

<p>General Service Bulletin (GSB):</p>	<p>Adaptive Fuel Viewer Service Tips</p>
<p>This GSB targets the use of the IDS adaptive fuel viewer.</p>	<p>A Guide to Diagnosing Rich/Lean DTCs and Associated Drivability Concerns with the IDS Fuel Viewer</p>
<p>NOTE: This information is not intended to replace or supersede any warranty, parts and service policy, Work Shop Manual (WSM) procedures or technical training or wiring diagram information.</p>	

Adaptive Fuel Viewer Service Tips



A Guide to Diagnosing Rich/Lean DTCs and Associated Drivability Concerns with the IDS Fuel Viewer

For 2013 and newer vehicles only

Adaptive Fuel Viewer Service Tips – 2013 and Newer Vehicles

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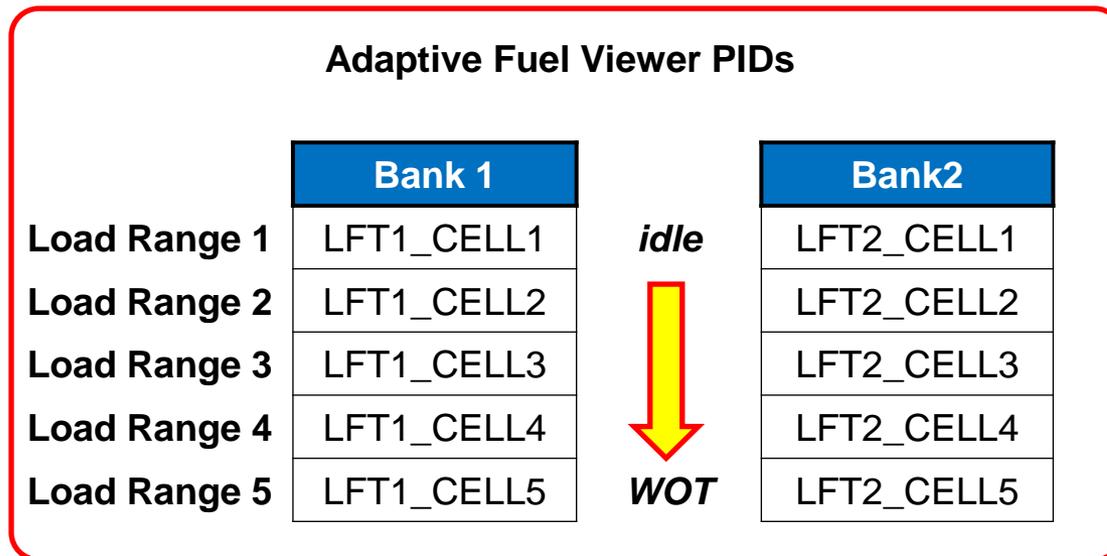
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NOTE: This GSB is not intended to replace current diagnostics listed in the Powertrain Control/Emissions Diagnosis (PC/ED) Manual and/or Workshop Manual (WSM), but to be an educational aid in understanding the interaction of how adaptive fuel correction tables relate to lean or rich fuel system diagnostic trouble codes. Refer to PC/ED, Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques, for further information.

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Adaptive Fuel Viewer Overview

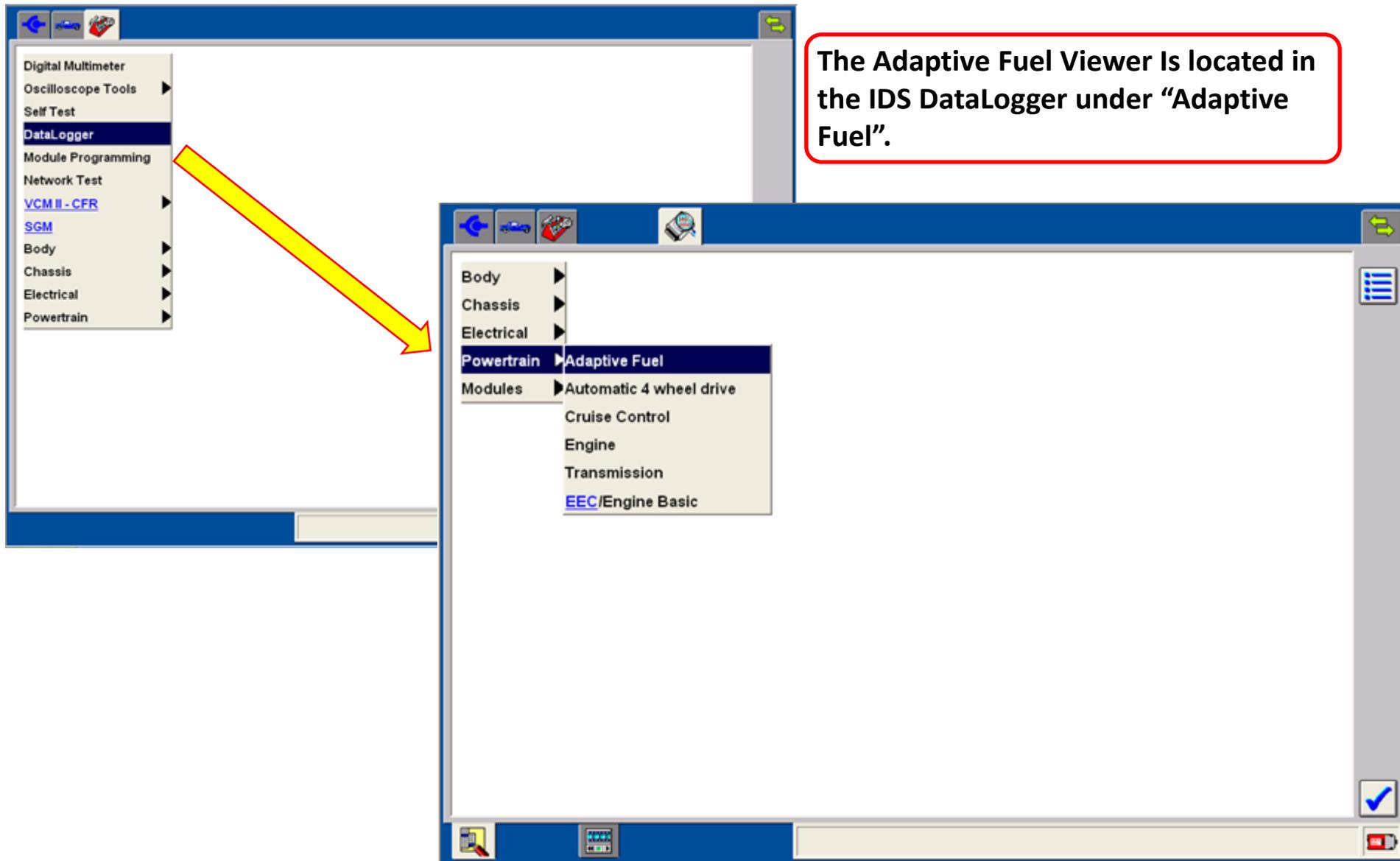
- ❑ The Adaptive Fuel Viewer is a set of PIDs in the IDS datalogger that provides the ability to monitor the fuel trim data without the need to drive the vehicle. The PIDs are a collection of the fuel trim data stored in the Keep Alive Memory (KAM) and then divided out into equal load ranges. While the Long Term Fuel Trim (LTFT) PIDs display the fuel trims currently being used at that particular load range, the Adaptive Fuel Viewer PIDs will show the history of the fuel trims used over all load ranges, therefore reducing the amount of time needed to diagnose lean or rich conditions.
- ❑ A representation of the Fuel Viewer PIDs can be seen below. The **Long Fuel Trim (LFT)** in the Adaptive Fuel Viewer refer to the banks of the engine as LFT1 (bank 1) and LFT2 (bank 2 for V-engines). The CELL values (shown 1-5) are not referring to cylinders but to load ranges. The higher the CELL number, the higher the load range. CELL1 always denotes load at idle and the highest available cell represents the max load. The total number of CELLS varies based on vehicle line and model year.



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Adaptive Fuel Viewer Location in IDS

The Adaptive Fuel Viewer Is located in the IDS DataLogger under “Adaptive Fuel”.



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IDS Datalogger Adaptive Fuel Viewer default PID selection screen

AAT (TEMP)	APP (PER)	BARO (PRESS)	CHT (TEMP)	DTCCHT (NUM)	EORAT11_DSD (RATIO)	EORAT_DSD21 (RATIO)	EQ_RAT11 (RATIO)
EQ_RAT21 (RATIO)	ETC_TRIM (ANGL)	ETC_TRIM_LRH (MODE)	EVAPCP # (PER)	FF_INF (PER)	FF_LRHID (MODE)	FLI (PER)	FP (PER)
FTP_H20 (IRUM)	IACKAM# (IRUM)	IACKAM1 (IRUM)	IACKAM2 (IRUM)	IACKAM3 (IRUM)	IACTRIM (IRUM)	IAC_MODE (MODE)	LFT1_C1_USED (MODE)
LFT1_C2_USED (MODE)	LFT1_C3_USED (MODE)	LFT1_C4_USED (MODE)	LFT1_C5_USED (MODE)	LFT1_C6_USED (MODE)	LFT1_C7_USED (MODE)	LFT1_CELL1 (PER)	LFT1_CELL2 (PER)
LFT1_CELL3 (PER)	LFT1_CELL4 (PER)	LFT1_CELL5 (PER)	LFT2_C1_USED (MODE)	LFT2_C2_USED (MODE)	LFT2_C3_USED (MODE)	LFT2_C4_USED (MODE)	LFT2_C5_USED (MODE)
LFT2_CELL1 (PER)	LFT2_CELL2 (PER)	LFT2_CELL3 (PER)	LFT2_CELL4 (PER)	LFT2_CELL5 (PER)	LOAD (PER)	LONGFT1 (PER)	LONGFT2 (PER)
MAF (FLOW)	MAF_HZ (FREQ)	RPM # (RPM)	RPMSD (RPM)	RUNTM (TIME)	SHRTFT1 (PER)	SHRTFT2 (PER)	TR (MODE)
VPWR (VOLT)	VSS (SPD)						

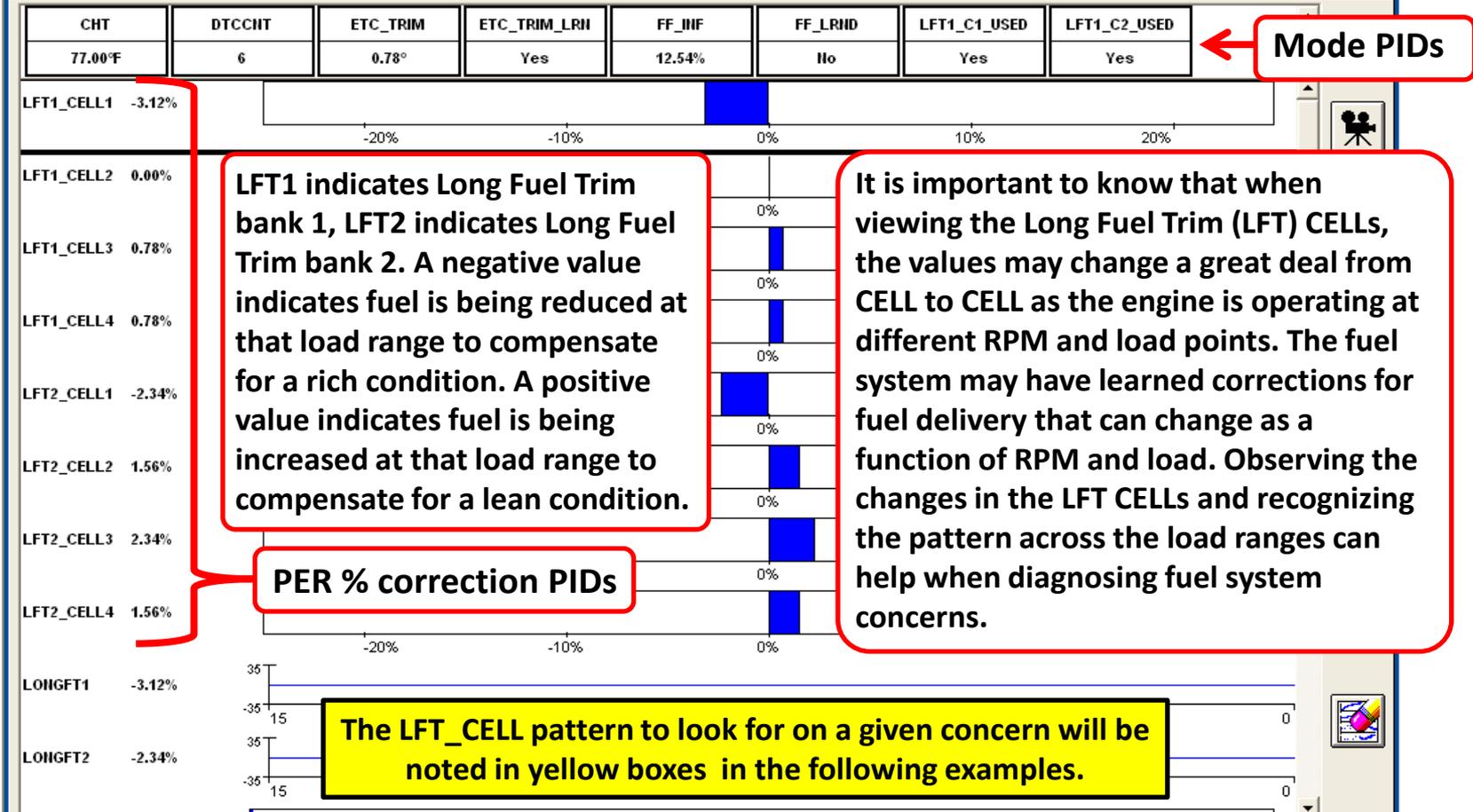
- A CELL is a load (Air Mass) range in which the LFT is adjusted
- Each load range has a CELL (PER) PID and a (MODE) PID
- The MODE PID simply displays a Y or N based on if it is used
- The PER PID will display as a bar with default ranges of +/-25%
- **The number of cells does not refer to the number of cylinders**

Ambient Air Temperature

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IDS Datalogger Adaptive Fuel Viewer screen, default PIDs selected

Adaptive Fuel Viewer (V-engine example)

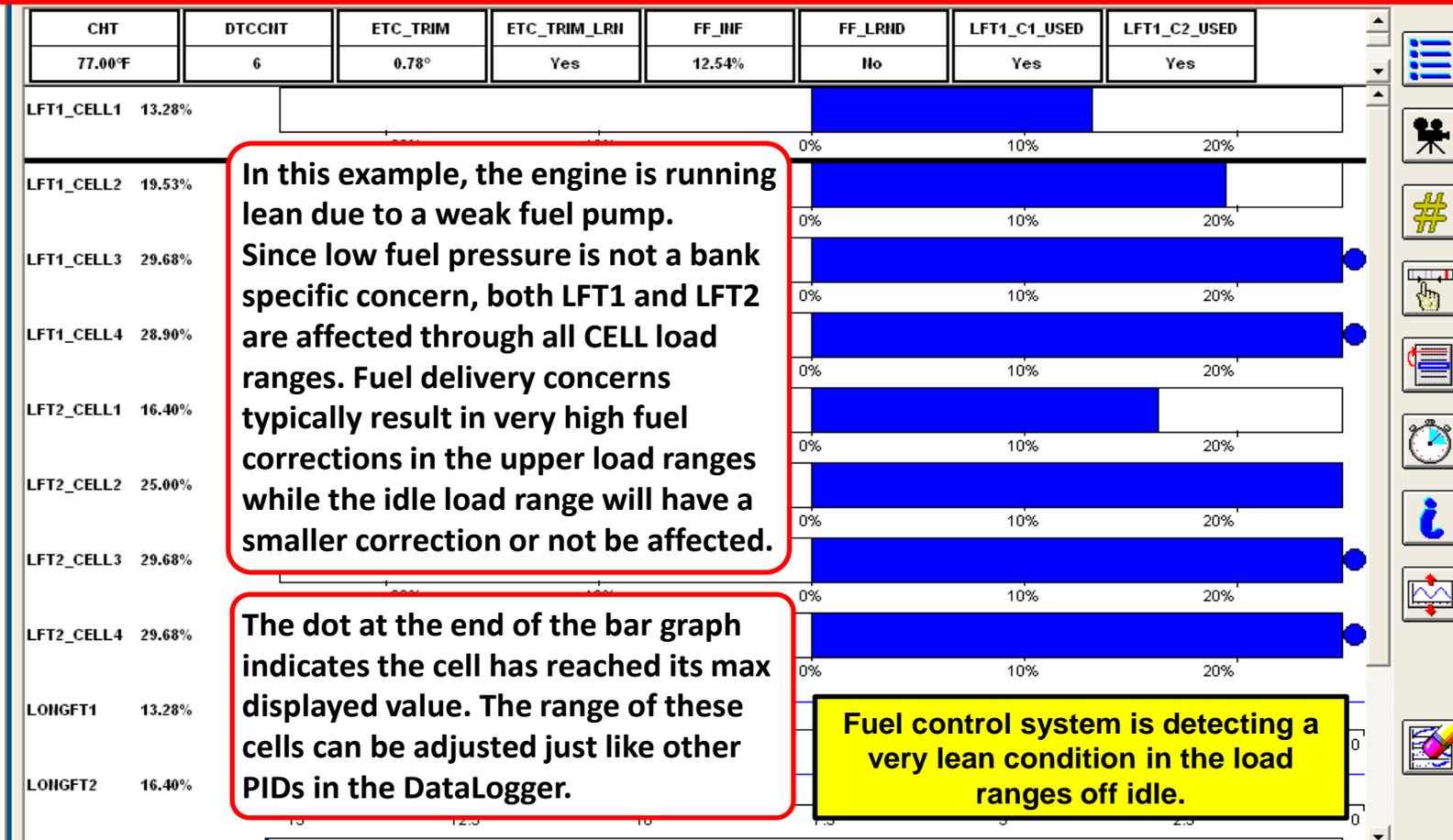


NOTE: This is just an example; the CELL % values will vary based on vehicle, engine type, and if the air management system uses a MAF or MAP sensor.

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IDS Datalogger Adaptive Fuel Viewer screen, default PIDs selected

Example of a fuel delivery concern (V-engine)

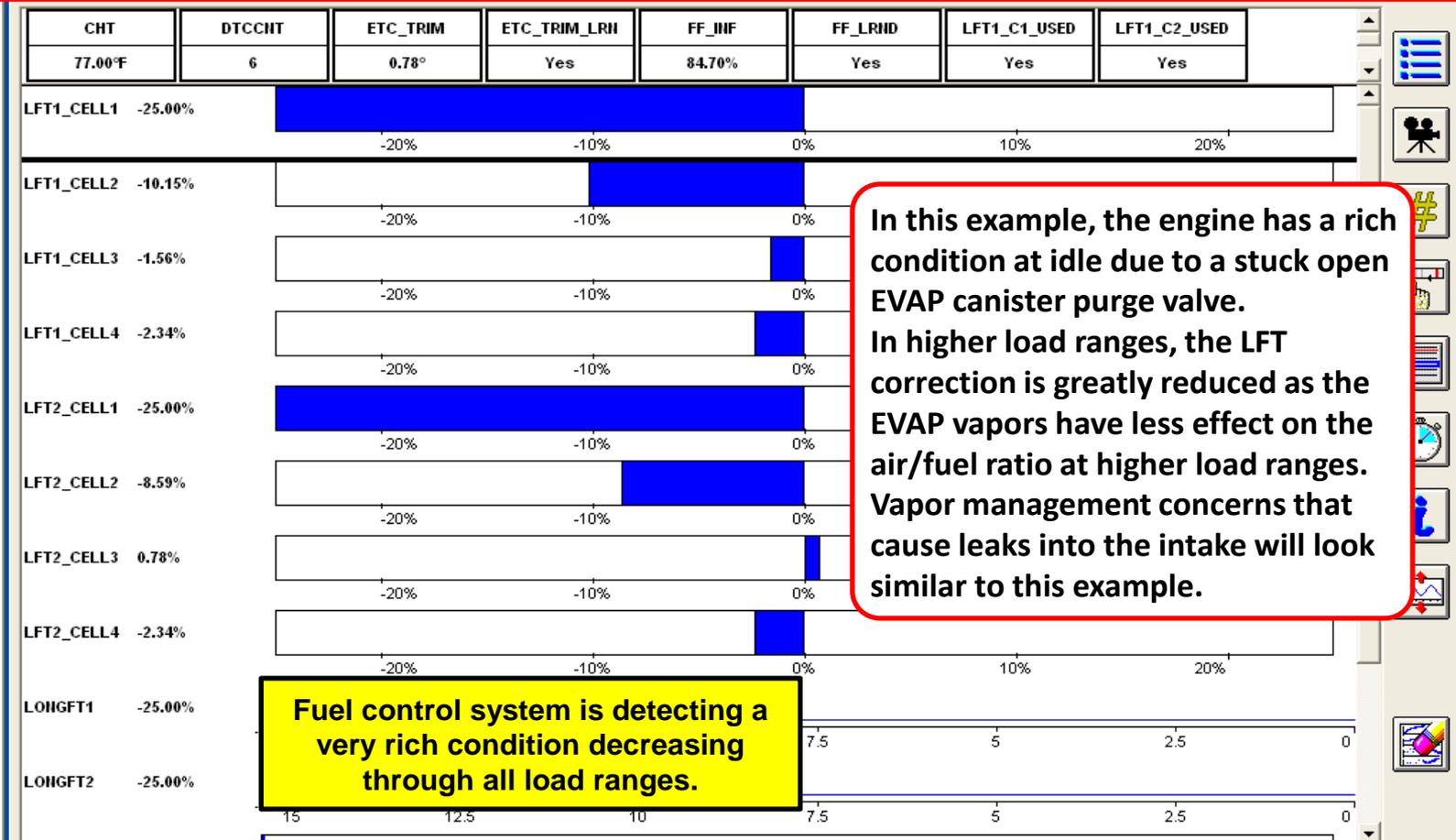


NOTE: This is just an example; the CELL % values will vary based on vehicle, engine type, and if the air management system uses a MAF or MAP sensor.

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IDS Datalogger Adaptive Fuel Viewer screen, default PIDs selected

Example of a stuck open EVAP canister purge valve

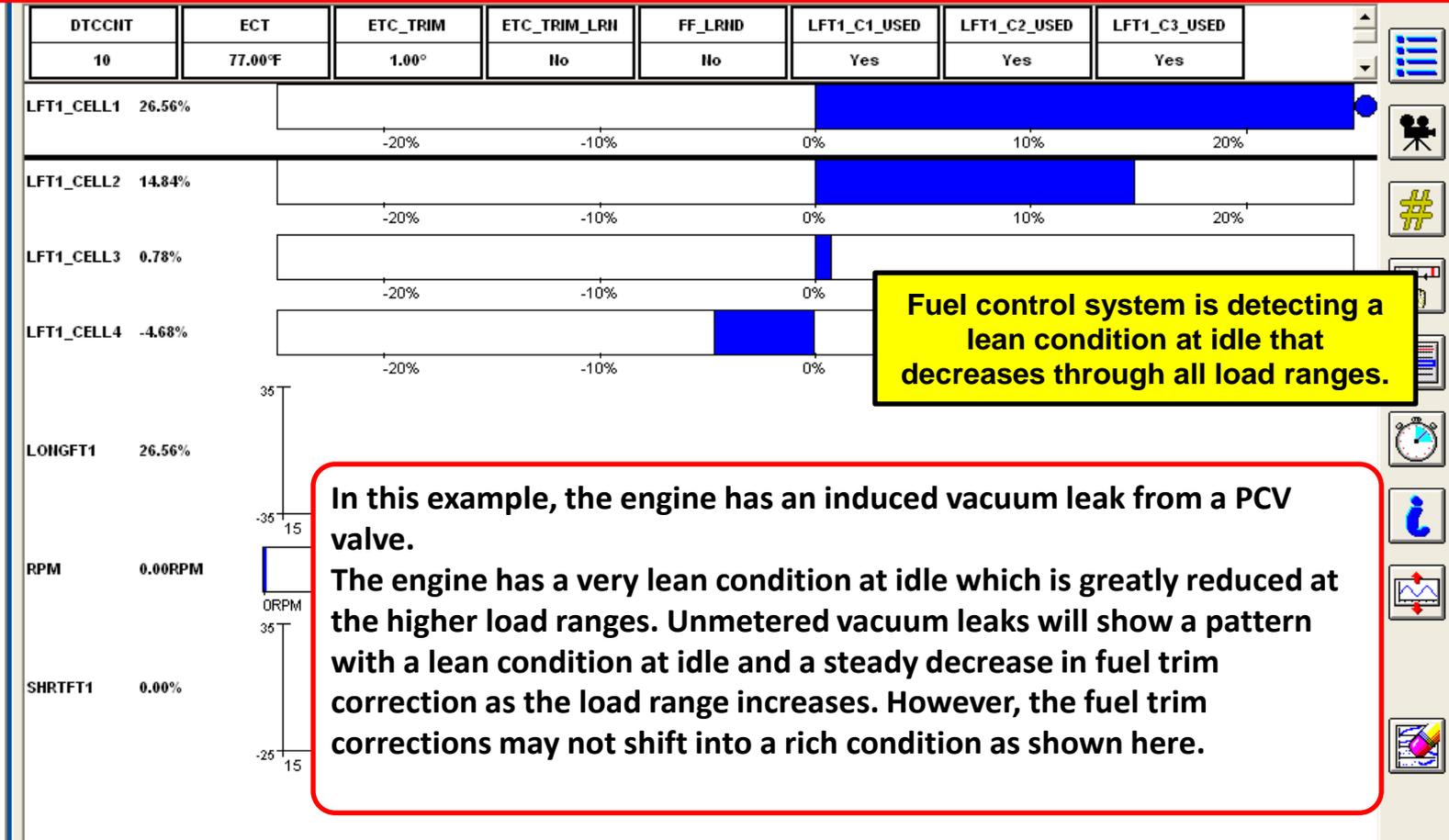


NOTE: This is just an example; the CELL % values will vary based on vehicle, engine type, and if the air management system uses a MAF or MAP sensor.

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IDS Datalogger Adaptive Fuel Viewer screen, default PIDs selected

Example of a vacuum leak on an I-4 engine

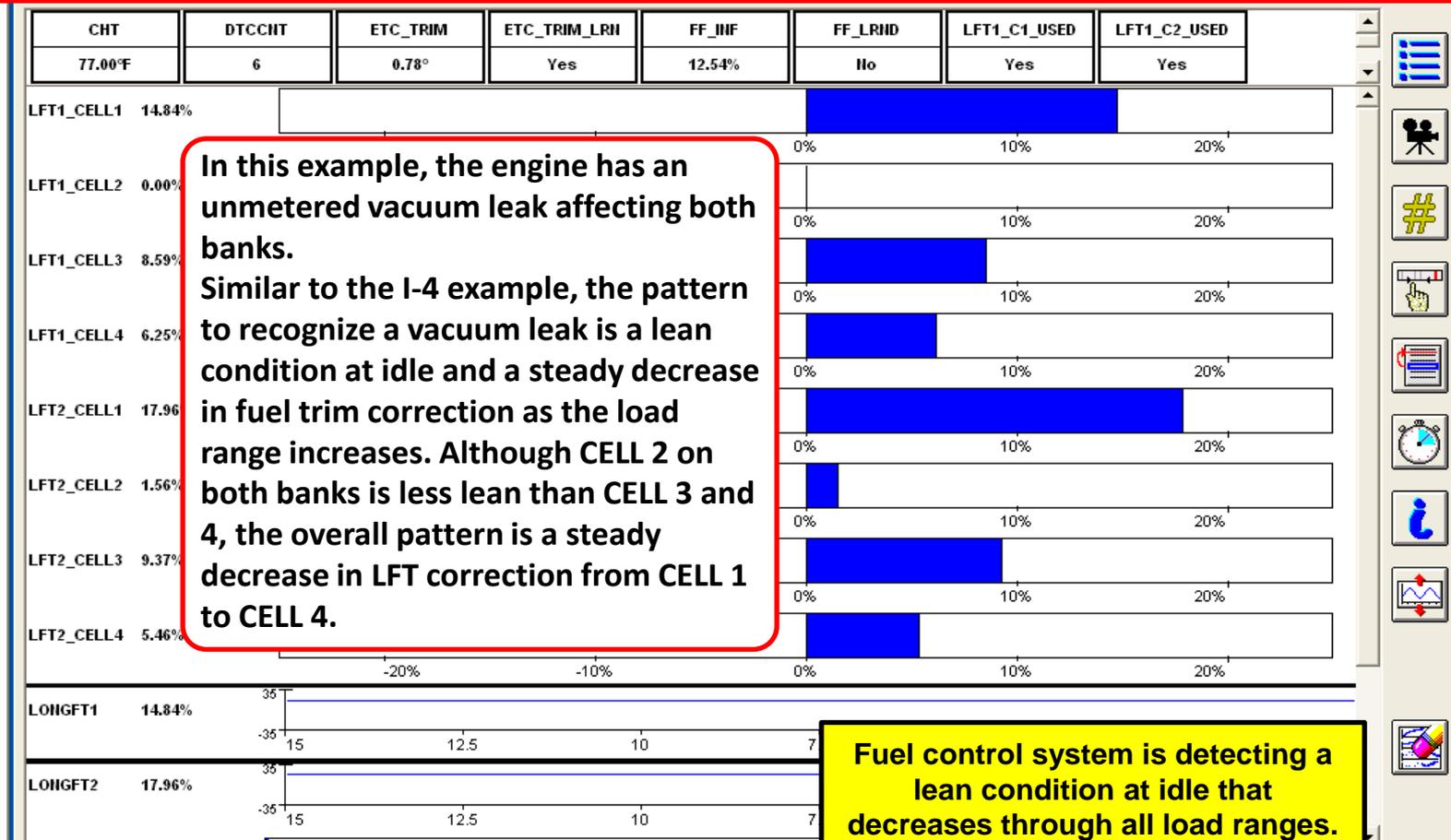


NOTE: This is just an example; the CELL % values will vary based on vehicle, engine type, and if the air management system uses a MAF or MAP sensor.

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IDS Datalogger Adaptive Fuel Viewer screen, default PIDs selected

Example of a vacuum leak on a V-engine

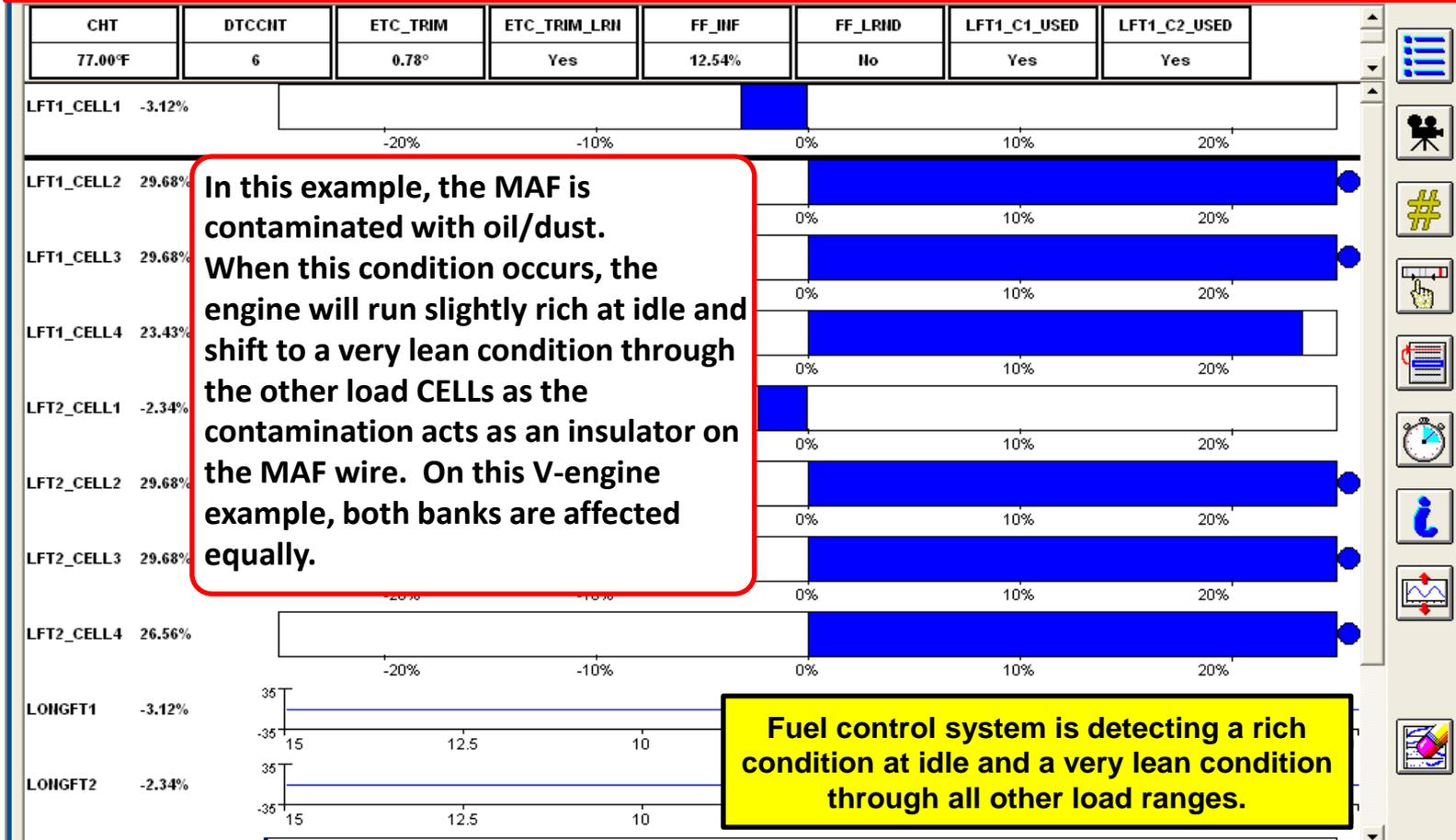


NOTE: This is just an example; the CELL % values will vary based on vehicle, engine type, and if the air management system uses a MAF or MAP sensor.

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IDS Datalogger Adaptive Fuel Viewer screen, default PIDs selected

Example of a MAF sensor contaminated with oil/dust, V-engine

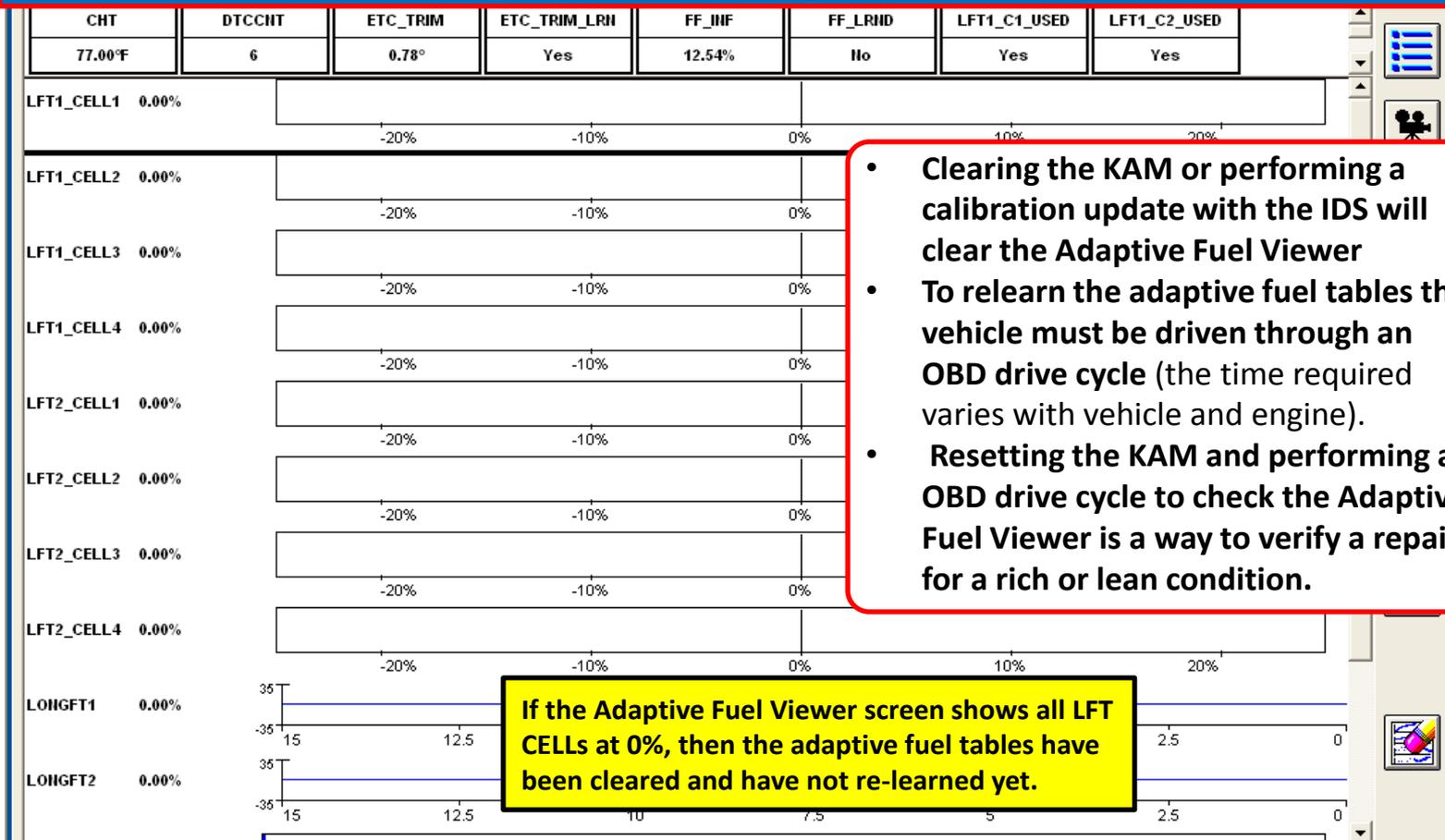


NOTE: This is just an example; the CELL % values will vary based on vehicle, engine type, and if the air management system uses a MAF or MAP sensor.

Adaptive Fuel Viewer Service Tips – 2013 and Newer Vehicles

IDS Datalogger Adaptive Fuel Viewer screen, default PIDs selected

Example of the Adaptive Fuel Viewer after a KAM reset or Calibration update



NOTE: This is what the Adaptive Fuel Viewer screen will look like if the Keep Alive Memory (KAM) has been reset or if a calibration update was performed.

Important Note on Adaptive Fuel on Flex Fuel Vehicles

The Adaptive fuel control and Flex Fuel calculation are an integral part of the overall fuel delivery based on O2 sensor feedback. The Flex Fuel calculation has a priority of learning first when a relatively large re-fuel event is detected (or KAM reset). This means that the adaptive fuel will be disabled until the Flex Fuel percentage is “learned” after a major refueling event. Only after the Flex Fuel percentage is “learned” will the adaptive fuel start learning. In cases where a rich/lean system fault is intermittent, it may be difficult to determine the root cause based only on the adaptive viewer. If there is any doubt of the FF_INF value, a fuel sample should be taken and tested (Refer to PC/ED Manual, PP test HC, or Flex Fuel GSB).

Example: A large vacuum leak in a Flex Fuel vehicle may cause an error in flex fuel calculation and/or adaptive fuel depending on re-fueling habits.

Refer to the Flex Fuel GSB and PC/ED Manual for testing fuel for ethanol percentage and more information on flex fuel calculation.