

2021 ENGINE PERFORMANCE

Engine Controls And Fuel - 2.8L (LWN) Diesel - Specifications - Canyon, Colorado

SPECIFICATIONS

TEMPERATURE VERSUS RESISTANCE - EXHAUST GAS TEMPERATURE SENSOR

B°C	B°F	Ω
Temperature vs. Resistance Values (Approximate)		
1000	1832	849
900	1652	795
800	1472	738
700	1292	679
600	1112	618
500	932	554
450	842	521
400	752	488
350	662	454
300	572	420
250	482	385
200	392	349
150	302	313
100	212	276
50	122	239
25	77	220
0	32	201
-20	-4	185
-40	-40	170

TEMPERATURE VERSUS RESISTANCE - INTAKE AIR TEMPERATURE SENSOR

Temperature	Resistance
150B°C (302B°F)	54 to 59 ohms
140B°C (284B°F)	67 to 73 ohms
120B°C (248B°F)	103 to 116 ohms
100B°C (212B°F)	175 to 197 ohms
80B°C (176B°F)	309 to 351 ohms
60B°C (140B°F)	571 to 655 ohms
40B°C (104B°F)	1, 113 to 1, 292 ohms
25B°C (77B°F)	1, 904 to 2, 236 ohms
20B°C (68B°F)	2, 308 to 2, 727 ohms
0B°C (32B°F)	5, 358 to 6, 458 ohms
-10B°C (14B°F)	8, 529 to 10, 399 ohms
-20B°C (-4B°F)	14, 039 to 17, 333 ohms
-40B°C (-40B°F)	42, 661 to 54, 224 ohms

TEMPERATURE VERSUS RESISTANCE - CHARGE AIR COOLER TEMPERATURE SENSOR

Temperature	Resistance
150B°C (302B°F)	0.15 k to 0.17 kohms
140B°C (284B°F)	0.19 k to 0.21 kohms
130B°C (266B°F)	0.23 k to 0.26 kohms
120B°C (248B°F)	0.29 k to 0.33 kohms
110B°C (230B°F)	0.37 k to 0.43 kohms
100B°C (212B°F)	0.47 k to 0.55 kohms
90B°C (194B°F)	0.61 k to 0.72 kohms
80B°C (176B°F)	0.80 k to 0.95 kohms
70B°C (158B°F)	1.07 k to 1.28 kohms
60B°C (140B°F)	1.45 k to 1.75 kohms
50B°C (122B°F)	2.00 k to 2.44 kohms
40B°C (104B°F)	2.79 k to 3.45 kohms
30B°C (86B°F)	3.98 k to 4.97 kohms
20B°C (68B°F)	5.80 k to 7.34 kohms
10B°C (50B°F)	8.63 k to 11.08 kohms
0B°C (32B°F)	13.15 k to 17.15 kohms
-10B°C (14B°F)	20.58 k to 27.30 kohms
-20B°C (-4B°F)	33.15 k to 44.80 kohms
-30B°C (-22B°F)	55.12 k to 76.03 kohms
-40B°C (-40B°F)	94.91 k to 133.90 kohms

TEMPERATURE VERSUS RESISTANCE - ENGINE COOLANT TEMPERATURE SENSOR

Temperature	Resistance
150B°C (302B°F)	42 to 44 ohms
140B°C (284B°F)	53 to 57 ohms

Temperature	Resistance
130B°C (266B°F)	68 to 72 ohms
120B°C (248B°F)	88 to 92 ohms
110B°C (230B°F)	114 to 120 ohms
100B°C (212B°F)	151 to 159 ohms
90B°C (194B°F)	203 to 215 ohms
80B°C (176B°F)	275 to 293 ohms
70B°C (158B°F)	379 to 405 ohms
60B°C (140B°F)	532 to 572 ohms
50B°C (122B°F)	762 to 824 ohms
45B°C (113B°F)	921 to 997 ohms
40B°C (104B°F)	1118 to 1212 ohms
35B°C (95B°F)	1366 to 1484 ohms
30B°C (86B°F)	1683 to 1829 ohms
25B°C (77B°F)	2088 to 2266 ohms
20B°C (68B°F)	2608 to 2828 ohms
15B°C (59B°F)	3289 to 3567 ohms
10B°C (50B°F)	4182 to 4532 ohms
5B°C (41B°F)	5356 to 5800 ohms
0B°C (32B°F)	6914 to 7484 ohms
-5B°C (23B°F)	8994 to 9732 ohms
-10B°C (14B°F)	11796 to 12762 ohms
-15B°C (5B°F)	15589 to 16871 ohms
-20B°C (-4B°F)	20791 to 22517 ohms
-30B°C (-22B°F)	37991 to 41273 ohms
-40B°C (-40B°F)	72230 to 78834 ohms

TRANSMITTING AND RECEIVING COMPONENTS

DTC	Transmitting Component	Receiving Component
DTC P1000	K111 Fuel Pump Driver Control Module	K20 Engine Control Module
DTC P1001	K111 Fuel Pump Driver Control Module	K20 Engine Control Module
DTC P1003	K111 Fuel Pump Driver Control Module	K20 Engine Control Module
DTC P1008	Q82 Passenger Compartment Heater Coolant Cut-Off Solenoid Valve	K20 Engine Control Module
DTC P1009	K111 Fuel Pump Driver Control Module	K20 Engine Control Module
DTC P100A	M103 Turbocharger Vane Position Actuator	K20 Engine Control Module
DTC P103D	G59 Engine Coolant Pump	K20 Engine Control Module
DTC P103E	G17 Heater Coolant Pump	K20 Engine Control Module
DTC P10C6	K115 Reductant Control Module	K20 Engine Control Module
DTC P10C7	K115 Reductant Control Module	K20 Engine Control Module
DTC P10C8	K115 Reductant Control Module	K20 Engine Control Module
DTC P10F5	G58 Evaporative Emission Canister Purge Pump	K20 Engine Control Module
DTC P1100	K111 Fuel Pump Driver Control Module	K20 Engine Control Module
DTC P1103	K111 Fuel Pump Driver Control Module	K20 Engine Control Module
DTC P117A	Q97 Engine Coolant Flow Control Valve	K20 Engine Control Module
DTC P11FF	K111 Fuel Pump Driver Control Module	K20 Engine Control Module
DTC P1200	K111 Fuel Pump Driver Control Module	K20 Engine Control Module
DTC P128C	B310 Fuel Pressure and Temperature Sensor	K20 Engine Control Module
DTC P128D	B310 Fuel Pressure and Temperature Sensor	K20 Engine Control Module
DTC P128F	B310 Fuel Pressure and Temperature Sensor	K20 Engine Control Module
DTC P129E	K111 Fuel Pump Driver Control Module or K209 Fuel Level Sensor Control Module	K20 Engine Control Module
DTC P12A8	K111 Fuel Pump Driver Control Module	K20 Engine Control Module
DTC P130F	K111 Fuel Pump Driver Control Module	K20 Engine Control Module
DTC P135C	G10 Cooling Fan Motor	K20 Engine Control Module
DTC P135D	G10 Cooling Fan Motor	K20 Engine Control Module
DTC P135E	G10 Cooling Fan Motor	K20 Engine Control Module
DTC P139A	K34 Glow Plug Control Module	K20 Engine Control Module
DTC P139B	K34 Glow Plug Control Module	K20 Engine Control Module
DTC P1436	B136 Exhaust Particulate Matter Sensor	K20 Engine Control Module
DTC P143A	K115 Reductant Control Module	K20 Engine Control Module
DTC P143B	K115 Reductant Control Module	K20 Engine Control Module
DTC P14A0	M10 Charge Air Cooler Coolant Pump	K20 Engine Control Module
DTC P14B6	B75 Mass Airflow Sensor or B75C Multifunction Intake Air Sensor	K20 Engine Control Module
DTC P14CD	K20 Engine Control Module	K111 Fuel Pump Driver Control Module
DTC P14CE	K20 Engine Control Module	K111 Fuel Pump Driver Control Module
DTC P14D4	K20 Engine Control Module	K111 Fuel Pump Driver Control Module
DTC P14D5	K20 Engine Control Module	K111 Fuel Pump Driver Control Module
DTC P14D6	K20 Engine Control Module	K111 Fuel Pump Driver Control Module
DTC P150C	K71 Transmission Control Module	K20 Engine Control Module
DTC P155D	K17 Electronic Brake Control Module	K20 Engine Control Module
DTC P15F2	K114 Hybrid/EV Powertrain Control Module	K20 Engine Control Module
DTC P15F9	K114 Hybrid/EV Powertrain Control Module	K20 Engine Control Module
DTC P15FB	K17 Electronic Brake Control Module	K20 Engine Control Module
DTC P165C	K111 Fuel Pump Driver Control Module	K20 Engine Control Module

DTC	Transmitting Component	Receiving Component
DTC P167F	K111 Fuel Pump Driver Control Module	K20 Engine Control Module
DTC P16FF	P16 Instrument Panel Cluster Control Module	K20 Engine Control Module
DTC P175F	K17 Electronic Brake Control Module	K20 Engine Control Module
DTC P1762	K9 Body Control Module	K20 Engine Control Module
DTC P1772	K71 Transmission Control Module	K20 Engine Control Module
DTC P1773	K71 Transmission Control Module	K20 Engine Control Module
DTC P1775	K20 Engine Control Module	K71 Transmission Control Module
DTC P188B	K71 Transmission Control Module	K20 Engine Control Module
DTC P18EF	K71 Transmission Control Module	K20 Engine Control Module
DTC P1919	K71 Transmission Control Module	K20 Engine Control Module
DTC P2544	K71 Transmission Control Module	K20 Engine Control Module
DTC P30B4	B195A Nitrogen Oxides Sensor 1	K20 Engine Control Module
DTC P30B5	B195B Nitrogen Oxides Sensor 2	K20 Engine Control Module
DTC P30BC	B136 Exhaust Particulate Matter Sensor	K20 Engine Control Module
DTC P30D5	B195C Nitrogen Oxides Sensor 3	K20 Engine Control Module
DTC P30DE	B310 Fuel Pressure and Temperature Sensor	K20 Engine Control Module
DTC P314E	K287 Fuel Heater Control Module	K20 Engine Control Module
DTC P316B	K103 Fuel Injector Control Module	K20 Engine Control Module

ALTITUDE VERSUS BAROMETRIC PRESSURE

Determine the current vehicle testing altitude.

The following table illustrates the relation between altitude and barometric pressure:

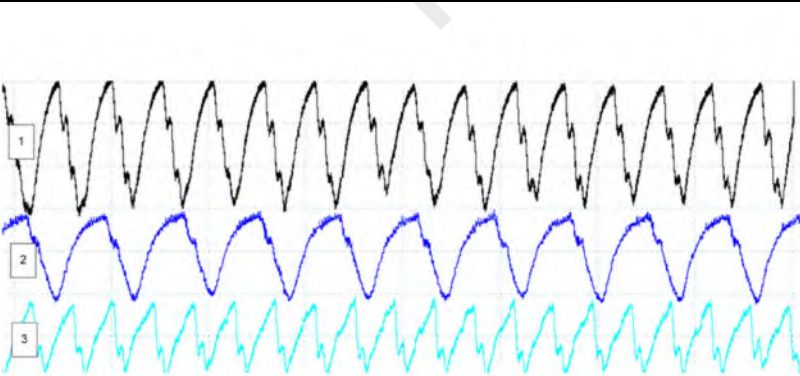
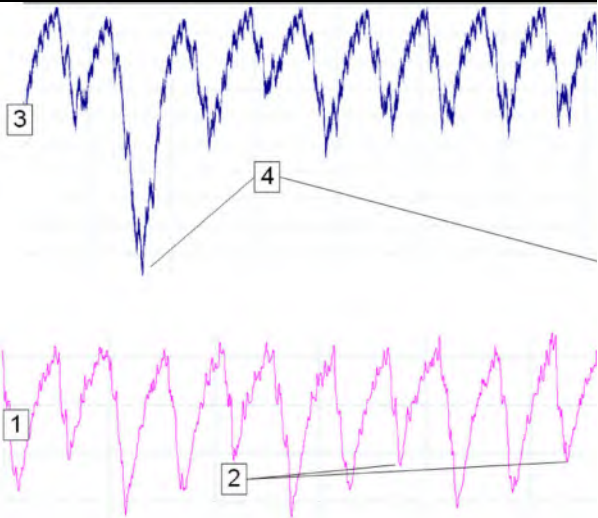
Altitude	Barometric Pressure
4, 267 m (14, 000 ft)	56 to 64 kPa (8.1 to 9.3 PSI)
3, 962 m (13, 000 ft)	58 to 66 kPa (8.4 to 9.6 PSI)
3, 658 m (12, 000 ft)	61 to 69 kPa (8.8 to 10.0 PSI)
3, 353 m (11, 000 ft)	64 to 72 kPa (9.3 to 10.4 PSI)
3, 048 m (10, 000 ft)	66 to 74 kPa (9.6 to 10.7 PSI)
2, 743 m (9, 000 ft)	69 to 77 kPa (10.0 to 11.2 PSI)
2, 438 m (8, 000 ft)	71 to 79 kPa (10.3 to 11.5 PSI)
2, 134 m (7, 000 ft)	74 to 82 kPa (10.7 to 11.9 PSI)
1, 829 m (6, 000 ft)	77 to 85 kPa (11.2 to 12.3 PSI)
1, 524 m (5, 000 ft)	80 to 88 kPa (11.6 to 12.8 PSI)
1, 219 m (4, 000 ft)	83 to 91 kPa (12.0 to 13.2 PSI)
914 m (3, 000 ft)	87 to 95 kPa (12.6 to 13.8 PSI)
610 m (2, 000 ft)	90 to 98 kPa (13.1 to 14.2 PSI)
305 m (1, 000 ft)	94 to 102 kPa (13.6 to 14.8 PSI)
0 m (0 ft)	96 to 104 kPa (13.9 to 15.1 PSI)
-305 m (-1, 000 ft)	101 to 105 kPa (14.6 to 15.2 PSI)

OSCILLOSCOPE WAVEFORM LIBRARY

Description

The figures in the tables below are reference waveforms collected from known-good vehicles and faulted vehicles. Each figure is accompanied by a description.

Relative Compression - Diesel Engines

Normal	Abnormal
	
1. 8 Cylinder Engine 2. 4 Cylinder Engine 3. 6 Cylinder Engine	1. 3 Cylinder Engine - Low Compression 2. Low Compression - The waveform repeats every 3 compression strokes and repeatable compression fault. 3. 8 Cylinder Engine - High Starter Load 4. Exhaust Valve = Stuck Closed - The waveform repeats every 8 compression strokes indicating a current and repeatable compression fault. When one cylinder

Normal	Abnormal
	double the relative compression, this is an indication of a stuck close the companion cylinder.

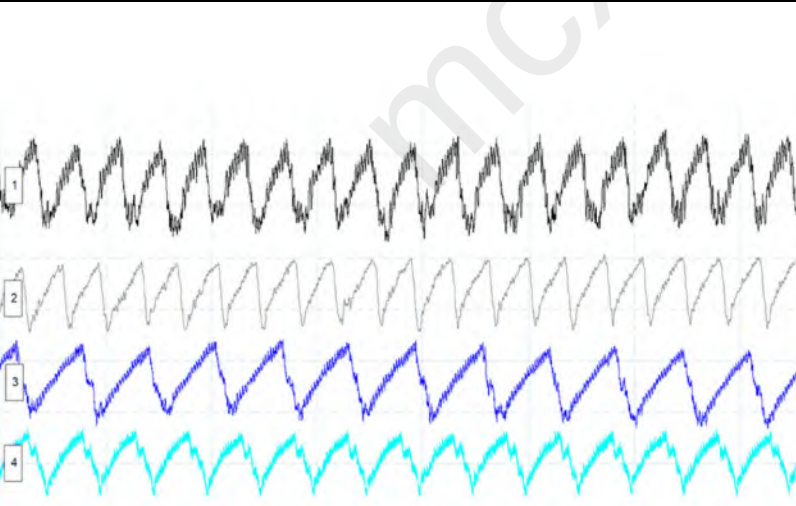
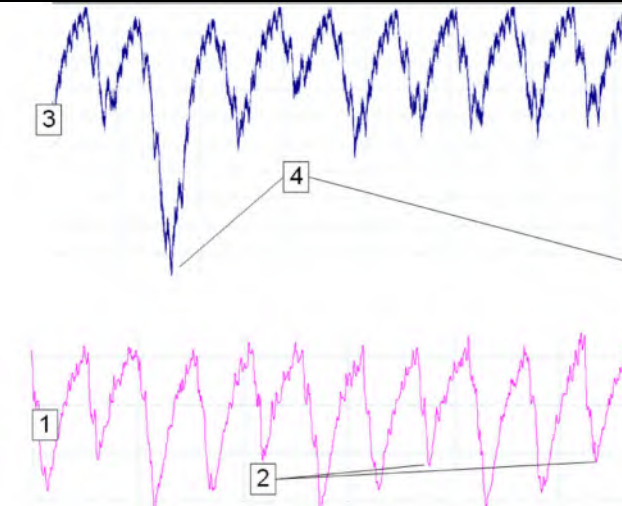
NOTE:

- An engine with little to no compression variance between cylinders will have waveform valleys that are even.
- If the engine compression is equally low across all cylinders, the oscilloscope pattern will appear good.
- The total amplitude (range from highest to lowest point of the waveform) is NOT an indicator of good compression.

Operating Conditions:

1. Fuel System - Disabled
2. {Automatic Transmission} Apply & Hold - Brake Pedal
{Manual Transmission} Apply & Hold - Clutch Pedal
3. Engine - Cranking - For 5 - 10 s

Relative Compression - Gasoline Engines

Normal	Abnormal
 1. 8 Cylinder Engine 2. 6 Cylinder Engine 3. 4 Cylinder Engine 4. 3 Cylinder Engine	 1. 3 Cylinder Engine - Low Compression 2. Low Compression - The waveform repeats every 3 compression str current and repeatable compression fault. 3. 8 Cylinder Engine - High Starter Load 4. Exhaust Valve = Stuck Closed - The waveform repeats every 8 cor indicating a current and repeatable compression fault. When one cy double the relative compression, this is an indication of a stuck close the companion cylinder.

NOTE:

- An engine with little to

Normal	Abnormal
no compression variance between cylinders will have waveform valleys that are even. - If the engine compression is equally low across all cylinders, the oscilloscope pattern will appear good. - The total amplitude (range from highest to lowest point of the waveform) is NOT an indicator of good compression.	
Operating Conditions: - Fully Applied - Accelerator Pedal @ Wide Open Throttle {Automatic Transmission} Apply & Hold - Brake Pedal {Manual Transmission} Apply & Hold - Clutch Pedal - Engine - Cranking - For 5 - 10 s	

FASTENER SPECIFICATIONS

Single Use Non-Threaded Fasteners/Components

NOTE: All fasteners/components listed in this table MUST BE DISCARDED and replaced with NEW after removal.	
Application	
Combustion Fuel Injector Seal	
Emission Reduction Fluid Injector Gasket	
Emission Reduction Fluid Supply Pump Module Seal	
Exhaust Gas Recirculation Cooler Gasket	
Exhaust Gas Recirculation Pipe Gasket	
Exhaust Gas Recirculation Pipe Seal	
Exhaust Gas Recirculation Valve Housing Gasket	
Exhaust Pressure Differential Sensor Hose Clamp	
Fuel Injection Pump Metering Valve O-ring Seal	
Fuel Injector Label - Discard if ANY fuel injector is replaced.	
Fuel Return Line Quick Connect Clip	
Fuel Tank Fuel Pump Module O-ring Seal	
Hose Clamp @ Exhaust Gas Recirculation Valve Housing	
Throttle Body Gasket	

Single Use Threaded Fastener/Component Tightening Specifications

NOTE: All fasteners/components listed in this table MUST BE DISCARDED and replaced with NEW after removal.		
Application	Specification	
	Metric (English)	
Fuel Feed Pipe Fitting (Fuel Injector to Fuel Rail)	30 N.m (22 lb ft)	
Fuel Feed Pipe Fitting (Fuel Pump to Fuel Rail)	30 N.m (22 lb ft)	

Reusable Threaded Fastener Tightening Specifications

NOTE:

All fasteners listed in this table can be reused after removal.

Application	Specification
	Metric (English)
Accelerator Pedal Position Sensor Fastener	9 N.m (80 lb in)
Air Cleaner Assembly Fastener (Bottom Case to Body)	12 N.m (106 lb in)
Air Cleaner Assembly Fastener (Top Case to Bottom Case)	3.1 N.m (27 lb in)
Air Cleaner Outlet Duct Clamp	3.5 N.m (31 lb in)
Camshaft Position Sensor Fastener	11 N.m (97 lb in)
Charge Air Cooler Bolt	9 N.m (80 lb in)
Charge Air Cooler Inlet Duct Clamp	5 N.m (44 lb in)
Charge Air Cooler Inlet Hose Clamp	5 N.m (44 lb in)
Charge Air Cooler Outlet Duct Clamp	5 N.m (44 lb in)
Charge Air Temperature Sensor	19 N.m (14 lb ft)
Chassis Control Module Fastener	9 N.m (80 lb in)
Crankshaft Position Sensor Fastener	5 N.m (44 lb in)
Diesel Fuel Separator Bracket Bolt	7 N.m (62 lb in)
Emission Reduction Fluid Controller Bolt	5 N.m (44 lb in)
Emission Reduction Fluid Injector Nut	22 N.m (16 lb ft)
Emission Reduction Fluid Tank Bolt	22 N.m (16 lb ft)
Emission Reduction Fluid Tank Filler Pipe Bolt	9 N.m (80 lb in)
Emission Reduction Fluid Tank Nut	28 N.m (21 lb ft)
Emission Reduction Fluid Tank Protector Nut	22 N.m (16 lb ft)
Engine Control Module Bracket Nut	9 N.m (80 lb in)
Engine Coolant Temperature Sensor	15 N.m (11 lb ft)
Exhaust Gas Recirculation Cooler Bolt @ Air Conditioning Compressor Bracket	25 N.m (18 lb ft)
Exhaust Gas Recirculation Cooler Bolt @ Exhaust Gas Recirculation Valve Machined Housing	15 N.m (11 lb ft)
Exhaust Gas Recirculation Cooler Bypass Valve Actuator Fastener	9 N.m (80 lb in)
Exhaust Gas Recirculation Cooler Temperature Sensor	45 N.m (33 lb ft)
Exhaust Gas Recirculation Manifold Brace Bolt	58 N.m (43 lb ft)
Exhaust Gas Recirculation Pipe Fastener @ Exhaust Gas Recirculation Valve	25 N.m (18 lb ft)
Exhaust Gas Recirculation Pipe Fastener @ Intake Manifold	11 N.m (97 lb in)
Exhaust Gas Recirculation Valve Adapter Nut	25 N.m (18 lb ft)
Exhaust Particulate Sensor	50 N.m (37 lb ft)
Exhaust Particulate Sensor Fastener	9 N.m (80 lb in)
Exhaust Pressure Differential Sensor Fastener	7 N.m (62 lb in)
Exhaust Pressure Differential Sensor Nut	45 N.m (33 lb ft)
Exhaust Pressure Differential Sensor Pipe Clamp Nut	9 N.m (80 lb in)
Exhaust Temperature Sensor	45 N.m (33 lb ft)
Flywheel and Crankshaft Position Sensor Access Cover Fastener	10 N.m (89 lb in)
Fuel Feed Pipe Fastener	15 N.m (11 lb ft)
Fuel Filter Cover	20 N.m (15 lb ft)
Fuel Filter Fastener	25 N.m (18 lb ft)
Fuel Filter Heater Bolt	9 N.m (80 lb in)
Fuel Injection Fuel Rail Fastener	25 N.m (18 lb ft)
Fuel Injection Fuel Rail Fuel Pressure Sensor	35 N.m (26 lb ft)
Fuel Injection Pump Drive Pulley Retaining Nut	88 N.m (65 lb ft)
Fuel Injection Pump Metering Valve Fastener	9 N.m (80 lb in)
Fuel Injector Bracket Bolt	32 N.m (24 lb ft)
Fuel Pipe Bracket Nut	10 N.m (89 lb in)
Fuel Pump Fuel Feed Hose Bolt	58 N.m (43 lb ft)
Fuel Pump Fuel Return Hose Bolt	22 N.m (16 lb ft)
Fuel Pump Nut	25 N.m (18 lb ft)
Fuel Return Hose Bracket Bolt	22 N.m (16 lb ft)
Fuel Tank Filler Hose Clamp	3.5 N.m (31 lb in)
Fuel Tank Filler Pipe Bolt	9 N.m (80 lb in)
Fuel Tank Filler Pipe Clamp	3.5 N.m (31 lb in)
Fuel Tank Strap Bolt	45 N.m (33 lb ft)
Glow Plug	14 N.m (10 lb ft)
Intake Air Baffle Bolt	1.5 N.m (13 lb in)
Intake Manifold Tuning Vacuum Control Solenoid Valve Bolt	7 N.m (62 lb in)
Low Pressure Diesel Hydrocarbon Injector	45 N.m (33 lb ft)
Low Pressure Diesel Hydrocarbon Injector Bolt	9 N.m (80 lb in)
Mass Airflow Sensor with Intake Air Temperature Sensor Bolt	1.5 N.m (13 lb in)
Nitrogen Oxides Sensor	50 N.m (37 lb ft)
Nitrogen Oxides Sensor Fastener	9 N.m (80 lb in)
Positive Crankcase Ventilation Tube Bolt	9 N.m (80 lb in)
Throttle Body Assembly Fastener	11 N.m (97 lb in)
Throttle Inlet Absolute Pressure Sensor Fastener	9 N.m (80 lb in)

All fasteners listed in this table can be reused after removal.

Application	Specification
	Metric (English)
Vacuum Pump Pipe Bolt	11 N.m (97 lb in)

Application	Specification	
	Metric	English
Emission Reduction Fluid Tank Capacity	21.3 liters	5.9 gallons
Fuel Tank Capacity	80.0 liters	21.0 gallons

What Fuel to Use in the United States

CAUTION: Use of diesel fuel other than Ultra Low Sulfur Diesel (15 ppm sulfur maximum) or engine oil other than low ash CJ-4 oil will cause damage to the DPF and related components.

In the United States, for best results use Number 2-D diesel fuel year-round, above and below freezing conditions, as oil companies blend Number 2-D fuel to address cold weather. Number 1-D diesel fuel may be used in very cold temperatures when the temperature stays below -18B°C (0B°F). However, the fuel will produce a power and fuel economy penalty. Use of Number 1-D diesel fuel in warm or hot climates may result in stalling, poor starting when the engine is hot and may damage the fuel injection system.

It is acceptable to use diesel fuel containing up to 20 percent biodiesel (B20), but the final blended fuel must meet the same specification, ASTM D 975 (Grades No. 2-I commonly known as Ultra Low Sulfur diesel), as the other fuels used in your vehicle, and the biodiesel used for making this fuel must meet the latest version of ASTM D 6751. Biodiesel is produced from vegetable oils or animal fat that have been chemically modified to reduce the possibility of damage to the fuel system and engine. Higher (i.e. greater than B20) biodiesel-containing fuels or the use of unmodified bio-oils blended into diesel fuel at any concentration is not recommended and could damage the engine. Such damage would not be covered by your warranty. If there are questions about the biodiesel-containing fuels you are using, contact your fuel supplier.

Because of the cleansing properties of biodiesel, switching from straight diesel to a biodiesel blend can prematurely restrict the fuel filter with normal deposits in the fuel system. A fuel filter replacement might be required sooner than the recommended interval.

Diesel fuel may foam when filling the tank. This can cause the automatic pump nozzle to shut OFF, even though the tank is not full. If this happens, just wait for the foam to settle and then continue to fill the tank.

What Fuel to Use in Canada

Canadian fuels are blended for seasonal changes. Diesel Type A fuel is blended for better cold weather starting, when it stays below -18B°C (0B°F). However, the fuel will cause some power loss and fuel economy loss. The use of Type A diesel fuel in warmer climates may result in stalling, poor starting. Diesel Type B fuel is blended for temperatures above -18B°C. The emission control system requires the use of diesel fuel with ultra low sulfur, 15 ppm (maximum), content. Both low and higher sulfur fuels will be available in Canada. Diesel fuels are available in the United States. Diesel-powered trucks must be refueled with ultra low sulfur fuel only. Use of fuels with higher-sulfur content will affect engine performance, emission components and may cause reduced performance, excessive smoke and unpleasant odor.

It is acceptable to use diesel fuel containing up to 20 percent biodiesel (B20), but the final blended fuel must meet the same specification, CAN/CGSB-3.517 (ULS) in C. Biodiesel is produced from vegetable oils that have been chemically modified to reduce the possibility of damage to the fuel system and engine. Higher concentration (i.e. greater than B20) biodiesel-containing fuels are not recommended. Unmodified bio-oils blended into diesel fuel at any concentration is not recommended and could damage the fuel system and engine. Such damage would not be covered by the warranty. If there are questions about the biodiesel-containing fuels you are using, contact your fuel supplier.

Very Cold Weather Operation

If the vehicle is driven in very cold temperatures and cannot get a winterized Number 2-D that has been adapted to cold weather or a Number 1-D, use one gallon of kerosene for every 20 gallons of diesel fuel. Once you add kerosene, run the engine for several minutes to mix the fuels. Only add kerosene when the temperature falls below -18B°C (0B°F), because the economy and lubricating qualities of kerosene is not as good as that of diesel fuel.

In cold weather, the fuel filter may become clogged (waxed). To unclog the filter, move the vehicle to a warm garage area and warm the filter to a temperature between 50B°F). Replacing the filter is not necessary.

Fuel Specific Gravity Testing

Use a **J 38641-B** Diesel Fuel Quality Tester to measure the fuel specific gravity (API Rating). Follow the instructions on the tool to obtain the proper temperature-adjusted information must be accurate for the proper diagnosis of the fuel system.

Water in Fuel

Sometimes, water can be found in the fuel tank along with diesel fuel. This can happen if the service station does not regularly inspect and clean their fuel storage tanks, contaminated as received from the service stations suppliers.

If water is detected by the Water in Fuel Sensor, a Water-In-Fuel light will illuminate. If the Water-In-Fuel light illuminates, the water must be drained from the fuel system.

ADHESIVES, FLUIDS, LUBRICANTS, AND SEALERS

Application	Type of Material	GM Part Number
All Purpose Parts Cleaner	Cleaner	Refer to the electronic parts catalog for the correct part number.
Anti-Seize Compound	Lubricant	
Coolant Temperature Sensor Threads	Sealant	
Engine Oil	5W-30 Oil - Synthetic	
Fuel Injection Fuel Rail Bolts	Threadlock	
Intake Air Temperature Sensor Threads	Sealant	
Top Engine Cleaner	Cleaner	

