

Foreign Service



**Dan
Marinucci**

A vehicle's repair history can provide worthwhile information that contributes to a successful diagnosis. But there are times when that history can be misleading.

This month's column carries two themes: First, don't frown upon or even discourage a repair job before investigating it. It may pleasantly surprise you by being easier than you ever imagined. Plus, the positive results may convert a first-timer into a trusting, regular customer—the kind you really want.

Second, vehicle history isn't always the help we hope it will be. I always have and always will urge MOTOR readers to gather as much vehicle history as possible. This is par-

ticularly important on vehicles with odd symptoms and/or those that already have been to other repair shops. But these are man-made machines we service. Things totally unrelated to a car's previous history can and do fail, sometimes without warning.

Such was the case when an unfamiliar Volkswagen owner asked my buddy to diagnose his 1997 Jetta equipped with a 1.9L turbocharged diesel engine. His bundle of work orders showed that he had spent a lot of money repairing a contaminated fuel system. Whether it's a diesel or gasoline system, we all agree that repair costs escalate if contamination isn't caught early enough. Anyway, this Jetta now had additional symptoms, and the owner claimed that other shops weren't exactly leaping at the opportunity to work on it.

The owner said the engine had become hard to start at temperatures colder than about 40°F. When it finally did start, the engine idled rough, misfired during acceleration and lacked power overall during the first 10 minutes of driving. Once it warmed up completely, it ran fine. The Check Engine light was on and we found two Volkswagen trouble codes stored. Code 00539 indicated a fuel temperature sensor or sensor circuit problem. Code 01050 pointed to the glow plug control circuit.

Recently my friend had strengthened his diagnostic arsenal by adding a Launch Tech scan tool (www.x431usa.com). He's doing more and more VW/Audi work and emphasized some things former dealership techs have told me. They like the Launch Tech scanner's Euro-vehicle capabilities and the fact that it displays data in nearly the same format as the factory scan tools do. Anyway, the data screen in the photo at left tells the story. The first line of data there shows the bogus fuel temp reading: -16.20°C, or 2.84°F. The next line, which is intake air temperature (IAT), shows 21.60°C, or

DATA STREAM			
GROUP:	7		
	-16.20 °C		
	21.60 °C		
	36.90 °C		
PAGE UP	PAGE DOWN	GRAPHIC-1	
HOME	BACK	PRINT	HELP
Start			

Printouts & photo: Dan Marinucci

This data screen shows three different temperature readings. From top to bottom they are fuel temperature, intake air temperature and coolant temperature. The indication that fuel temperature (-16.20°C, or 2.84°F) is supposedly so cold when air temperature is a balmy 21.60°C (70.88°F) suggests that a sensor is lying.

continued on page 12

Foreign Service



Here a diesel technician holds the infamous fuel temperature sensor directly above the positioner housing on the top of the injection pump. This sensor is available only through Bosch-authorized diesel service centers.

=====		=====	
X431 DIAG Report	LAUNCH	X431 DIAG Report	LAUNCH
-----		-----	
SMARTBOX: 980242800700		SMARTBOX: 980242800700	
DATE: 5/25/2005 9:19:43 PM		DATE: 5/25/2005 10:20:12 PM	
-----		-----	
DATA STREAM	VALUE/STATUS	DATA STREAM	VALUE/STATUS
GROUP:	7	GROUP:	7
	-8.10 °C		31.50 °C
	22.50 °C		27.90 °C
	31.50 °C		82.80 °C
=====		=====	

These diagnostic printouts from the Launch Tech scan tool show test readings before and after we replaced the diesel fuel temperature sensor. Note that after we replaced the sensor, the fuel temperature reading on the right (31.50°C) is nearly the same as the intake air temperature reading (27.90°C).

70.88°F. The thermometer on the shop wall showed 71°F and my trusty ol' digital pocket thermometer, which I often use to measure air conditioning air outlet temperatures, was showing 69°F. *Hmmm.* These readings are all a long, long way from 2.84°F, wouldn't you agree?

I monitored the fuel temperature voltage signal from a cold start until the engine reached operating temperature and it never changed. After

a quick wiring harness check, we were congratulating each other on an easy diagnosis of a bad fuel temp sensor. The smiles faded when we discovered that not only is this sensor inside the diesel injection pump, but the only way to get one is to buy an entire pump assembly from the dealer. That's 863 bucks—a \$600 core charge and probably 4.00 to 4.50 hours of R&R time!

When all else fails, call a specialist. The Jetta has a Bosch diesel in-

jection pump, so we located the nearest Bosch-authorized diesel service center, Perry Diesel Service (service@perrydiesel.com) in Canton, Ohio. The helpful techs there explained that this fuel temp sensor appears in various VW diesels from approximately 1995-2003. The sensor sits inside a removable piece on top of the injection pump called the positioner housing (see photo at left). A new sensor and positioner housing gasket totaled less than 25 bucks. Their techs added that any authorized Bosch diesel specialist can get these parts for you, but they'll probably have to order them. Our order took two days.

There was just one more obstacle to this sensor job, however. Bosch secures this positioner housing with a tamper-resistant bolt that has an odd, triangular-shaped head on it. You can't buy the special socket for this tamper-resistant bolt unless you're an authorized service center. So we farmed the task out to Perry Diesel, incurring a \$65 labor charge. Even after my pal tacked a reasonable profit on to the fuel temp sensor parts and labor bill, he still saved a grateful customer a pile of money—and in the process established his shop as an effective alternative to the car dealership.

If you don't have an authorized Bosch diesel specialist near you, you'd have to shuttle the car to one or else ship the injection pump to one. Pump R&R time is probably within the range of 4.00-4.50 hours. What's more, you need a scan tool that's capable of electronically resetting diesel pump timing on these Volkswagen diesels. (We would have had that base covered because the Launch Tech scanner does perform this reset procedure.)

Glow Plug Precaution

The main glow plug fuse, which is located on the firewall, had blown. Also, it was obvious that the fuse holder or fuse housing had gotten hot. *Aha!* The wiring harness connector was not fully seated and

properly clipped onto the fuse housing. Our best guess was that someone who worked on this before us disturbed this connection. Anyway, we carefully cleaned the connections there, seated the harness connector onto the fuse assembly correctly and tested the glow plug system. My friend predicted that there wouldn't be any more fuse problems, and he was right.

Because this Jetta had a history of hard starting, we went beyond the routine glow plug checks that VW recommends. The guys at Perry Diesel said years of on-car testing on hard-starting VW diesels taught them a valuable clue: When you power up a good, reliable glow plug, the entire tip of the plug should glow immediately *and* evenly. They claim that when the glow

**When all else
fails, call a
specialist. We
did for this
Jetta.**

plugs are beginning to fail, the tip of the plug heats up slowly and unevenly. For instance, you'll see the failing glow plug begin glowing about ¼ in. down from its tip. Then the heat travels slowly toward the tip of the plug.

Indeed, the glow plugs in this Jetta were heating up slowly and unevenly, so we replaced 'em. If you don't have much diesel experience, replacing the glow plug relay at the same time is cheap insurance against a comeback.

Okay, we earned our keep. This Jetta has been running like a charm since then and my friend earned himself a loyal new customer. Apparently, this fellow was just unlucky enough to have these things fail after the series of repairs that were required to clean up his car's contaminated fuel system. **M**