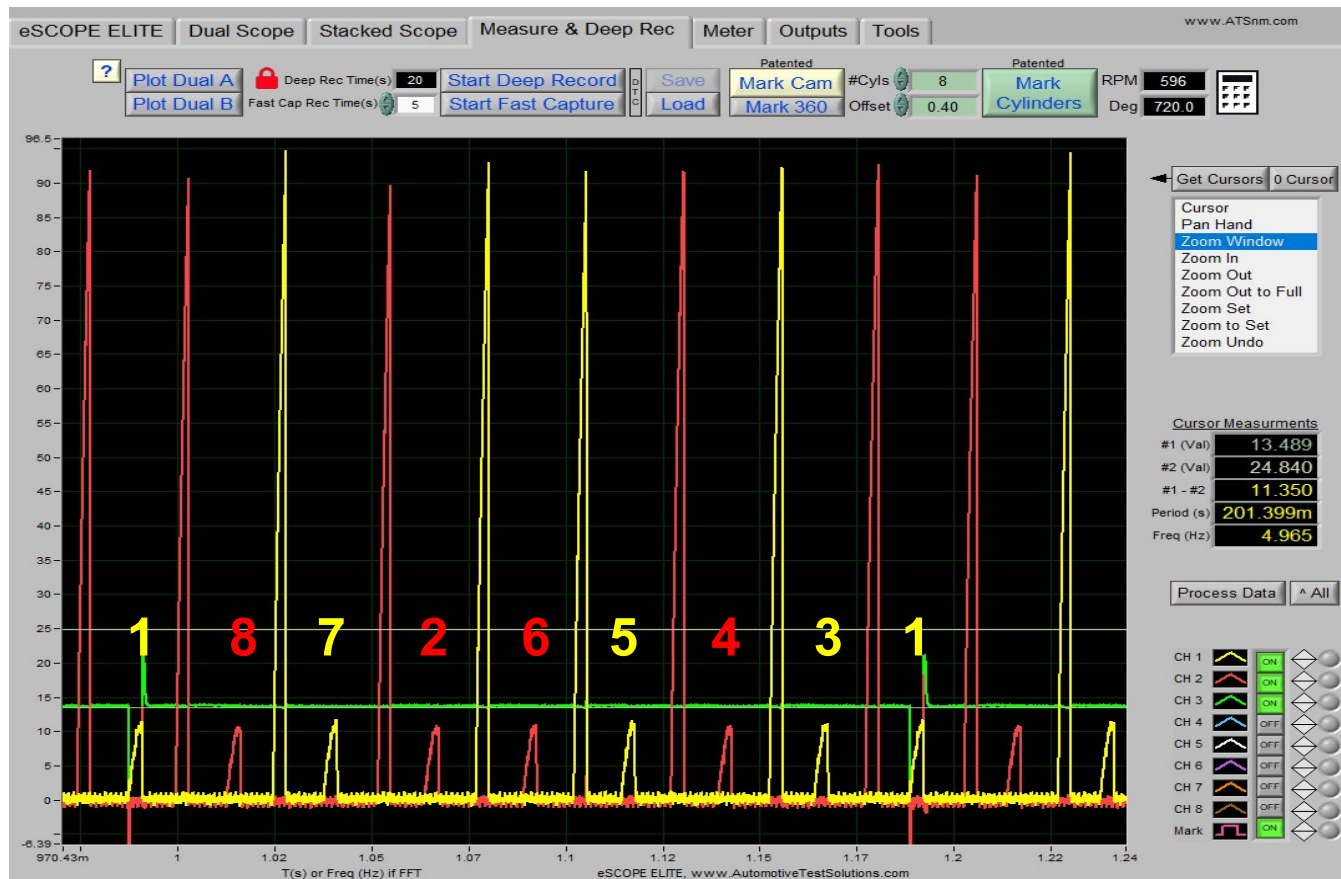
2010 Chevy Silverado



Bank 1

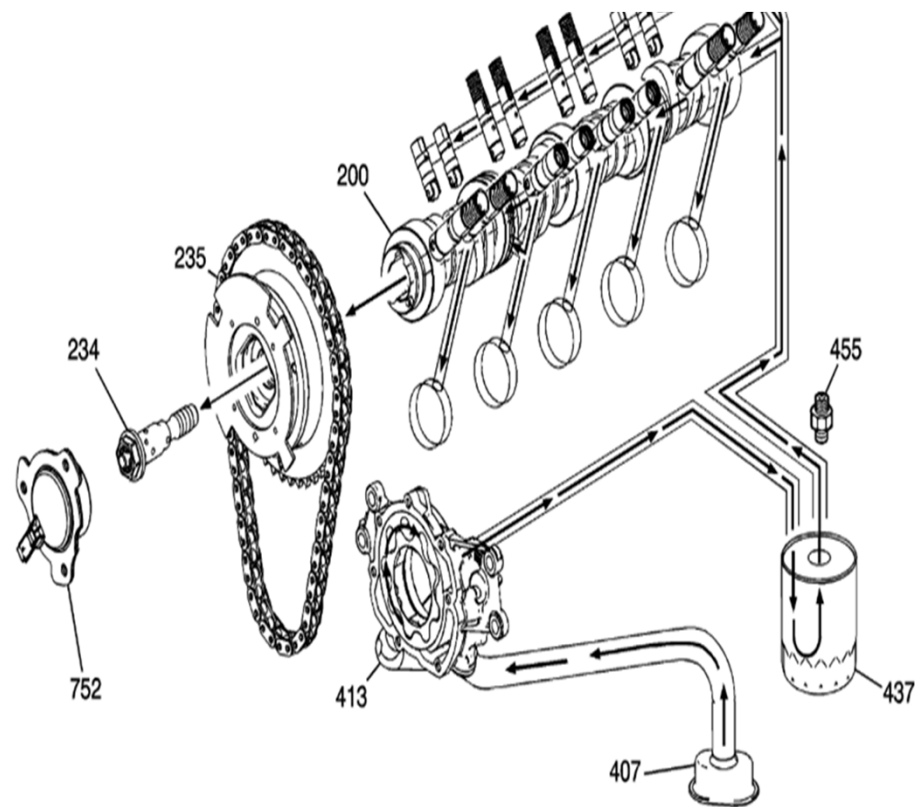
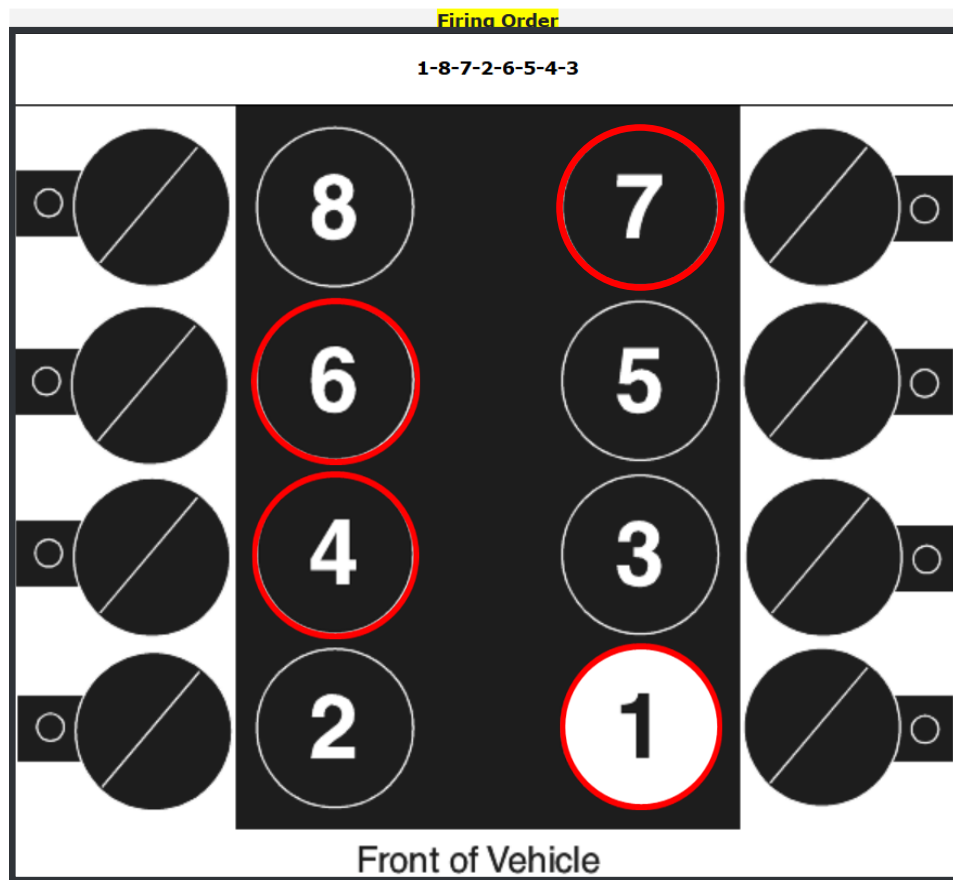
Bank 2

2010 Chevy Silverado



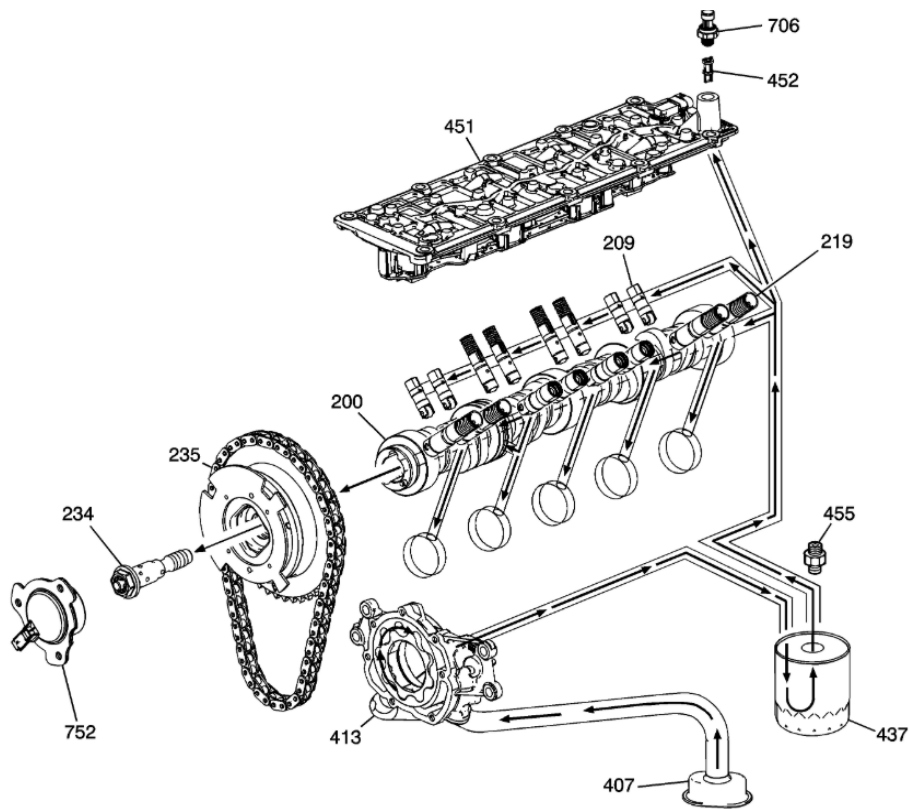
All injector and coil current ramps appear to be the same

2010 Chevy Silverado

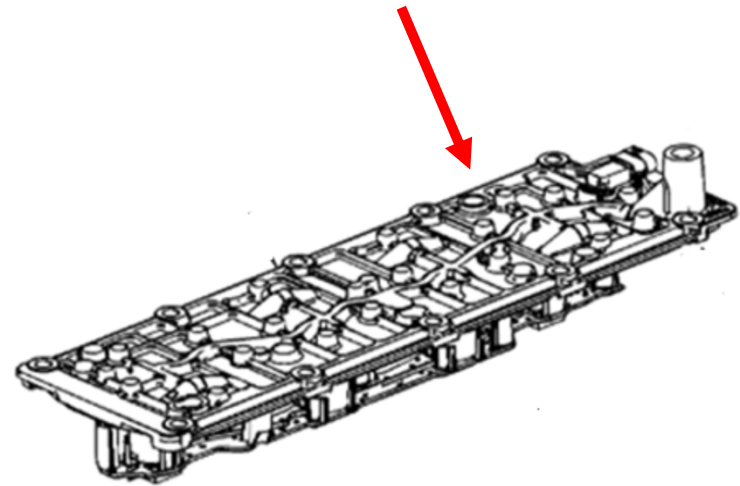


Is this a cam timing issue?

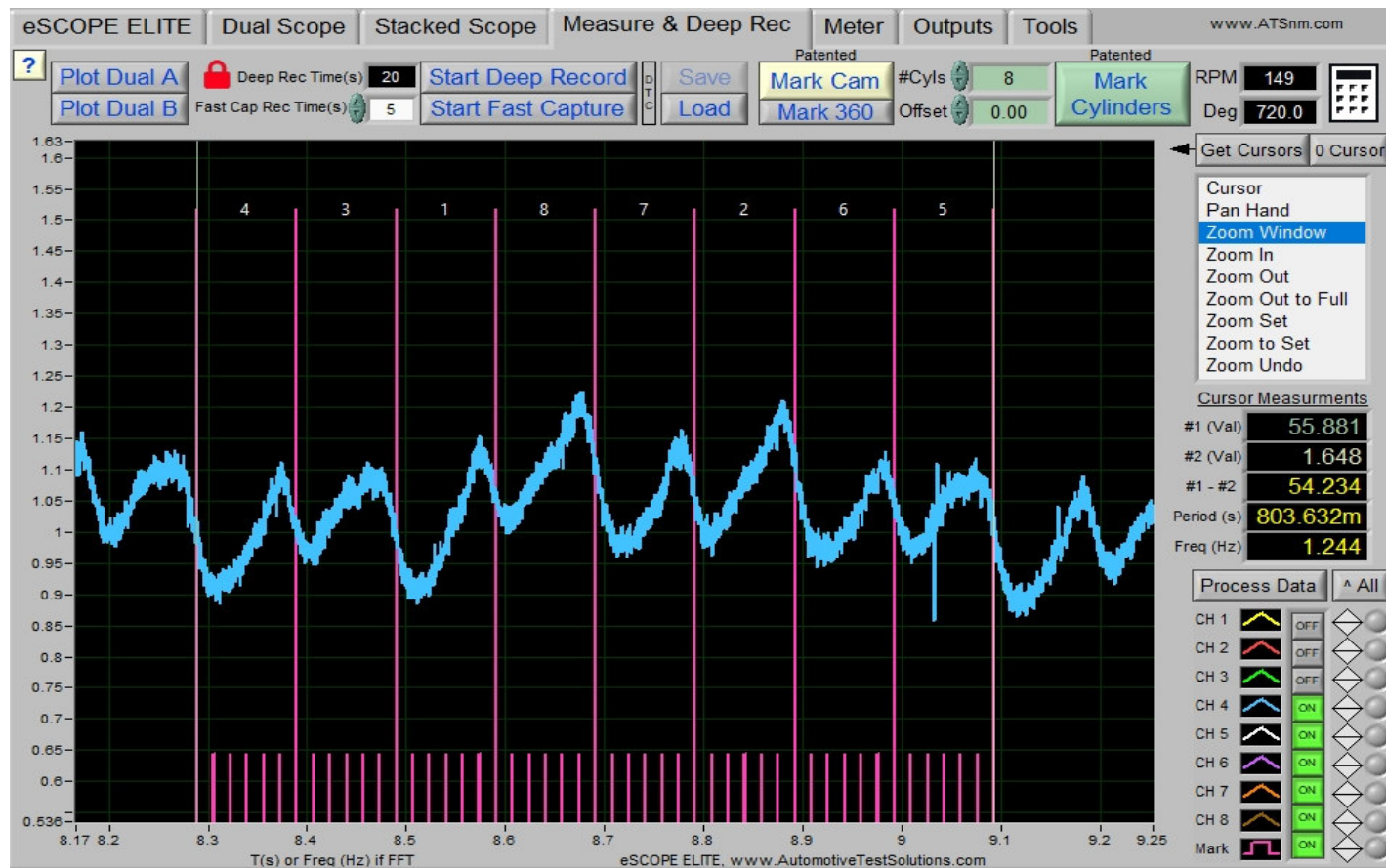
2010 Chevy Silverado



Connector is unplugged

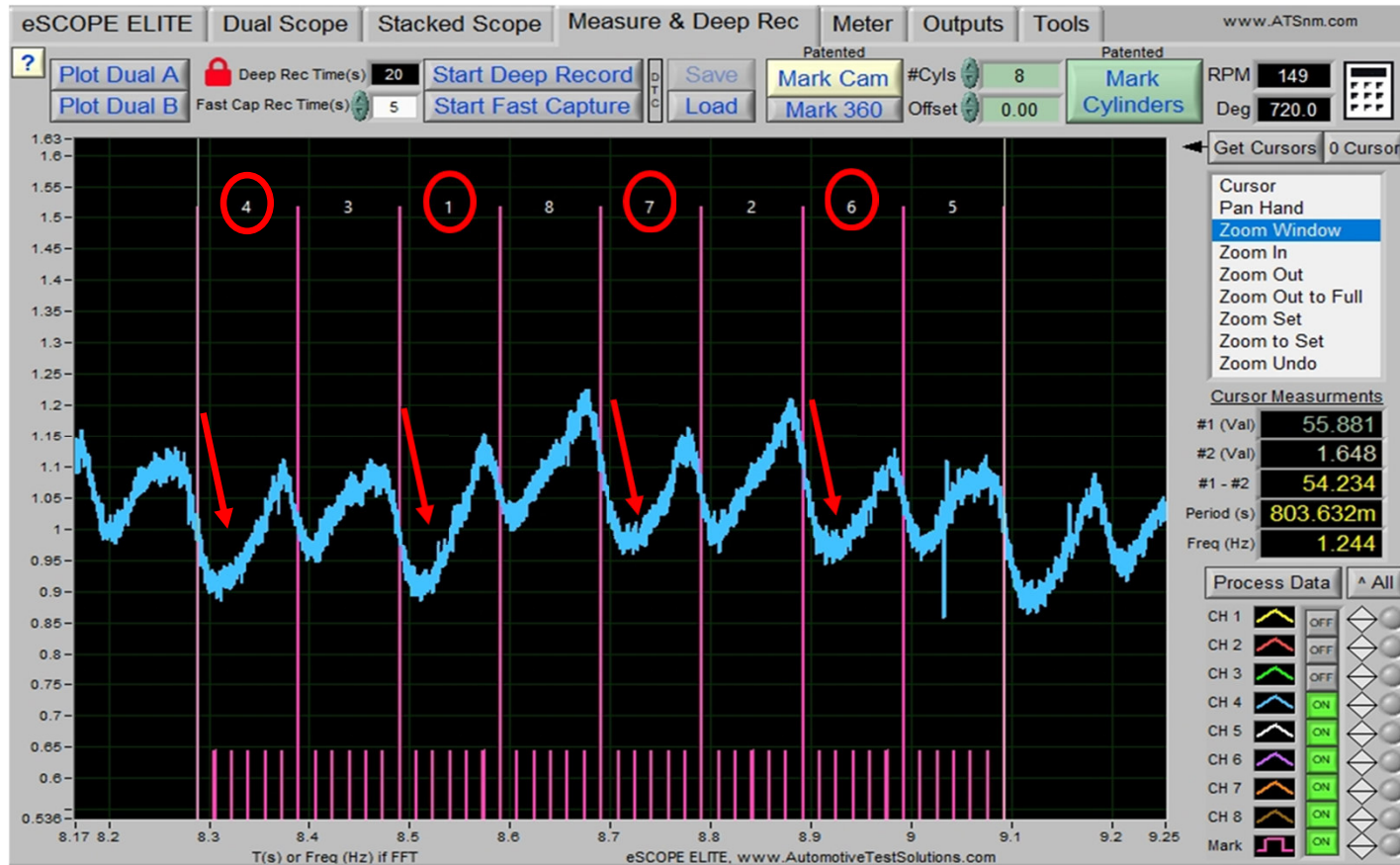


2010 Chevy Silverado



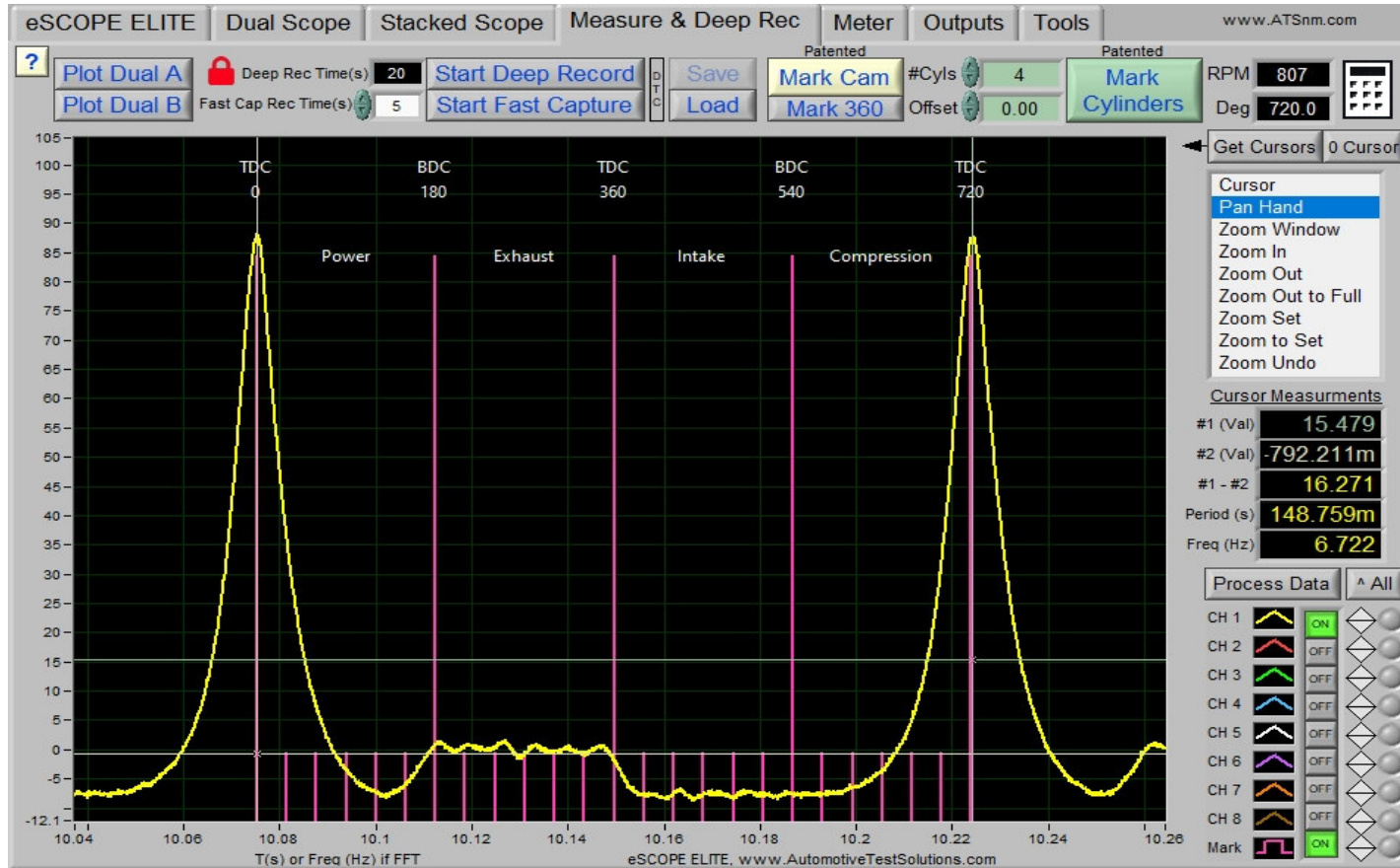
Cranking engine vacuum

2010 Chevy Silverado



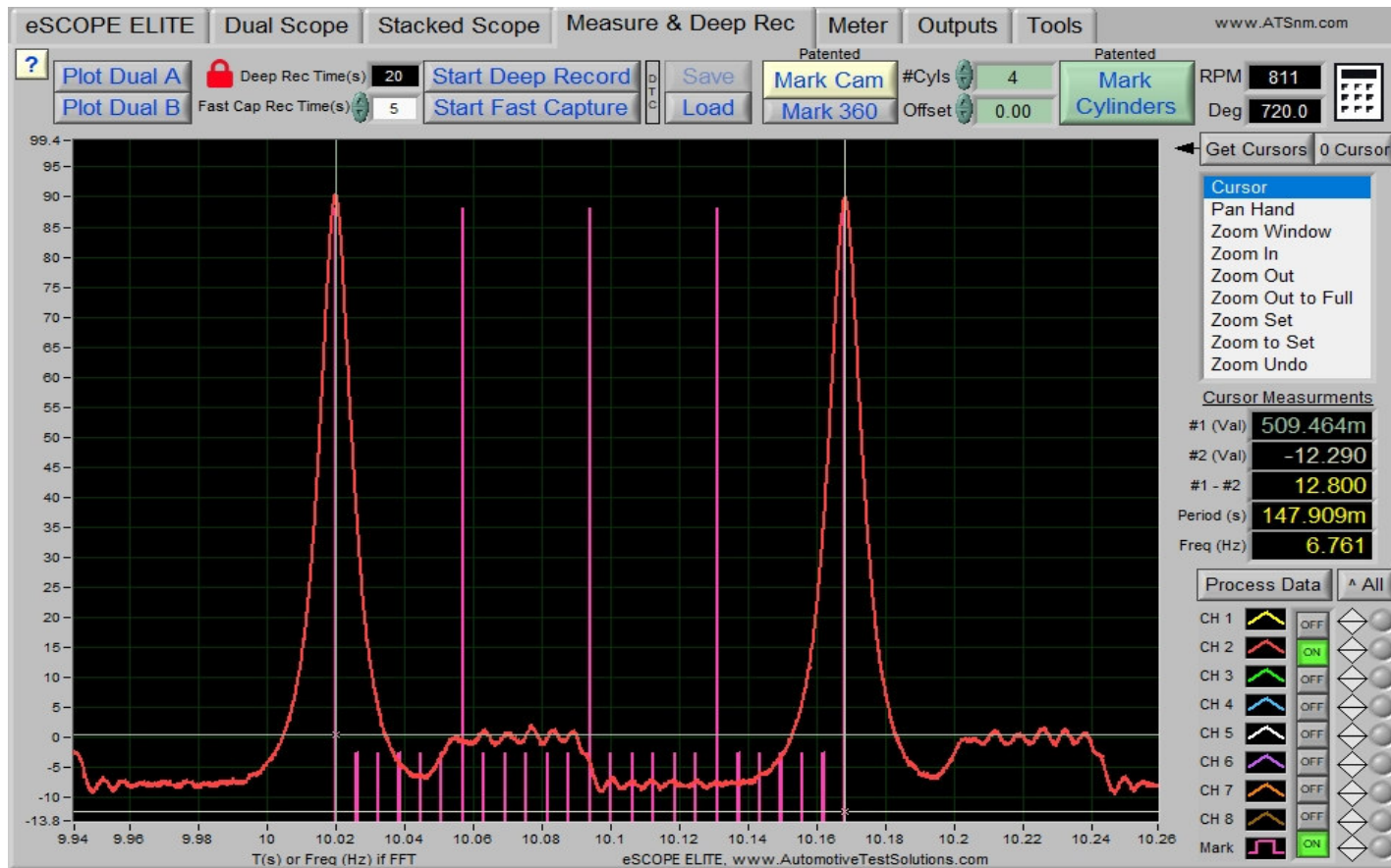
Cranking engine vacuum

2010 Chevy Silverado



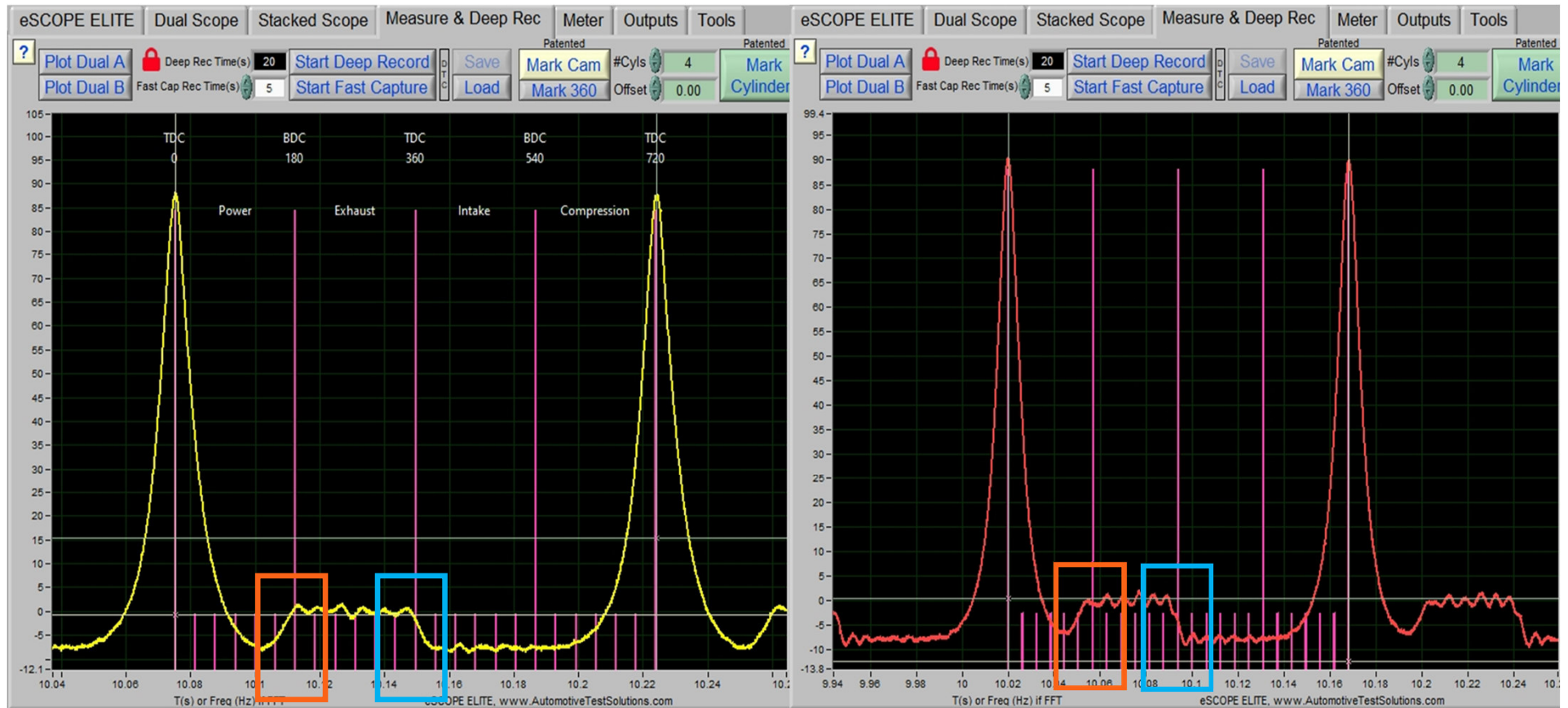
Cylinders 2,3,5 and 8

2010 Chevy Silverado



Cylinders 1,4,6 and 7

2010 Chevy Silverado



2010 Chevy Silverado

Conclusion: A phone call was made to engine remanufacture with details on what was found. They then went to the assembly line and evaluated camshafts and found the camshafts were ground wrong. They re-use the original camshaft but regrind the lobes for the DOD cylinders.

Unfortunately, we were not allowed to pull the motor apart, but a replacement reman motor was sent out with the updated camshaft that fixed the misfire.

2011 Ford Escape

Vehicle Specification

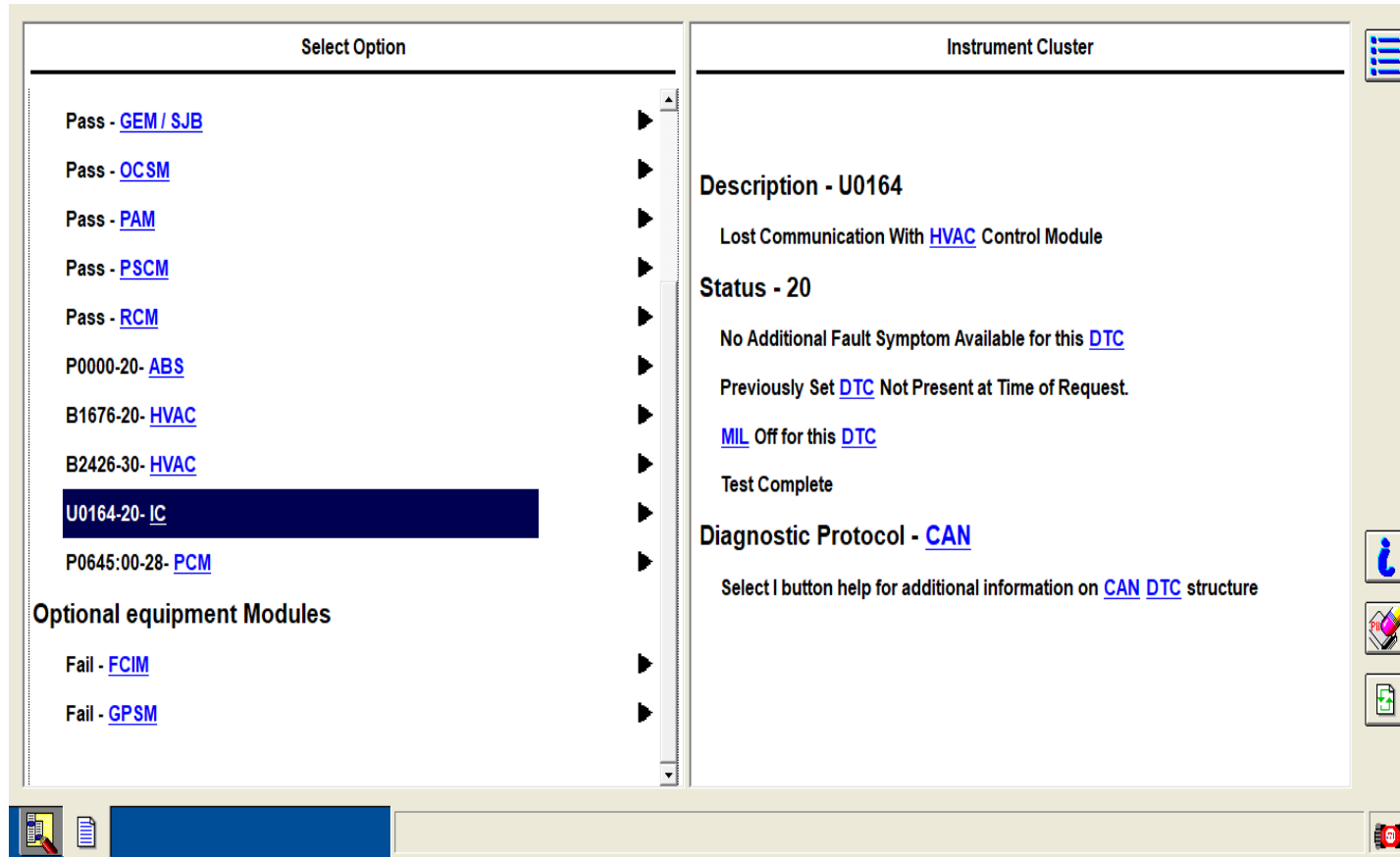
Vehicle: Escape / Tribute / Mariner
Engine Type: 4V
Capacity: 3.0L
Transmission: Automatic
Fuel Type: Gasoline
Emission level: 50 State Emission
Model Year: 2011 [MY](#)
Odometer: 151646.4mi
[VIN](#) 1FMCU9EG0BKB57137



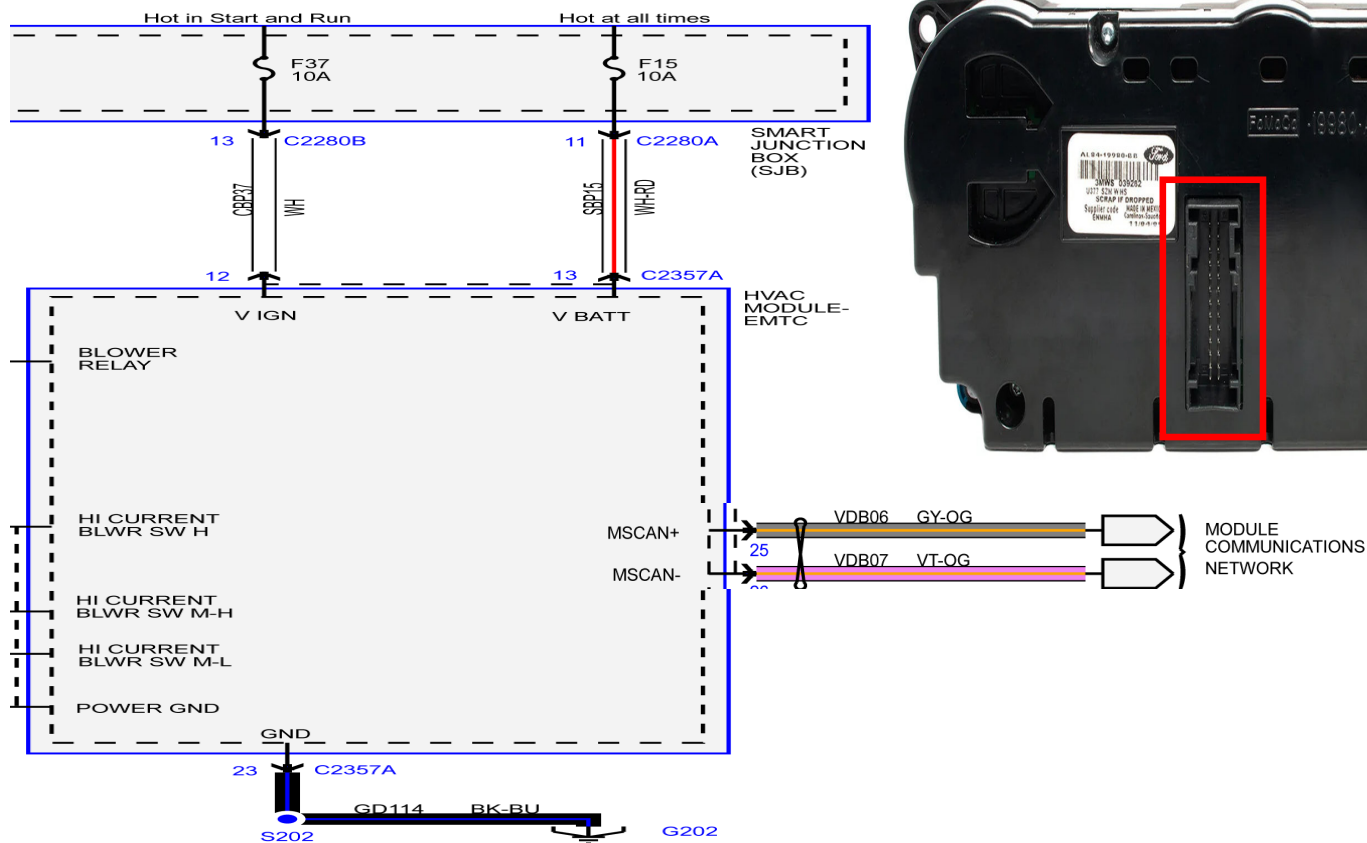
Customer states HVAC buttons do not work, and the air is stuck on defrost

Complete

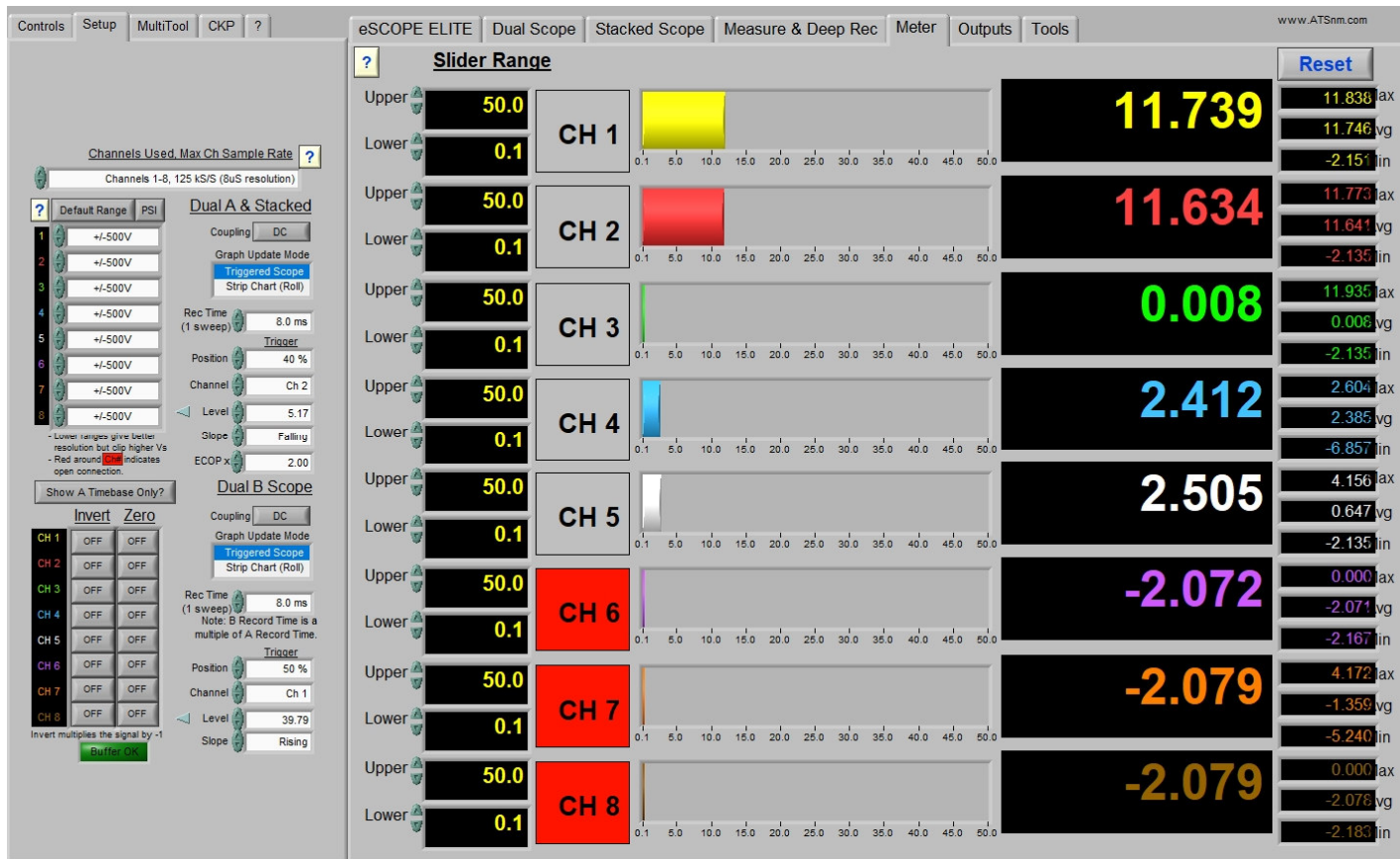
2011 Ford Escape



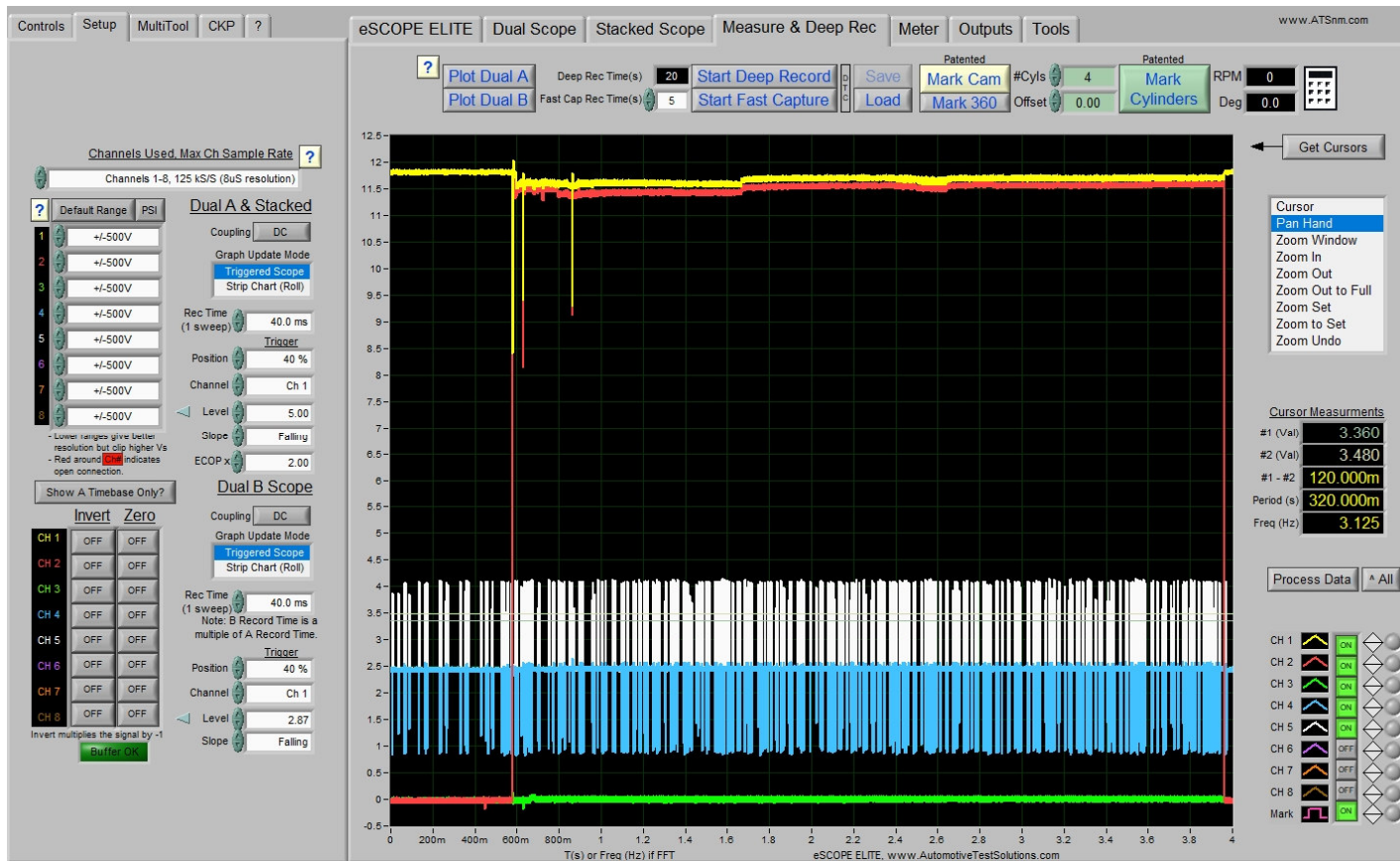
2011 Ford Escape



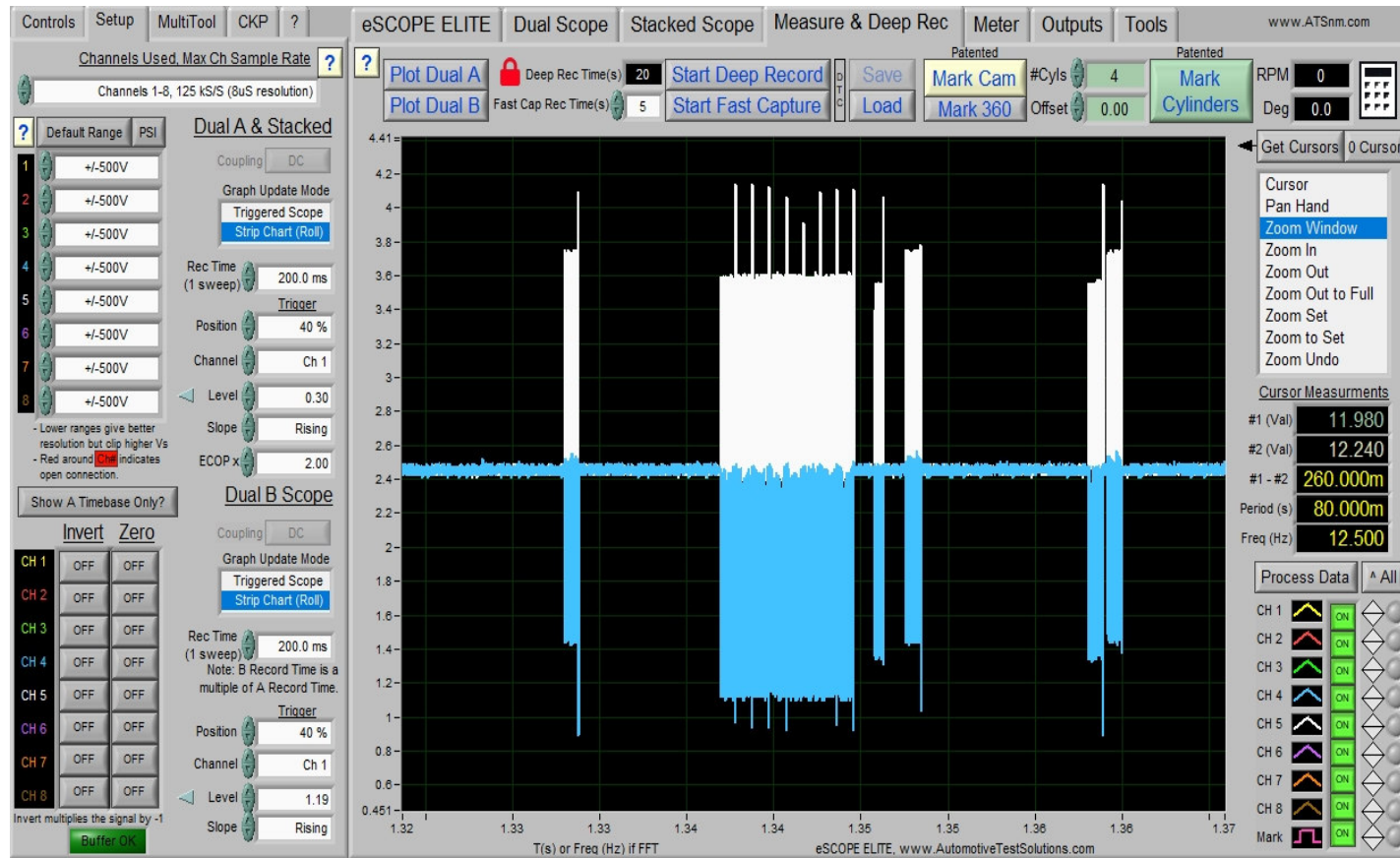
2011 Ford Escape



2011 Ford Escape



2011 Ford Escape

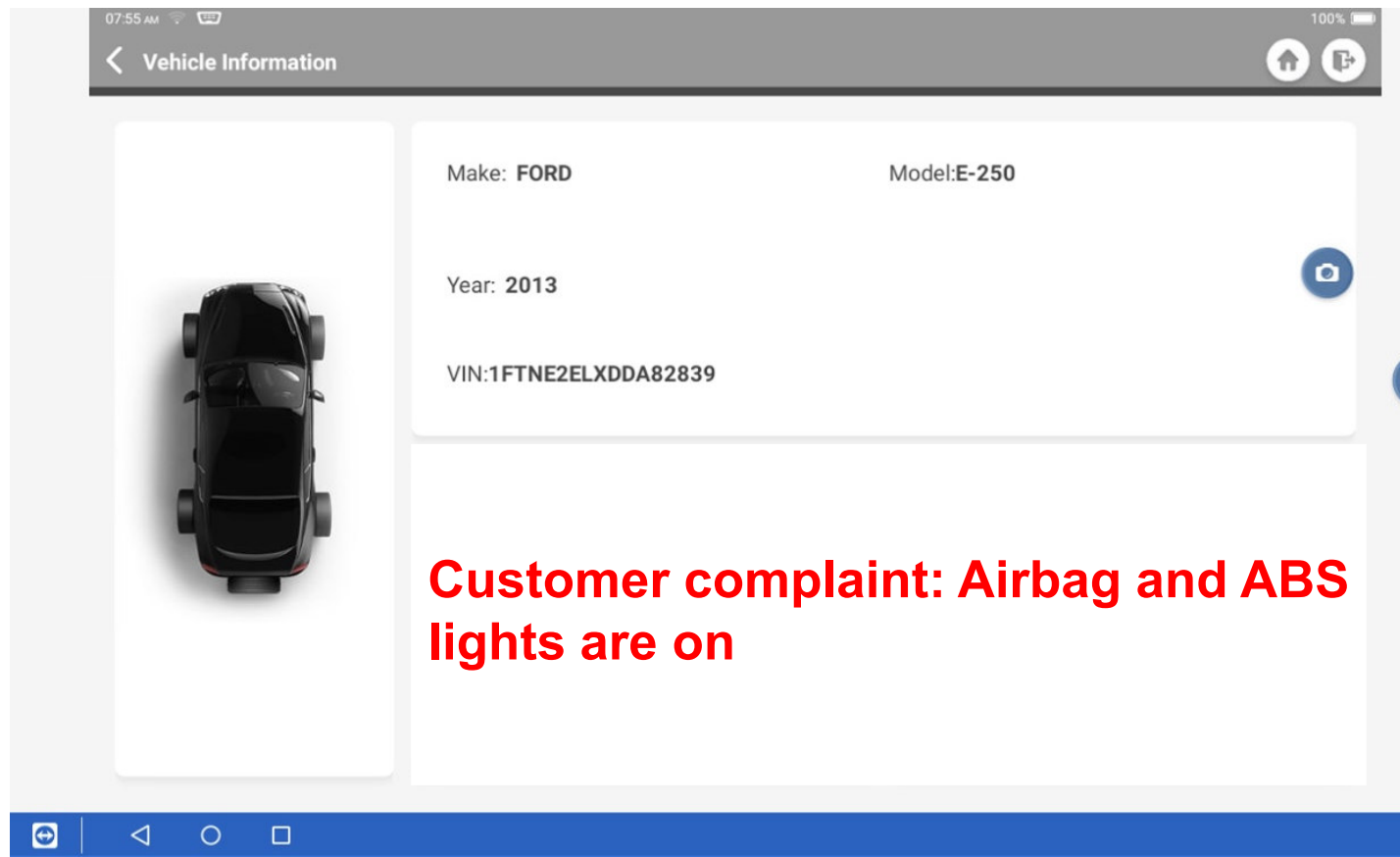


CAN high from 2.5 - 3.5 and CAN low from 2.5 - 1.5

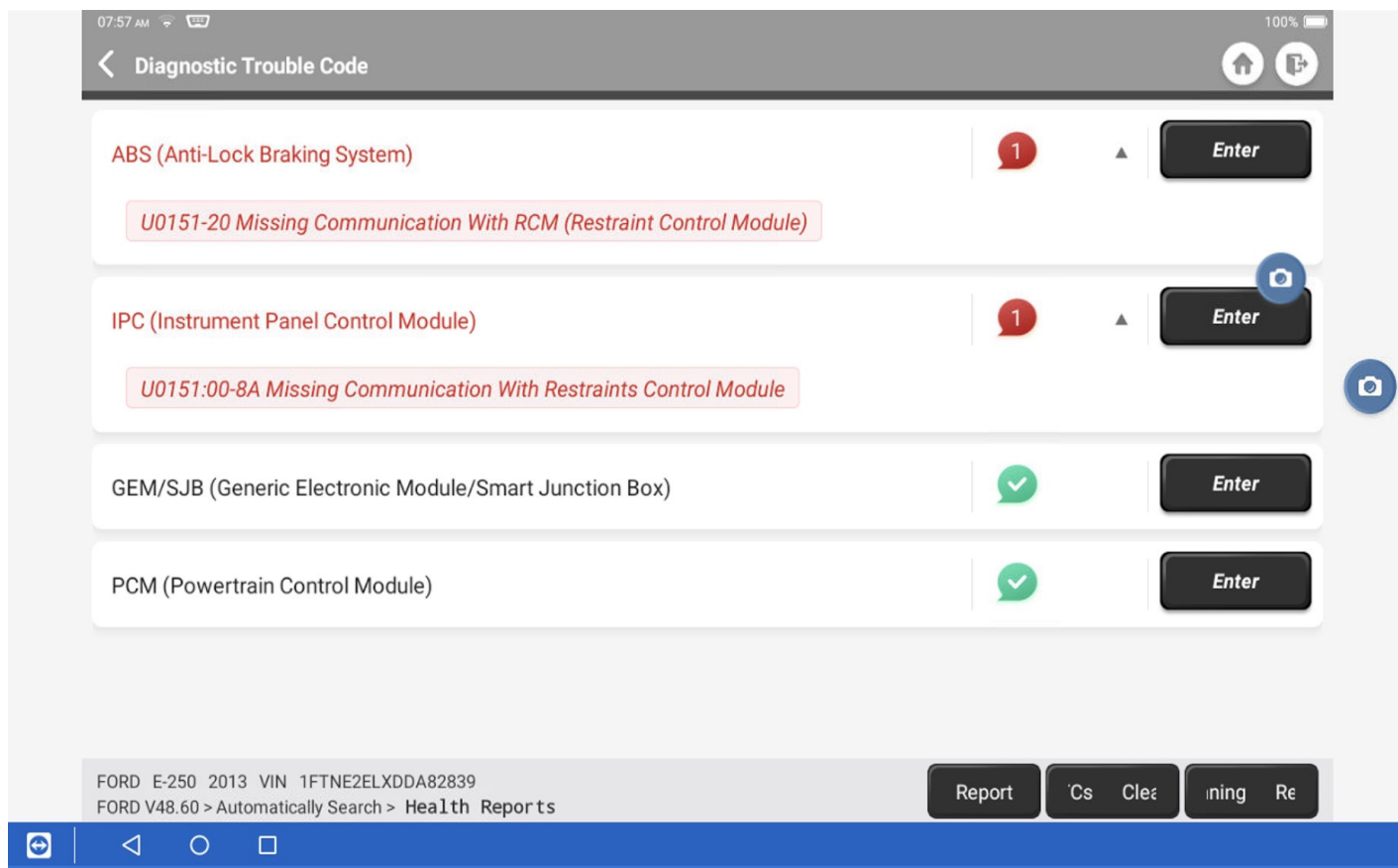
2011 Ford Escape

Conclusion: all powers, grounds and communication wires all tested good at the back of the HVAC control head. A used HVAC control module was sourced and installed in the vehicle. Now all the functions on the front of the unit now work as designed along with all position modes.

2013 Ford E-250



2013 Ford E-250



2013 Ford E-250

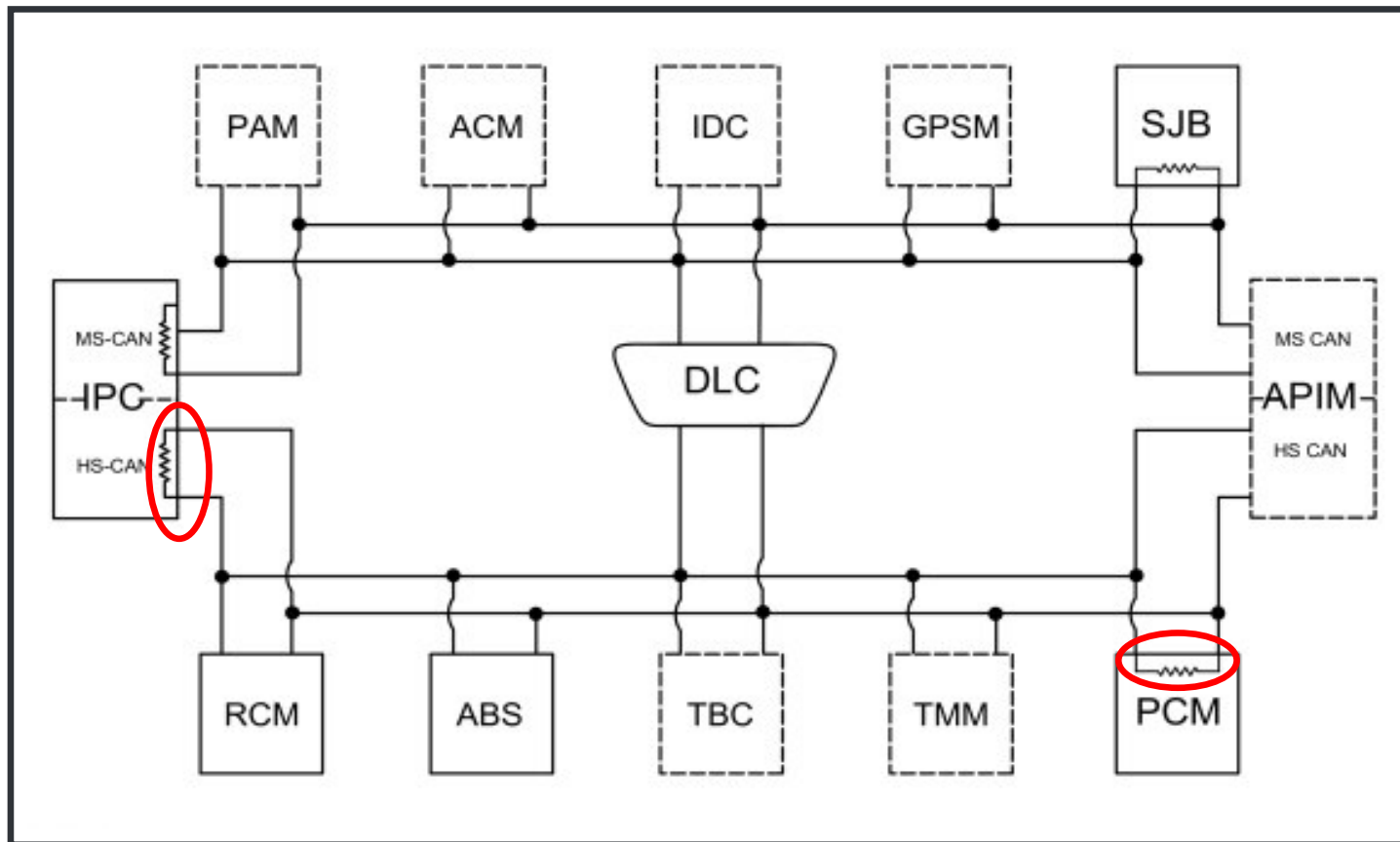


Positive Meter Lead CAN High PIN 6

Negative Meter Lead CAN Low PIN 14

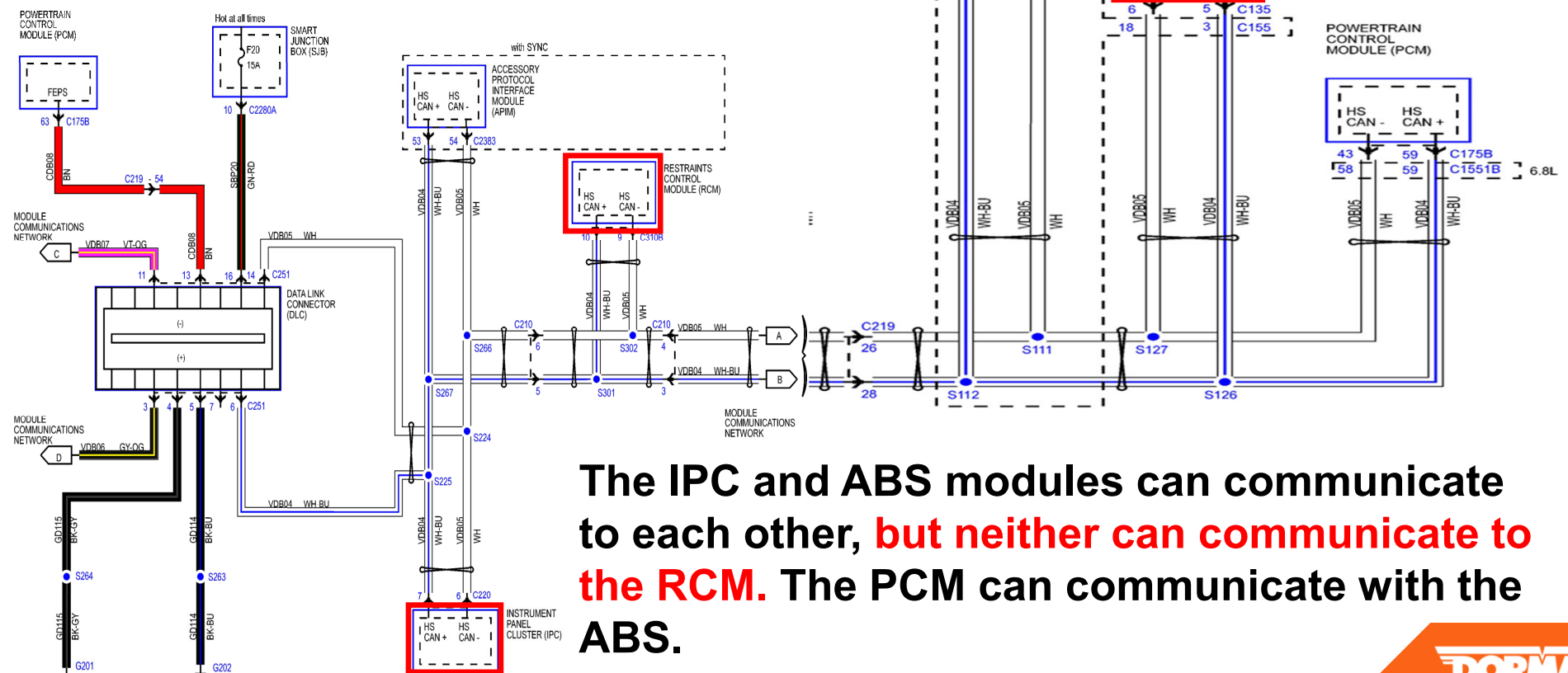
The BUS must be OFF to test resistance

2013 Ford E-250



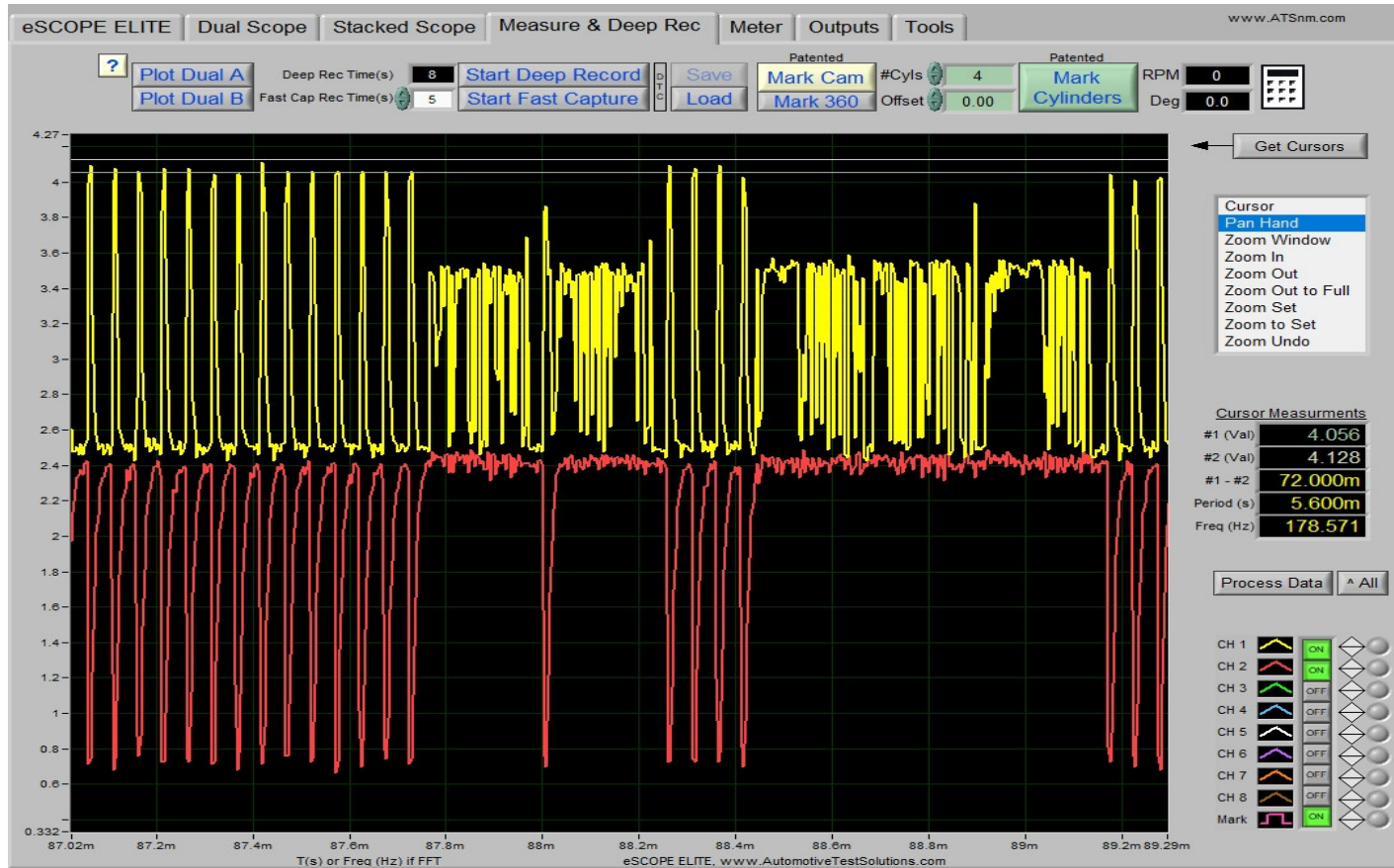
2013 Ford E-250

EXCEPT STRIPPED CHASSIS



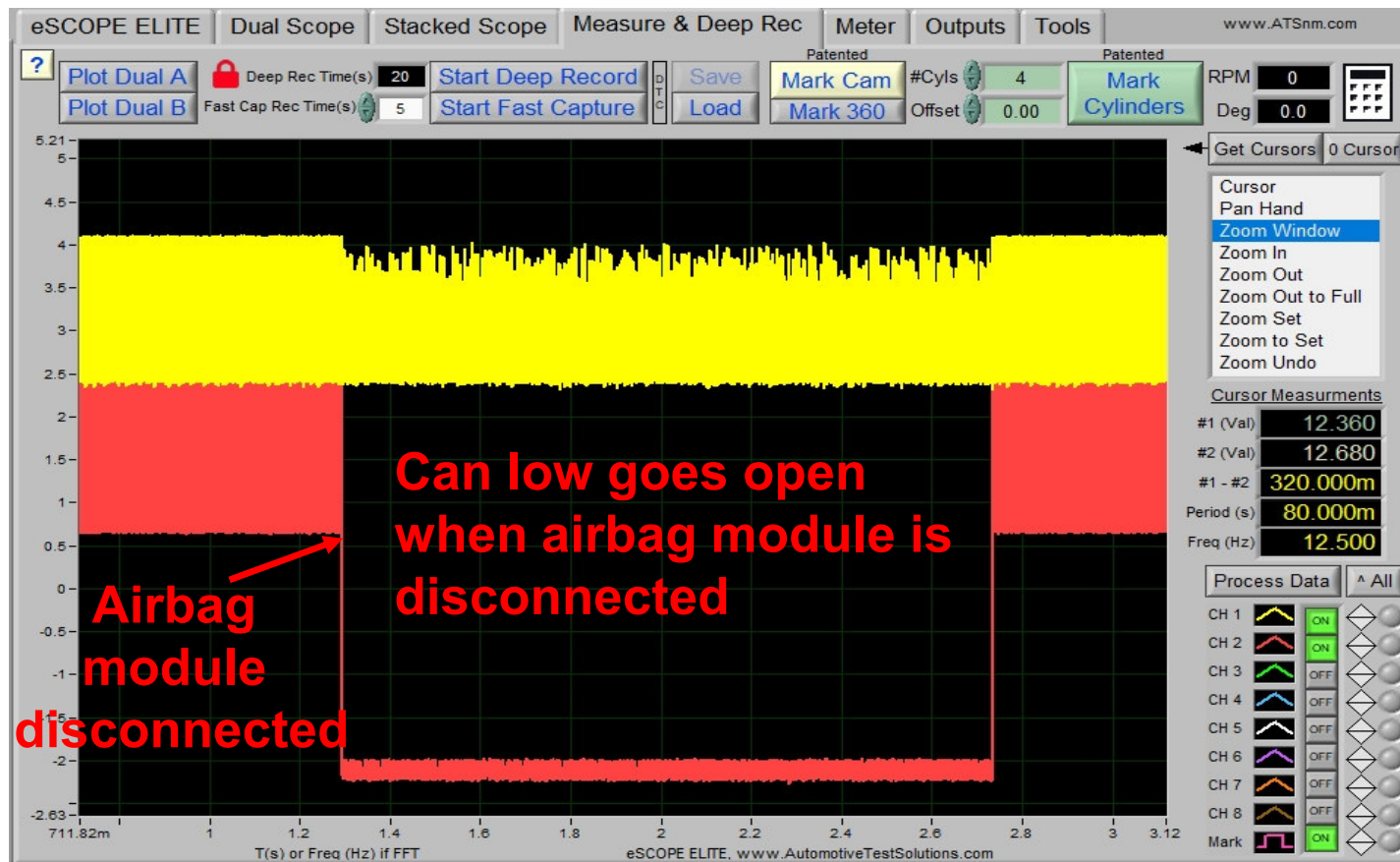
The IPC and ABS modules can communicate to each other, **but neither can communicate to the RCM.** The PCM can communicate with the **ABS.**

2013 Ford E-250

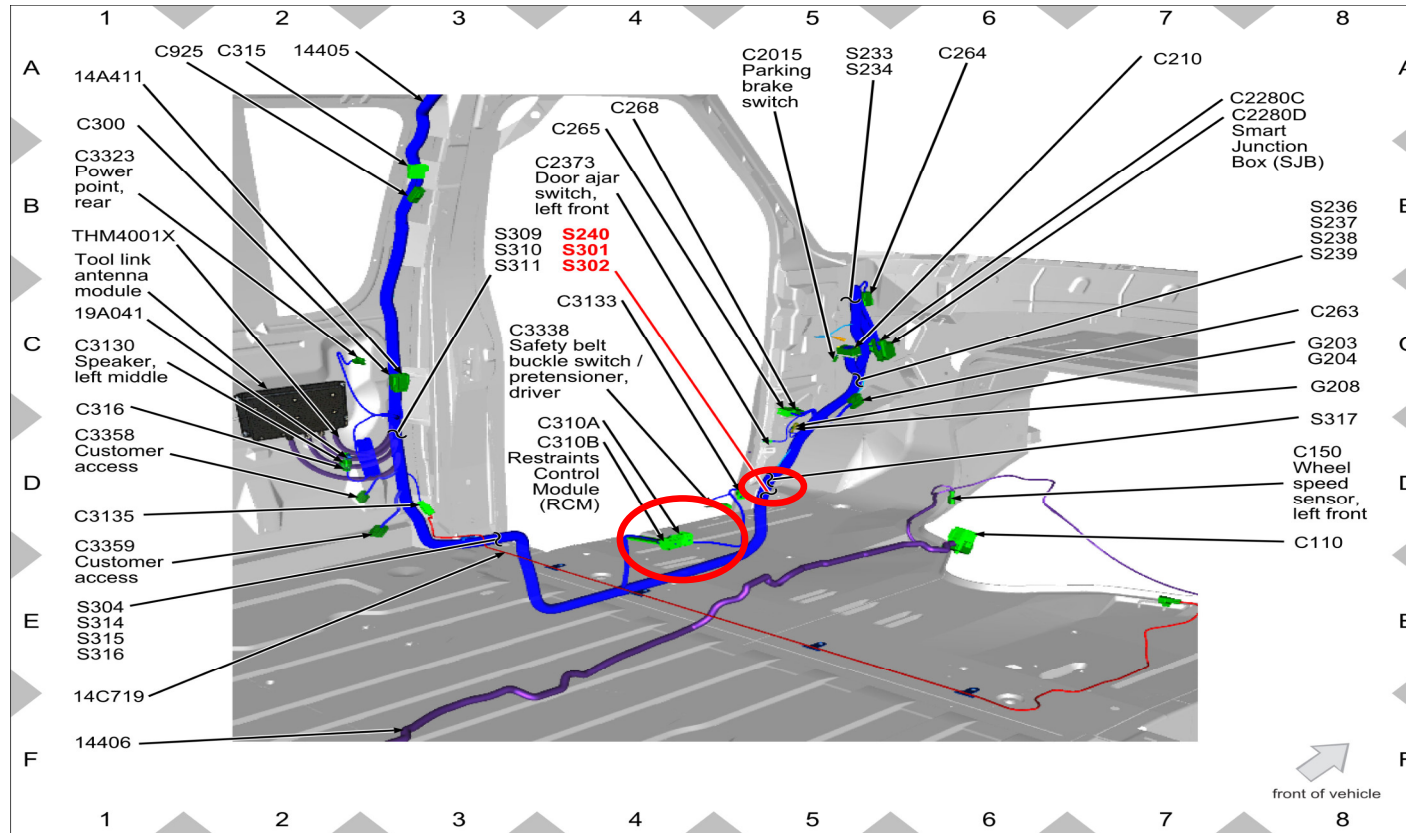


Testing at the airbag module under driver seat

2013 Ford E-250



2013 Ford E-250



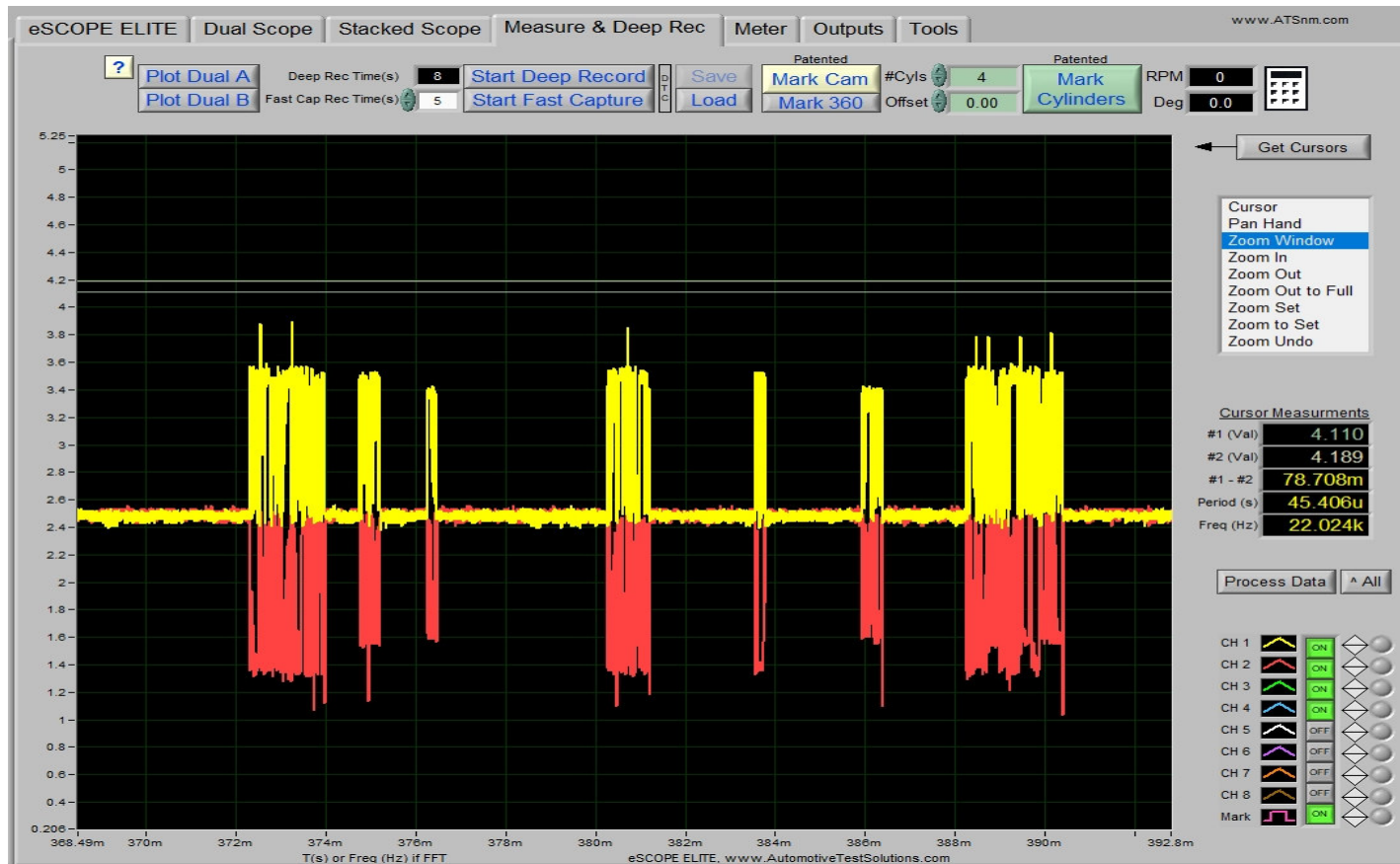
Suspect that the issue is between the airbag control module and S301 and S302

2013 Ford E-250

**Found wires under the
driver side floor sill
corroded**



2013 Ford E-250



After wiring repaired

Questions?

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