

6.0L Diesel Talk LIVE



6.0L Recalibration for Cold Injector Spool Valve Sticking

October 25, 2006

Diesel Talk Live

- **Today - 6.0L Recalibration for Cold Injector Spool Valve Sticking**
TSB 06-22-3
- Turbocharger Information
 - Presentations will be available on Power Stroke Central
 - Links to streaming video will be available on Power Stroke Central

Cold Injector Stiction Recalibration

Last Broadcast:

- Tech Time Plus

- Turbo cleaning episode 30
- EGR valve cleaning episode 31

- Warranty Coverage Questions:

- Recalibration and E-Series wiring modification are covered under Emissions.
- Rotunda 164-R5903 tool is available through PTS Web site or 1-800-Rotunda.

Turbo Charger Updates

Turbo Service Release without VGT

- Please be aware that service turbos will soon come without the VGT Solenoid.
- Turbos with the VGT installed will continue to be used until stock is exhausted.
- There are no differences between the current Turbo with VGT and the Turbo that will come without VGT.

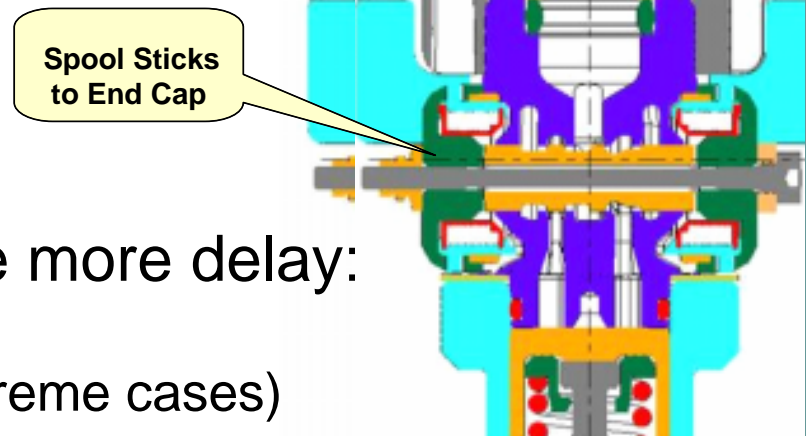
Turbo Charger Updates

VGT Replacements

- Objective is to reuse the existing VGT valve from the Turbo being replaced. Especially on corroded turbos.
- VGT replacement should not be needed in 80% of Turbo repairs. Please ensure the VGT is replaced only after following PCED or if coking is present as described in TSB 06-18-3.
- VGT warranty replacements have increased in the last 2 months over & above use of turbo cleaning. We are asking for your help and assistance in ensuring proper VGT replacements.

Cold Injector “Stiction” - What is it?

- Stiction is caused by excess oil in the closed side end cap/spool interface area increasing the hydraulic latching of the spool valve
 - Stiction increases as oil viscosity increases
 - Temperature decreases
 - Oil viscosity changes
 - Oil ages
 - Oil additives
 - Oil type, weight



The colder and thicker the oil, the more delay:

- Rough idle
- Lacks power/no pedal response (extreme cases)
- White smoke

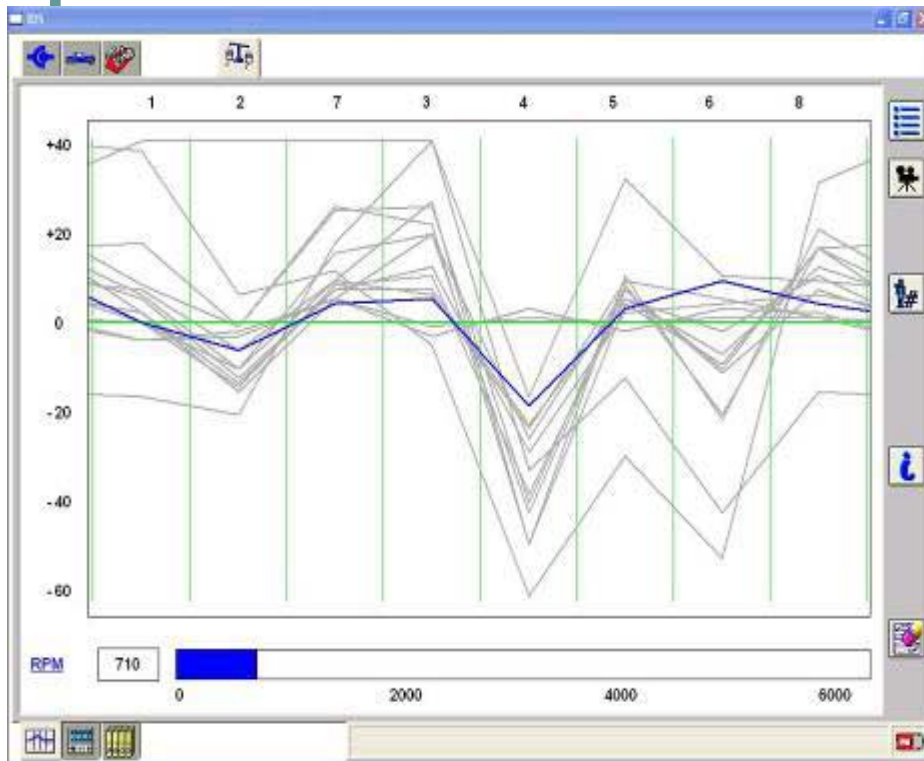
NOTE: issue corrected in 6.4L with common rail injector – Piezo vs. oil actuation

Cold Injector “Stiction” - Solution

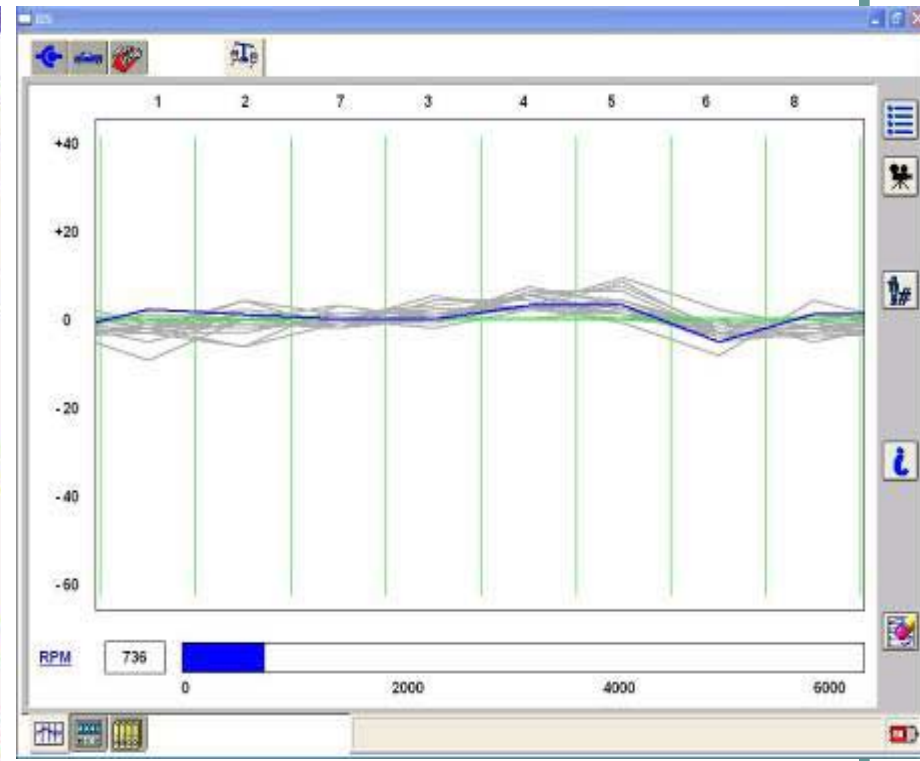
- A new calibration has been developed and extensively tested in lab and field over the past 6 months.
 - Removes the oil in the spool-endcap interface inside the injector by cycling the spool valves for 30 seconds.
 - At start up, the coils are left on longer to heat & thin the oil. The injector performs as if EOT is warm.
- This is a permanent fix, more effective long-term than injector replacement (since any injector can develop stiction)

Software Solution Results – Idle Quality

171K Field test vehicle, Sheboygan, WI



Production software cold start

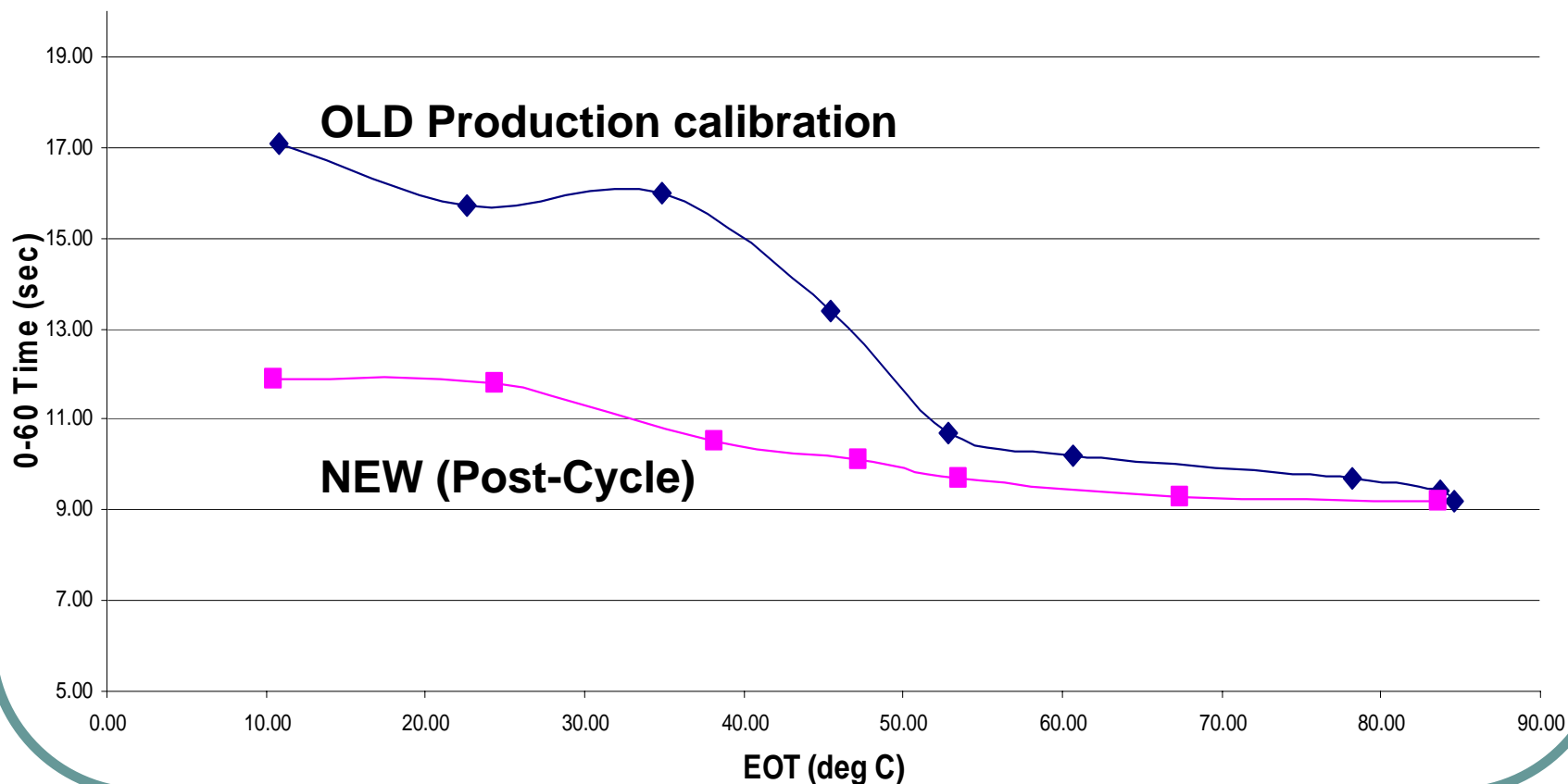


Post-cycle software cold start

- Same start temp, power balance snapshot of first 60 seconds after start
- No issues since reflash, vehicles continue to perform as temp drops

Software Solution Results - Acceleration

**0-60 mph WOT Performance Evaluation
(Successive 0-60 runs starting at 10C EOT)**



Customer Information Sheet

To be provided to customer by Shop Foreman/Service Writer



6.0L Powerstroke Engine Control Improvement Software

Your vehicle received revised engine control software to improve engine operation by cycling the fuel injectors every time the engine is shut off.

You will notice a soft buzzing sound from under the hood after the ignition key is turned off. This is expected. The cycling is very difficult to hear inside the vehicle but it can be heard from the outside. The new software will not reduce engine life, fuel economy, or performance.

The injector cycling sound will last for 30 seconds after every engine shut down.

Stiction TSB:

- 1. Receive vehicle with complaint:**
 - **Runs rough cold**
 - **No start cold**
 - **Lacks power cold**
 - **White smoke**
 - **Exhaust odor**
 - **Surges**
- 2. (E-Series only) – perform wiring modifications <see video>**
- 3. Reflash, start and shut down to verify post-cycle**
- 4. Test-drive to warm oil to 180F (at least 12 aggressive accelerations)**
- 5. Service Manager/Foreman notifies customer of new cycling sound for 30 seconds after shutdown and returns vehicle**

Other Fuel System Issues

Maintenance is critical:

- Fuel filter changes
- Oil changes
- Max 5% BioDiesel

If injectors require replacement:

- Clamp bolt torque is critical
- Copper washers are one-time use
ONLY – NEVER re-use

Taped Rebroadcast Dates

Ford Dealer TV – Channel 11

<i>Topic</i>	<i>Date</i>	<i>Time (ET)</i>
6.0L Recalibration for Cold Injector Spool Valve Sticking	Th-10/26	5:00 – 7:00 PM
	Tu-10/31	9:00 – 11:00 AM
	W -11/1	6:00 – 8:00 PM
	Th-11/2	11:00AM – 1:00PM
	Tu-11/7	7:00 – 9:00 PM
	W -11/8	3:30 – 5:30 PM

Question ?

- Injector spool valve sticking is caused by:
 - A. Fuel viscosity
 - B. Oil pressure
 - C. Cold oil in the spool & endcap interface
 - D. Fuel quality

Question ?

- Can spool valve sticking cause a total lack of accelerator pedal response?
 - A. Yes
 - B. No

Question ?

- What does spool valve sticking do to the engine?
 - A. Retards effective injection timing
 - B. Creates more soot
 - C. Increases MFDES
 - D. All of the above

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Q & A

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Appendix

E-Series Wiring Modification Views

Rotunda tool kit 164-R5903:



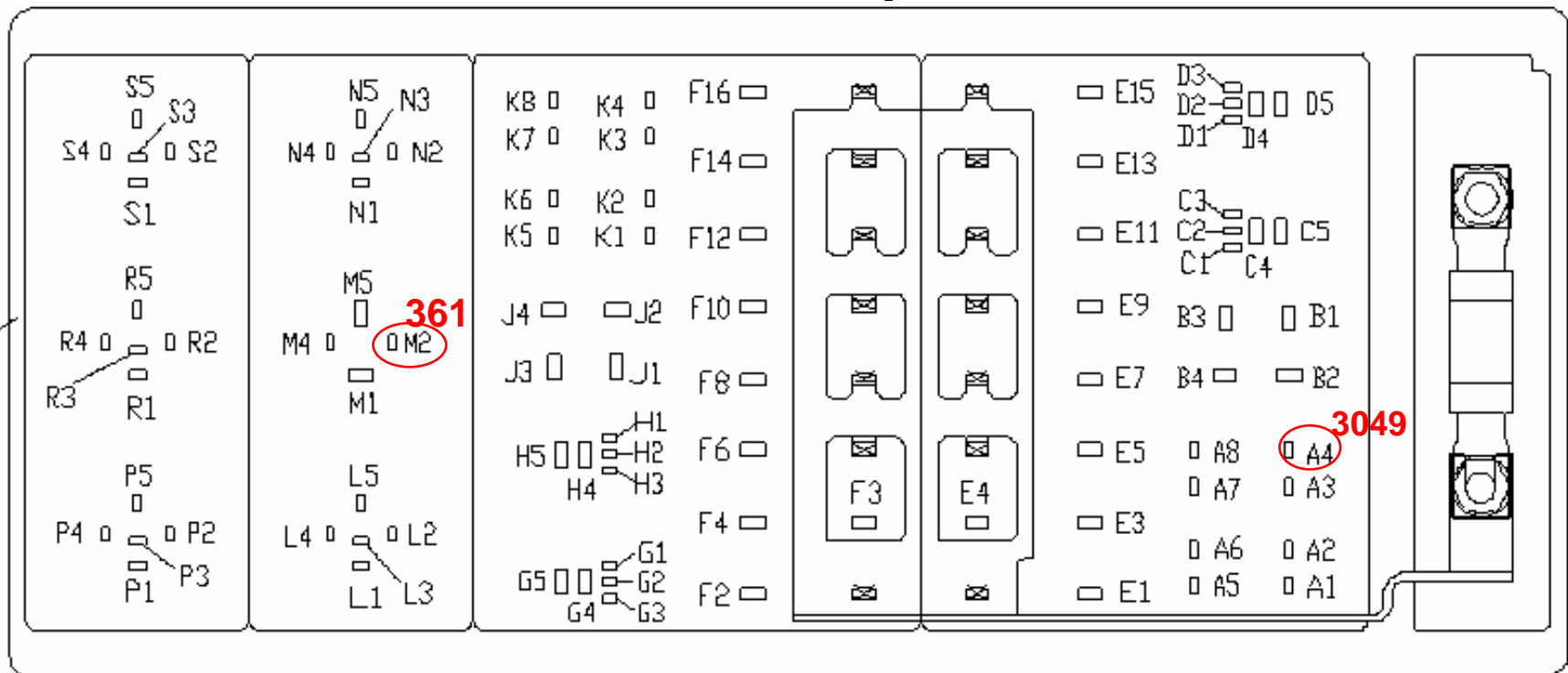
E-Series Wiring Modification Views

PDB bottom view:



E-Series Wiring Modification Views

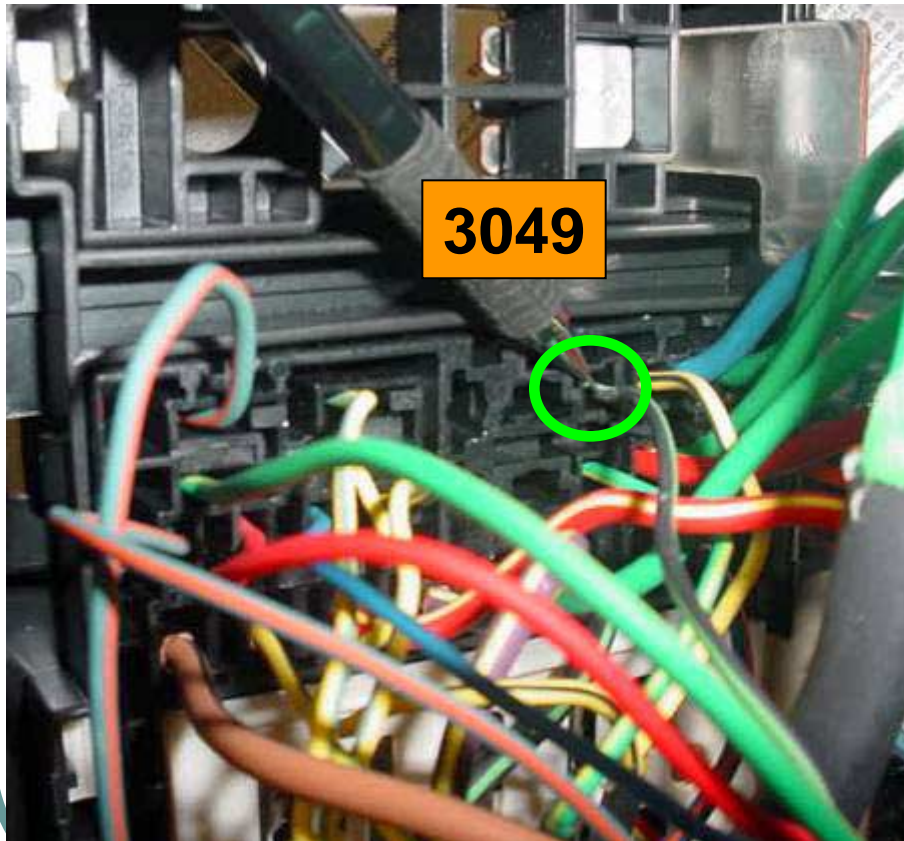
PDB wires to be spliced:



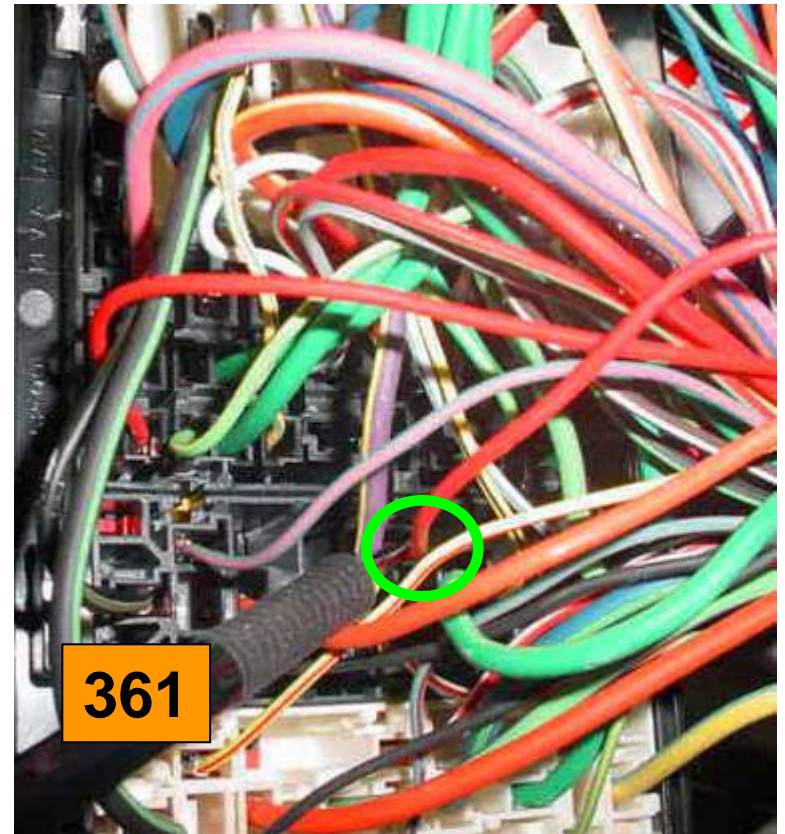
BOTTOM VIEW

E-Series Wiring Modification Views

3049:

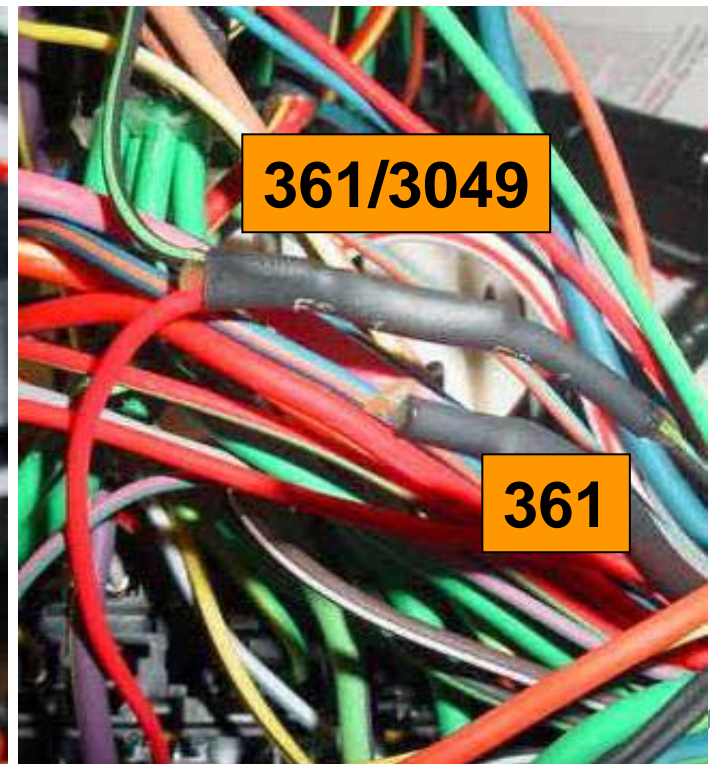
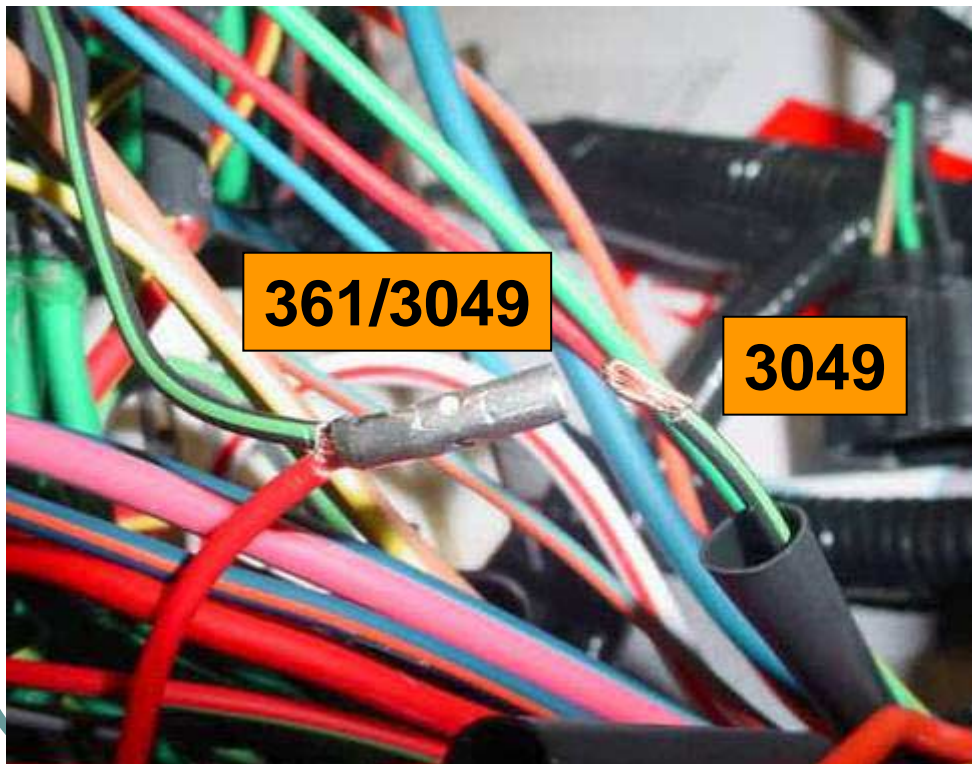


361:



E-Series Wiring Modification Views

Splice 361/3049 on PDB side to 3049 on harness side & cap off harness side of 361:

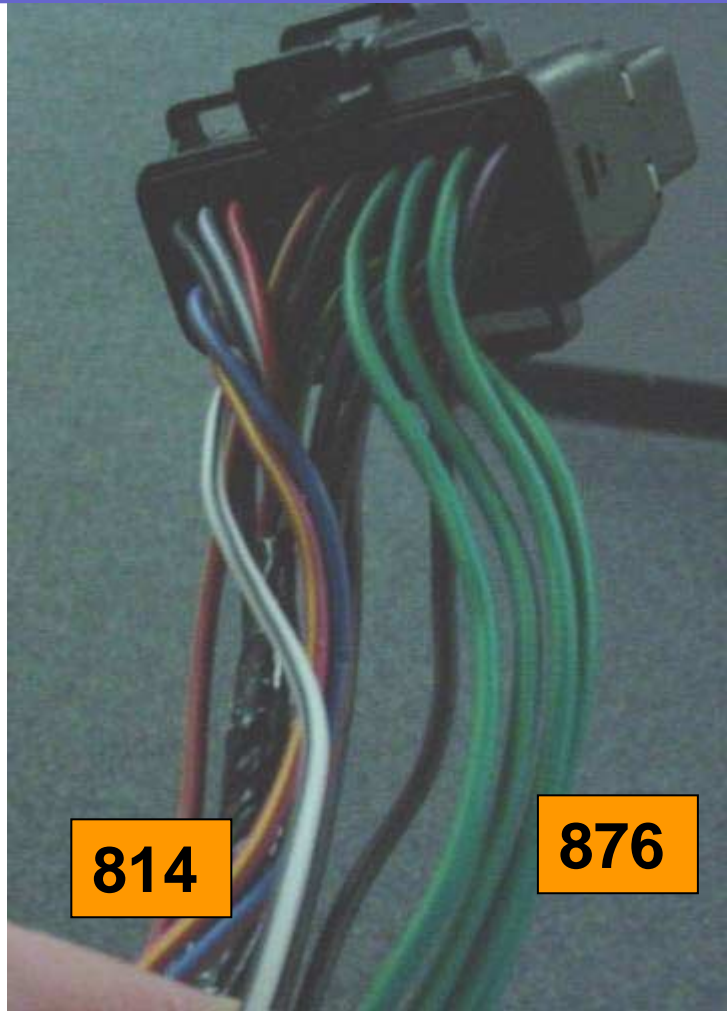


E-Series Wiring Modification Views

Access FICM & Strip 6" of X3 FICM takeout:



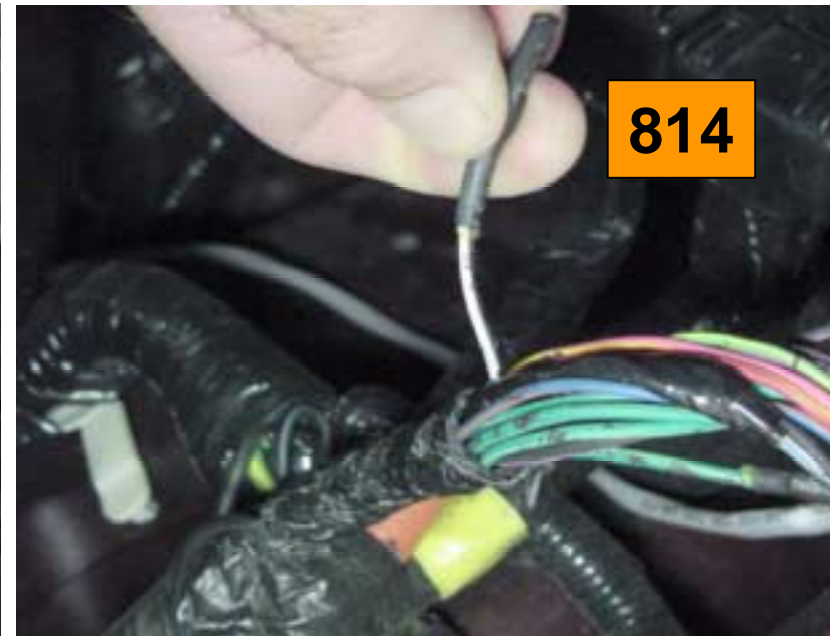
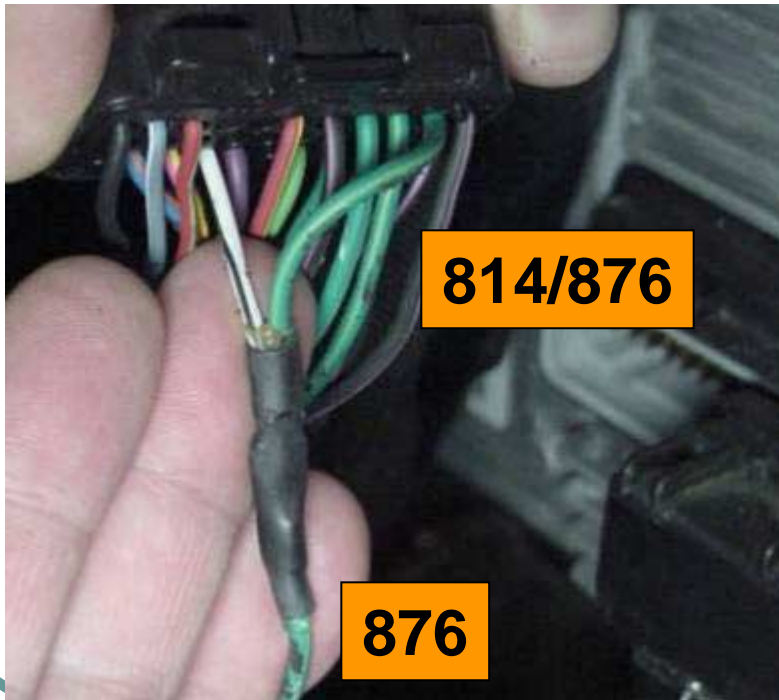
E-Series Wiring Modification Views



**Select 814
(WH/BK) and one
876 (GN/LG) wire
for splicing**

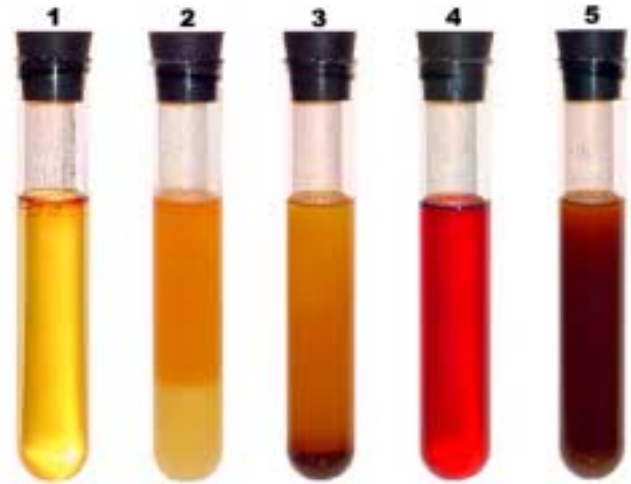
E-Series Wiring Modification Views

Splice 814/876 on connector side to 876 on harness side & cap off harness side of 814



Sources of Debris

- Poor Fuel Quality
 - 1: Good clean fuel
 - 2: Fuel contaminated with water
 - 3: Fuel contaminated with dirt
 - 4: Off-highway fuel
 - 5: Contaminated
- Additives
- Driving Conditions
 - Road salts
 - Dusty roads
- Delamination of Steel Fuel Tanks
 - Steel tanks are on F-Series Chassis Cabs and E-Series
 - **SSM 18945**



Answers to Broadcast Questions

Question: Is there a new requirement for maintenance records for fuel injector replacement?

Answer: There is no change in the documentation requirements for Diesel Fuel Injectors. However, Fuel filters (frame rail & on engine) and engine oil & filter changes are especially important to proper 6.0L fuel injector operation.

Answers to Broadcast Questions

Question: Are F650/750 & Low Cab Forward (LCF) vehicles affected by TSB 06-22-3, Reflash for Injector Spool Valve Sticking?

Answer: The F650/750 and LCF will have a separate TSB and calibration, which are under development. They are not part of this TSB but will have a recalibration that cycles the injectors after engine-shutdown.