On-Board Diagnostics (OBD) Inspection and Maintenance (I/M) Program Implementation for Flexible Fuel Vehicles (FFVs)

EPA United States Environmental Protection Agency

On-Board Diagnostics (OBD) Inspection and Maintenance (I/M) Program Implementation for Flexible Fuel Vehicles (FFVs)

Compliance and Innovative Strategies Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

EPA United States Environmental Protection Agency

EPA-420-B-07-022
May 2007

On-Board Diagnostics (OBD) Inspection and Maintenance (I/M) Program Implementation For Flexible Fuel Vehicles (FFVs)

May 29, 2007

Developed by:

United States Environmental Protection Agency (U.S. EPA)

Arvon L. Mitcham
Program Manager/Engineer
Certification and Innovative Strategies Division
Office of Transportation and Air Quality
United States Environmental Protection Agency

Automobile Manufacturers

Frank Krich
Daimler Chrysler Corporation

Andre Welch
Ford Motor Company

Chris Brown
General Motors Corporation

Jeffery A. Marsee
Isuzu Motors America

David Robertson
Mazda North American Operations

Eric Schneider
Daimler Chrysler A.G.

Farrukh Khan
Nissan Motor Company

BACKGROUND

The purpose of this document is to provide additional information on the inspection process of alternative fueled vehicles equipped with On-Board Diagnostic (OBD) systems. Specifically, this document provides additional technical information and impacts on the OBD system monitoring capability when flexible fuel vehicles (FFVs) are operated using alternative fuel. Also, it will assist Inspection and Maintenance (I/M) Programs in implementing OBD system checks and educating owners of FFVs.

Alternative fuel vehicles are vehicles that are designed to operate on fuels such as compressed natural gas (CNG), liquid petroleum gas (LPG), ethanol-based and methanol-based fuels in lieu of or in conjunction with traditional petroleum-based fuels (e.g. gasoline or diesel fuel) and can be divided into three categories. Dedicated alternate fuel vehicles operate solely on an alternative fuel. Bi-fuel vehicles can operate on two different fuel types (e.g., a petroleum-based fuel and an alternative fuel) but store the fuels in separate tanks allowing manual switching between fuels. FFVs can also operate on two different fuel types but allow the fuels to mix or blend in a single fuel tank.

For FFVs, the engine system typically monitors the fuel content in the fuel tank to determine the level of alternative fuel versus petroleum-based fuel, and adjust the vehicle/engine calibrations accordingly. Currently, ethanol has been the alternate fuel of choice for FFVs with fuel contents ranging from E0 (0% ethanol, 100% unleaded gasoline) up to E85 (85% ethanol, 10% unleaded gasoline) but this is subject to change due to continued alternative energy research.

On-Board Diagnostics (OBD) systems have been implemented on light-duty vehicles and trucks equipped with Otto-cycle, diesel-cycle and alternative fuel engines since the 1996 model year. The OBD system monitors many emission control and emission-related powertrain components and the vehicle must be operated under specific conditions to enable this monitoring. As a result, state programs that typically required inspection of tailpipe emissions are now relying and implementing diagnostic checks of OBD systems in lieu of tailpipe emissions inspections.

For alternative fuel vehicles, there were earlier concerns during OBD implementation regarding OBD system monitoring capability during alternative fuel operation. These concerns necessitated additional OBD monitoring flexibilities during alternative fuel operation to eliminate the potential of false illumination of malfunction indicator lamp (MIL, “check engine” or “service engine soon” light). Therefore, Federal OBD regulations in 40 CFR 86.1806-05 allowed manufacturers of alternate fuel vehicles to request waivers from OBD monitoring during alternate fuel operation until the 2004 model year (MY). In particular, FFVs are of greater concern since there is no clear indication of a switch from a petroleum-based fuel to an alternative fuel. As a result, the OBD system for FFVs may operate differently from other vehicles including revised OBD system capability and engine calibration when the level of alternative fuel, specifically ethanol, is increased. This is further complicated if the vehicle is operated for an extended period of time or solely on ethanol prior to a state inspection of the OBD system.

This document attempts to outline the universe of certified FFVs, clarify the OBD system capabilities of these vehicles when operated on alternative fuel, and provide recommended procedures to enable proper OBD I/M inspection of FFVs that may have a reduced level of OBD system capability during alternative fuel operation.

The U.S. EPA has coordinated with the automotive industry to develop this list document. The document is separated by manufacturer and by ascending model year starting with MY1996, the first year that full OBD compliance was required, and ending with MY2007 (in some cases MY2008 information was provided and is included, where available). However, it should be noted that all MY2005 and beyond light-duty alternative fuel vehicles are required to have full OBD monitoring capabilities during gasoline and alternative fuel operation since the OBD monitoring flexibilities during alternate fuel operation have been removed. Therefore, MY2005 and beyond FFVs should be fully functional with any fuel type or blend.

If you discover that the information in this document is incorrect or there is information missing, please contact the author, Arvon L. Mitcham, at the information provided on the last page of this document.

Manufacturer Section

Section A: Chrysler Corporation 3
Section B: Ford Motor Company 5
Section C: General Motors Corporation 10
Section D: Isuzu Motor Corporation 15
Section E: Mazda North American Operations 16
Section F: Mercedes-Benz 17
Section G: Nissan Motor Company 18

Section A: Chrysler Corporation				
Model Year	**Model**	**Displacement & Engine Type / Ethanol Content**	**Engine Family / Test Group (VIN ID)**	**Comments**
1996–1997	**No FFVs produced during these model years.**			
1998	*Chrysler Caravan and Town and Country / Dodge Caravan / Plymouth Voyager*	3.3L V-6 / (E85)	WCRXT03.32BP (VIN 8th digit: G)	All monitors disabled for operation >E30 and ethanol fuel content learning. Desensitized system monitors: - fuel system rail check only for >E30; - fuel system rich for >E50; - fuel system lean and misfire for E0-E10 and coolant temp >230 deg. F; - purge flow check. Re-enablement procedure: five (5) fuel add events[1] of gasoline followed by two engine cold starts[2] .
1999	*Chrysler Town and Country / Dodge Caravan / Plymouth Voyager*		XCRXT03.32BP (VIN 8th digit: G)	
2000	*Chrysler Caravan, Voyager, and Town and Country / Dodge Caravan / Plymouth Voyager*		YCRXT03.32BP (VIN 8th digit: G)	
2001	*Chrysler Caravan, Voyager and Town and Country / Dodge Caravan*		1CRXT03.32DP 1CRXT03.32DT (VIN 8th digit: 3)	No monitors disabled for alternate fuel operation. Desensitized system monitors: - evaporative leak check for >E30; - fuel System Rich for >E50; - purge flow check. Re-enablement procedure: five (5) fuel add events[1] of gasoline followed by two engine cold starts[2].
2002	*Chrysler Caravan, Voyager and Town and Country / Dodge Caravan*		2CRXT03.32DP (VIN 8th digit: 3)	
2003	*Dodge Stratus / Chrysler Sebring* Convertible/Sedan	2.7L V-6 / (E10 and E85)	3CRXV02.7VDP (VIN 8th digit: T)	
	Chrysler Caravan, Voyager and Town and Country / Dodge Caravan	3.3L V-6 / (E85)	3CRXT03.32DP 3CRXT03.32DR (VIN 8th digit: 3)	

[1] A fuel add event is defined by an increase in fuel tank level of at least five (5) gallons.
[2] Engine cold start occurs with engine coolant temperature between 40 & 95°F and within 12°F of ambient temperature.

Section A: Chrysler Corporation (cont.)

Model Year	Model	Displacement & Engine Type / Ethanol Content	Engine Family / Test Group (VIN ID)	Comments
2004	*Dodge Stratus / Chrysler Sebring* Convertible/Sedan	2.7L V-6 / (E10 and E85)	4CRXV02.7VHP (VIN 8th digit: T)	OBD II monitors fully functional and compliant on all FFV fuel blends.
	Dodge Ram 1500 Pick-Up 2-wheel and 4-wheel drive	4.7L V-8 / (E85)	4CRXT04.75TP (VIN 8th digit: P)	
2005	*Dodge Stratus / Chrysler Sebring* Sedan	2.7L V-6 / (E85)	5CRXV02.7VHP (VIN 8th digit: T)	
	Chrysler Town and Country / Dodge Caravan	3.3L V-6 / (E85)	5CRXT03.32NP (VIN 8th digit: E)	
	Dodge Ram 1500 Pick-Up 2-wheel and 4-wheel drive	4.7L V-8 / (E85)	5CRXT04.75SP (VIN 8th digit: P)	
2006	*Dodge Stratus / Chrysler Sebring* Sedan	2.7L V-6 / (E85)	6CRXV02.7VHP (VIN 8th digit: T)	
	Dodge Caravan	3.3L V-6 / (E85)	6CRXT03.32NP (VIN 8th digit: E)	
	Dodge Durango / Ram 1500 Pick-Up 2-wheel and 4-wheel drive	4.7L V-8 / (E85)	6CRXT04.75SP (VIN 8th digit: P)	
2007	*Chrysler Sebring* Sedan	2.7L V-6 / (E85)	7CRXV02.7MHP (VIN 8th digit: n/a)	
	Dodge Caravan	3.3L V-6 / (E85)	7CRXT03.3NHP (VIN 8th digit: E)	
	Jeep Commander and Grand Cherokee 2-wheel and 4-wheel drive	4.7L V-8 / (E85)	7CRXT04.7PSP (VIN 8th digit: P)	
	Dodge Dakota / Mitsubishi Raider Pick-Up 2-wheel and 4-wheel drive		7CRXT04.7PJP (VIN 8th digit: P)	

*Note: DaimlerChrysler Corporation may not designate FFV in the VIN ID for future model years.

Section B: Ford Motor Company

Model Year	Model	Displacement & Engine Type / Ethanol Content	Engine Family / Test Group (Sales Area) (VIN ID)	Comments
1996	*Ford Taurus* Sedan	3.0L V-6 (E85)	TFM3.0V8NFGK (Federal) (VIN 8th digit: 2)	System monitors disabled on both gasoline and flex fuel operation: catalyst, misfire, evaporative leak/purge check, oxygen sensor, fuel system. I/M readiness bits for disabled monitors will always be set to "ready."
		3.0L V-6 (Methanol M85)	TFM3.0V8FFEK (Federal) TFM3.0V8F2EK (CA.) (VIN 8th digit: 1)	
1997	*Ford Taurus* Sedan	3.0L V-6 (E85)	VFM3.0V8NKGK (50-state: Federal and CA.) (VIN 8th digit: 2)	
		3.0L V-6 (Methanol M85)	VFM3.0V8FKEK (Federal) VFM3.0V8F2EK (CA.) (VIN 8th digit: 1)	
1998	*Ford Taurus* Sedan	3.0L V-6 (E85)	WFMXV03.0AEA (50-state) (VIN 8th digit: 2)	
		3.0L V-6 (Methanol M85)	WFMXV03.0BMA (50-state) WFMXV03.0AMA (CA.) (VIN 8th digit: 1)	

Section B: Ford Motor Company (cont.)

Model Year	Model	Displacement & Engine Type / Ethanol Content	Engine Family / Test Group (VIN ID)	Comments
1999	*Ford Taurus* Sedan	3.0L V-6 (E85)	XFMXV03.0VDC (50-state) (VIN 8th digit: 2)	System monitors disabled on both gasoline and flex fuel operation: catalyst, misfire, evaporative leak/purge check, oxygen sensor, fuel system. I/M readiness bits for disabled monitors will always be set to "ready."
	Ford Ranger 2-wheel drive		XFMXT03.01BA (Federal) XFMXT03.01DC (CA.) (VIN 8th digit: V)	
	Ford Ranger 4-wheel drive		XFMXT03.02BB (Federal) XFMXT03.02DC (CA.) (VIN 8th digit: V)	
2000	*Ford Taurus* Sedan/Wagon		YFMXV03.0VF9 (50-state) (VIN 8th digit: 2)	
	Ford Ranger 2-wheel drive		YFMXT03.01D5 (50-state) YFMXT03.01BA (Federal) (VIN 8th digit: V)	System monitors disabled for operation >E10 blends: catalyst, misfire, evaporative leak/purge check. I/M readiness bits for monitors disabled above will always be set to "ready" during flex-fuel operation. procedure needed when switching from flex-fuel to gasoline operation.
	Ford Ranger 4-wheel drive		YFMXT03.02D5 (50-state) YFMXT03.02BB (Federal) (VIN 8th digit: V)	
	Ford Explorer Postal Version 4-wheel drive	4.0L V-6 (E85)	YFMXT04.02D5 (Federal) (VIN 8th digit: K)	

Section B: Ford Motor Company (cont.)

Model Year	Model	Displacement & Engine Type / Ethanol Content	Engine Family / Test Group (VIN ID)	Comments
2001	*Ford Taurus/Mercury Sable* Sedan/Wagon	3.0L V-6 (E85)	1FMXV03.0VF9 (50-state) (VIN 8th digit: 2)	Desensitized evaporative leak/purge check monitor implemented to detect 0.040" leak for operation >E75 blends.
	Ford Ranger 2-wheel drive		1FMXT03.02F6 (50-state) (VIN 8th digit: V)	Monitors disabled for operation >E10 blends: catalyst. Desensitized evaporative leak/purge check monitor implemented to detect gross leak for operation >E75 blends (monitor fully compliant up to E75 blends). I/M readiness bits for monitors disabled above will always be set to "ready" during flex-fuel operation. No OBD monitor re-enablement procedure needed when switching from flex-fuel to gasoline operation.
	Ford Explorer Sport/Sport Trac/ Postal Version 4-wheel drive	4.0L V-6 (E85)	1FMXT04.02F6 (50-state) (VIN 8th digit: K)	
2002	*Ford Ranger* 2-wheel drive	3.0L V-6 (E85)	2FMXT03.02F6 (50 State) (VIN 8th digit: V)	Monitors Disabled for operation >E10 blends: catalyst. Desensitized evaporative leak/purge check monitor to detect gross leak for operation >E75 blends (monitor fully compliant up to E75 blends). No OBD monitor re-enablement procedure needed when switching from flex-fuel to gasoline operation.

Section B: Ford Motor Company (cont.)

Model Year	Model	Displacement & Engine Type / Ethanol Content	Engine Family / Test Group (VIN ID)	Comments
2002	*Ford Taurus/Mercury Sable* Sedan/Wagon	3.0L V-6 (E85)	2FMXV03.0VF8 2FMXV03.0VF9 (50 State) (VIN 8th digit: 2)	No monitors disabled for alternate fuel operation. Desensitized evaporative leak/purge check monitor to detect 0.040" leak for operation >E75 blends (monitor fully compliant up to E75 blends). No OBD monitor re-enablement procedure needed when switching from flex-fuel to gasoline operation.
	Ford Explorer / Mercury Mountaineer 4-wheel drive	4.0L V-6 (E85)	2FMXT04.02F7 (50 State) (VIN 8th digit: K)	
2003	*Ford Taurus/Mercury Sable* Sedan/Wagon	3.0L V-6 (E85)	3FMXV03.0VFZ (50 State) (VIN 8th digit: 2)	OBD II monitors fully functional and compliant on all FFV fuel blends.
	Ford Ranger 2-wheel drive		3FMXT03.02F6 (50 State) (VIN 8th digit: V)	
	Ford Explorer / Mercury Mountaineer 4-wheel drive	4.0L V-6 (E85)	3FMXT04.02F7 3FMXT04.02FB (50 State) (VIN 8th digit: K)	
2004	*Ford Taurus/Mercury Sable* Sedan/Wagon	3.0L V-6 (E85)	4FMXV03.0VFZ (50 State) (VIN 8th digit: 2)	
	Ford Explorer / Mercury Mountaineer 4-wheel drive	4.0L V-6 (E85)	4FMXT04.02K6 4FMXT04.02K8 (50 State) (VIN 8th digit: K)	
	Ford Explorer Sport Trac 4-wheel drive		4FMXT04.02K4 (50 State) (VIN 8th digit: K)	

Section B: Ford Motor Company (cont.)

Model Year	Model	Displacement & Engine Type / Ethanol Content	Engine Family / Test Group (VIN ID)	Comments
2005	*Ford Taurus/Mercury Sable* Sedan/Wagon	3.0L V-6 (E85)	5FMXV03.0VFZ (50 State) (VIN 8th digit: 2)	OBD II monitors fully functional and compliant on all FFV fuel blends.
	Ford Explorer / Mercury Mountaineer 4-wheel drive	4.0L V-6 (E85)	5FMXT04.02K8 (50 State) (VIN 8th digit: K)	
2005	*Ford Explorer Sport Trac* 4-wheel drive	4.0L V-6 (E85)	5FMXT04.02K4 (50 State) (VIN 8th digit: K)	OBD II monitors fully functional and compliant on all FFV fuel blends.
2006	*Ford Taurus* Sedan/Wagon	3.0L V-6 (E85)	6FMXV03.0VFZ (Federal) (VIN 8th digit: 2)	
	Ford Crown Victoria / Mercury Grand Marquis/ Lincoln Town Car	4.6L V-8 (E85)	6FMXV04.6VE2 (Federal) (VIN 8th digit: V)	
	Ford F-150	5.4L V-8 (E85)	6FMXT05.4RH2 (Federal) (VIN 8th digit: V)	
2007	*Ford Crown Victoria / Mercury Grand Marquis/ Lincoln Town Car*	4.6L V-8 (E85)	7FMXV04.6VE2 (Federal) 7FMXV04.6VEF (50 State) (VIN 8th digit: V)	
	Ford F-150	5.4L V-8 (E85)	7FMXT05.44H2 7FMXT05.44HF (Federal) 7FMXT05.44E2 (50 State) (VIN 8th digit: V)	

**** NOTE: 50 State = Product certified for sale in all 50 States; Fed = federally certified product available in all states which do not require California emissions; Cal = California emissions certified product available in California and all states which require California emissions.***

Section C: General Motors Corporation

Model Year	Model	Displacement & Engine Type / Ethanol Content	Engine Family / Test Group (VIN ID)	Comments
1996-1999	**No FFVs produced during these model years.**			
2000	*Chevrolet S-10/GMC Sonoma* 2-wheel drive	2.2 L I-4 / (E85)	YGMXT02.2121 YGMXT02.2122 (VIN 8th digit: 5)	System monitors disabled for operation ≥E15 blends: O2 sensor heater, secondary air, catalyst. System monitors disabled for operation ≥E10 blends: evaporative leak check. Desensitized O2 sensor monitor implemented; only reports faults during operation ≤E15 blends. No OBD monitor re-enablement procedure needed when switching from flex-fuel to gasoline operation.
2001	*Chevrolet S-10/GMC Sonoma* 2-wheel drive		1GMXT02.2122 (VIN 8th digit: 5)	
2002	*Chevrolet S-10/GMC Sonoma* 2-wheel drive		2GMXT02.2122 (VIN 8th digit: 5)	
	C1500 Sierra / Silverado 2-wheel drive *K1500 Sierra / Silverado* 4-wheel drive	5.3L V-8 / (E85)	2GMXT05.3177 (VIN 8th digit: Z)	OBD II monitors fully functional and compliant on all FFV fuel blends.
	C1500 Suburban / Tahoe / Yukon / Yukon XL 2-wheel drive *K1500 Suburban / Tahoe / Yukon / Yukon XL* 4-wheel drive		2GMXT05.3188 (VIN 8th digit: Z)	

Section C: General Motors Corporation (cont.)

Model Year	Model	Displacement & Engine Type / Ethanol Content	Engine Family / Test Group (VIN ID)	Comments
2003	*C1500 Sierra / Silverado* 2-wheel drive *K1500 Sierra / Silverado* 4-wheel drive	5.3L V-8 / (E85)	3GMXT05.3177 (VIN 8th digit: Z)	OBD II monitors fully functional and compliant on all FFV fuel blends.
2003	*C1500 Suburban / Tahoe / Yukon / Yukon XL* 2-wheel drive *K1500 Suburban / Tahoe / Yukon / Yukon XL* 4-wheel drive *K1500 Suburban / Tahoe / Yukon / Yukon XL* All-wheel drive	5.3L V-8 / (E85)	3GMXT05.3175 (VIN 8th digit: Z)	OBD II monitors fully functional and compliant on all FFV fuel blends.
2004	*C1500 Sierra / Silverado* 2-wheel drive *K1500 Sierra / Silverado* 4-wheel drive		4GMXT05.3177 (VIN 8th digit: Z)	
	C1500 Suburban / Tahoe / Yukon / Yukon XL 2-wheel drive *K1500 Sierra / Silverado / Suburban / Tahoe / Yukon / Yukon XL* 4-wheel drive *K1500 Suburban / Tahoe / Yukon / Yukon XL* All-wheel drive		4GMXT05.3175 (VIN 8th digit: Z)	

Section C: General Motors Corporation (cont.)

Model Year	Model	Displacement & Engine Type / Ethanol Content	Engine Family / Test Group (VIN ID)	Comments
2005	*C1500 Sierra / Silverado / Tahoe* 2-wheel drive *K1500 Sierra / Silverado* 4-wheel drive	5.3L V-8 / (E85)	5GMXT05.3177 (VIN 8th digit: Z)	OBD II monitors fully functional and compliant on all FFV fuel blends.
2005	*C1500 Suburban / Tahoe / Yukon / Yukon XL / Avalanche* 2-wheel drive *K1500 Sierra / Silverado / Suburban / Tahoe / Yukon / Yukon XL / Avalanche* 4-wheel drive *K1500 Suburban / Tahoe / Yukon / Yukon XL* All-wheel drive	5.3L V-8 / (E85)	5GMXT05.3175 (VIN 8th digit: Z)	OBD II monitors fully functional and compliant on all FFV fuel blends.
2006	*Impala / Monte Carlo*	3.5L V-6 / (E85)	6GMXV03.5050 6GMXV03.5051 (VIN 8th digit: K)	
	C1500 Sierra / Silverado / Suburban / Tahoe / Yukon / Yukon XL / Avalanche 2-wheel drive *K1500 Sierra / Silverado / Suburban / Tahoe / Yukon / Yukon XL / Avalanche* 4-wheel drive	5.3L V-8 / (E85)	6GMXT05.3375 (VIN 8th digit: Z)	
2007	*Impala / Monte Carlo*	3.5L V-6 / (E85)	7GMXV03.5052 (VIN 8th digit: K)	
	Terraza / Uplander	3.9L V-6 / (E85)	7GMXT03.9140 (VIN 8th digit: W)	

Section C: General Motors Corporation (cont.)

Model Year	Model	Displacement & Engine Type / Ethanol Content	Engine Family / Test Group (VIN ID)	Comments
2007	*C1500 Sierra Classic / Silverado Classic* *G1500/2500 Express / Savana Cargo & Passenger* *G1500/2500 Van* 2-wheel drive *K1500 Sierra Classic / Silverado Classic* 4-wheel drive *H1500 Express / Savana Passenger Van* *H1500/2500 Savana Cargo/ Van* All-wheel drive	5.3L V-8 / (E85)	7GMXT05.3373 (VIN 8th digit: Z)	OBD II monitors fully functional and compliant on all FFV fuel blends.
	C1500 Sierra Classic / Silverado Classic / Sierra / Silverado / Avalanche / Suburban / Tahoe / Yukon / Yukon XL, G1500/2500 Express / Savana Cargo & Passenger, G1500/2500 Van 2-wheel drive *K1500 Sierra Classic / Silverado Classic / Sierra / Silverado / Avalanche / Suburban / Tahoe / Yukon / Yukon XL* 4-wheel drive *H1500 Express / Savana Passenger* *H1500/2500 Savana Cargo/ Van* All-wheel drive		7GMXT05.3375 (VIN 8th digit: Z, 3, or 0)	

Section C: General Motors Corporation (cont.)

Model Year	Model	Displacement & Engine Type / Ethanol Content	Engine Family / Test Group (VIN ID)	Comments
2007	*C1500 Silverado / Avalanche / Suburban / Tahoe / Yukon / Yukon XL* *G1500/2500 Express / Savana Cargo & Passenger* *G1500/2500 Van* 2-wheel drive *K1500 Sierra / Silverado / Avalanche / Suburban / Tahoe / Yukon / Yukon XL*	5.3L V-8 / (E85)	7GMXT05.3381 (VIN 8th digit: 3 or 0)	OBD II monitors fully functional and compliant on all FFV fuel blends.

Section D: Isuzu Motor Corporation

Model Year	Model	Displacement & Engine Type / Ethanol Content	Engine Family / Test Group (VIN ID)	Comments
1996-1999	**No FFVs produced during these model years.**			
2000	*Hombre* 2-wheel drive	2.2 L I-4 / (E85)	YGMXT02.2121 YGMXT02.2122 (VIN 8th digit: 5)	This model shares a platform with the Chevrolet S-10 and GMC Sonoma. ***For guidance on these models, please refer to Section C "General Motors Corporation."***
2001	*Hombre* 2-wheel drive		YGMXT02.2121 YGMXT02.2122 (VIN 8th digit: 5)	
2002-2007	**No FFVs produced during these model years.**			

Section E: Mazda North American Operations

Model Year	Model	Displacement & Engine Type / Ethanol Content	Engine Family / Test Group (VIN ID)	Comments
1996-1998	**No FFVs produced during these model years.**			
1999	*B3000* 4-wheel drive	3.0 L V-6 / (E85)	XFMXT03.02BB (VIN 8th digit: V)	This model shares a platform with the Ford Ranger. ***For guidance on these models, please refer to Section B "Ford Motor Corporation."***
2000	*B3000* 2-wheel drive		YFMXT03.01BA YFMXT03.01D5 (VIN 8th digit: V)	
	B3000 4-wheel drive		XFMXT03.02BB (VIN 8th digit: V)	
2001	**No FFVs produced during these model years.**			
2002	*B3000* 2-wheel drive	3.0 L V-6 / (E85)	2FMXT03.02F6 (VIN 8th digit: V)	This model shares a platform with the Ford Ranger. ***For guidance on these models, please refer to Section B "Ford Motor Corporation."***
2003	*B3000* 2-wheel drive		3FMXT03.02F6 (VIN 8th digit: V)	
2004-2007	**No FFVs produced during these model years.**			

Section F: Mercedes-Benz

Model Year	Model	Displacement & Engine Type / Ethanol Content	Engine Family / Test Group	Comments
1996–2002	**No FFVs produced during these model years.**			
2003	*C-Class: C320* Sedan/Wagon/Sportscoupe	3.2 L V-6 / (E85 + Premium)	3MBXV03.2LXY	No disablements or desensitization during alternate fuel operation.
2004	*C-Class: C240* Sedan/Wagon	2.6 L V-6 / (E85 + Premium)	4MBXV03.2LXX	
	C-Class: C320 Sedan/Wagon/Sportscoupe	3.2 L V-6 / (E85 + Premium)		
2005	*C-Class: C240* Sedan/Wagon	2.6 L V-6 / (E85 + Premium)	5MBXV03.2LBX	
	C-Class: C320 Sedan/Wagon/Sportscoupe	3.2 L V-6 / (E85 + Premium)		
2006	**No FFVs produced during this model year.**			
2007	*C-Class: C230* Sedan	2.5 L V-6 / (E85 + Premium)	7MBXV02.5U2A	No disablements or desensitization during alternate fuel operation.
2008	*C-Class: C300* Sedan	3.0 L V-6 / (E85 + Premium)	8MBXV03.0U2A	

**** NOTE: Mercedes-Benz do not use a special indicator in the VIN for FFVs.***

Section G: Nissan Motor Company

Model Year	Model	Displacement & Engine Type / Ethanol Content	Engine Family / Test Group (VIN ID)	Comments
1996-2004	**No FFVs produced during these model years.**			
2005	*Titan* 2-Wheel Drive	5.6 L V-8 / (E85)	5NSXT05.6M9B (VIN 4th digit: B)	No disablements or desensitization during alternate fuel operation.
	Titan 4-Wheel Drive		5NSXT05.6P9C (VIN 4th digit: B)	
2006	*Titan* 2-Wheel Drive		6NSXT05.6M9B (VIN 4th digit: B)	
	Titan 4-Wheel Drive		6NSXT05.6P9B (VIN 4th digit: B)	
2007	*Armada* 2-Wheel and 4-Wheel Drive		7NSXT05.6G9B (VIN 4th digit: B)	
	Titan 2-Wheel and 4-Wheel Drive			

EPA Contact Information

For questions or comments on this document, please contact:
Arvon L. Mitcham
Program Manager/Engineer
Certification and Innovative Strategies Division
Office of Transportation and Air Quality
United States Environmental Protection Agency
734.214.4522
mitcham.arvon@epa.gov

Manufacturer Contacts

Frank A. Krich
Regulatory Planning Specialist
Environmental and Energy Planning
Daimler Chrysler Corporation
800 Chrysler Drive
Auburn Hills, MI. 48326-2752
248.576.7928
fak6@daimlerchrysler.com

Andre Welch
Vehicle Environmental Engineering
Ford Motor Company
World Headquarters, Room 224 E6
One American Road
Dearborn, MI 48126
313.322.5180
awelch4@ford.com

Chris S. Brown
In-Use OBD and Emission Compliance
GM Powertrain
General Motors Corporation
248.255-7398
Christopher.S.Brown@GM.com

Jeffery A. Marsee
Vehicle Compliance
Isuzu Manufacturing Services America, Inc
46401 Commerce Center Drive.
Plymouth, MI 48170
734.582.9262
jamarsee@isza.com

David Robertson
Group Manager
ESE and PT
Mazda North American Operations
1500 Enterprise Drive
Allen Park, MI. 48101
313.594.7778
drobertson@mazdausa.com

Farrukh Khan
Senior Project Engineer
Engine Testing & Emission Certification
Nissan Technical Center North America, Inc.
39001 Sunrise DR
Farmington Hills, MI 48331
248.488.4649
khanf@ntcna.nissan-usa.com

Eric A. Schneider
Manager, Ann Arbor & Los Angeles Emission Testing Laboratories
Mercedes-Benz EPA & ARB Liaison
Daimler Chrysler A.G.
Ann Arbor Technology Center
3953 Research Park Drive
Ann Arbor, Michigan 48108
734.995.3066
734.730.0197 Cellular
Los Angeles Technology Center
4035 Via Oro Avenue
Long Beach, California 90810
310.549.7600 Telephone
eric.a.schneider@mbusa.com