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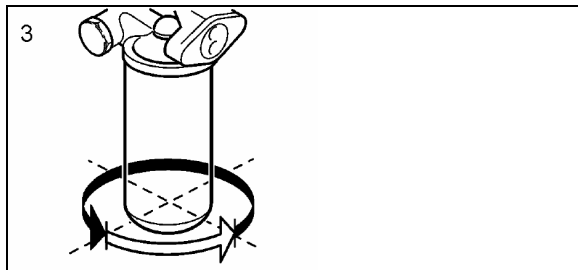
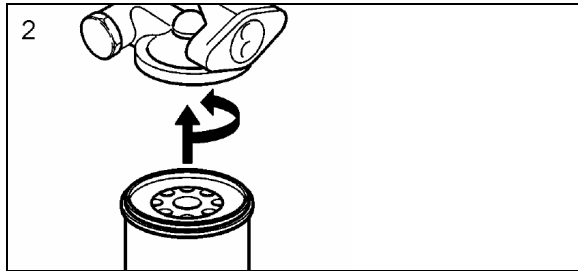



FIGURE 5: OIL FILTER REPLACEMENT

- Start the engine and check for leaks around the oil filter housing and filters.
- Check the oil level. Add approved engine oil to the recommended level, if necessary. Do not overfill.

### 1.3.11 Checking the Oil Level

Ensure that the vehicle is parked on level ground before checking the oil level. Wait five minutes after shutting off the engine and then proceed with checking the oil.

 <b>CAUTION</b>
<p><b>DO NOT</b> let the oil level fall below the marking on the dipstick. <b>DO NOT</b> overfill so the level is above the upper marking on the dipstick. This could lead to excessive oil temperature and/or poor crankcase breather performance. Add oil through the oil filler pipe as required in order to maintain level within the safe range.</p>

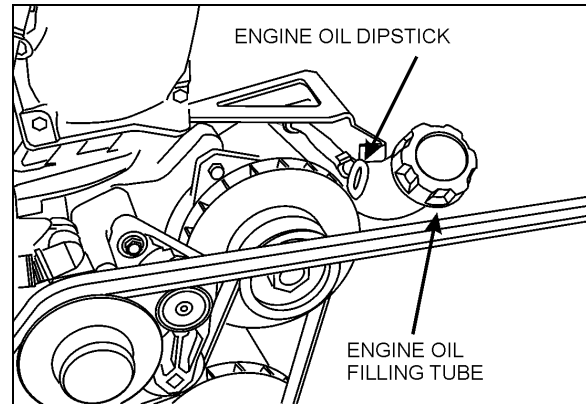


FIGURE 6: ENGINE OIL FILLING TUBE

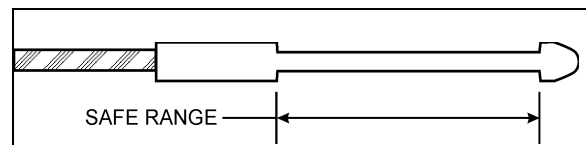



FIGURE 7: ENGINE OIL LEVEL DIPSTICK

### 1.4 POWER PLANT ASSEMBLY REMOVAL

To access the engine or engine-related components, the vehicle power plant assembly must be removed as a whole unit by means of a slide-out cradle. The power plant assembly includes the engine, transmission (including retarder if so equipped), air compressor, alternator and transmission oil cooler.

Remove the power plant assembly as follows:

 <b>CAUTION</b>
<p>Tag hoses and cables for identification before disconnecting in order to facilitate reinstallation. Plug all openings to prevent dirt from entering the system.</p>

<p><i><b>NOTE</b></i></p> <p><i>No parts within the EECU are serviceable. If found defective, replace the EECU as a unit.</i></p>
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#### • Preparation

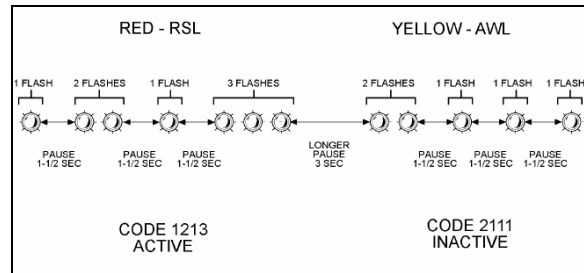
1. Close the heater lines shut-off valves.
2. Disconnect the battery or batteries from the starting system by removing one or both of the battery cables from each battery system. With the electrical circuit disrupted, accidental contact with the starter button will not produce an engine start.

**Active Codes:** Codes that are currently keeping the Check Engine or Stop Engine telltale light illuminated. Active codes are flashed via the Stop Engine Light when checked with the stop-engine-override switch.

**Inactive Codes:** These are all the codes logged in the CPC, which have previously occurred, (whether or not they are currently turning on the Stop or Check Engine Light). Inactive codes are flashed via the Check Engine telltale light when checked with the stop-engine-override switch.

In most instances, only the DDR can provide the information necessary for a quick diagnosis of the problem. If you just need to read out codes, however, and do not have a DDR available, the following procedure will let you read out codes. Make sure the rear-starting switch (located in the engine compartment) is in the normal position. With the ignition ON, the engine idling or engine shut-off, momentarily depress the Stop Engine Override (SEO) switch. Active codes will be flashed on the stop engine telltale, followed by the inactive codes being flashed on the check-engine telltale panel. The cycle repeats itself until the operator depresses the stop engine override switch again.

Flashing codes provide a four digit number. Each fault code is flashed twice in order to help with counting the flashes. If there are no active faults or if there are no inactive faults the number "3" is flashed once followed by an ~3s delay.



**FIGURE 16: FLASHING FAULTS CODES**

Refer to DDEC Troubleshooting Manual 6SE567 for more information and SAE codes.

**NOTE**

Active codes are flashed in ascending numerical flash code order. Inactive codes are flashed in most recent to least recent order.

**NOTE**

Fault codes can only be cleared using the DDR.

**NOTE**

The listed codes may not be used in all applications. A default value in the normal operating range is used by the MCM to provide for engine operation if a sensor failure is present.

2.10 DDEC VI CPC DIAGNOSTIC CODES LIST

SPN	FMI	PID/SID	PID/SID ID	FLASH CODES	FAULT DESCRIPTION
70	2	PID	70	2111	Park Brake Status Not Plausible (Vehicle Moving)
70	19	SID	234	2112	J1939 Park Brake Switch Signal from Source #1 is erratic
70	13	SID	234	2112	J1939 Park Brake Switch Signal from Source #1 is missing
70	19	SID	234	2112	J1939 Park Brake Switch Signal from Source #2 is erratic
70	13	SID	234	2112	J1939 Park Brake Switch Signal from Source #2 is missing
70	19	SID	234	2112	J1939 Park Brake Switch Signal from Source #3 is erratic
70	13	SID	234	2112	J1939 Park Brake Switch Signal from Source #3 is missing
84	21	PID	84	2113	Vehicle Speed Failure

**Section 01: ENGINE**

SPN	FMI	PID/SID	PID/SID ID	FLASH CODE	FAULT DESCRIPTION
615	3	SID	167	1615	Volute Shut Off Valve, Shorted to Battery
615	5	SID	168	1615	Volute Shut Off Valve, Open Load
615	4	SID	169	1615	Function 30 Circuit Failed Low
615	3	SID	170	1615	Function 30 Circuit Failed High
615	5	SID	171	1615	Function 30 Circuit Failed Open
615	4	SID	172	1615	Function 31 Circuit Failed Low
615	3	SID	173	1615	Function 31 Circuit Failed High
615	5	SID	174	1615	Function 31 Circuit Failed Open
615	14	SID	155	1453	Smart Remote Actuator 2, No Failsafe Mode, Motor Off
615	9	SID	155	1453	Smart Remote Actuator 2, Failsafe Mode, Motor Off
615	16	SID	155	1453	Smart Remote Actuator 2, Temperature Fault
615	7	SID	155	1453	Smart Remote Actuator 2, Failsafe Mode, Motor On
615	11	SID	155	1453	Smart Remote Actuator 2, Restricted Operability
615	15	SID	155	1453	Smart Remote Actuator 2, Temperature Warning
615	8	SID	155	1453	Smart Remote Actuator 2, Internal Test Running
615	31	SID	155	1453	Smart Remote Actuator 2, Unknown Error Code
615	13	SID	155	1454	Turbocharger Compressor Outlet Differential Pressure Sensor Out Of Calibration
615	13	SID	155	1454	Turbocharger Compressor Outlet Differential Pressure Sensor Out Of Calibration
615	19	SID	155	1637	Smart Actuator Indicates Actuator Position Error
625	2	SID	248	1234	Invalid Data on Engine CAN Link
625	9	SID	248	1234	No Data Received from Engine CAN Link
625	9	SID	248	1234	Engine CAN Low Wire Defect - (wire 1)
625	9	SID	248	1234	Engine CAN High Wire Defect - (wire 2)
630	12	SID	253	1452	EEPROM Read / Write Operation Failed
630	13	SID	253	1455	Calibration Data Not Plausible
630	13	SID	253	1455	Calibration Data Not Plausible (CPLD)
634	4	SID	40	1321	Constant Throttle Valve Circuit Failed Low
634	3	SID	40	1321	Constant Throttle Valve Circuit Failed High
634	5	SID	40	1321	Constant Throttle Valve Circuit Failed Open
636	1	SID	21	1235	Crankshaft Position Sensor Signal Voltage Too Low
636	3	SID	21	1235	Crankshaft Position Sensor Open Circuit
636	4	SID	21	1235	Crankshaft Position Sensor Short to Ground
636	8	SID	21	1235	Crankshaft Position Sensor Time Out
636	14	SID	21	1235	Crankshaft Position Sensor Pins Swapped
636	2	SID	21	1235	No Match of Camshaft and Crankshaft Signals
641	4	SID	27	1542	Turbo Control Circuit Failed Low
641	3	SID	27	1542	Turbo Control Circuit Failed High
641	5	SID	27	1542	Turbo Control Circuit Open
641	14	SID	147	1241	Smart Remote Actuator 5 (VGT), No Failsafe Mode, Motor Off
641	9	SID	147	1241	Smart Remote Actuator 5 (VGT), Failsafe Mode, Motor Off
641	7	SID	147	1241	Smart Remote Actuator 5 (VGT), Failsafe Mode, Motor On
641	11	SID	147	1241	Smart Remote Actuator 5 (VGT), Restricted Operability
641	8	SID	147	1241	Smart Remote Actuator 5 (VGT), Internal Test Running
641	31	SID	147	1241	Smart Remote Actuator 5 (VGT), Unknown Error Code
647	4	SID	33	1334	Fan Stage 1 Circuit Failed Low
647	3	SID	33	1334	Fan Stage 1 Circuit Failed High



## MAINTENANCE

Engine oil temperature should be checked every 25,000 miles (40 000 km) to determine oil cooler efficiency. This check should be made by inserting a steel jacketed thermometer in the dipstick opening, immediately after stopping a hot, loaded engine. If the oil temperature exceeds the coolant temperature by more than 60 °F (33 °C), the oil cooler may be clogged.

For detailed oil specifications, refer to DETROIT DIESEL SERIES 60 2007 ON-HIGHWAY SERVICE MANUAL 6SE2007 under heading «*Lubricating Oil for Detroit Diesel Engines*».

### 2.14 RECOMMENDED ENGINE OIL TYPE

To provide maximum engine life, lubricants shall meet the following specifications: SAE Viscosity Grade: 15W-40 API Classification: CJ-4.



## CAUTION

Low ash oil formulation designated API CJ-4 is required in EPA-07 engines.

CJ-4 contains less than 1% ash which is the key to achieving maximum diesel particulate filter cleaning intervals. Use of high ash engine oils will reduce the cleaning interval on the Diesel Particulate Filter (DPF). DPF regenerates the combustible soot, but the ash (a product of the oil lubricant package) slowly accumulates in the channels of the DPF.

### NOTE

Monograde oils should not be used in these engines regardless of API Service Classification.

### NOTE

The use of supplemental oil additives is discouraged from use in Detroit Diesel Engines.

**Synthetic oils:** Synthetic oils may be used in Detroit Diesel engines provided they are API-licensed and meet the performance and chemical requirements of non-synthetic oils outlined previously. Synthetic oils do not permit extension of recommended oil drain intervals.

### NOTE

#### COLD WEATHER STARTING

The proper selection of the engine oil grade will ease cold weather starting (refer to the lubrication and servicing schedule for the engine oil grade recommendation). Other practical considerations, such as the use of batteries, cables and connectors of adequate size, proper setting of voltage regulator, ether starting aid, oil and coolant heater systems, and proper fuel selection will ease cold weather starting.

### 2.15 POWER PLANT ASSEMBLY REMOVAL

To access the engine or engine-related components, the vehicle power plant assembly must be removed as a whole unit by means of a slide-out cradle. The power plant assembly includes the engine, transmission (including retarder if so equipped), air compressor, alternator and transmission oil cooler.

Remove the power plant assembly as follows:



## CAUTION

Tag hoses and cables for identification before disconnecting in order to facilitate reinstallation. Plug all openings to prevent dirt from entering the system.

### NOTE

*The MCM is non-serviceable. If found defective, replace as a unit.*

1. Disconnect the battery cables from the batteries. With the electrical circuit disrupted, accidental contact with the starter button will not produce an engine start. In addition, the Electronic Unit Injectors (EUI) will be disabled, preventing any fuel delivery to the injector tips.



## WARNING

Due to the heavy load of the rear bumper assembly, it must be adequately supported before attempting to remove it.

2. Remove the rear bumper assembly from the vehicle. Refer to Section 18 BODY, under "Rear Bumper Removal And Installation".

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