



RAM

2017

**RAM TRUCK
DIESEL SUPPLEMENT**

OWNER'S MANUAL

VEHICLES SOLD IN CANADA

With respect to any Vehicles Sold in Canada, the name FCA US LLC shall be deemed to be deleted and the name FCA Canada Inc. used in substitution therefore.

DRIVING AND ALCOHOL

Drunken driving is one of the most frequent causes of accidents.

Your driving ability can be seriously impaired with blood alcohol levels far below the legal minimum. If you are drinking, don't drive. Ride with a designated non-drinking driver, call a cab, a friend, or use public transportation.

WARNING!

Driving after drinking can lead to an accident. Your perceptions are less sharp, your reflexes are slower, and your judgment is impaired when you have been drinking. Never drink and then drive.

This manual illustrates and describes the operation of features and equipment that are either standard or optional on this vehicle. This manual may also include a description of features and equipment that are no longer available or were not ordered on this vehicle. Please disregard any features and equipment described in this manual that are not on this vehicle.

FCA US LLC reserves the right to make changes in design and specifications, and/or make additions to or improvements to its products without imposing any obligation upon itself to install them on products previously manufactured.

Copyright © 2016 FCA US LLC



RAM DIESEL SUPPLEMENT

RAM 1500	3
RAM 2500 / 3500 / 4500 / 5500	85
INDEX	217

RAM 1500

TABLE OF CONTENTS

SECTION

PAGE

1	INTRODUCTION	7	1
2	THINGS TO KNOW BEFORE STARTING YOUR VEHICLE	9	2
3	UNDERSTANDING YOUR INSTRUMENT PANEL	13	3
4	STARTING AND OPERATING	31	4
5	MAINTAINING YOUR VEHICLE	53	5
6	MAINTENANCE SCHEDULE	77	6

INTRODUCTION

CONTENTS

■ A MESSAGE FROM FCA US LLC	8
---------------------------------------	---

A MESSAGE FROM FCA US LLC

FCA US LLC welcomes you as a turbocharged diesel-powered truck owner. Your diesel truck will sound, feel, drive, and operate differently from a gasoline-powered truck. It is important that you read and understand this manual.

Almost 100% of the heavy trucks in the United States and Canada are diesel-powered because of the fuel economy, rugged durability, and high torque which permits pulling heavy loads.

You may find that some of the starting, operating, and maintenance procedures are different. However, they are simple to follow and careful adherence to them will ensure that you take full advantage of the features of this engine.

NOTE:

- Some aftermarket products may cause severe engine/transmission and/or exhaust system damage. Your vehicle's Powertrain Control Systems can detect and store information about vehicle modifications that increase horsepower and torque output such as whether or not performance-enhancing powertrain components, commonly referred to as downloaders, power boxes, or performance chips have been used.

- Any chassis/suspension or tire size modifications to the vehicle will effect the performance of the Adaptive Cruise Control and Forward Collision Warning System.

This information cannot be erased and will stay in the system's memory even if the modification is removed. This information can be retrieved by FCA US LLC, and service and repair facilities, when servicing your vehicle. This information may be used to determine if repair will be covered by New Vehicle Limited Warranty.

There is a probability that the use of a "performance chip" will prohibit the engine from starting. In this instance, the vehicle will need to be serviced by a authorized dealer in order to return the vehicle to its factory settings.

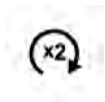
When it comes to service, remember that your authorized dealer knows your vehicle best, has factory-trained technicians and genuine MOPAR® parts, and cares about your satisfaction.

THINGS TO KNOW BEFORE STARTING YOUR VEHICLE

CONTENTS

■ REMOTE STARTING SYSTEM	10	■ ENGINE BREAK-IN RECOMMENDATIONS	11
□ How To Use Remote Start.	10		

REMOTE STARTING SYSTEM



This system uses the key fob to start the engine conveniently from outside the vehicle while still maintaining security. The system has a range of approximately 300 ft (91 m).

NOTE:

- The vehicle must be equipped with an automatic transmission to be equipped with Remote Start.
- Obstructions between the vehicle and the key fob may reduce this range.
- The Remote Start system will wait for the “Wait To Start” amber telltale to extinguish before cranking the engine. This allows time for the engine pre-heat cycle to pre-heat the cylinder air, and is normal in cold weather. Refer to “Instrument Cluster Display” in “Understanding Your Instrument Panel” for further information on the “Wait To Start” amber telltale and the pre-heat cycle.

How To Use Remote Start

All of the following conditions must be met before the engine will remote start:

- Gear selector in PARK
- Doors closed
- Hood closed
- HAZARD switch off
- BRAKE switch inactive (brake pedal not pressed)
- Battery at an acceptable charge level
- PANIC button not pushed
- Fuel meets minimum requirement
- System not disabled from previous remote start event
- Vehicle security alarm not active
- Water In Fuel Indicator Light is not illuminated
- “Wait To Start” telltale is not illuminated

WARNING!

- Do not start or run an engine in a closed garage or confined area. Exhaust gas contains Carbon Monoxide (CO) which is odorless and colorless. Carbon Monoxide is poisonous and can cause serious injury or death when inhaled.
- Keep Remote Keyless Entry key fobs away from children. Operation of the Remote Start System, windows, door locks or other controls could cause serious injury or death.

ENGINE BREAK-IN RECOMMENDATIONS

The diesel engine does not require a break-in period due to its construction. Normal operation is allowed, providing the following recommendations are followed:

- Warm up the engine before placing it under load.
- Do not operate the engine at idle for prolonged periods.
- Use the appropriate transmission gear to prevent engine lugging.

- Observe vehicle oil pressure and temperature indicators.
- Check the coolant and oil levels frequently.
- Vary throttle position at highway speeds when carrying or towing significant weight.

NOTE: Light duty operation such as light trailer towing or no load operation will extend the time before the engine is at full efficiency. Reduced fuel economy and power may be seen at this time.

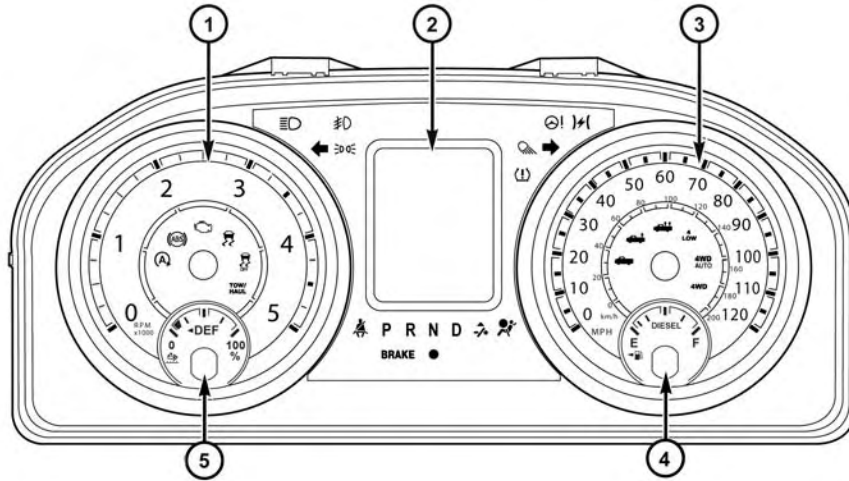
The engine oil installed in the engine at the factory is a high-quality energy conserving type lubricant. Oil changes should be consistent with anticipated climate conditions under which vehicle operations will occur. The recommended viscosity and quality grades are shown under “Fluids, Lubricants and Genuine Parts”, under “Maintaining Your Vehicle” in this manual. **NON-DETERGENT OR STRAIGHT MINERAL OILS MUST NEVER BE USED.**

UNDERSTANDING YOUR INSTRUMENT PANEL

CONTENTS

■ INSTRUMENT CLUSTER	14	□ Displays	26
■ WARNING AND INDICATOR LIGHTS	19	□ Vehicle Information (Customer Information Features).	27
□ Yellow Telltale Indicator Lights	19	□ Diesel Exhaust Fluid (DEF) Warning Messages	28
■ INSTRUMENT CLUSTER DISPLAY	21	□ Diesel Exhaust Fluid (DEF) Fault Warning Messages	29
□ Oil Life Reset	23		
□ Fuel Filter Life Reset	24		
□ Diesel Particulate Filter (DPF) Messages	25		

INSTRUMENT CLUSTER



0403084407US

Instrument Cluster

1. Tachometer

- Indicates the engine speed in revolutions per minute (RPM x 1000).


2. Instrument Cluster Display

- When the appropriate conditions exist, this display shows the Instrument Cluster Display messages. Refer to "Instrument Cluster Display" in "Understanding Your Instrument Panel" for further information.

3. Speedometer

- Indicates vehicle speed.

4. Fuel Gauge

- The pointer shows the level of fuel in the fuel tank when the ignition switch is in the ON/RUN position.
-  The fuel pump symbol points to the side of the vehicle where the fuel filler door is located.

5. DEF Gauge

- The DEF Gauge displays the actual level of Diesel Exhaust Fluid in the DEF tank. Diesel Exhaust Fluid (DEF) is required to maintain normal vehicle operation and emissions compliance. If something is wrong with the gauge, a DEF Warning Message or Malfunction Indicator Light (MIL) will be displayed. More information is available in the Instrument Cluster Display section under the heading of Diesel Exhaust Fluid (DEF) Warning Messages.

WARNING!

A hot engine cooling system is dangerous. You or others could be badly burned by steam or boiling coolant. You may want to call an authorized dealer for

(Continued)

WARNING! (Continued)

service if your vehicle overheats. If you decide to look under the hood yourself, see “Maintaining Your Vehicle.” Follow the warnings under the “Cooling System Pressure Cap” paragraph.

3

CAUTION!

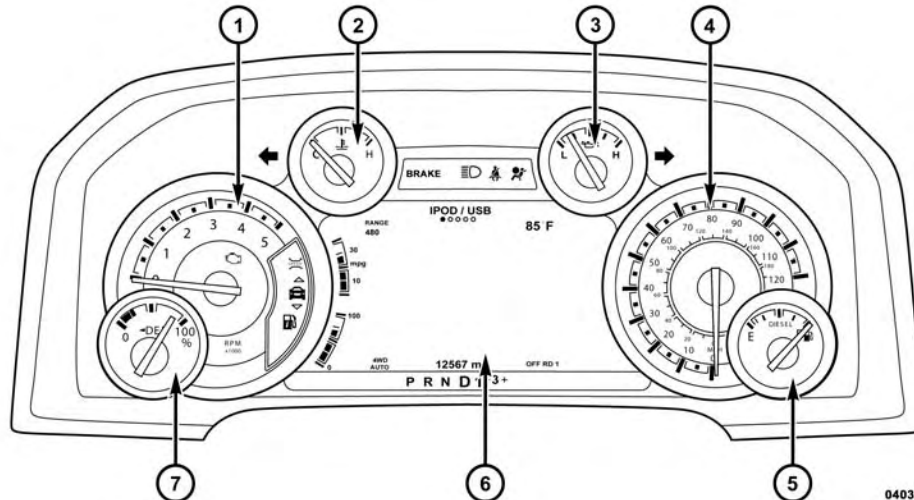
Driving with a hot engine cooling system could damage your vehicle. If the temperature gauge reads “H” pull over and stop the vehicle. Idle the vehicle with the air conditioner turned off until the pointer drops back into the normal range. If the pointer remains on the “H”, turn the engine off immediately and call an authorized dealer for service.

NOTE:

- The gauge may take up to five seconds to update after adding a gallon or more of Diesel Exhaust Fluid (DEF) to the DEF tank. If you have a fault related to the DEF system, the gauge may not update to the new level. See your authorized dealer for service.

16 UNDERSTANDING YOUR INSTRUMENT PANEL

- The DEF gauge may also not immediately update after a refill if the temperature of the DEF fluid is below 12°F (-11°C). The DEF line heater will possibly warm up the DEF fluid and allow the gauge to update after a period of run time. Under very cold conditions, it is possible that the gauge may not reflect the new fill level for several drives.
- Outside temperature can affect DEF consumption. In cold conditions, 12° F (-11° C) and below, the DEF gauge needle can stay on a fixed position and may not move for extended periods of time. This is a normal function of the system.



0403084413US

Instrument Cluster

1. Tachometer

- Indicates the engine speed in revolutions per minute (RPM x 1000).

2. Engine Coolant Temperature

- This gauge shows the engine coolant temperature. The gauge pointer will likely show higher temperatures when driving in hot weather, up mountain grades, or in heavy stop and go traffic. If the red Warning Light turns on while driving, safely bring the vehicle to a stop, and turn off the engine. DO NOT operate the vehicle until the cause is corrected.

WARNING!

A hot engine cooling system is dangerous. You or others could be badly burned by steam or boiling coolant. You may want to call an authorized dealer for service if your vehicle overheats. If you decide to look under the hood yourself, see "Maintaining Your Vehicle." Follow the warnings under the "Cooling System Pressure Cap" paragraph.

CAUTION!

Driving with a hot engine cooling system could damage your vehicle. If the temperature gauge reads "H" pull over and stop the vehicle. Idle the vehicle with the air conditioner turned off until the pointer drops back into the normal range. If the pointer remains on the "H", turn the engine off immediately and call an authorized dealer for service.

3


3. Oil Pressure Gauge

- The pointer should always indicate some oil pressure when the engine is running. A continuous high or low reading under normal driving conditions may indicate a lubrication system malfunction. Immediate service should be obtained from an authorized dealer.

4. Speedometer

- Indicates vehicle speed.

5. Fuel Gauge

- The pointer shows the level of fuel in the fuel tank when the ignition switch is in the ON/RUN position.
-  The fuel pump symbol points to the side of the vehicle where the fuel filler door is located.

6. Instrument Cluster Display

- When the appropriate conditions exist, this display shows the Instrument Cluster Display messages. Refer to “Instrument Cluster Display” in “Understanding Your Instrument Panel” for further information.

7. DEF Gauge

- The DEF Gauge displays the actual level of Diesel Exhaust Fluid in the DEF tank. Diesel Exhaust Fluid (DEF) is required to maintain normal vehicle operation and emissions compliance. If something is wrong with the gauge, a DEF Warning Message or Malfunction Indicator Light (MIL) will be displayed. More information is available in the Instrument Cluster Display section under the heading of Diesel Exhaust Fluid (DEF) Warning Messages.

NOTE:

- The DEF tank on these vehicles is designed with a large amount of full reserve. So the level sensor will indicate a full reading even before the tank is completely full. To put it another way, there’s additional storage capacity in the tank above the Full mark that’s not represented in the gauge. You may not see any movement in the reading – even after driving up to 2,000 miles in some cases.

- The gauge may take up to five seconds to update after adding a gallon or more of Diesel Exhaust Fluid (DEF) to the DEF tank. If you have a fault related to the DEF system, the gauge may not update to the new level. See your authorized dealer for service.
- The DEF gauge may also not immediately update after a refill if the temperature of the DEF fluid is below 12F (-11C). The DEF line heater will possibly warm up the DEF fluid and allow the gauge to update after a period of run time. Under very cold conditions, it is possible that the gauge may not reflect the new fill level for several drives.
- Outside temperature can affect DEF consumption. In cold conditions, 12° F (-11° C) and below, the DEF gauge needle can stay on a fixed position and may not move for extended periods of time. This is a normal function of the system.

CAUTION!

Driving with a hot engine cooling system could damage your vehicle. If the temperature gauge reads “H” pull over and stop the vehicle. Idle the vehicle with the

(Continued)


CAUTION! (Continued)

air conditioner turned off until the pointer drops back into the normal range. If the pointer remains on the "H", turn the engine off immediately and call an authorized dealer for service.

WARNING AND INDICATOR LIGHTS

IMPORTANT: The warning / indicator lights switch on in the instrument panel together with a dedicated message and/or acoustic signal when applicable. These indications


Yellow Telltale Indicator Lights**Wait To Start Light — If Equipped**

Yellow Telltale Light	What It Means
	<p>Wait To Start Light The "Wait To Start" telltale will illuminate for approximately two seconds when the ignition is turned to the RUN position. It's duration may be longer based on colder operating conditions. Vehicle will not initiate start until telltale is no longer displayed. Refer to "Starting Procedures" in "Starting and Operating" for further information.</p> <p>NOTE: The "Wait To Start" telltale may not illuminate if the intake manifold temperature is warm enough.</p>


are indicative and precautionary and as such must not be considered as exhaustive and/or alternative to the information contained in the Owner's Manual, which you are advised to read carefully in all cases. Always refer to the information in this chapter in the event of a failure indication.

All active telltales will display first if applicable. The system check menu may appear different based upon equipment options and current vehicle status. Some telltales are optional and may not appear.

Water in Fuel Indicator Light — If Equipped

Yellow Telltale Light	What It Means
	<p>Water in Fuel Indicator Light The “Water In Fuel Indicator Light” will illuminate when there is water detected in the fuel filters. If this light remains on, DO NOT start the vehicle before you drain the water from the fuel filters to prevent engine damage.</p>

Low Diesel Exhaust Fluid (DEF) Indicator Light — If Equipped

Yellow Telltale Light	What It Means
	<p>Low Diesel Exhaust Fluid (DEF) Indicator Light The Low Diesel Exhaust Fluid (DEF) Indicator will illuminate if the vehicle is low on Diesel Exhaust Fluid (DEF). Refer to “Starting And Operating” for further information.</p>

- Trip B
- Stop/Start Info (If Equipped)
- Trailer Tow
- Audio
- Stored Messages
- Screen Setup
- Vehicle Settings (Not Equipped with a Uconnect 5.0 & 8.4 radio)
- Settings
- Turn Menu Off

The system allows the driver to select information by pushing the following buttons mounted on the steering wheel:



040971549

Steering Wheel Buttons

- *UP Arrow Button*



Push and release the **UP** arrow button to scroll upward through the main menu and submenus (Fuel Economy, Trip A, Trip B, Audio, Stored Messages, Screen Set Up).

- *DOWN Arrow Button*



Push and release the **DOWN** arrow button to scroll downward through the main menu and submenus (Fuel Economy, Trip A, Trip B, Audio, Stored Messages, Screen Set Up).

- **RIGHT Arrow Button**



Push and release the **RIGHT** arrow button to access/select the information screens or submenu screens of a main menu item. Push and hold the **RIGHT** arrow button for two seconds to

reset displayed/selected features that can be reset.

- **LEFT Arrow Button**



Push the **LEFT** arrow button to access/select the information screens or submenu screens of a main menu item or to return to the main menu from an info screen or submenu item.

Oil Life Reset

Your vehicle is equipped with an engine oil change indicator system. The “Oil Change Required” message will display in the instrument cluster display after a single chime has sounded, to indicate the next scheduled oil change interval. The engine oil change indicator system is duty cycle based, which means the engine oil change interval may fluctuate, dependent upon your personal driving style.




NOTE: Use the steering wheel instrument cluster display controls for the following procedure(s).

Vehicles Equipped With Passive Entry

1. Without pushing the brake pedal, push the ENGINE START/STOP button and place the ignition to the ON/RUN position (do not start the engine).
2. Push and release the **down** ▽ arrow button to scroll downward through the main menu to “Vehicle Info.”
3. Push and release the **right** ▷ arrow button to access the “Oil Life” screen.
4. Push and hold the **right** ▷ arrow button to select “Reset”.
5. Push and release the appropriate arrow button to select “YES” to reset the Oil Life.
6. Push and release the **up** ▲ arrow button to exit the instrument cluster display screen.

Vehicles Not Equipped With Passive Entry

1. Without pushing the brake pedal, cycle the ignition to the ON/RUN position (do not start the engine).
2. Push and release the **down** ▽ arrow button to scroll downward through the main menu to “Vehicle Info.”

3. Push and release the **right**  arrow button to access the “Oil Life” screen.
4. Push and hold the **right**  arrow button to select the Oil Life Reset.
5. Push and release the appropriate arrow button to select “YES” to reset the Oil Life.
6. Push and release the **up**  arrow button to exit the instrument cluster display screen.




NOTE: If the indicator message illuminates when you start the vehicle, the Oil Life indicator system did not reset. If necessary, repeat this procedure.

Fuel Filter Life Reset


The cluster will display the “Service Fuel Filter” message when the fuel filter maintenance life is less than 5%. To check the remaining fuel filter life, go to the “Fuel Filter Life” screen in the “Vehicle Info” menu. When this message appears, dealers should replace the fuel filter.



NOTE: Use the steering wheel button controls for the following procedure(s)

Vehicles Equipped With Passive Entry

1. Without pushing the brake pedal, push the ENGINE START/STOP button and cycle the ignition to the ON/RUN position (do not start the engine.)
2. Push and release the **DOWN**  arrow button to scroll downward through the main menu to “Vehicle Info”.
3. Push and release the **RIGHT**  arrow button to access the “Fuel Filter Life” screen.
4. Push and release the appropriate arrow button to access the “Reset” screen.
5. Push and release the appropriate arrow to select the reset of the Fuel Filter Life.
6. Push and release the **UP**  arrow button to exit the Instrument Cluster Display screen.

Vehicles Not Equipped With Passive Entry

1. Without pressing the brake pedal, cycle the ignition to the ON/RUN position (do not start the engine.)
2. Push and release the **DOWN**  arrow button to scroll downward through the main menu to “Vehicle Info”.

3. Push and release the **RIGHT**  arrow button to access the "Fuel Filter Life" screen.
4. Push and release the appropriate arrow button to access the "Reset" screen.
5. Push and release the appropriate arrow to select the reset of the Fuel Filter Life.
6. Push and release the **UP**  arrow button to exit the Instrument Cluster Display screen.

NOTE: If the indicator message illuminates when you start the vehicle, the Fuel Filter indicator system did not reset. If necessary, repeat this procedure.

Diesel Particulate Filter (DPF) Messages

This engine meets all required diesel engine emissions standards. To achieve these emissions standards, your vehicle is equipped with a state-of-the-art engine and exhaust system. These systems are seamlessly integrated into your vehicle and managed by the Powertrain Control Module (PCM). The PCM manages engine combustion to allow the exhaust system's catalyst to trap and burn Particulate Matter (PM) pollutants, with no input or interaction on your part.

WARNING!

A hot exhaust system can start a fire if you park over materials that can burn. Such materials might be grass or leaves coming into contact with your exhaust system. Do not park or operate your vehicle in areas where your exhaust system can contact anything that can burn.

3

Your vehicle has the ability to alert you to additional maintenance required on your vehicle or engine. Refer to the following messages that may be displayed on your instrument cluster:

- **Exhaust Filter XX% Full Safely Drive at Highway Speeds to Remedy** — This message will be displayed in the instrument cluster if the exhaust particulate filter reaches 80% of its maximum storage capacity. Under conditions of exclusive short duration and low speed driving cycles, your diesel engine and exhaust after-treatment system may never reach the conditions required to cleanse the filter to remove the trapped PM. If this occurs, the "Exhaust Filter XX% Full Safely Drive at Highway Speeds to Remedy" message will be displayed in the Instrument Cluster Display. If this message is displayed, you will hear one chime to assist in alerting

you of this condition. By simply driving your vehicle at highway speeds for up to 20 minutes, you can remedy the condition in the particulate filter system and allow your diesel engine and exhaust after-treatment system to cleanse the filter to remove the trapped PM and restore the system to normal operating condition.

- **Exhaust System — Regeneration In Process Exhaust Filter XX% Full** — This message indicates that the Diesel Particulate Filter (DPF) is self-cleaning. Maintain your current driving condition until regeneration is completed.
- **Exhaust System — Regeneration Completed** — This message indicates that the Diesel Particulate Filter (DPF) self-cleaning is completed. If this message is displayed, you will hear one chime to assist in alerting you of this condition.
- **Exhaust Service Required — See Dealer Now** — This message indicates regeneration has been disabled due to a system malfunction. At this point the engine Powertrain Control Module (PCM) will register a fault code, the instrument panel will display a MIL light.

CAUTION!

See your authorized dealer, as damage to the exhaust system could occur soon with continued operation.

- **Exhaust Filter Full — Power Reduced See Dealer** — This message indicates the PCM has derated the engine to limit the likelihood of permanent damage to the after-treatment system. If this condition is not corrected and a dealer service is not performed, extensive exhaust after-treatment damage can occur. To correct this condition it will be necessary to have your vehicle serviced by your local authorized dealer.

CAUTION!

See your authorized dealer, as damage to the exhaust system could occur soon with continued operation.

Displays

When the appropriate conditions exist, the Instrument Cluster Display displays the following messages:

- System Setup Unavailable – Vehicle Not in Park
- System Setup Unavailable – Vehicle in Motion

- Exhaust Filter Full Safely Drive at Highway Speeds To Remedy
- Exhaust Filter XX% Full – Power Reduced See Dealer
- Exhaust Service Required – See Dealer Now
- Exhaust System – Filter XX% Full Service Required See Dealer
- Exhaust System – Regeneration In Process Exhaust Filter XX% Full
- Exhaust System – Regeneration Completed
- Engine Will Not Restart in XXXX mi DEF Low Refill Soon
- Engine Will Not Restart in XXXX mi Refill DEF
- Engine Will Not Restart Refill DEF
- Service DEF System See Dealer
- Incorrect DEF Detected See Dealer
- Engine Will Not Restart in XXX mi Service DEF See Dealer
- Engine Will Not Restart Service DEF System See Dealer

Vehicle Information (Customer Information Features)

Vehicle Information Submenus

- *Battery Voltage*

Displays the actual battery voltage.

- *Fuel Filter Life*

Displays the life of the fuel filter.

- *Oil Pressure*

Displays the actual oil pressure.

- *Oil Temperature*

Displays the actual oil temperature.

- *Trans Temperature*

Displays the actual transmission sump temperature.

- *Coolant Temp*

Displays the actual coolant temperature.

- *Tire Pressure Monitor System*

Displays the actual tire pressure.

- *Engine Hours*

Displays the actual engine hours.

Gauge Summary (Coolant Temp, Trans Temp, Oil Temp, Oil Pressure)

Diesel Exhaust Fluid (DEF) Warning Messages

Your vehicle will begin displaying warning messages when the DEF level reaches a driving range of approximately 500 miles (800 km). If the following warning message sequence is ignored, your vehicle may not restart unless DEF is added with in the displayed mileage shown in the cluster message.

- **Engine Will Not Restart in XXXX mi DEF Low Refill Soon** — This message will display when DEF driving range is less than 500 miles, DEF fluid top off is required with in the displayed mileage. The message will be displayed in the cluster during vehicle start up with the current allowed mileage and accompanied by a single chime. The remaining mileage can be pulled up anytime by way of the “Messages” list within the Instrument Cluster Display
- **Engine Will Not Restart in XXXX mi Refill DEF** — This message will display when DEF driving range is less than 200 miles. It is also displayed at 150 miles and 100 miles. DEF fluid top off is required with in the displayed mileage. The message will be displayed in the Instrument Cluster Display during vehicle start up with an updated distance mileage, and it will be accompanied by a single chime. Starting at 100 miles, remaining range will be continuously displayed while operating the vehicle. Chimes will also accompany the 75, 50 and 25 mile remaining distances. The DEF Low telltale will be on continuously until DEF fluid is topped off.
- **Engine Will Not Restart Refill DEF** — This message will display when the DEF driving range is less than 1 mile, DEF fluid top off is required or the engine will not restart. The message will be displayed in the Instrument Cluster Display during vehicle start up, and it will be accompanied by a single chime. The DEF Low telltale will be illuminated continuously until DEF fluid tank is filled with a minimum of two gallons of DEF.

Diesel Exhaust Fluid (DEF) Fault Warning Messages

There are different messages which are displayed if the vehicle detects that the DEF system has been filled with a fluid other than DEF, has experienced component failures, or when tampering has been detected.

When the DEF system needs to be serviced the following warnings will display:

- **Service DEF System See Dealer** — This message will display when the fault is initially detected and each time the vehicle is started. The message will be accompanied by a single chime and the Malfunction Indicator Light. We recommend you drive to your nearest authorized dealer and have your vehicle serviced immediately. If not corrected in 50 miles, vehicle will enter the “Engine Will not restart in XXXmi Service DEF See dealer” warning stage and message.
- **Incorrect DEF Detected See Dealer** — This message will display if the DEF system has detected the incorrect fluid has been introduced to the DEF tank. The message will be accompanied by a single chime. We recommend you drive to your nearest authorized dealer and have your vehicle serviced immediately. If not corrected in

30 miles, vehicle will enter the “Engine Will not restart in XXX mi Service DEF See dealer” warning stage and message.

- **Engine Will Not Restart in XXX mi Service DEF See Dealer** — This message is first displayed if the fault detected is not serviced after 50 miles of operation. It is also displayed at 150 miles 125 miles and 100 miles. System service is required within the displayed mileage. The message will be displayed during vehicle start up with an updated distance mileage, and it will be accompanied by a single chime. Starting at 100 miles, remaining range will be continuously displayed while operating the vehicle. Chimes will also accompany the 75, 50 and 25 mile remaining distances. We recommend you drive to your nearest authorized dealer and have your vehicle serviced immediately.
- **Engine Will Not Restart Service DEF System See Dealer** — This message will display if DEF system issue detected is not serviced during the allowed period. Your engine will not restart unless your vehicle is serviced by your authorized dealer. This message will be displayed when under 1 mile until engine will not start and each time the vehicle is started, and will be continuously displayed. The message will be accompanied by a single

chime. Your Malfunction Indicator Light will be continuously illuminated. We highly recommend you drive to your nearest authorized dealer if the message appears while engine is running.

- **Engine Will Not Start Service DEF System See Dealer**
— This message will display when the fault detected is not serviced after the Engine will not restart Service DEF System See Dealer message is displayed on the next subsequent restart. Your engine will not start unless your vehicle is serviced by your authorized dealer. The message will be accompanied by a single chime. Your Malfunction Indicator Light will be continuously illuminated. If the message appears and you can not start the engine, we recommend you have your vehicle towed to your nearest authorized dealer immediately.

STARTING AND OPERATING

CONTENTS

■ STARTING PROCEDURES	32	■ ENGINE BLOCK HEATER — IF EQUIPPED	40
□ Normal Starting	33	■ FUEL REQUIREMENTS	40
□ Automatic Transmission	33	□ Fuel Specifications	41
□ Keyless Enter-N-Go — Ignition	33	□ Biodiesel Fuel Requirements	42
□ Extreme Cold Weather	34	■ DIESEL EXHAUST FLUID	44
□ Starting Fluids	34	□ System Overview	44
■ NORMAL OPERATION	35	■ ADDING FUEL — 1500 DIESEL MODELS	45
□ Cold Weather Precautions	36	□ Avoid Using Contaminated Fuel	47
□ Engine Idling	38	□ Bulk Fuel Storage — Diesel Fuel	48
□ Stopping The Engine	38	□ Diesel Exhaust Fluid Storage	48
□ Cooling System Tips — Automatic Transmission	39	□ Adding Diesel Exhaust Fluid	49

STARTING PROCEDURES

Before starting your vehicle, adjust your seat, both inside and outside mirrors, and fasten your seat belts.

The starter is allowed to crank for up to 30-second intervals. Waiting a few minutes between such intervals will protect the starter from overheating.

WARNING!

- Before exiting a vehicle, always shift the automatic transmission into PARK and apply the parking brake. Always make sure the keyless ignition node is in the "OFF" mode, remove the key fob from the vehicle and lock the vehicle.
- Never leave children alone in a vehicle, or with access to an unlocked vehicle. Leaving children in a vehicle unattended is dangerous for a number of reasons. A child or others could be seriously or fatally injured. Children should be warned not to touch the parking brake, brake pedal or the gear selector.

(Continued)

WARNING! (Continued)

- Do not leave the key fob in or near the vehicle, or in a location accessible to children, and do not leave the ignition of a vehicle equipped with Keyless Enter-N-Go in the ACC or ON/RUN mode. A child could operate power windows, other controls, or move the vehicle.
- Do not leave children or animals inside parked vehicles in hot weather. Interior heat build-up may cause serious injury or death.

NOTE: Engine start up in very low ambient temperature could result in evident white smoke. This condition will disappear as the engine warms up.

CAUTION!

- The engine is allowed to crank as long as 30 seconds. If the engine fails to start during this period, please wait at least two minutes for the starter to cool before repeating start procedure.

(Continued)

CAUTION! *(Continued)*

- If the “Water in Fuel Indicator Light” remains on, **DO NOT START** engine before you drain the water from the fuel filters to avoid engine damage. Refer to “Maintenance Procedures/Draining Fuel/Water Separator Filter” in “Maintaining Your Vehicle” for further information.

Normal Starting

Normal starting of either a warm or cold engine is obtained without pumping or pressing the accelerator pedal. Turn the key fob to the START position and release when the engine starts. If the engine fails to start, turn the key fob to the OFF position, wait five seconds, then repeat the “Normal Starting” procedure.

Automatic Transmission

Start the engine with the transmission gear selector in the PARK position. Apply the brake before shifting to any driving range.

Tip Start Feature

Do not press the accelerator. Cycle the ignition switch briefly to the START position and release it. The starter motor will continue to run but will automatically disengage when the engine is running.

Keyless Enter-N-Go — Ignition

This feature allows the driver to operate the ignition switch with the push of a button, as long as the Remote Start/Keyless Enter-N-Go key fob is in the passenger compartment.

Normal Starting Procedure — Keyless Enter-N-Go

Observe the instrument panel cluster lights when starting the engine.

NOTE: Normal starting of either a cold or a warm engine is obtained without pumping or pressing the accelerator pedal

1. Always apply the parking brake.

2. Press and hold the brake pedal while pushing the ENGINE START/STOP button once.

NOTE: A delay of the start of up to five seconds is possible under very cold conditions. The "Wait to Start" telltale will be illuminated during the pre-heat process. When the engine Wait To Start light goes off the engine will automatically crank.

CAUTION!

If the "Water in Fuel Indicator Light" remains on, DO NOT START the engine before you drain the water from the fuel filters to avoid engine damage. Refer to "Maintenance Procedures/Draining Fuel/Water Separator Filter" in "Maintaining Your Vehicle" for further information.

3. The system will automatically engage the starter to crank the engine. If the vehicle fails to start, the starter will disengage automatically after 25 seconds.
4. If you wish to stop the cranking of the engine prior to the engine starting, push the button again.
5. Check that the oil pressure warning light has turned off.
6. Release the parking brake.

Extreme Cold Weather

The engine block heater is a resistance heater installed in the water jacket of the engine. It requires a 110–115 Volt AC electrical outlet with a grounded, three-wire extension cord. Its use is recommended for environments that routinely fall below -10°F (-23°C). It should be used when the vehicle has not been running overnight or longer periods and should be plugged in two hours prior to start. Its use is required for cold starts with temperatures under -20°F (-28°C).

NOTE: The engine block heater cord is a factory installed option. If your vehicle is not equipped, heater cords are available from your authorized MOPAR dealer.

- A 12 Volt heater built into the fuel filter housing aids in preventing fuel gelling. It is controlled by a built-in thermostat.
- A Diesel Pre-Heat system both improves engine starting and reduces the amount of white smoke generated by a warming engine.

Starting Fluids

The engine is equipped with a glow plug preheating system. If the instructions in this manual are followed, the engine should start in all conditions and no type of starting fluid should be used.

WARNING!

- Do not leave children or animals inside parked vehicles in hot weather. Interior heat build up may cause serious injury or death.
- When leaving the vehicle, always make sure the keyless ignition node is in the "OFF" mode, remove the key fob from the vehicle and lock the vehicle.
- Never leave children alone in a vehicle, or with access to an unlocked vehicle. Allowing children to be in a vehicle unattended is dangerous for a number of reasons. A child or others could be seriously or fatally injured. Children should be warned not to touch the parking brake, brake pedal or the gear selector.
- Do not leave the key fob in or near the vehicle, or in a location accessible to children, and do not leave the ignition of a vehicle equipped with Keyless Enter-N-Go in the ACC or ON/RUN mode. A child could operate power windows, other controls, or move the vehicle.

NORMAL OPERATION

Observe the following when the diesel engine is operating.

- All message center lights are off.
- Malfunction Indicator Light (MIL) is off.
- Engine Oil Pressure telltale is not illuminated.
- Voltmeter operation:

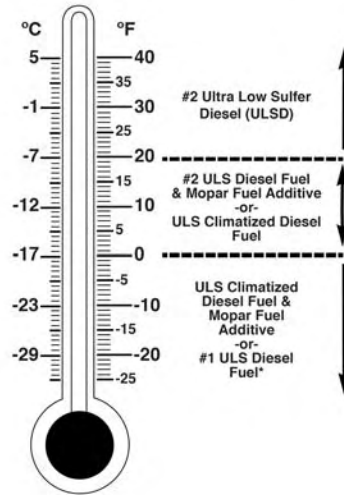
The voltmeter may show a gauge fluctuation at various engine temperatures. This is caused by the glow plug heating system. The number of cycles and the length of the cycling operation is controlled by the engine control module. Glow plug heater operation can run for several minutes, once the heater operation is complete the voltmeter needle will stabilize.

Cold Weather Precautions

Operation in ambient temperature below 32°F (0°C) may require special considerations. The following charts suggest these options:

Fuel Operating Range

NOTE: Use “Ultra Low Sulfur Diesel Fuels” **ONLY**.



Fuel Operating Range Chart

*No. 1 Ultra Low Sulfur Diesel Fuel should only be used where extended arctic conditions (0°F/-18°C) exist.

NOTE:

- Use of Climatized Ultra Low Sulfur Diesel Fuel or Number 1 Ultra Low Sulfur Diesel Fuel results in a noticeable decrease in fuel economy.
- Climatized Ultra Low Sulfur Diesel Fuel is a blend of Number 2 Ultra Low Sulfur and Number 1 Ultra Low Sulfur Diesel Fuels which reduces the temperature at which wax crystals form in fuel.
- The fuel grade should be clearly marked on the pump at the fuel station.
- The engine requires the use of **“Ultra Low Sulfur Diesel Fuel”**. Use of incorrect fuel could result in engine and exhaust system damage. Refer to “Fuel Requirements” in “Starting And Operating” for further information.
- If climatized or diesel Number 1 ULSD fuel is not available, and you are operating below (20°F/-6°C), in sustained arctic conditions, Mopar Premium Diesel Fuel Treatment (or equivalent) is recommended to avoid gelling (see Fuel Operating Range Chart).

Engine Oil Usage

Refer to “Maintenance Procedures” in “Maintaining Your Vehicle” for the correct engine oil viscosity.

Winter Front Usage

0502092148US

4

Winter Front Cover

A winter front or cold weather cover is to be used in ambient temperatures below 32°F (0°C), especially during extended idle conditions. This cover is equipped with four flaps for managing total grille opening in varying ambient temperatures. If a winter front or cold weather cover is to be used the flaps should be in the full open position to allow air flow to the charge air cooler and automatic transmission oil cooler. When ambient temperatures drop

below 0°F (-17°C) the four flaps need to be closed. A suitable cold weather cover is available from your MOPAR dealer.

Engine Warm-Up

Avoid full throttle operation when the engine is cold. When starting a cold engine, bring the engine up to operating speed slowly to allow the oil pressure to stabilize as the engine warms up.

If temperatures are below 32°F (0°C), operate the engine at moderate speeds for five minutes before full loads are applied.

Engine Idling

Avoid prolonged idling, long periods of idling may be harmful to your engine because combustion chamber temperatures can drop so low that the fuel may not burn

completely. Incomplete combustion allows carbon and varnish to form on piston rings, cylinder head valves, and injector nozzles. Also, the unburned fuel can enter the crankcase, diluting the oil and causing rapid wear to the engine.

Stopping The Engine

After full load operation, idle the engine for a few minutes before shutting it down. This idle period will allow the lubricating oil and coolant to carry excess heat away from the turbocharger.

NOTE: Refer to the following chart for proper engine shutdown.

Driving Condition	Load	Turbocharger Temperature	Idle Time (min.) Before Engine Shutdown
Stop and Go	Empty	Cool	None
Stop and Go	Medium		0.5
Highway Speeds	Medium	Warm	1.0
City Traffic	Maximum GCWR		1.5

Driving Condition	Load	Turbocharger Temperature	Idle Time (min.) Before Engine Shutdown
Highway Speeds	Maximum GCWR		2.0
Uphill Grade	Maximum GCWR	Hot	2.5

NOTE: Under certain conditions the engine fan will run after the engine is turned off. These conditions are under high load and high temperature conditions.

Cooling System Tips — Automatic Transmission

To reduce the potential for engine and transmission overheating in high ambient temperature conditions, take the following actions:

- City Driving — When stopped, shift the transmission into NEUTRAL and increase engine idle speed.
- Highway Driving — Reduce your speed.
- Up Steep Hills — Select a lower transmission gear.
- Air Conditioning — Turn it off temporarily.

NOTE: If the coolant temperature is too high the A/C will automatically turn off.

Do Not Operate The Engine With Low Oil Pressure

If the low oil pressure warning light turns on while driving, stop the vehicle and shut down the engine as soon as possible. A chime will sound when the light turns on.

NOTE: Do not operate the vehicle until the cause is corrected. This light does not show how much oil is in the engine. The engine oil level must be checked under the hood.

CAUTION!

If oil pressure falls to less than normal readings, shut the engine off immediately. Failure to do so could result in immediate and severe engine damage.

Do Not Operate The Engine With Failed Parts

All engine failures give some warning before the parts fail. Be on the alert for changes in performance, sounds, and visual evidence that the engine requires service. Some important clues are:

- Engine misfiring or vibrating severely.
- Sudden loss of power.
- Unusual engine noises.
- Fuel, oil or coolant leaks.
- Sudden change, outside the normal operating range, in the engine operating temperature.
- Excessive smoke.
- Oil pressure drop.

ENGINE BLOCK HEATER — IF EQUIPPED

The engine block heater warms engine coolant and permits quicker starts in cold weather. Connect the heater cord to a ground-fault interrupter protected 110–115 Volt AC electrical outlet with a grounded, three-wire extension cord.

Its use is recommended for environments that routinely fall below -10°F (-23°C). It should be used when the vehicle has not been running for long periods of time and should be

plugged in two hours prior to start. Its use is required for cold starts with temperatures under -20°F (-28°C).

To ensure reliable starting at these temperatures, use of an externally powered electric engine block heater (available from your authorized dealer) is recommended.

WARNING!

Remember to disconnect the cord before driving. Damage to the 110–115 Volt electrical cord could cause electrocution.

NOTE: The block heater will require 110 Volts AC and 6.5 Amps to activate the heater element.

FUEL REQUIREMENTS

Use good quality diesel fuel from a reputable supplier in your vehicle. Federal law requires that you must fuel this vehicle with Ultra Low Sulfur Highway Diesel fuel (15 ppm Sulfur maximum) and prohibits the use of Low Sulfur Highway Diesel fuel (500 ppm Sulfur maximum) to avoid damage to the emissions control system.

For most year-round service, No. 2 diesel fuel meeting ASTM (formerly known as the American Society for Testing and Materials) specification D-975 Grade S15 will

provide good performance. If the vehicle is exposed to extreme cold (below 20°F or -7°C), or is required to operate at colder-than-normal conditions for prolonged periods, use climatized No. 2 diesel fuel or dilute the No. 2 diesel fuel with 50% No. 1 diesel fuel. This will provide better protection from fuel gelling or wax-plugging of the fuel filter.

WARNING!

Do not use alcohol or gasoline as a fuel blending agent. They can be unstable under certain conditions and hazardous or explosive when mixed with diesel fuel.

Diesel fuel is seldom completely free of water. To prevent fuel system trouble, drain the accumulated water from the fuel/water separator using the fuel/water separator drain provided on the fuel filter housing. If you buy good quality fuel and follow the cold weather advice above, fuel conditioners should not be required in your vehicle. If available in your area, a high cetane “premium” diesel fuel may offer improved cold-starting and warm-up performance.

CAUTION!

If the “Water in Fuel Indicator Light” remains on, DO NOT START engine before you drain the water from the fuel filter(s) to avoid engine damage. Refer to “Maintenance Procedures/Draining Fuel/Water Separator Filter” in “Maintaining Your Vehicle” for further information.

4

Fuel Specifications

This diesel engine has been developed to take advantage of the high energy content and generally lower cost No. 2 Ultra Low Sulfur diesel fuel or No. 2 Ultra Low Sulfur climatized diesel fuels.

NOTE:

- If you accidentally fill the fuel tank with gasoline on your diesel vehicle, do not start the engine. Damage to the engine and fuel system could occur. Please call your authorized dealer for service.
- A maximum blend of 5% biodiesel meeting ASTM specification D-975 may be used with your diesel engine without any adjustments to regular service schedules.

- Commercially available fuel additives are not necessary for the proper operation of your diesel engine.
- No. 1 Ultra Low Sulfur diesel fuel should only be used where extended arctic conditions (-10°F or -23°C) exist.

Biodiesel Fuel Requirements

A maximum blend of 5% biodiesel meeting ASTM specification D975 is recommended for use with your diesel engine. If frequent operation with biodiesel blends that are between 6% and 20% (B6–B20) is desired, the maintenance schedule is subject to shorter intervals.

The oil and filter change along with fuel filter replacement is subject to shorter intervals when operating your engine on biodiesel greater than 5%. Do not use biodiesel greater than 20%.

For regular use of biodiesel blends between 6% and 20% (B6–B20) it is important that you understand and comply with these requirements. Refer to the “Maintenance Chart” in the “Maintenance Schedules” section for further direction.

CAUTION!

Failure to comply with Oil Change requirements for vehicles operating on biodiesel blends between 6% and 20% (B6–B20) will result in premature engine wear. Such wear is not covered by the New Vehicle Limited Warranty.

Biodiesel is a fuel produced from renewable resources typically derived from animal fat, rapeseed oil (Rapeseed Methyl Ester (RME) base), or soybean oil (Soy Methyl Ester (SME or SOME) base).

Biodiesel fuel has inherent limitations which require that you understand and adhere to the following requirements if you use blends of biodiesel between 6% and 20% (B6–B20). There are no unique restrictions for the use of B5.

CAUTION!

Use of blends greater than 20% is not approved. Use of blends greater than 20% can result in engine damage. Such damage is not covered by the New Vehicle Limited Warranty.

Biodiesel Fuel Properties — Low Ambient Temperatures

Biodiesel fuel may gel or solidify at low ambient temperatures, which may pose problems for both storage and operation. Precautions can be necessary at low ambient temperatures, such as storing the fuel in a heated building or a heated storage tank, or using cold temperature additives.

Fuel Quality — Must Comply With ASTM Standards

The quality of biodiesel fuel may vary widely. Only fuel produced by a BQ9000 supplier to the following specifications may be blended to meet biodiesel blend B6 – B20 fuel meeting ASTM specification D-7467:

- Petrodiesel fuel meeting ASTM specification D-975 and biodiesel fuel (B100) meeting ASTM specification D-6751

Fuel Oxidation Stability — Must Use Fuel Within Six Months Of Manufacture

Biodiesel fuel has poor oxidation stability which can result in long term storage problems. Fuel produced to approved ASTM standards, if stored properly, provides for protection against fuel oxidation for up to six months.

Fuel Water Separation — Must Use MOPAR Approved Fuel Filter Elements

Biodiesel fuel has a natural affinity to water and water accelerates microbial growth. Your MOPAR filtration system is designed to provide adequate fuel water separation capabilities.

Fuel In Oil Dilution — Must Adhere To Required Oil Change Interval

Fuel dilution of lubricating oil has been observed with the use of biodiesel fuel. Fuel in oil must not exceed 5%. To ensure this limit is met your oil change interval must be maintained with in the suggested schedule. The regular use of biodiesel between 6% and 20% requires intervals shorter than the outlined 10,000 miles and must not exceed the suggested schedule. When routinely operating on biodiesel between 6% and 20%, oil and filter replacement intervals must not exceed 8,000 Miles or 6 months, which ever comes first.

Biodiesel Fuel Filter Change Intervals

The use of biodiesel requires intervals shorter than the outlined 30,000 miles (48,280 km) and must not exceed the

suggested schedule. When operating on biodiesel between 6% and 20%, fuel filter replacement intervals must not exceed 20,000 Miles (40,233 km).

NOTE: Under no circumstances should oil change intervals exceed 8,000 miles (12,875 km) or 6 months, if regular operation occurs with 6% - 20% biodiesel blends. Under no circumstances should fuel filter intervals exceed 20,000 miles (40,233 km), if regular operation occurs with 6% - 20% biodiesel blends. Failure to comply with these Oil Change and fuel filter requirements for vehicles operating on biodiesel blends up to B20 may result in premature engine wear. Such wear is not covered by the New Vehicle Limited Warranty. The engine may suffer severe damage if operated with concentrations of biodiesel higher than 20%.

DIESEL EXHAUST FLUID

Your vehicle is equipped with a Selective Catalytic Reduction system to meet the very stringent diesel emissions standards required by the Environmental Protection Agency.

The purpose of the SCR system is to reduce levels of NO_x (oxides of nitrogen emitted from engines) that are harmful to our health and the environment to a near-zero level. Small quantities of Diesel Exhaust Fluid (DEF) is injected

into the exhaust upstream of a catalyst where, when vaporized, it converts smog-forming nitrogen oxides (NO_x) into harmless nitrogen (N₂) and water vapor (H₂O), two natural components of the air we breathe. You can operate with the comfort that your vehicle is contributing to a cleaner, healthier world environment for this and generations to come.

System Overview

This vehicle is equipped with a Diesel Exhaust Fluid (DEF) injection system and a Selective Catalytic Reduction (SCR) catalyst to meet the emission requirements.

The DEF injection system consists of the following components:

- DEF tank
- DEF pump
- DEF injector
- Electronically-heated DEF lines
- NO_x sensors
- Temperature sensors
- SCR catalyst

The DEF injection system and SCR catalyst enable the achievement of diesel emissions requirements; while maintaining outstanding fuel economy, drivability, torque and power ratings.

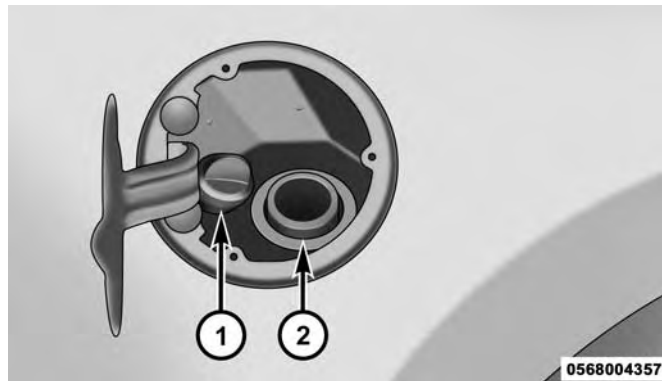
Refer to “Instrument Cluster Display” in “Understanding Your Instrument Panel” for system messages and warnings.

NOTE:

- Your vehicle is equipped with a DEF injection system. You may occasionally hear an audible clicking noise from under the vehicle at a stop. This is normal operation.
- The DEF pump will run for a period of time after engine shutdown to purge the DEF system. This is normal operation and may be audible from the rear of the vehicle.

ADDING FUEL — 1500 DIESEL MODELS

1. Open the fuel filler door.



Diesel Fuel And Diesel Exhaust Fluid Fill Location

- 1 — Diesel Exhaust Fluid Fill Location
- 2 — Diesel Fuel Fill Location

NOTE: There is no fuel filler cap. A flapper door inside the filler pipe seals the system.

2. Insert the fuel nozzle fully into the filler pipe – the nozzle opens and holds the flapper door while refueling.

3. Fill the vehicle with fuel – when the fuel nozzle “clicks” or shuts off the fuel tank is full.
4. Remove the fuel nozzle and close the fuel door.

Emergency Fuel Can Refueling

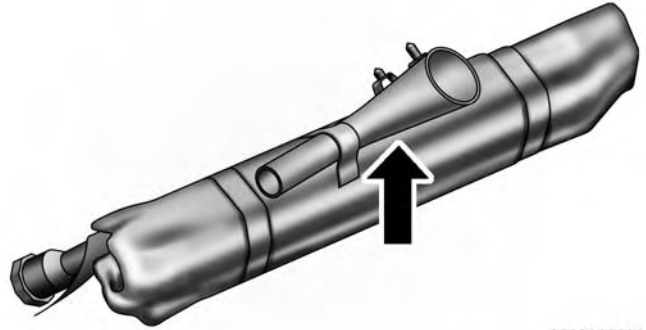
Most fuel cans will not open the flapper door.

A funnel is provided to open the flapper door to allow emergency refueling with a fuel can.



Diesel Fuel And DEF Fluid Filler Door

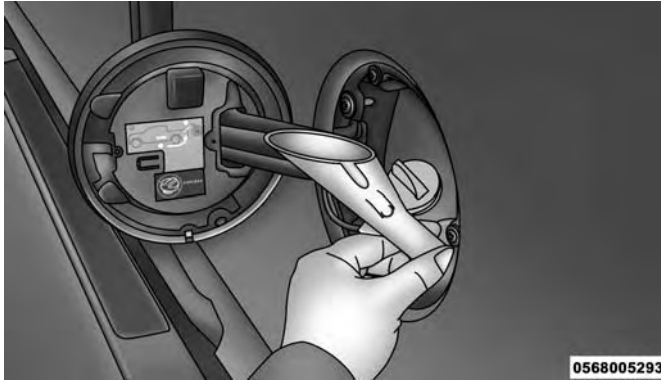
1. Retrieve fuel funnel from the jack kit located under the front passenger seat.



0568005290

Fuel Fill Funnel Location 1500 Models

2. Insert funnel into same filler pipe opening as the fuel nozzle.



Emergency Fuel Fill Location

NOTE: Ensure funnel is inserted fully to hold flapper door open.

3. Pour fuel into funnel opening.
4. Remove funnel from filler pipe, clean off prior to putting back in the jack kit.

WARNING!

- Never have any smoking materials lit in or near the vehicle when the fuel door is open or the tank is being filled.
- Never add fuel when the engine is running. This is in violation of most state and federal fire regulations and may cause the "Malfunction Indicator Light" to turn on.
- A fire may result if fuel is pumped into a portable container that is inside of a vehicle. You could be burned. Always place fuel containers on the ground while filling.

CAUTION!

To avoid fuel spillage and overfilling, do not "top off" the fuel tank after filling.

Avoid Using Contaminated Fuel

Fuel that is contaminated by water or dirt can cause severe damage to the engine fuel system. Proper maintenance of the engine fuel filter and fuel tank is essential. Refer to "Maintenance Procedures" in "Maintaining Your Vehicle" for further information.

Bulk Fuel Storage — Diesel Fuel

If you store quantities of fuel, good maintenance of the stored fuel is also essential. Fuel contaminated with water will promote the growth of “microbes.” These microbes form “slime” that will clog the fuel filtration system and lines. Drain condensation from the supply tank and change the line filter on a regular basis.

NOTE: When a diesel engine is allowed to run out of fuel, air is pulled into the fuel system.

If the vehicle will not start, refer to “Maintenance Procedures/Priming If The Engine Has Run Out Of Fuel” in “Maintaining Your Vehicle” for further information.

WARNING!

Do not open the high pressure fuel system with the engine running. Engine operation causes high fuel pressure. High pressure fuel spray can cause serious injury or death.

Diesel Exhaust Fluid Storage

Diesel Exhaust Fluid (DEF) is considered a very stable product with a long shelf life. If DEF is kept in temperatures between 10° and 90°F (-12° and 32°C), it will last a minimum of one year.

DEF is subject to freezing at the lowest temperatures. For example, DEF may freeze at temperatures at or below 12° F (-11° C). The system has been designed to operate in this environment.

NOTE: When working with DEF, it is important to know that:

- Any containers or parts that come into contact with DEF must be DEF compatible (plastic or stainless steel). Copper, brass, aluminum, iron or non-stainless steel should be avoided as they are subject to corrosion by DEF.
- If DEF is spilled, it should be wiped up completely.

Adding Diesel Exhaust Fluid

The DEF gauge (located on the instrument cluster) will display the level of DEF remaining in the tank. Refer to “Instrument Cluster” and “Instrument Cluster Descriptions” in “Understanding Your Instrument Panel” for further information.

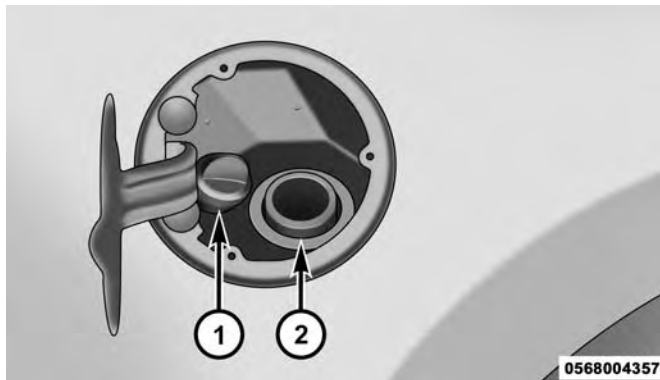
NOTE:

- Driving conditions (altitude, vehicle speed, load, etc.) will effect the amount of DEF that is used in your vehicle.
- Another factor is that outside temperature can affect DEF consumption. In cold conditions, 12° F (-11° C) and below, the DEF gauge needle can stay on a fixed position and may not move for extended periods of time. This is a normal function of the system.
- There is an electric heater inside the DEF tank that automatically works when necessary. And if the DEF supply does freeze, the truck will operate normally until it thaws.

DEF Fill Procedure

NOTE: Refer to “Fluids, Lubricants, and Genuine Parts” in “Maintaining Your Vehicle” for the correct fluid type.

1. Remove cap from DEF tank (located on drivers side of the vehicle or in fuel door).



DEF Filler Cap And Fuel Fill 1500/2500/3500 Models

- 1 — Diesel Exhaust Fluid Fill Location
2 — Fuel Fill Location

2. Insert DEF fill adapter/nozzle into DEF tank filler neck.

NOTE:

- The DEF gauge may take up to five seconds to update after adding a gallon or more of Diesel Exhaust Fluid (DEF) to the DEF tank. If you have a fault related to the DEF system, the gauge may not update to the new level. See your authorized dealer for service.
- The DEF gauge may also not immediately update after a refill if the temperature of the DEF fluid is below 12F (-11C). The DEF line heater will possibly warm up the DEF fluid and allow the gauge to update after a period of run time. Under very cold conditions, it is possible that the gauge may not reflect the new fill level for several drives.

CAUTION!

- To avoid DEF spillage, and possible damage to the DEF tank from overfilling, do not “top off” the DEF tank after filling.
- **DO NOT OVERFILL.** DEF will freeze below 12°F (-11°C). The DEF system is designed to work in temperatures below the DEF freezing point, however, if the tank is overfilled and freezes, the system could be damaged.
- When DEF is spilled, clean the area immediately with water and use an absorbent material to soak up the spills on the ground.
- Do not attempt to start your engine if DEF is accidentally added to the diesel fuel tank as it can result in severe damage to your engine, including but not limited to failure of the fuel pump and injectors.

(Continued)

CAUTION! (Continued)

- Never add anything other than DEF to the tank – especially any form of hydrocarbon such as diesel fuel, fuel system additives, gasoline, or any other petroleum-based product. Even a very small amount of these, less than 100 parts per million or less than 1 oz. per 78 gallons (295 liters) will contaminate the entire DEF system and will require replacement. If owners use a container, funnel or nozzle when refilling the tank, it should either be new or one that is has only been used for adding DEF. MOPAR provides an attachable nozzle with its DEF for this purpose.
3. Stop filling the DEF tank immediately when any of the following happen: DEF stops flowing from the fill bottle into the DEF tank, DEF splashes out the filler neck, or a DEF pump nozzle automatically shuts off.
 4. Reinstall cap onto DEF tank.

Filling The Def Tank In Cold Climates

Since DEF will begin to freeze at 12°F (-11°C), your vehicle is equipped with an automatic DEF heating system. This allows the DEF injection system to operate properly at temperatures below 12°F (-11°C). If your vehicle is not in operation for an extended period of time with temperatures below 12°F (-11°C), the DEF in the tank may freeze. If the tank is overfilled and freezes, it could be damaged. Therefore, do not overfill the DEF tank.

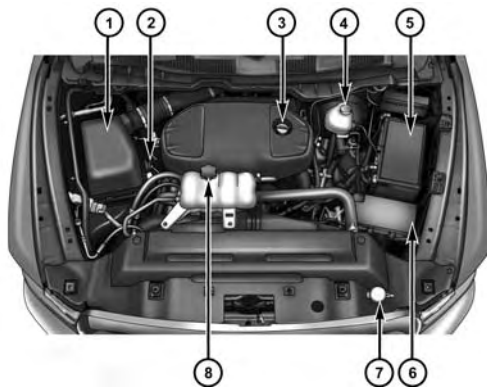
Extra care should be taken when filling with portable containers to avoid overfilling. Note the level of the DEF gauge in your instrument cluster. You may safely add a maximum of 2 gallons (7.5 Liters) of DEF from portable containers when your DEF gauge is reading ½ full.

MAINTAINING YOUR VEHICLE

CONTENTS

■ ENGINE COMPARTMENT — 3.0L DIESEL . . . . .	.54	□ Maintenance-Free Batteries . . . . .	.64
■ MAINTENANCE PROCEDURES . . . . .	.55	□ Cooling System . . . . .	.65
□ Engine Oil . . . . .	.55	□ Charge Air Cooler — Inter-Cooler . . . . .	.69
□ Engine Air Cleaner Filter . . . . .	.57	□ Brake System . . . . .	.69
□ Draining Fuel/Water Separator Filter . . . . .	.60	■ FLUID CAPACITIES . . . . .	.71
□ Underbody Mounted Fuel Filter Replacement. . .	.61	■ FLUIDS, LUBRICANTS AND GENUINE PARTS . .	.72
□ Priming If The Engine Has Run Out Of Fuel . . .	.62	□ Engine . . . . .	.72
□ Intervention Regeneration Strategy — Message Process Flow . . . . .	.64	□ Chassis . . . . .	.75

ENGINE COMPARTMENT — 3.0L DIESEL



0707005439

- 1 — Air Cleaner Filter
- 2 — Engine Oil Dipstick
- 3 — Engine Oil Fill
- 4 — Brake Fluid Reservoir

- 5 — Battery
 - 6 — Power Distribution Center (PDC)
 - 7 — Washer Fluid Reservoir
 - 8 — Engine Coolant
-

MAINTENANCE PROCEDURES

The pages that follow contain the **required** maintenance services determined by the engineers who designed your vehicle.

Besides those maintenance items specified in the fixed maintenance schedule, there are other components which may require servicing or replacement in the future.

CAUTION!

- **Failure to properly maintain your vehicle or perform repairs and service when necessary could result in more costly repairs, damage to other components or negatively impact vehicle performance. Immediately have potential malfunctions examined by an authorized dealership or qualified repair center.**
- **Your vehicle has been built with improved fluids that protect the performance and durability of your vehicle and also allow extended maintenance intervals. Do not use chemical flushes in these components as the chemicals can damage your engine, transmission, power steering or air conditioning. Such damage is not covered by the New Vehicle**

(Continued)

CAUTION! *(Continued)*

Limited Warranty. If a flush is needed because of component malfunction, use only the specified fluid for the flushing procedure.

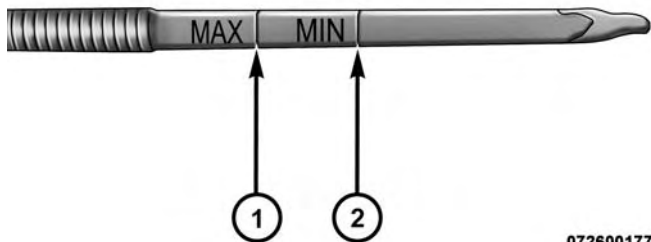
Engine Oil

Engine Oil Selection

For best performance and maximum protection under all types of operating conditions, the manufacturer recommends engine oils that meet the requirements of FCA Material Standard MS-10902, and that are API CJ-4 certified and meet the requirements of FCA LLC.

Checking Oil Level

To assure proper lubrication of your vehicle's engine, the engine oil must be maintained at the correct level. Check the oil level at regular intervals. The best time to check the oil level is before starting the engine after it has been parked overnight. When checking oil after operating the engine, first ensure the engine is at full operating temperature, then wait for five minutes after engine shutdown to check the oil.



0726001776

Engine Oil Dipstick

1 — MAX Mark

2 — MIN Mark

Checking the oil while the vehicle is on level ground will improve the accuracy of the oil level readings. Add oil only when the level on the dipstick is below the “MIN” mark. The total capacity from the MIN mark to the MAX mark is 1.3 qts (1.2 L).

CAUTION!

Overfilling or underfilling the crankcase will cause oil aeration or loss of oil pressure. This could damage your engine.

NOTE: It is possible for your oil level to be slightly higher than a previous check. This would be due to diesel fuel that may temporarily be in the crankcase due to operation of the diesel particulate filter regeneration strategy. This fuel will evaporate out under normal operation.

Never operate the engine with oil level below the “MIN” mark or above the upper “MAX” mark.

Change Engine Oil

Refer to the “Maintenance Schedule” for the proper maintenance intervals.

Engine Oil Viscosity (SAE Grade)**CAUTION!**

Your vehicle is equipped with an advanced technology Diesel Engine and an emission device designed to limit Diesel Particulate Emissions from being released

(Continued)

CAUTION! (Continued)

into the atmosphere. The durability of your engine and life expectancy of this diesel particulate filter emission device is highly dependent on the use of the correct engine oil.

We recommend you use 5W-40 **synthetic** engine oil such as MOPAR or Shell Rotella that meets FCA Material Standard MS-10902 and the API CJ-4 engine oil category is required.

Materials Added To Engine Oil

The manufacturer strongly recommends against the addition of any additives (other than leak detection dyes) to the engine oil. Engine oil is an engineered product and its performance may be impaired by supplemental additives.

Engine Oil Filter

Refer to “Fluids, Lubricants, And Genuine Parts” in “Maintaining Your Vehicle” for further information. The engine oil filter should be changed at every engine oil change.

Disposing Of Used Engine Oil And Oil Filters

Care should be taken in disposing of used engine oil and oil filters from your vehicle. Used oil and oil filters, indiscriminately discarded, can present a problem to the

environment. Contact your authorized dealer, service station or governmental agency for advice on how and where used oil and oil filters can be safely discarded in your area.

Engine Air Cleaner Filter**WARNING!**

The air induction system (air cleaner, hoses, etc.) provides a measure of protection. Do not remove the air induction system (air cleaner, hoses, etc.) unless such removal is necessary for repair or maintenance. Make sure that no one is near the engine compartment before starting the vehicle with the air induction system (air cleaner, hoses, etc.) removed. Failure to do so can result in serious personal injury.

CAUTION!

All air entering the engine intake must be filtered. The abrasive particles in unfiltered air will cause rapid wear to engine components.

Refer to the “Maintenance Schedule” for the proper maintenance intervals.

CAUTION!

Many aftermarket performance air filter elements do not adequately filter the air entering the engine. Use of such filters can severely damage your engine.

Engine Air Cleaner Filter Selection

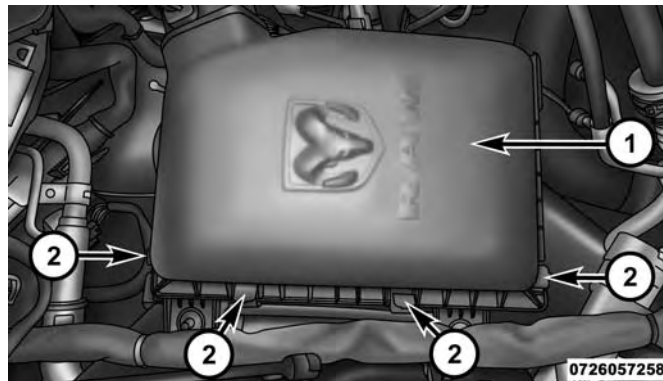
The quality of replacement engine air cleaner filters varies considerably. Only high quality filters should be used to assure most efficient service. MOPAR engine air cleaner filters are a high quality filter and are recommended.

Engine Air Cleaner Filter Inspection and Replacement

Inspect engine air cleaner filter for dirt and or debris, if you find evidence of either dirt or debris you should change your air cleaner filter.

Engine Air Cleaner Filter Removal

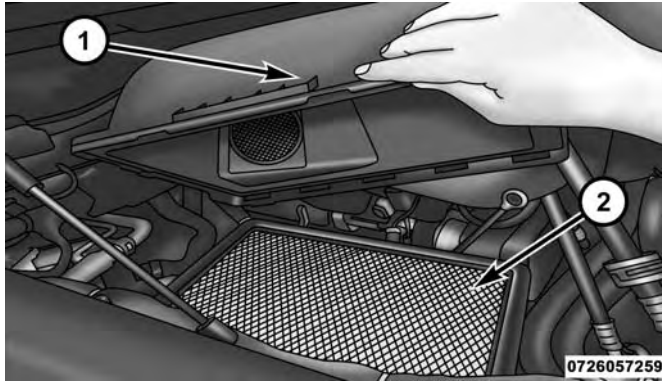
1. Release the spring clips from the air cleaner cover.



3.0 Diesel Air Cleaner Filter Cover

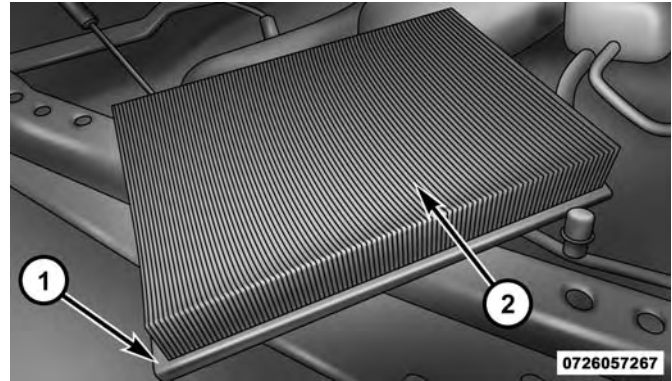
- 1 — Air Cleaner Filter Cover
2 — Spring Clips

2. Lift the air cleaner cover to access the air cleaner filter.



Open Air Cleaner Filter Assembly

- 1 — Air Cleaner Cover
- 2 — Air Cleaner Filter



Air Cleaner Filter

- 1 — Air Cleaner Filter
- 2 — Air Cleaner Filter Inspection Surface

3. Remove the air cleaner filter element from the housing assembly.

Engine Air Cleaner Filter Installation

NOTE: Inspect and clean the housing if dirt or debris is present before replacing the air filter element.

1. Install the air cleaner filter element into the housing assembly with the air cleaner filter inspection surface facing downward.

2. Install the air cleaner cover onto the housing assembly locating tabs.
3. Latch the spring clips and lock the air cleaner cover to the housing assembly.

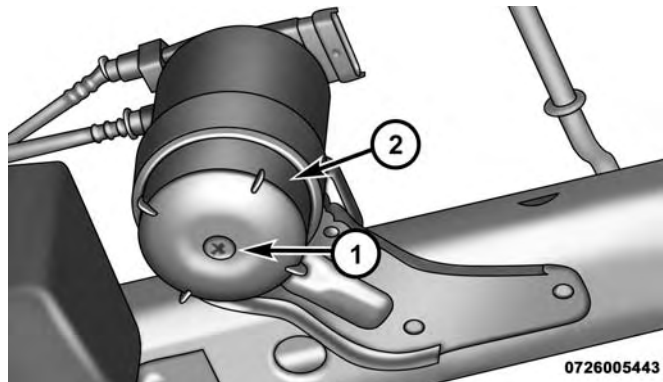
Draining Fuel/Water Separator Filter

The fuel filter/water separator filter housing is located above the rear axle next to the fuel tank. The best access to this water drain valve is from under the vehicle.

CAUTION!

- Do not drain the fuel/water separator filter when the engine is running.
- Diesel fuel will damage blacktop paving surfaces. Drain the filter into an appropriate container.

If water is detected in the water separator while the engine is running, or while the ignition switch is in the ON position, the “Water In Fuel Indicator Light” will illuminate and an audible chime will be heard. At this point, you should stop the engine and drain the water from the filter housing.



Fuel Filter Assembly

- 1 — Water In Fuel Drain
- 2 — Fuel Filter Access

CAUTION!

If the “Water In Fuel Indicator Light” remains on, DO NOT START the engine before you drain water from the fuel filter to avoid engine damage.

If the “Water In Fuel Indicator Light” comes on and a single chime is heard while you are driving, or with the ignition

in the ON position, there may be a problem with your water separator wiring or sensor. See your authorized dealer for service.

Upon proper draining of the water from the fuel filter, the “Water In Fuel Indicator Light” will remain illuminated for approximately 10 seconds. If the water was drained while the engine was running, the “Water In Fuel Indicator Light” may remain on for approximately three minutes.

NOTE: Care should be taken in disposing of used fluids from your vehicle. Used fluids, indiscriminately discarded, can present a problem to the environment. Contact an authorized dealer, service station, or government agency for advice on recycling programs and for where used fluids and filters can be properly disposed of in your area.

Drain the fuel/water separator filter when the “Water In Fuel Indicator Light” is ON. Within 10 minutes of vehicle shutdown, turn the filter drain valve (located on the bottom of the filter housing) counterclockwise to drain fuel/water, then turn the ignition switch to the ON position, and allow any accumulated water to drain. Leave the drain valve open until all water and contaminants have been removed. When clean fuel is visible, close the drain valve by turning it clockwise, and turn the ignition switch to OFF.

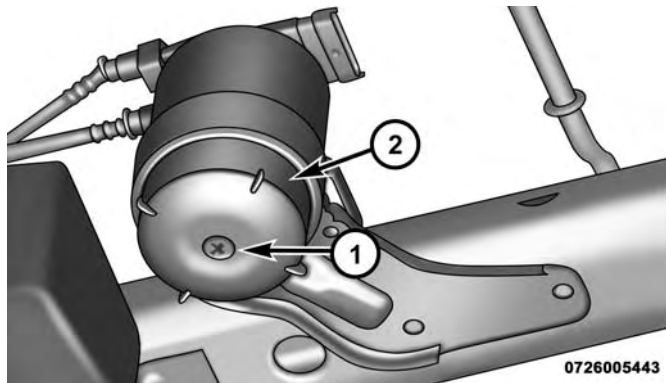
If more than two ounces or 60 milliliters of fuel have been drained, follow the directions for “Priming If The Engine Has Run Out Of Fuel.”

Underbody Mounted Fuel Filter Replacement

NOTE: Using a fuel filter that does not meet the manufacturer’s filtration and water separating requirements can severely impact fuel system life and reliability.

CAUTION!

- Diesel fuel will damage blacktop paving surfaces. Drain the filter into an appropriate container.
- Do not prefill the fuel filter when installing a new fuel filter. There is a possibility debris could be introduced into the fuel filter during this action. It is best to install the filter dry and allow the in-tank lift pump to prime the fuel system.



Fuel Filter Assembly

- 1 — Water in Fuel Drain
2 — Fuel Filter Access

1. Turn engine off.
2. Place a drain pan under the fuel filter assembly.
3. Open the water drain valve, and let any accumulated water drain.
4. Close the water drain valve.

5. Remove bottom cover using a strap wrench. Rotate counterclockwise for removal. Remove the used o-ring and discard it.
6. Remove the used filter cartridge from the housing and dispose of it according to your local regulations.
7. Wipe the sealing surfaces of the lid and housing clean.
8. Install a new o-ring into the ring groove on the filter housing and lubricate with clean engine oil.

NOTE: WIF (Water In Fuel) sensor is re-usable. Service kit comes with new o-ring for filter canister and WIF sensor.

Priming If The Engine Has Run Out Of Fuel

WARNING!

Do not open the high pressure fuel system with the engine running. Engine operation causes high fuel pressure. High pressure fuel spray can cause serious injury or death.

1. Add a substantial amount of fuel to the tank, approximately 2 to 5 gal (8L to 19L).

2. Press ignition switch twice without your foot on brake to put vehicle in Run position. This will activate the in tank fuel pump for approximately 30 seconds. Repeat this process twice.
3. Start the engine using the "Normal Starting" procedure. Refer to "Starting Procedures" in "Starting and Operating" for further information.

CAUTION!

The starter motor will engage for approximately 30 seconds at a time. Allow two minutes between cranking intervals.

NOTE: The engine may run rough until the air is forced from all the fuel lines.

WARNING!

Do not use alcohol or gasoline as a fuel blending agent. They can be unstable under certain conditions and be hazardous or explosive when mixed with diesel fuel.

CAUTION!

Due to lack of lubricants in alcohol or gasoline, the use of these fuels can cause damage to the fuel system.

NOTE:

- Use of biodiesel mixture in excess of 20% can negatively impact the fuel filter's ability to separate water from the fuel, resulting in high pressure fuel system corrosion or damage.
- In addition, commercially available fuel additives are not necessary for the proper operation of your diesel engine.
- For extreme cold conditions, "Mopar Premium Diesel Fuel Treatment" is recommended to assist with cold starting.

Intervention Regeneration Strategy — Message Process Flow

This engine meets all required diesel engine emissions standards. To achieve these emissions standards, your vehicle is equipped with a state-of-the-art engine and exhaust system. These systems are seamlessly integrated into your vehicle and managed by the Powertrain Control Module (PCM). The PCM manages engine combustion to allow the exhaust system's catalyst to trap and burn Particulate Matter (PM) pollutants, with no input or interaction on your part.

Additionally, your vehicle has the ability to alert you to additional maintenance required on your vehicle or engine.

Refer to "Instrument Cluster Display" in "Understanding Your Instrument Panel" for further information.

WARNING!

A hot exhaust system can start a fire if you park over materials that can burn. Such materials might be grass or leaves coming into contact with your exhaust system. Do not park or operate your vehicle in areas where your exhaust system can contact anything that can burn.

Maintenance-Free Batteries

Your vehicle is equipped with a maintenance-free battery. The top of the maintenance-free battery is permanently sealed. You will never have to add water, nor is periodic maintenance required.

WARNING!

Battery posts, terminals, and related accessories contain lead and lead compounds. Always wash hands after handling the battery.

CAUTION!

It is essential when replacing the cables on the battery that the positive cable is attached to the positive post and the negative cable is attached to the negative post. Battery posts are marked (+) positive and negative (-) and are identified on the battery case. Also, if a "fast charger" is used while the battery is in vehicle, disconnect both vehicle battery cables before connecting the charger to the battery. Do not use a "fast charger" to provide starting voltage.

Cooling System

WARNING!

You or others can be badly burned by hot engine coolant (antifreeze) or steam from your radiator. If you see or hear steam coming from under the hood, do not open the hood until the radiator has had time to cool. Never try to open a cooling system pressure cap when the radiator is hot.

Engine Coolant Checks

Check the engine coolant (antifreeze) protection every 12 months (before the onset of freezing weather, where applicable). If the engine coolant (antifreeze) is dirty or rusty in appearance, the system should be drained, flushed and refilled with fresh coolant. Check the front of the A/C condenser (if equipped) or radiator for any accumulation of bugs, leaves, etc. If dirty, clean by gently spraying water from a garden hose vertically down the face of the A/C condenser (if equipped) or the back of the radiator core.

Check the engine cooling system hoses for brittle rubber, cracking, tears, cuts and tightness of the connection at the coolant recovery bottle and radiator. Inspect the entire system for leaks.

With the engine at normal operating temperature (but not running), check the cooling system pressure cap for proper vacuum sealing by draining a small amount of engine coolant (antifreeze) from the radiator drain cock. The radiator drain cock is located in the lower radiator tank. If the cap is sealing properly, the engine coolant (antifreeze) will begin to drain from the coolant expansion bottle. **DO NOT REMOVE THE COOLANT PRESSURE CAP WHEN THE COOLING SYSTEM IS HOT.**

Cooling System — Drain Flush And Refill

If the engine coolant (antifreeze) is dirty or contains a considerable amount of sediment, clean and flush with a reliable cooling system cleaner. Follow with a thorough rinsing to remove all deposits and chemicals. Properly dispose of old engine coolant (antifreeze).

Refer to the “Maintenance Schedule” for the proper maintenance intervals.

Selection Of Coolant

Refer to “Fluids, Lubricants, And Genuine Parts” in “Maintaining Your Vehicle” for further information.

CAUTION!

- **Mixing of engine coolant (antifreeze) other than specified Organic Additive Technology (OAT) engine coolant (antifreeze), may result in engine damage and may decrease corrosion protection. Organic Additive Technology (OAT) engine coolant is different and should not be mixed with Hybrid Organic Additive Technology (HOAT) engine coolant (antifreeze) or any “globally compatible” coolant (antifreeze). If a non-OAT engine coolant (antifreeze) is introduced into the cooling system in an emergency, the cooling system will need to be drained, flushed, and refilled with fresh OAT coolant (conforming to MS.90032), by an authorized dealer as soon as possible.**
- **Do not use water alone or alcohol-based engine coolant (antifreeze) products. Do not use additional rust inhibitors or antirust products, as they may not be compatible with the engine coolant and may plug the radiator.**
- **This vehicle has not been designed for use with propylene glycol-based engine coolant (antifreeze). Use of propylene glycol-based engine coolant (antifreeze) is not recommended.**

Adding Coolant

Your vehicle has been built with an improved engine coolant (OAT coolant conforming to MS.90032) that allows extended maintenance intervals. This engine coolant (antifreeze) can be used up to ten years or 150,000 miles (240,000 km) before replacement. To prevent reducing this extended maintenance period, it is important that you use the same engine coolant (OAT coolant conforming to MS.90032) throughout the life of your vehicle.

Please review these recommendations for using Organic Additive Technology (OAT) engine coolant (antifreeze) that meets the requirements of FCA Material Standard MS.90032. When adding engine coolant (antifreeze):

- We recommend using MOPAR Antifreeze/Coolant 10 Year/150,000 Mile Formula OAT (Organic Additive Technology) that meets the requirements of FCA Material Standard MS.90032.
- Mix a minimum solution of 50% OAT engine coolant that meets the requirements of FCA Material Standard MS.90032 and distilled water. Use higher concentrations (not to exceed 70%) if temperatures below -34°F (-37°C) are anticipated. Please contact your authorized dealer for assistance.

- Use only high purity water such as distilled or deionized water when mixing the water/engine coolant (antifreeze) solution. The use of lower quality water will reduce the amount of corrosion protection in the engine cooling system.

NOTE:

- It is the owner's responsibility to maintain the proper level of protection against freezing according to the temperatures occurring in the area where the vehicle is operated.
- Some vehicles require special tools to add coolant properly. Failure to fill these systems properly could lead to severe internal engine damage. If any coolant is needed to be added to the system, please contact your local authorized dealer.
- Mixing engine coolant (antifreeze) types is not recommended and can result in cooling system damage. If HOAT and OAT coolant are mixed in an emergency, have a authorized dealer drain, flush, and refill with OAT coolant (conforming to MS.90032) as soon as possible.

Cooling System Pressure Cap

The cap must be fully tightened to prevent loss of engine coolant (antifreeze), and to ensure that the engine coolant (antifreeze) will return to the radiator from the coolant expansion bottle.

The cap should be inspected and cleaned if there is any accumulation of foreign material on the sealing surfaces.

WARNING!

- **Do not open hot engine cooling system. Never add engine coolant (antifreeze) when the engine is overheated. Do not loosen or remove the cap to cool an overheated engine. Heat causes pressure to build up in the cooling system. To prevent scalding or injury, do not remove the pressure cap while the system is hot or under pressure.**
- **Do not use a pressure cap other than the one specified for your vehicle. Personal injury or engine damage may result.**

Disposal Of Used Engine Coolant

Used ethylene glycol-based engine coolant (antifreeze) is a regulated substance requiring proper disposal. Check with your local authorities to determine the disposal rules for your community. To prevent ingestion by animals or children, do not store ethylene glycol-based engine coolant (antifreeze) in open containers or allow it to remain in puddles on the ground. If ingested by a child or pet, seek emergency assistance immediately. Clean up any ground spills immediately.

Points To Remember

NOTE: When the vehicle is stopped after a few miles/kilometers of operation, you may observe vapor coming from the front of the engine compartment. This is normally a result of moisture from rain, snow, or high humidity accumulating on the radiator and being vaporized when the thermostat opens, allowing hot engine coolant (antifreeze) to enter the radiator.

If an examination of your engine compartment shows no evidence of radiator or hose leaks, the vehicle may be safely driven. The vapor will soon dissipate.

- Do not overfill the coolant expansion bottle.

- Check the coolant freeze point in the radiator and in the coolant expansion bottle. If engine coolant (antifreeze) needs to be added, the contents of the coolant expansion bottle must also be protected against freezing.
- If frequent engine coolant (antifreeze) additions are required, the cooling system should be pressure tested for leaks.
- Maintain engine coolant (antifreeze) concentration at a minimum of 50% OAT coolant (conforming to MS.90032) and distilled water for proper corrosion protection of your engine which contains aluminum components.
- Make sure that the coolant expansion bottle overflow hoses are not kinked or obstructed.
- Keep the front of the radiator clean. If your vehicle is equipped with air conditioning, keep the front of the condenser clean.
- Do not change the thermostat for Summer or Winter operation. If replacement is ever necessary, install **ONLY** the correct type thermostat. Other designs may result in unsatisfactory engine coolant (antifreeze) performance, poor gas mileage, and increased emissions.

Charge Air Cooler — Inter-Cooler

The charge air cooler is positioned in front of the radiator and the air conditioner condenser. Air enters the engine through the air cleaner and passes through the turbocharger, where it is pressurized. This pressurized air rapidly reaches high temperature. The air is then directed through a hose to the charge air cooler and through another hose to the intake manifold of the engine. This cooling process enables more efficient burning of fuel resulting in fewer emissions.

To guarantee optimum performance of the system, keep the surfaces of the charge air cooler, condenser and radiator clean and free of debris. Periodically check the hoses leading to and from the charge air cooler for cracks or loose clamps resulting in loss of pressure and reduced engine performance.

Brake System

Brake Master Cylinder — Brake Fluid Level Check

The fluid level of the master cylinder should be checked when performing under the hood service, or immediately if the “Brake System Warning Light” indicates system failure.

The brake master cylinder has a translucent plastic reservoir. On the outboard side of the reservoir, there is a “MAX” mark and a “MIN” mark. The fluid level must be kept within these two marks. Do not add fluid above the full mark because leakage may occur at the cap.

With disc brakes, the fluid level can be expected to fall as the brake linings wear. However, an unexpected drop in fluid level may be caused by a leak and a system check should be conducted.

Refer to “Fluids, Lubricants, And Genuine Parts” in “Maintaining Your Vehicle” for further information.

5

WARNING!

- Use only manufacturer’s recommended brake fluid. Refer to “Fluids, Lubricants, and Genuine Parts” in “Maintaining Your Vehicle” for further information. Using the wrong type of brake fluid can severely damage your brake system and/or impair its performance. The proper type of brake fluid for your vehicle is also identified on the original factory installed hydraulic master cylinder reservoir.

(Continued)

WARNING! (Continued)

- To avoid contamination from foreign matter or moisture, use only new brake fluid or fluid that has been in a tightly closed container. Keep the master cylinder reservoir cap secured at all times. Brake fluid in a open container absorbs moisture from the air resulting in a lower boiling point. This may cause it to boil unexpectedly during hard or prolonged braking, resulting in sudden brake failure. This could result in a accident.

(Continued)

WARNING! (Continued)

- Overfilling the brake fluid reservoir can result in spilling brake fluid on hot engine parts, causing the brake fluid to catch fire. Brake fluid can also damage painted and vinyl surfaces, care should be taken to avoid its contact with these surfaces.
- Do not allow petroleum based fluid to contaminate the brake fluid. Brake seal components could be damaged, causing partial or complete brake failure. This could result in an accident.

FLUID CAPACITIES

	U.S.	Metric
Fuel (Approximate)		
3.0L Diesel Engine	26 Gallons	98.5 Liters
Diesel Exhaust Fluid Tank	8 Gallons	30.3 Liters
Engine Oil With Filter		
3.0L Liter Diesel Engine (SAE 5W-40 Synthetic, ACEA C3)	10.5 Quarts	10 Liters
Cooling System		
3.0L Turbo Diesel Engine (MOPAR Engine Coolant/Antifreeze 10 Year/150,000 Mile Formula OAT (Organic Additive Technology))	11.6 Quarts	11 Liters

FLUIDS, LUBRICANTS AND GENUINE PARTS**Engine**

Component	Fluid, Lubricant, or Genuine Part
Engine Coolant	We recommend you use MOPAR Antifreeze/Coolant 10 Year/150,000 Mile Formula OAT (Organic Additive Technology).
Engine Oil	We recommend you use 5W-40 synthetic engine oil such as MOPAR or Shell Rotella that meets FCA Material Standard MS-10902 and the API CJ-4 engine oil category is required.
Engine Oil Filter	We recommend you use MOPAR Engine Oil Filters.
Fuel Filters	We recommend you use MOPAR Fuel Filter. Must meet 3 micron rating. Using a fuel filter that does not meet the manufacturers filtration and water separating requirements can severely impact fuel system life and reliability.

Component	Fluid, Lubricant, or Genuine Part
Fuel Selection	<p>Use good quality diesel fuel from a reputable supplier in your vehicle. Federal law requires that you must fuel this vehicle with Ultra Low Sulfur Highway Diesel fuel (15 ppm Sulfur maximum) and prohibits the use of Low Sulfur Highway Diesel fuel (500 ppm Sulfur maximum) to avoid damage to the emissions control system.</p> <p>For most year-round service, No. 2 diesel fuel meeting ASTM specification D-975 Grade S15 will provide good performance. We recommend you use a blend of up to 5% biodiesel, meeting ASTM specification D-975 with your diesel engine. This vehicle is compatible with biodiesel blends greater than 5% but no greater than 20% biodiesel meeting ASTM specification D-7467 provided the shortened maintenance intervals are followed as directed.</p>
Diesel Exhaust Fluid	MOPAR Diesel Exhaust Fluid (API Certified) (DEF) or equivalent that has been API Certified to the ISO 22241 standard. Use of fluids not API Certified to ISO 22241 may result in system damage.

NOTE: If climatized or diesel Number 1 ULSD fuel is not available, and you are operating below (20°F/-6°C), in sustained arctic conditions, Mopar Premium Diesel Fuel Treatment (or equivalent) is recommended to avoid gelling.

CAUTION!

- Mixing of engine coolant (antifreeze) other than specified Organic Additive Technology (OAT) engine coolant (antifreeze), may result in engine damage and may decrease corrosion protection. Organic Additive Technology (OAT) engine coolant is different and should not be mixed with Hybrid Organic Additive Technology (HOAT) engine coolant (antifreeze) or any “globally compatible” coolant (antifreeze). If a non-OAT engine coolant (antifreeze) is introduced into the cooling system in an emergency, the cooling system will need to be drained, flushed, and refilled with fresh OAT coolant (conforming to MS.90032), by an authorized dealer as soon as possible.

(Continued)

CAUTION! (Continued)

- Do not use water alone or alcohol-based engine coolant (antifreeze) products. Do not use additional rust inhibitors or antirust products, as they may not be compatible with the radiator engine coolant and may plug the radiator.
- This vehicle has not been designed for use with propylene glycol-based engine coolant (antifreeze). Use of propylene glycol-based engine coolant (antifreeze) is not recommended.

Chassis

Component	Fluid, Lubricant, or Genuine Part
Automatic Transmission (3.0L Diesel, 8-Speed Transmission)	Only use MOPAR ZF 8&9 Speed ATF Automatic Transmission Fluid or equivalent. Failure to use the correct fluid may affect the function or performance of your transmission.
Transfer Case	We recommend you use MOPAR BW44-44 Transfer Case Fluid.
Front Axle – 1500 Four-Wheel Drive Models	We recommend you use MOPAR GL-5 Synthetic Axle Lubricant SAE 75W-85.
Rear Axle	We recommend you use MOPAR Synthetic Gear Lubricant SAE 75W-140 (MS-8985). Limited-Slip Rear Axles require the addition of 5 oz. (148 ml) MOPAR Limited Slip Additive (MS-10111).
Brake Master Cylinder	We recommend you use MOPAR DOT 3 Brake Fluid, SAE J1703 should be used. If DOT 3, SAE J1703 brake fluid is not available, then DOT 4 is acceptable.

MAINTENANCE SCHEDULE

CONTENTS

■ MAINTENANCE SCHEDULE . . . . .	.78	□ Additional Maintenance — B6 To B20 Biodiesel . . . . .	.82
□ Maintenance Chart — Diesel Fuel Up To B5 Biodiesel . . . . .	.79		

MAINTENANCE SCHEDULE

Your vehicle is equipped with an automatic oil change indicator system. The oil change indicator system will remind you that it is time to take your vehicle in for scheduled maintenance.

Based on engine operation conditions, the oil change indicator message will illuminate. This means that service is required for your vehicle. Operating conditions such as frequent short-trips, trailer tow, extremely hot or cold ambient temperatures will influence when the “Oil Change Required” message is displayed. Severe Operating Conditions can cause the change oil message to illuminate as early as 3,500 miles (5,600 km) since last reset. Have your vehicle serviced as soon as possible, within the next 500 miles (805 km).

Your authorized dealer will reset the oil change indicator message after completing the scheduled oil change. If a scheduled oil change is performed by someone other than

your authorized dealer, the message can be reset by referring to the steps described under “Instrument Cluster Display” in “Understanding Your Instrument Panel” for further information.

NOTE: Under no circumstances should oil change intervals exceed 10,000 miles (16,000 km) or twelve months, whichever comes first.

Once A Month Or Before A Long Trip:

- Check engine oil level
- Check windshield washer fluid level
- Check the tire inflation pressures and look for unusual wear or damage
- Check the fluid levels of the coolant reservoir, brake master cylinder, and power steering, and fill as needed
- Check function of all interior and exterior lights

Maintenance Chart — Diesel Fuel Up To B5 Biodiesel

Required Maintenance

Refer to the Maintenance Schedules on the following pages for required maintenance.

At Every Oil Change Interval As Indicated By Oil Change Indicator System:

- Change oil and filter.
- Completely fill the Diesel Exhaust Fluid tank.
- Drain water from fuel filter assembly.
- Rotate the tires. **Rotate at the first sign of irregular wear, even if it occurs before the oil indicator system turns on.**
- Inspect battery and clean and tighten terminals as required.

At Every Oil Change Interval As Indicated By Oil Change Indicator System:

- Inspect brake pads, shoes, rotors, drums, hoses and park brake.
- Inspect engine cooling system protection and hoses.
- Inspect exhaust system.
- Inspect engine air cleaner if using in dusty or off-road conditions.

80 MAINTENANCE SCHEDULE

Mileage or time passed (whichever comes first)	10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000	100,000	110,000	120,000	130,000	140,000	150,000
Or Years:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Or Kilometers:	16,000	32,000	48,000	64,000	80,000	96,000	112,000	128,000	144,000	160,000	176,000	192,000	208,000	224,000	240,000
Additional Inspections															
Completely fill the Diesel Exhaust Fluid tank.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inspect the CV/Universal joints.			X			X			X			X			X
Inspect front suspension, tie rod ends, and replace if necessary.		X		X		X		X		X		X		X	
Inspect the front and rear axle fluid. If gear oil leakage is suspected, check the fluid level. If using your vehicle for police, taxi, fleet, off-road or frequent trailer towing change the axle fluid.				X		X			X			X			X
Inspect the brake linings, parking brake function.		X		X		X		X		X		X		X	
Inspect the transfer case fluid.			X						X						X
Additional Maintenance															
Replace cabin air filter		X		X		X		X		X		X		X	
Drain water from fuel filter assembly.	X	X		X	X		X	X		X	X		X	X	
Replace fuel filter and drain water from the fuel filter assembly.			X			X			X			X			X
Replace engine air filter.			X			X			X			X			X

Mileage or time passed (whichever comes first)	10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000	100,000	110,000	120,000	130,000	140,000	150,000
Or Years:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Or Kilometers:	16,000	32,000	48,000	64,000	80,000	96,000	112,000	128,000	144,000	160,000	176,000	192,000	208,000	224,000	240,000
Flush and replace the engine coolant at 10 years or 150,000 miles (240,000 km) whichever comes first.										X					X
Replace accessory drive belt(s).										X					
Inspect the transfer case fluid, change for any of the following: police, taxi, fleet, or frequent trailer towing.						X						X			
Change transfer case fluid.												X			

WARNING!

- You can be badly injured working on or around a motor vehicle. Do only service work for which you have the knowledge and the right equipment. If you have any doubt about your ability to perform a service job, take your vehicle to a competent mechanic.

WARNING! (Continued)

- Failure to properly inspect and maintain your vehicle could result in a component malfunction and effect vehicle handling and performance. This could cause an accident.

(Continued)

WARNING!

- You can be badly injured working on or around a motor vehicle. Do only service work for which you have the knowledge and the right equipment. If you have any doubt about your ability to perform a service job, take your vehicle to a competent mechanic.
- Failure to properly inspect and maintain your vehicle could result in a component malfunction and effect vehicle handling and performance. This could cause an accident.

RAM 2500 / 3500 / 4500 / 5500

TABLE OF CONTENTS

SECTION

PAGE

1	INTRODUCTION	89	1
2	THINGS TO KNOW BEFORE STARTING YOUR VEHICLE	91	2
3	UNDERSTANDING THE FEATURES OF YOUR VEHICLE	95	3
4	UNDERSTANDING YOUR INSTRUMENT PANEL	101	4
5	STARTING AND OPERATING	119	5
6	WHAT TO DO IN EMERGENCIES	169	6
7	MAINTAINING YOUR VEHICLE	173	7
8	MAINTENANCE SCHEDULE	209	8

INTRODUCTION

CONTENTS

■ A MESSAGE FROM FCA US LLC	90
---------------------------------------	----

A MESSAGE FROM FCA US LLC

FCA US LLC and Cummins welcome you as a Cummins turbocharged diesel-powered truck owner. Your diesel truck will sound, feel, drive, and operate differently from a gasoline-powered truck. It is important that you read and understand this manual.

Almost 100% of the heavy duty trucks in the United States and Canada are diesel-powered because of the fuel economy, rugged durability, and high torque which permits pulling heavy loads. Cummins engines power well over half of these trucks. Now this same technology and proven performance is yours in your truck equipped with the Cummins turbocharged diesel engine.

You may find that some of the starting, operating, and maintenance procedures are different. However, they are simple to follow and careful adherence to them will ensure that you take full advantage of the features of this engine.

NOTE: Some aftermarket products may cause severe engine/transmission and/or exhaust system damage. Your vehicle's Powertrain Control Systems can detect and store information about vehicle modifications that increase horsepower and torque output such as whether or not performance-enhancing powertrain components, commonly referred to as downloaders, power boxes, or performance chips have been used.

This information cannot be erased and will stay in the system's memory even if the modification is removed. This information can be retrieved by FCA US LLC, and service and repair facilities, when servicing your vehicle. This information may be used to determine if repair will be covered by the New Vehicle Limited Warranty.

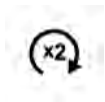
There is a probability that the use of a "performance chip" will prohibit the engine from starting. In this instance, the vehicle will need to be serviced by a authorized dealer in order to return the vehicle to its factory settings.

When it comes to service, remember that your authorized dealer knows your vehicle best, has factory-trained technicians and genuine MOPAR® parts, and cares about your satisfaction.

THINGS TO KNOW BEFORE STARTING YOUR VEHICLE

CONTENTS

■ REMOTE STARTING SYSTEM — IF EQUIPPED . . .92	□ To Exit Remote Start Mode And Drive The Vehicle93
□ How To Use Remote Start.92	□ Remote Start Comfort Systems — If Equipped . . .94
□ Remote Start Abort Message.93	■ ENGINE BREAK-IN RECOMMENDATIONS94
□ To Enter Remote Start Mode.93	
□ To Exit Remote Start Mode Without Driving The Vehicle93	

REMOTE STARTING SYSTEM — IF EQUIPPED

This system uses the key fob to start the engine conveniently from outside the vehicle while still maintaining security. The system has a range of approximately 300 ft (91 m).

NOTE:

- The vehicle must be equipped with an automatic transmission to be equipped with Remote Start.
- The Remote Start system will wait for the “Wait To Start” telltale to extinguish before cranking the engine. This allows time for the intake heater to pre-heat the incoming air, and is normal operation in cold weather. Refer to “Wait To Start” located in “Warning and Indicator Lights” within “Understanding Your Instrument Panel”.

How To Use Remote Start

All of the following conditions must be met before the engine will remote start:

- Transmission in PARK
- Doors closed
- Hood closed

- HAZARD switch off
- BRAKE switch inactive (brake pedal not pushed)
- Ignition key removed from ignition switch
- Battery at an acceptable charge level
- PANIC button not pushed
- Fuel meets minimum requirement
- Water In Fuel Indicator Light is not illuminated
- Wait To Start Light is not illuminated

WARNING!

- **Do not start or run an engine in a closed garage or confined area. Exhaust gas contains Carbon Monoxide (CO) which is odorless and colorless. Carbon Monoxide is poisonous and can cause serious injury or death when inhaled.**
- **Keep Remote Keyless Entry key fobs away from children. Operation of the Remote Start System, windows, door locks or other controls could cause serious injury or death.**

Remote Start Abort Message

The following messages will display in the Instrument Cluster Display if the vehicle fails to remote start or exits remote start prematurely:

- Remote Start Aborted - Door Open
- Remote Start Aborted - Hood Open
- Remote Start Aborted - Fuel Low
- Remote Start Aborted - System Fault

The Instrument Cluster Display message stays active until the ignition is placed in the ON/RUN position.

To Enter Remote Start Mode



Push and release the REMOTE START button on the key fob twice, within five seconds. The parking lights will flash and the horn will chirp twice (if programmed). In cold ambient temperature conditions, the diesel vehicle may delay crank up to 30 seconds for the fuel and grid heater. Once the vehicle has started, the engine will run for 15 minutes or 75 seconds in extreme cold and high elevation.

NOTE:

- The park lamps will turn on and remain on during Remote Start mode.
- For security, power window and power sunroof operation (if equipped) are disabled when the vehicle is in the Remote Start mode.
- The engine can be started two consecutive times (two 15-minute cycles) with the key fob. However, the ignition switch must be cycled to the ON position before you can repeat the start sequence for a third cycle.

To Exit Remote Start Mode Without Driving The Vehicle

Push and release the REMOTE START button one time or allow the engine to run for the entire fifteen minute cycle.

NOTE: To avoid unintentional shut downs, the system will disable the one time push of the REMOTE START button for two seconds after receiving a valid Remote Start request.

To Exit Remote Start Mode And Drive The Vehicle

To exit Remote Start Mode and drive the vehicle before the end of the 15-minute cycle, push and release the unlock button on the key fob to unlock the door and disarm the

Vehicle Security Alarm System (if equipped). Then, prior to the end of the 15-minute cycle, place the ignition to the ON/RUN position.

NOTE: The ignition switch must be in the ON/RUN position in order to drive the vehicle.

Remote Start Comfort Systems — If Equipped

When remote start is activated, the heated steering wheel, and driver heated seat features will automatically turn on in cold weather. In warm weather, the driver vented seat feature will automatically turn on when the remote start is activated. These features will stay on through the duration of remote start or until the ignition switch is turned to the ON/RUN position.

The Remote Start Comfort System can be activated and deactivated through the Instrument Cluster Display. For more information on Remote Start Comfort System operation refer to your Owners Manual.

ENGINE BREAK-IN RECOMMENDATIONS

The Cummins turbocharged diesel engine does not require a break-in period due to its construction. Normal operation is allowed, providing the following recommendations are followed:

- Warm up the engine before placing it under load.
- Do not operate the engine at idle for prolonged periods.
- Use the appropriate transmission gear to prevent engine lugging.
- Observe vehicle oil pressure and temperature indicators.
- Check the coolant and oil levels frequently.
- Vary throttle position at highway speeds when carrying or towing significant weight.

NOTE: Light duty operation such as light trailer towing or no load operation will extend the time before the engine is at full efficiency. Reduced fuel economy and power may be seen at this time.

For additional vehicle break-in requirements, refer to “Trailer Towing” in “Starting And Operating” of the Owners Manual.

Because of the construction of the Cummins turbocharged diesel engine, engine run-in is enhanced by loaded operating conditions which allow the engine parts to achieve final finish and fit during the first 6,000 miles (10 000 km).

UNDERSTANDING THE FEATURES OF YOUR VEHICLE

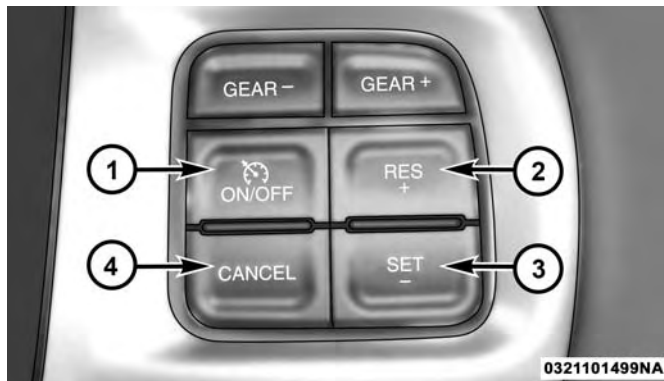
CONTENTS

■ ELECTRONIC SPEED CONTROL . . . . .	.96	□ To Resume Speed . . . . .	.97
□ To Activate . . . . .	.96	□ To Vary The Speed Setting . . . . .	.97
□ To Set A Desired Speed . . . . .	.97	□ To Accelerate For Passing . . . . .	.99
□ To Deactivate . . . . .	.97		

ELECTRONIC SPEED CONTROL

When engaged, the Electronic Speed Control takes over accelerator operations at speeds greater than 25 mph (40 km/h).

The Electronic Speed Control buttons are located on the right side of the steering wheel.



Electronic Speed Control Switches

1 — ON/OFF
2 — RES +

3 — SET -
4 — CANCEL

NOTE: In order to ensure proper operation, the Electronic Speed Control System has been designed to shut down if multiple speed control functions are operated at the same time. If this occurs, the Electronic Speed Control System can be reactivated by pushing the Electronic Speed Control ON/OFF button and resetting the desired vehicle set speed.

To Activate

Push the on/off button. The cruise control set indicator light in the instrument cluster display will illuminate. To turn the system off, push the on/off button a second time. The cruise control set indicator light will turn off. The system should be turned off when not in use.

WARNING!

Leaving the Electronic Speed Control system on when not in use is dangerous. You could accidentally set the system or cause it to go faster than you want. You could lose control and have an accident. Always leave the system off when you are not using it.

To Set A Desired Speed

Turn the Electronic Speed Control on. When the vehicle has reached the desired speed, push the SET (-) button and release. Release the accelerator and the vehicle will operate at the selected speed.

NOTE: The vehicle should be traveling at a steady speed and on level ground before pushing the SET (-) button.

To Deactivate

A soft tap on the brake pedal, pushing the CANC button or normal brake pressure while slowing the vehicle will deactivate the Electronic Speed Control without erasing the set speed from memory.

Pushing the on/off button or turning the ignition to the OFF position erases the set speed from memory.

To Resume Speed

To resume a previously set speed, push the RES (+) button and release. Resume can be used at any speed above 25 mph (40 km/h).

To Vary The Speed Setting

To Increase Speed

When the Electronic Speed Control is set, you can increase speed by pushing the RES (+) button.

The driver's preferred units can be selected through the instrument panel settings if equipped. Refer to "Understanding Your Instrument Panel" for more information. The speed decrement shown is dependant on the chosen speed unit of U.S. (mph) or Metric (km/h):

U.S. Speed (mph)

- Pushing the RES (+) button once will result in a 1 mph increase in set speed. Each subsequent tap of the button results in an increase of 1 mph.
- If the button is continually pushed, the set speed will continue to increase until the button is released, then the new set speed will be established.

Metric Speed (km/h)

- Pushing the RES (+) button once will result in a 1 km/h increase in set speed. Each subsequent tap of the button results in an increase of 1 km/h.
- If the button is continually pushed, the set speed will continue to increase until the button is released, then the new set speed will be established.

To Decrease Speed

When the Electronic Speed Control is set, you can decrease speed by pushing the SET (-) button.

The driver's preferred units can be selected through the instrument panel settings if equipped. Refer to "Understanding Your Instrument Panel" for more information. The speed decrement shown is dependant on the chosen speed unit of U.S. (mph) or Metric (km/h):

U.S. Speed (mph)

- Pushing the SET (-) button once will result in a 1 mph decrease in set speed. Each subsequent tap of the button results in a decrease of 1 mph.
- If the button is continually pushed, the set speed will continue to decrease until the button is released, then the new set speed will be established.

Metric Speed (km/h)

- Pushing the SET (-) button once will result in a 1 km/h decrease in set speed. Each subsequent tap of the button results in a decrease of 1 km/h.
- If the button is continually pushed, the set speed will continue to decrease until the button is released, then the new set speed will be established.

To Accelerate For Passing

Press the accelerator as you would normally. When the pedal is released, the vehicle will return to the set speed.

Using Electronic Speed Control On Hills

The transmission may downshift on hills to maintain the vehicle set speed.

NOTE: The Electronic Speed Control system maintains speed up and down hills. A slight speed change on moderate hills is normal.

On steep hills, a greater speed loss or gain may occur so it may be preferable to drive without Electronic Speed Control.

WARNING!

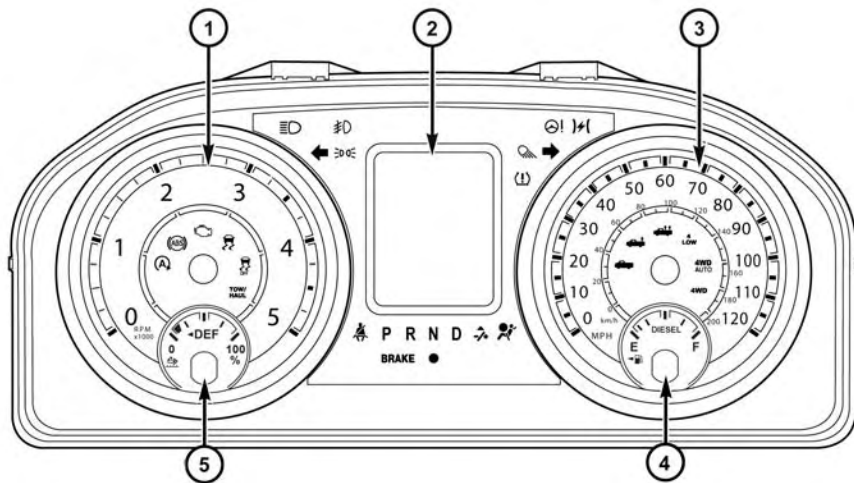
Electronic Speed Control can be dangerous where the system cannot maintain a constant speed. Your vehicle could go too fast for the conditions, and you could lose control and have an accident. Do not use Electronic Speed Control in heavy traffic or on roads that are winding, icy, snow-covered or slippery.

UNDERSTANDING YOUR INSTRUMENT PANEL

CONTENTS

■ INSTRUMENT CLUSTER	102	□ Instrument Cluster Display Messages	115
■ WARNING AND INDICATOR LIGHTS	107	□ Cold Ambient Derate Mode Messages	116
□ Yellow Telltale Indicator Lights	107	□ Diesel Exhaust Fluid (DEF) Warning Messages	116
■ INSTRUMENT CLUSTER DISPLAY	109	□ Diesel Exhaust Fluid (DEF) Fault Warning Messages	117
□ Oil Life Reset	111	□ RAM Active Air System	118
□ Fuel Filter Life Reset	112		
□ Diesel Particulate Filter (DPF) Messages	113		

INSTRUMENT CLUSTER



0403084407US

Instrument Cluster

1. Tachometer

- Indicates the engine speed in revolutions per minute (RPM x 1000).


2. Instrument Cluster Display

- When the appropriate conditions exist, this display shows the Instrument Cluster Display messages. Refer to “Instrument Cluster Display” in “Understanding Your Instrument Panel” for further information.

3. Speedometer

- Indicates vehicle speed.

4. Fuel Gauge

- The pointer shows the level of fuel in the fuel tank when the ignition switch is in the ON/RUN position.
-  The fuel pump symbol points to the side of the vehicle where the fuel filler door is located.

5. DEF Gauge

- The DEF Gauge displays the actual level of Diesel Exhaust Fluid in the DEF tank. Diesel Exhaust Fluid (DEF) is required to maintain normal vehicle operation and emissions compliance. If something is wrong with the gauge, a DEF Warning Message or Malfunction Indicator Light (MIL) will be displayed. More information is available in the Instrument Cluster Display section under the heading of Diesel Exhaust Fluid (DEF) Warning Messages.

WARNING!

A hot engine cooling system is dangerous. You or others could be badly burned by steam or boiling coolant. You may want to call an authorized dealer for

(Continued)

WARNING! (Continued)

service if your vehicle overheats. If you decide to look under the hood yourself, see “Maintaining Your Vehicle.” Follow the warnings under the “Cooling System Pressure Cap” paragraph.

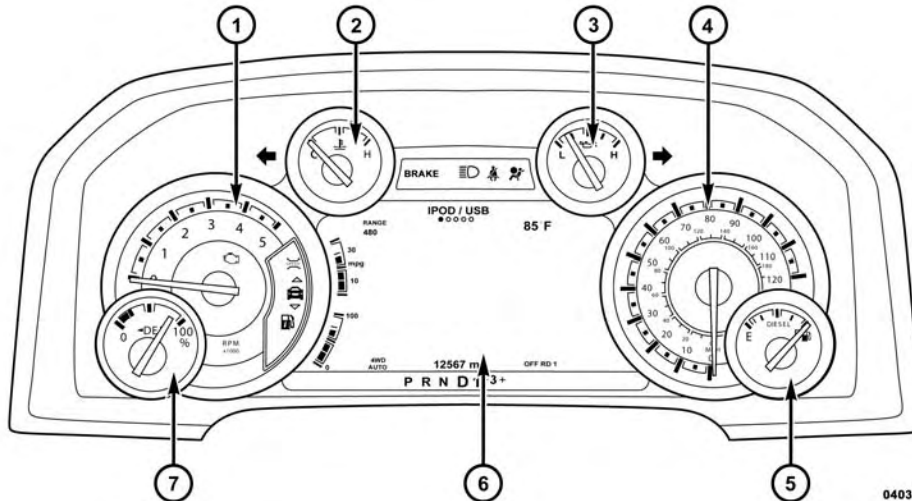
CAUTION!

Driving with a hot engine cooling system could damage your vehicle. If the temperature gauge reads “H” pull over and stop the vehicle. Idle the vehicle with the air conditioner turned off until the pointer drops back into the normal range. If the pointer remains on the “H”, turn the engine off immediately and call an authorized dealer for service.

NOTE:

- The gauge may take up to five seconds to update after adding a gallon or more of Diesel Exhaust Fluid (DEF) to the DEF tank. If you have a fault related to the DEF system, the gauge may not update to the new level. See your authorized dealer for service.

- The DEF gauge may also not immediately update after a refill if the temperature of the DEF fluid is below 12F (-11C). The DEF line heater will possibly warm up the DEF fluid and allow the gauge to update after a period of run time. Under very cold conditions, it is possible that the gauge may not reflect the new fill level for several drives.
- Outside temperature can affect DEF consumption. In cold conditions, 12° F (-11° C) and below, the DEF gauge needle can stay on a fixed position and may not move for extended periods of time. This is a normal function of the system.



0403084413US

Instrument Cluster

1. Tachometer

- Indicates the engine speed in revolutions per minute (RPM x 1000).

2. Engine Coolant Temperature

- This gauge shows the engine coolant temperature. The gauge pointer will likely show higher temperatures when driving in hot weather, up mountain grades, or in heavy stop and go traffic. If the red Warning Light turns on while driving, safely bring the vehicle to a stop, and turn off the engine. DO NOT operate the vehicle until the cause is corrected.

WARNING!

A hot engine cooling system is dangerous. You or others could be badly burned by steam or boiling coolant. You may want to call an authorized dealer for service if your vehicle overheats. If you decide to look under the hood yourself, see "Maintaining Your Vehicle." Follow the warnings under the "Cooling System Pressure Cap" paragraph.

CAUTION!

Driving with a hot engine cooling system could damage your vehicle. If the temperature gauge reads "H" pull over and stop the vehicle. Idle the vehicle with the air conditioner turned off until the pointer drops back into the normal range. If the pointer remains on the "H", turn the engine off immediately and call an authorized dealer for service.


3. Oil Pressure Gauge

- The pointer should always indicate some oil pressure when the engine is running. A continuous high or low reading under normal driving conditions may indicate a lubrication system malfunction. Immediate service should be obtained from an authorized dealer.

4. Speedometer

- Indicates vehicle speed.

5. Fuel Gauge

- The pointer shows the level of fuel in the fuel tank when the ignition switch is in the ON/RUN position.
-  The fuel pump symbol points to the side of the vehicle where the fuel filler door is located.

6. Instrument Cluster Display

- When the appropriate conditions exist, this display shows the Instrument Cluster Display messages. Refer to “Instrument Cluster Display” in “Understanding Your Instrument Panel” for further information.

7. DEF Gauge

- The DEF Gauge displays the actual level of Diesel Exhaust Fluid in the DEF tank. Diesel Exhaust Fluid (DEF) is required to maintain normal vehicle operation and emissions compliance. If something is wrong with the gauge, a DEF Warning Message or Malfunction Indicator Light (MIL) will be displayed. More information is available in the Instrument Cluster Display section under the heading of Diesel Exhaust Fluid (DEF) Warning Messages.

NOTE:

- The DEF tank on these vehicles is designed with a large amount of full reserve. So the level sensor will indicate a full reading even before the tank is completely full. To put it another way, there’s additional storage capacity in the tank above the Full mark that’s not represented in the gauge. You may not see any movement in the reading – even after driving up to 2,000 miles in some cases.

- The gauge may take up to five seconds to update after adding a gallon or more of Diesel Exhaust Fluid (DEF) to the DEF tank. If you have a fault related to the DEF system, the gauge may not update to the new level. See your authorized dealer for service.
- The DEF gauge may also not immediately update after a refill if the temperature of the DEF fluid is below 12F (-11C). The DEF line heater will possibly warm up the DEF fluid and allow the gauge to update after a period of run time. Under very cold conditions, it is possible that the gauge may not reflect the new fill level for several drives.
- Outside temperature can affect DEF consumption. In cold conditions, 12° F (-11° C) and below, the DEF gauge needle can stay on a fixed position and may not move for extended periods of time. This is a normal function of the system.

CAUTION!

Driving with a hot engine cooling system could damage your vehicle. If the temperature gauge reads “H” pull over and stop the vehicle. Idle the vehicle with the

(Continued)


CAUTION! (Continued)

air conditioner turned off until the pointer drops back into the normal range. If the pointer remains on the "H", turn the engine off immediately and call an authorized dealer for service.

WARNING AND INDICATOR LIGHTS

IMPORTANT: The warning / indicator lights switch on in the instrument panel together with a dedicated message and/or acoustic signal when applicable. These indications


Yellow Telltale Indicator Lights**Wait To Start Light — If Equipped**

Yellow Telltale Light	What It Means
	<p>Wait To Start Light The "Wait To Start" telltale will illuminate for approximately two seconds when the ignition is turned to the RUN position. It's duration may be longer based on colder operating conditions. Vehicle will not initiate start until telltale is no longer displayed. Refer to "Starting Procedures" in "Starting and Operating" for further information.</p> <p>NOTE: The "Wait To Start" telltale may not illuminate if the intake manifold temperature is warm enough.</p>


are indicative and precautionary and as such must not be considered as exhaustive and/or alternative to the information contained in the Owner's Manual, which you are advised to read carefully in all cases. Always refer to the information in this chapter in the event of a failure indication.

All active telltales will display first if applicable. The system check menu may appear different based upon equipment options and current vehicle status. Some telltales are optional and may not appear.

Water in Fuel Indicator Light — If Equipped

Yellow Telltale Light	What It Means
	<p>Water in Fuel Indicator Light The “Water In Fuel Indicator Light” will illuminate when there is water detected in the fuel filters. If this light remains on, DO NOT start the vehicle before you drain the water from the fuel filters to prevent engine damage.</p>

Low Diesel Exhaust Fluid (DEF) Indicator Light — If Equipped

Yellow Telltale Light	What It Means
	<p>Low Diesel Exhaust Fluid (DEF) Indicator Light The Low Diesel Exhaust Fluid (DEF) Indicator will illuminate if the vehicle is low on Diesel Exhaust Fluid (DEF). Refer to “Starting And Operating” for further information.</p>

- Trip B
- Stop/Start Info (If Equipped)
- Trailer Tow
- Audio
- Stored Messages
- Screen Setup
- Vehicle Settings (Not Equipped with a Uconnect 5.0 & 8.4 radio)
- Settings
- Turn Menu Off

The system allows the driver to select information by pushing the following buttons mounted on the steering wheel:



040971549

Steering Wheel Buttons

- *UP Arrow Button*



Push and release the **UP** arrow button to scroll upward through the main menu and submenus (Fuel Economy, Trip A, Trip B, Audio, Stored Messages, Screen Set Up).

- *DOWN Arrow Button*



Push and release the **DOWN** arrow button to scroll downward through the main menu and submenus (Fuel Economy, Trip A, Trip B, Audio, Stored Messages, Screen Set Up).

- **RIGHT Arrow Button**



Push and release the **RIGHT** arrow button to access/select the information screens or submenu screens of a main menu item. Push and hold the **RIGHT** arrow button for two seconds to

reset displayed/selected features that can be reset.

- **LEFT Arrow Button**







Push the **LEFT** arrow button to access/select the information screens or submenu screens of a main menu item or to return to the main menu from an info screen or submenu item.

Oil Life Reset


Your vehicle is equipped with an engine oil change indicator system. The “Oil Change Required” message will display in the instrument cluster display after a single chime has sounded, to indicate the next scheduled oil change interval. The engine oil change indicator system is duty cycle based, which means the engine oil change interval may fluctuate, dependent upon your personal driving style.




NOTE: Use the steering wheel instrument cluster display controls for the following procedure(s).

Vehicles Equipped With Passive Entry

1. Without pushing the brake pedal, push the **ENGINE START/STOP** button and place the ignition to the **ON/RUN** position (do not start the engine).
2. Push and release the **down**  arrow button to scroll downward through the main menu to “Vehicle Info.”
3. Push and release the **right**  arrow button to access the “Oil Life” screen.
4. Push and hold the **right**  arrow button to select “Reset”.
5. Push and release the appropriate arrow button to select “**YES**” to reset the Oil Life.
6. Push and release the **up**  arrow button to exit the instrument cluster display screen.

Vehicles Not Equipped With Passive Entry

1. Without pushing the brake pedal, cycle the ignition to the **ON/RUN** position (do not start the engine).
2. Push and release the **down**  arrow button to scroll downward through the main menu to “Vehicle Info.”

3. Push and release the **right**  arrow button to access the “Oil Life” screen.
4. Push and hold the **right**  arrow button to select the Oil Life Reset.
5. Push and release the appropriate arrow button to select “YES” to reset the Oil Life.
6. Push and release the **up**  arrow button to exit the instrument cluster display screen.




NOTE: If the indicator message illuminates when you start the vehicle, the Oil Life indicator system did not reset. If necessary, repeat this procedure.

Fuel Filter Life Reset


The cluster will display the “Service Fuel Filter” message when the fuel filter maintenance life is less than 5%. To check the remaining fuel filter life, go to the “Fuel Filter Life” screen in the “Vehicle Info” menu. When this message appears, dealers should replace the fuel filter.



NOTE: Use the steering wheel button controls for the following procedure(s)

Vehicles Equipped With Passive Entry

1. Without pushing the brake pedal, push the ENGINE START/STOP button and cycle the ignition to the ON/RUN position (do not start the engine.)
2. Push and release the **DOWN**  arrow button to scroll downward through the main menu to “Vehicle Info”.
3. Push and release the **RIGHT**  arrow button to access the “Fuel Filter Life” screen.
4. Push and release the appropriate arrow button to access the “Reset” screen.
5. Push and release the appropriate arrow to select the reset of the Fuel Filter Life.
6. Push and release the **UP**  arrow button to exit the Instrument Cluster Display screen.

Vehicles Not Equipped With Passive Entry

1. Without pressing the brake pedal, cycle the ignition to the ON/RUN position (do not start the engine.)
2. Push and release the **DOWN**  arrow button to scroll downward through the main menu to “Vehicle Info”.

3. Push and release the **RIGHT**  arrow button to access the "Fuel Filter Life" screen.
4. Push and release the appropriate arrow button to access the "Reset" screen.
5. Push and release the appropriate arrow to select the reset of the Fuel Filter Life.
6. Push and release the **UP**  arrow button to exit the Instrument Cluster Display screen.

NOTE: If the indicator message illuminates when you start the vehicle, the Fuel Filter indicator system did not reset. If necessary, repeat this procedure.

Diesel Particulate Filter (DPF) Messages

The Cummins diesel engine meets all diesel emissions standards, resulting in one of the lowest emitting diesel engines ever produced. To achieve these emissions standards, your vehicle is equipped with a state-of-the-art engine and exhaust system. These systems are seamlessly integrated into your vehicle and managed by the Powertrain Control Module (PCM). The PCM manages engine combustion to allow the exhaust system's catalyst to trap and burn Particulate Matter (PM) pollutants, with no input or interaction on your part.

WARNING!

A hot exhaust system can start a fire if you park over materials that can burn. Such materials might be grass or leaves coming into contact with your exhaust system. Do not park or operate your vehicle in areas where your exhaust system can contact anything that can burn.

4

Your vehicle has the ability to alert you to additional maintenance required on your vehicle or engine. The following messages may display in your Instrument Cluster Display:

- **Perform Service** — Your vehicle will require emissions maintenance at a set interval. To help remind you when this maintenance is due, the Instrument Cluster Display will display "Perform Service". When the "Perform Service" message is displayed in the Instrument Cluster Display it is necessary to have the emissions maintenance performed. Emissions maintenance may include replacing the Closed Crankcase Ventilation (CCV) filter element. The procedure for clearing and resetting the "Perform Service" indicator message is located in the appropriate Service Information.

- **Exhaust System — Regeneration Required Now** — “Exhaust Filter XX% Full Safely Drive at Highway Speeds to Remedy” will be displayed in the Instrument Cluster Display if the exhaust particulate filter reaches 80% of its maximum storage capacity. Under conditions of exclusive short duration and low speed driving cycles, your Cummins diesel engine and exhaust after-treatment system may never reach the conditions required to remove the trapped PM. If this occurs, the “Exhaust Filter XX% Full Safely Drive at Highway Speeds to Remedy” message will be displayed in the Instrument Cluster Display. If this message is displayed, you will hear one chime to assist in alerting you of this condition
- By simply driving your vehicle at highway speeds for as little as 45 minutes, you can remedy the condition in the particulate filter system and allow your Cummins diesel engine and exhaust after-treatment system to remove the trapped PM and restore the system to normal operating condition.
- **Exhaust System — Regeneration In Process Exhaust Filter XX% Full** — Indicates that the Diesel Particulate Filter (DPF) is self-cleaning. Maintain your current driving condition until regeneration is completed.
- **Exhaust System — Regeneration Completed** — This message indicates that the Diesel Particulate Filter (DPF) self-cleaning is completed. If this message is displayed, you will hear one chime to assist in alerting you of this condition.
- **Exhaust Service Required — See Dealer Now** — This message indicates regeneration has been disabled due to a system malfunction. At this point the engine Powertrain Control Module (PCM) will register a fault code, the instrument panel will display a MIL light.

CAUTION!

See your authorized dealer, as damage to the exhaust system could occur soon with continued operation.

- **Exhaust Filter Full — Power Reduced See Dealer** — This message indicates the PCM has derated the engine to limit the likelihood of permanent damage to the after-treatment system. If this condition is not corrected and a dealer service is not performed, extensive exhaust after-treatment damage can occur. To correct this condition it will be necessary to have your vehicle serviced by your local authorized dealer.

CAUTION!

See your authorized dealer, as damage to the exhaust system could occur soon with continued operation.

Instrument Cluster Display Messages

When the appropriate conditions exist, the Instrument Cluster Display displays the following messages:

- System Setup Unavailable – Vehicle Not in Park
- System Setup Unavailable – Vehicle in Motion
- Service Air Filter
- Perform Service
- Exhaust Filter Full Safely Drive at Highway Speeds To Remedy
- Exhaust Filter XX% Full – Power Reduced See Dealer
- Exhaust Service Required – See Dealer Now
- Exhaust System – Filter XX% Full Service Required See Dealer
- Exhaust System – Regeneration In Process Exhaust Filter XX% Full
- Exhaust System – Regeneration Completed
- Speed Limited to 5 MPH in XXX mi Refill DEF
- 5 MPH Max Speed on Restart, Long Idle or Refuel Refill DEF
- 5 MPH Max Speed Refill DEF
- Service DEF System See Dealer
- 5 MPH Max Speed in XXX mi Service DEF System See Dealer
- 5 MPH Max Speed on Restart, Long Idle or Refuel Service DEF See Dealer
- 5 MPH Max Speed Service DEF System See Dealer
- Coolant Low
- Engine Power Reduced During Warm-up
- Engine Power Reduced up to 30-sec During Warmup
- Engine Power Reduced up to 2-min During Warmup
- Active Airbox Service Required See Dealer

Cold Ambient Derate Mode Messages

The vehicle will display messages when a derate (engine power reduction) is activated to protect the turbocharger during engine start up in cold ambient temperatures.

- **Engine Power Reduced During Warmup** — This message will display during start up when the ambient temperature is between 10° F (-12° C) and -10° F (-23° C).
- **Engine Power Reduced Up To 30 Sec (Seconds) During Warmup** — This message will display during start up when the ambient temperature is between -10° F (-23° C) and -25 F (-32° C).
- **Engine Power Reduced Up To 2 Min (Minutes) During Warmup** — This message will display during start up when the ambient temperature is -25° F (-32° C) and below.
- **Coolant Low** — This telltale will turn on to indicate the vehicle coolant level is low. See “Adding Coolant” under the section “Maintaining Your Vehicle” for more information.

Diesel Exhaust Fluid (DEF) Warning Messages

Your vehicle will begin displaying warning messages when the DEF level reaches a driving range of approximately

350 miles (560 km). If the following warning message sequence is ignored, your vehicle may be limited to a maximum speed of 5 MPH (8 km/H) unless DEF is added.

- **DEF Low Refill Soon** — This message will display when the low level is reached, during vehicle start up, and with increased frequency during vehicle operation. It will be accompanied by a single chime. Approximately 5 gallons (19 Liters) of DEF is required to refill the tank when this message is initially displayed. on pickup applications, and approximately 7 gallons (28 Liters) are required on chassis-cab applications.
- **Speed Limited to 5 MPH in XXX mi Refill DEF** — This message will continuously display if the “DEF Low Refill Soon” message is ignored, and the frequency of occurrence of the chime will increase unless up to 2 gallons (7.5 Liters) of DEF is added to the tank.
- **5 MPH Max Speed on Restart, Long Idle or Refuel Refill DEF** — This message will continuously display when the counter reaches zero, and will be accompanied by a periodic chime.
- The vehicle will only be capable of a maximum speed of 5 MPH upon the first of the following conditions to occur:

- If the vehicle is shut off and restarted.
- If the vehicle is idled for an extended period of time, approximately one hour or greater.
- If the system detects that the level of fuel in the tank has increased.
- Add a minimum of 2 gallons (9.5 Liters) of DEF to the tank in order to avoid vehicle operation at a maximum speed of 5 MPH (8 km/H).

NOTE: A minimum of 2 gallons (9.5 Liters) may be required to restore normal vehicle operation. Although the vehicle will start normally and can be placed in gear after this message has been initially displayed, extreme caution should be utilized since the vehicle will only be capable of maneuvering at a maximum speed of 5 MPH (8 km/H).

Diesel Exhaust Fluid (DEF) Fault Warning Messages

There are five different messages which are displayed if the vehicle detects that the DEF system has been filled with a fluid other than DEF, has experienced component failures, or when tampering has been detected. The vehicle may be limited to a maximum speed of 5 MPH (8 km/H) if the DEF system is not serviced within less than 200 miles (322 km) of the fault being detected.

When the DEF system needs to be serviced the following warnings will display:

- **Service DEF System See Dealer** — This message will display when the fault is initially detected, each time the vehicle is started, and periodically during driving. The message will be accompanied by a single chime. We recommend you drive to your nearest authorized dealer and have your vehicle serviced as soon as possible.
- **5 MPH Max Speed in 150 mi Service DEF System See Dealer** — This message will display if the DEF system has not been serviced after the “Service DEF System – See Dealer” message is displayed. This message will continuously display until the mileage counter reaches zero, and will be accompanied by a periodic chime. The message will continue to countdown until it reaches zero unless the vehicle is serviced. We recommend you drive to your nearest authorized dealer and have your vehicle serviced immediately.

NOTE: Under some circumstances this mileage counter may start with a value of less than 150 miles (241 km). For example, if recurring faults are detected in a time interval of less than 40 hours, the counter may restart at the value where it stopped when a previous fault was temporarily remedied, or at a minimum of 50 miles (80 km).

- **5 MPH Max Speed on Restart, Long Idle or Refuel Service DEF See Dealer** — This message will continuously display when the mileage counter reaches zero, and will be accompanied by a periodic chime.
- The vehicle will only be capable of a maximum speed of 5 MPH upon the first of the following conditions to occur:
 - If the vehicle is shutoff and restarted.
 - If the vehicle is idled for an extended period of time, approximately one hour or greater.
 - If the system detects that the level of fuel in the tank has increased.
- **5 MPH Max Speed Service DEF System See Dealer** — This message will continuously display, and will be accompanied by a periodic chime. Although the vehicle can be started and placed in gear, the vehicle will only operate at a maximum speed of 5 MPH. Your vehicle will require towing, see your authorized dealer for service.

NOTE: When this message is displayed, the engine can still be started. However, the vehicle will only operate at a maximum speed of 5 MPH.

- **Incorrect DEF Detected See Dealer** — This message will display when the fault is initially detected, each time the vehicle is started, and periodically during driving. The message will be accompanied by a single chime. We recommend you drive to your nearest authorized dealer and have your vehicle serviced as soon as possible.

RAM Active Air System

Your vehicle is equipped with an advanced Ram Active Air system that provides enhanced performance, especially when towing under demanding hot or high altitude conditions. If the Instrument Cluster Display displays the message “Active Airbox Service Required See Dealer”, vehicle performance may be reduced until service is performed by an authorized RAM dealer.

STARTING AND OPERATING

CONTENTS

■ STARTING PROCEDURES	121	■ NORMAL OPERATION — DIESEL ENGINE	130
□ Manual Transmission — If Equipped	121	□ Cold Weather Precautions	131
□ Automatic Transmission — If Equipped	121	□ Engine Idling	133
□ Keyless Enter-N-Go — If Equipped	122	□ Stopping The Engine	134
□ Extreme Cold Weather	125	□ Idle Shutdown	135
□ Normal Starting Procedure — Engine Manifold Air Temperature Above 66° F (19° C)	126	□ Programmable Maximum Vehicle Speed (Chassis Cab Only)	136
□ Starting Procedure — Engine Manifold Air Temperature 0°F To 66°F (-18°C to 19°C)	126	□ Operating Precautions	136
□ Starting Procedure — Engine Manifold Air Temperature Below 0°F (-18°C)	128	□ Cooling System Tips — Automatic Transmission	136
□ Starting Fluids	129	■ ENGINE BLOCK HEATER — IF EQUIPPED	137
		□ Block Heater Usage	138
		■ DIESEL EXHAUST BRAKE (ENGINE BRAKING)	138

- AUTOMATIC TRANSMISSION — IF EQUIPPED .140
 - Key Ignition Park Interlock141
 - Brake/Transmission Shift Interlock System141
 - Six-Speed Automatic Transmission — If Equipped141
- MANUAL TRANSMISSION — IF EQUIPPED . . .150
 - Shifting151
 - Downshifting.152
 - Reverse Shifting.153
- AUXILIARY SWITCHES — IF EQUIPPED153
- POWER TAKE OFF OPERATION — IF EQUIPPED (CHASSIS CAB ONLY)154
 - Stationary Mode154
 - Mobile Mode155
- ENGINE RUNAWAY156
- FUEL REQUIREMENTS157
 - Fuel Specifications157
 - Bio-Diesel Fuel Requirements158
- ADDING FUEL — 2500/3500 DIESEL MODELS . .160
- ADDING FUEL — CHASSIS CAB MODELS162
 - Fuel Filler Cap163
 - Avoid Using Contaminated Fuel163
 - Bulk Fuel Storage — Diesel Fuel163
 - Diesel Exhaust Fluid Storage.164
 - Adding Diesel Exhaust Fluid.164
- DIESEL EXHAUST FLUID167
 - System Overview168

STARTING PROCEDURES

Before starting your vehicle, adjust your seat, adjust both inside and outside mirrors, and fasten your seat belts.

The starter should not be operated for more than 15-second intervals. Waiting a few minutes between such intervals will protect the starter from overheating.

WARNING!

- Do not leave children or animals inside parked vehicles in hot weather. Interior heat build up may cause serious injury or death.
- When leaving the vehicle, always make sure the keyless ignition node is in the "OFF" mode, remove the key fob from the vehicle and lock the vehicle.
- Never leave children alone in a vehicle, or with access to an unlocked vehicle. Allowing children to be in a vehicle unattended is dangerous for a number of reasons. A child or others could be seriously or fatally injured. Children should be warned not to touch the parking brake, brake pedal or the gear selector.

(Continued)

WARNING! *(Continued)*

- Do not leave the key fob in or near the vehicle, or in a location accessible to children, and do not leave the ignition of a vehicle equipped with Keyless Enter-N-Go in the ACC or ON/RUN mode. A child could operate power windows, other controls, or move the vehicle.

Manual Transmission — If Equipped

Apply the parking brake, place the gear selector in NEUTRAL and press the clutch pedal to the floor before starting the vehicle. This vehicle is equipped with a clutch interlocking ignition system. It will not start unless the clutch is fully pressed.

Automatic Transmission — If Equipped

Start the engine with the transmission in the NEUTRAL or PARK position. Apply the brake before shifting to any driving range.

Tip Start Feature

Do not press the accelerator. Turn the ignition switch briefly to the START position and release it. The starter motor will continue to run but will automatically disengage when the engine is running.

Keyless Enter-N-Go — If Equipped



This feature allows the driver to operate the ignition switch with the push of a button, as long as the Remote Start/Keyless Enter-N-Go key fob is in the passenger compartment.

Normal Starting

Using The ENGINE START/STOP Button

1. The transmission must be in PARK or NEUTRAL.
2. Press and hold the brake pedal while pushing the ENGINE START/STOP button once.
3. The system takes over and attempts to start the vehicle. If the vehicle fails to start, the starter will disengage automatically after 25 seconds.
4. If you wish to stop the cranking of the engine prior to the engine starting, remove your foot from the brake pedal and push the button again.

NOTE:

- Normal starting of either a cold or a warm engine is obtained without pumping or pressing the accelerator pedal.
- Under cold weather conditions, the engine may not immediately crank if the "Wait To Start" telltale is illuminated. This is normal operation. For vehicles equipped with Keyless Enter-N-Go, the vehicle will automatically crank when the "Wait To Start" time has elapsed. See the section "Starting Procedure Engine Manifold Air Temperature 0°F to 66°F (18° C to 19°C)" for more information.

To Turn Off The Engine Using ENGINE START/STOP Button

1. Place the gear selector in PARK, then push and release the ENGINE START/STOP button.
2. The ignition will return to the OFF position.

3. If the gear selector is not in PARK, the ENGINE START/STOP button must be held for two seconds or three short pushes in a row with the vehicle speed above 5 mph (8 km/h) before the engine will shut off. The ignition switch position will remain in the ACC position until the gear selector is in PARK and the button is pushed twice to the OFF position. If the gear selector is not in PARK and the ENGINE START/STOP button is pushed once, the instrument cluster display will display a “Vehicle Not In Park” message and the engine will remain running. Never leave a vehicle out of the PARK position, or it could roll.
4. If the gear selector is in NEUTRAL, push and release the ENGINE START/STOP button with the vehicle speed below 5 mph (8 km/h) before the engine will shut off. The ignition will remain in the ACC position.

NOTE: If the ignition is left in the ACC or RUN (engine not running) position and the transmission is in PARK, the system will automatically time out after 30 minutes of inactivity and the ignition will switch to the OFF position.

ENGINE START/STOP Button Functions — With Driver’s Foot OFF The Brake Pedal (In PARK Or NEUTRAL Position)

The ENGINE START/STOP button operates similar to an ignition switch. It has three positions, OFF, ACC, RUN. To change the ignition switch positions without starting the vehicle and use the accessories follow these steps:

1. Starting with the ignition in the OFF position:
2. Push the ENGINE START/STOP button once to change the ignition to the ACC position.
3. Push the ENGINE START/STOP button a second time to change the ignition to the RUN position.
4. Push the ENGINE START/STOP button a third time to return the ignition to the OFF position.

Keyless Enter-N-Go Starting Procedure — Engine Manifold Air Temperature 0° F To 66° F (–18° C to 19° C)

NOTE: The temperature displayed in the instrument cluster does not necessarily reflect the engine manifold air temperature. Refer to “Instrument Cluster Display” in “Understanding Your Instrument Panel” for further information. When engine temperatures fall below 66°F (19°C) the “Wait To Start Light” will remain on indicating the intake manifold heater system is active.

Follow the steps in the “Normal Starting” procedure except:

1. Pushing the engine start button with the driver’s foot on the brake will move the ignition from OFF or ACC to RUN, and will illuminate the “Wait To Start” telltale. The engine will not immediately crank, this is normal operation.
2. The “Wait To Start” telltale will remain on for a period of time that varies depending on the engine temperature.

3. While the “Wait to Start” telltale is on, the instrument cluster will additionally display a gauge or bar whose initial length represents the full “Wait to Start” time period. Its length will decrease until it disappears when the “Wait to Start” time has elapsed.

CAUTION!

If the “Water in Fuel Indicator Light” remains on, **DO NOT START** engine before you drain the water from the fuel filters to avoid engine damage. Refer to “Maintenance Procedures/Draining Fuel/Water Separator Filter” in “Maintaining Your Vehicle” for further information.

4. After the engine “Wait To Start” telltale goes off, the engine will automatically crank.

CAUTION!

The engine may automatically crank when the “Wait To Start” time has elapsed. To abort the automatic starting process, ensure the driver’s foot is fully removed from the brake pedal prior to pushing the START/STOP button to cycle the ignition off.

5. After engine start-up, check to see that there is oil pressure.
6. Allow the engine to idle about three minutes until the manifold heaters have completed the post-heat cycle.
7. Release the parking brake and drive.

NOTE:

- Engine idle speed will automatically increase to 1,000 RPM and engage the Variable Geometry Turbocharger at low coolant temperatures to improve engine warm-up.
- The engine may not automatically crank after the engine "Wait To Start" telltale goes off if a door or the hood is ajar.
- If the engine stalls, or if the ignition switch is left ON for more than two minutes after the "Wait To Start Light" goes out, reset the grid heaters by turning the ignition switch to the OFF position for at least five seconds and then back ON. Repeat steps 1 through 7 of "Keyless Enter-N-Go Starting Procedure – Engine Manifold Air Temperature Below 66° F (19° C)."

Extreme Cold Weather

The Cummins diesel engine is equipped with several features designed to assist cold weather starting and operation:

- The engine block heater is a resistance heater installed in the water jacket of the engine just above and behind the oil filter. It requires a 110–115 Volt AC electrical outlet with a grounded, three-wire extension cord.

NOTE: The engine block heater cord is a factory installed option. If your vehicle is not equipped, heater cords are available from your authorized MOPAR dealer.

- A 12 Volt heater built into the fuel filter housings aid in preventing fuel gelling. It is controlled by a built-in thermostat.
- A heated intake air system both improves engine starting and reduces the amount of white smoke generated by a warming engine.

Normal Starting Procedure — Engine Manifold Air Temperature Above 66° F (19° C)

Observe the instrument panel cluster lights when starting the engine.

1. Always apply the parking brake.
2. Shift into PARK for an automatic transmission. For vehicles equipped with a manual transmission, fully press and hold the clutch pedal and shift into NEUTRAL.
3. Turn the ignition switch to the ON position and watch the instrument panel cluster lights.

CAUTION!

If the “Water in Fuel Indicator Light” remains on, DO NOT START the engine before you drain the water from the fuel filters to avoid engine damage. Refer to “Maintenance Procedures/Draining Fuel/Water Separator Filter” in “Maintaining Your Vehicle” for further information.

4. Turn the ignition switch to the START position and crank the engine. Do not press the accelerator during starting.

CAUTION!

Do not crank engine for more than 15 seconds at a time or starter motor damage may result. Turn the ignition switch to the OFF position and wait at least two minutes for the starter to cool before repeating start procedure.

5. When the engine starts, release the key fob.
6. Check that the oil pressure warning light has turned off.
7. Release the parking brake.

Starting Procedure — Engine Manifold Air Temperature 0°F To 66°F (–18°C to 19°C)

NOTE: The temperature displayed in the instrument cluster does not necessarily reflect the engine manifold air temperature. Refer to “Instrument Cluster Display” in “Understanding Your Instrument Panel” for further information. When engine temperatures fall below 66°F (19°C) the “Wait To Start Light” will remain on indicating the intake manifold heater system is active.

Follow the steps in the “Normal Starting” procedure except:

1. The “Wait To Start” telltale will remain on for a period of time that varies depending on the engine temperature.
2. While the “Wait To Start” telltale is on, the instrument cluster will additionally display a gauge or bar whose initial length represents the full “Wait To Start” time period. Its length will decrease until it disappears when the “Wait To Start” time has elapsed.

CAUTION!

If the “Water in Fuel Indicator Light” remains on, DO NOT START engine before you drain the water from the fuel filters to avoid engine damage. Refer to “Maintenance Procedures/Draining Fuel/Water Separator Filter” in “Maintaining Your Vehicle” for further information.

3. After the “Wait To Start” telltale goes off, turn the ignition switch to the START position. Do not press the accelerator during starting.

CAUTION!

Do not crank engine for more than 15 seconds at a time or starter motor damage may result. Turn the ignition switch to the OFF position and wait at least two minutes for the starter to cool before repeating start procedure.

4. After engine start-up, check that the oil pressure warning light has turned off.
5. Allow the engine to idle about three minutes until the manifold heaters have completed the post-heat cycle.
6. Release the parking brake and drive.

NOTE:

- Engine idle speed will automatically increase to 1,000 RPM and engage the Variable Geometry Turbocharger at low coolant temperatures to improve engine warm-up.
- Automatic equipped vehicles with optional Keyless Enter-N-Go – If the start button is pushed once while in park with the ignition off and driver’s foot on the brake pedal, the vehicle will automatically crank and start after the Wait to Start time has elapsed. If it is desired to

about the start process before it completes, the driver's foot should be fully removed from the brake pedal prior to pushing the start button again in order for the ignition to move directly to off.

- If the engine stalls, or if the ignition switch is left ON for more than two minutes after the "Wait To Start" telltale goes out, reset the grid heaters by turning the ignition switch to the OFF position for at least five seconds and then back ON. Repeat steps 1 through 5 of "Starting Procedure – Engine Manifold Air Temperature Below 66°F (19°C)."

Starting Procedure — Engine Manifold Air Temperature Below 0°F (-18°C)

In extremely cold weather below 0°F (-18°C) it may be beneficial to cycle the manifold heaters twice before attempting to start the engine. This can be accomplished by turning the ignition OFF for at least five seconds and then back ON after the "Wait To Start" telltale has turned off, but before the engine is started. However, excessive cycling of the manifold heaters will result in damage to the heater elements or reduced battery voltage.

NOTE: If multiple pre-heat cycles are used before starting, additional engine run time may be required to maintain battery state of charge at a satisfactory level.

1. If the engine stalls after the initial start, the ignition must be turned to the OFF position for at least five seconds and then to the ON position to recycle the manifold heaters.

NOTE: Excessive white smoke and poor engine performance will result if manifold heaters are not recycled.

2. Heat generated by the manifold heaters dissipates rapidly in a cold engine. If more than two minutes pass between the time the "Wait To Start" telltale turns off and the engine is started, recycle the manifold heaters by turning the ignition switch to the OFF position for at least five seconds and then back ON.
3. If the vehicle is driven and vehicle speed exceeds 19 mph (31 km/h) before the manifold heater post-heat (after start) cycle is complete, the manifold heaters will shut off.
4. If the engine is started before the "Wait To Start" telltale turns off, the preheat cycle will turn off.
5. If the engine is cranked for more than 10 seconds, the post-heat cycle will turn off.

NOTE:

- Engine idle speed will automatically increase to 1,000 RPM and engage the Variable Geometry Turbocharger at low coolant temperatures to improve engine warm-up.
- When a diesel engine is allowed to run out of fuel or the fuel gels at low temperatures, air is pulled into the fuel system. If your engine has run out of fuel, refer to “Maintenance Procedures/Priming If The Engine Has Run Out Of Fuel” in “Maintaining Your Vehicle” for further information.
- If the engine stalls, or if the ignition switch is left ON for more than two minutes after the “Wait To Start” telltale goes out, reset the grid heaters by turning the ignition switch to the OFF position for at least five seconds and then back ON. Repeat steps 1 through 5 of “Starting Procedure – Engine Manifold Air Temperature Below 66°F (19°C).”

Starting Fluids**WARNING!**

Starting fluids or flammable liquids must never be used in the Cummins diesel engine (see Warning label). Never pour diesel fuel, flammable liquid, starting fluids (ether) into the air cleaner canister, air intake piping, or turbocharger inlet in an attempt to start the vehicle. This could result in a flash fire and explosion causing serious personal injury and engine damage.

The engine is equipped with an automatic electric air preheating system. If the instructions in this manual are followed, the engine should start in all conditions.

WARNING!

- **Do not leave children or animals inside parked vehicles in hot weather. Interior heat build up may cause serious injury or death.**
- **When leaving the vehicle, always make sure the keyless ignition node is in the “OFF” mode, remove the key fob from the vehicle and lock the vehicle.**

(Continued)

WARNING! *(Continued)*

- Never leave children alone in a vehicle, or with access to an unlocked vehicle. Allowing children to be in a vehicle unattended is dangerous for a number of reasons. A child or others could be seriously or fatally injured. Children should be warned not to touch the parking brake, brake pedal or the gear selector.
- Do not leave the key fob in or near the vehicle, or in a location accessible to children, and do not leave the ignition of a vehicle equipped with Keyless Enter-N-Go in the ACC or ON/RUN mode. A child could operate power windows, other controls, or move the vehicle.

NORMAL OPERATION — DIESEL ENGINE

Observe the following when the engine is operating.

- All message center lights are off.
- Malfunction Indicator Light (MIL) is off.
- Engine oil pressure is above 10 psi (69 kPa) at idle.
- Voltmeter operation:

The voltmeter may show a gauge fluctuation at various engine temperatures. This cycling operation is caused by the post-heat cycle of the intake manifold heater system. The number of cycles and the length of the cycling operation is controlled by the engine control module. Post-heat operation can run for several minutes, and then the electrical system and voltmeter needle will stabilize.

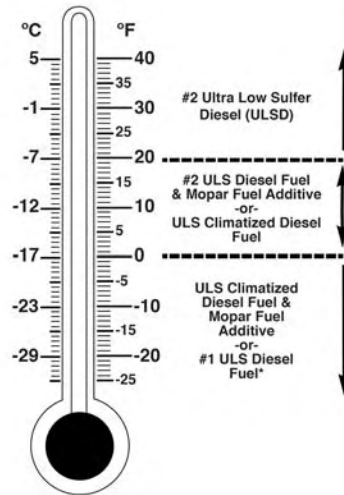
The cycling action will cause temporary dimming of the headlamps, interior lamps, and also a noticeable reduction in blower motor speed.

Cold Weather Precautions

Operation in ambient temperature below 32°F (0°C) may require special considerations. The following charts suggest these options:

Fuel Operating Range

NOTE: Use “Ultra Low Sulfur Diesel Fuels” **ONLY**.



Fuel Operating Range Chart

*No. 1 Ultra Low Sulfur Diesel Fuel should only be used where extended arctic conditions (0°F/-18°C) exist”.

NOTE:

- Use of Climatized Ultra Low Sulfur Diesel Fuel or Number 1 Ultra Low Sulfur Diesel Fuel results in a noticeable decrease in fuel economy.
- Climatized Ultra Low Sulfur Diesel Fuel is a blend of Number 2 Ultra Low Sulfur and Number 1 Ultra Low Sulfur Diesel Fuels which reduces the temperature at which wax crystals form in fuel.
- The fuel grade should be clearly marked on the pump at the fuel station.
- The engine requires the use of **“Ultra Low Sulfur Diesel Fuel”**. Use of incorrect fuel could result in engine and exhaust system damage. Refer to “Fuel Requirements” in “Starting And Operating” for further information.
- If climatized or diesel Number 1 ULSD fuel is not available, and you are operating below (20°F/-6°C), in sustained arctic conditions, Mopar Premium Diesel Fuel Treatment (or equivalent) is recommended to avoid gelling (see Fuel Operating Range Chart).

Engine Oil Usage

Refer to “Maintenance Procedures” in “Maintaining Your Vehicle” for the correct engine oil viscosity.

Winter Front Cover Usage

A winter front or cold weather cover is to be used in ambient temperatures below 32°F (0°C), especially during extended idle conditions. This cover is equipped with four flaps for managing total grille opening in varying ambient temperatures. If a winter front or cold weather cover is to be used the flaps should be left in the full open position to allow air flow to the charge air cooler and automatic transmission oil cooler. When ambient temperatures drop below 0°F (-17°C) the four flaps need to be closed. A suitable cold weather cover is available from your MOPAR dealer.

Battery Blanket Usage

A battery loses 60% of its cranking power as the battery temperature decreases to 0°F (-18°C). For the same decrease in temperature, the engine requires twice as much power to crank at the same RPM. The use of 120 VAC powered battery blankets will greatly increase starting capability at low temperatures. Suitable battery blankets are available from your authorized MOPAR dealer.

Engine Warm-Up

Avoid full throttle operation when the engine is cold. When starting a cold engine, bring the engine up to operating speed slowly to allow the oil pressure to stabilize as the engine warms up.

NOTE: High-speed, no-load running of a cold engine can result in excessive white smoke and poor engine performance. No-load engine speeds should be kept under 1,200 RPM during the warm-up period, especially in cold ambient temperature conditions.

Your vehicle is equipped with a turbo speed limiter, this feature limits the engine speed to 1,200 RPM when engine coolant temperatures are below 70°F (21°C). This feature is designed to protect the turbocharger from damage and will only operate in PARK or NEUTRAL.

If temperatures are below 32°F (0°C), operate the engine at moderate speeds for five minutes before full loads are applied.

NOTE: If ambient temperatures are low and the coolant temperature is below 180°F (82°C), the engine idle speed will slowly increase to 1,000 RPM after two minutes of idle, if the following conditions are met:

- Foot is off brake pedal and throttle pedal.

- Automatic transmission is in PARK.
- Vehicle speed is 0 mph (0 km/h).
- Applying the throttle will cancel fast idle.
- Operating the exhaust brake at idle will greatly improve warm up rate and will help keep the engine close to operating temperature during extended idle.

Engine Idling

Avoid prolonged idling, long periods of idling may be harmful to your engine because combustion chamber temperatures can drop so low that the fuel may not burn completely. Incomplete combustion allows carbon and varnish to form on piston rings, engine valves, and injector nozzles. Also, the unburned fuel can enter the crankcase, diluting the oil and causing rapid wear to the engine.

If the engine is allowed to idle or the truck is driven on low engine speed drive cycles for more than 2 hours, the system will automatically enter an emissions operating mode that will increase the engine idle speed to 900 RPM (1050 RPM for Chassis Cab). While in this mode, which is designed to help maintain the diesel particulate filter, the engine idle speed will return to normal when the brake pedal is applied. A small change in engine tone or a slight change in engine performance while accelerating may also

be noticeable at speeds below 20 mph (32 kmh). This operating mode may last for up to an hour of idle time, or around 20 minutes of driving time.

Your truck may have been ordered with an optional voltage monitoring idle up feature. If a load is placed on the electrical system while the truck is in park, this feature will attempt to maintain normal system voltage by automatically increasing engine idle speed. You may notice several consecutive increases in idle speed, up to a maximum of 1450 RPM, as the system will attempt to utilize the smallest increase in idle speed necessary to maintain normal system voltage. The idle speed will return to normal when either the electrical load is removed, or when the brake pedal is applied.

NOTE: For instrument cluster display messages related to the vehicle's exhaust system, refer to "Instrument Cluster Display" in "Understanding Your Instrument Panel" for further information.

Idle-Up Feature — Automatic Transmission Only

The driver-controlled high idle speed feature will help increase cylinder temperatures and provide additional cab heat, however, excessive idling may still cause the exhaust aftertreatment system to not properly regenerate. Extended periods of idle time should be avoided.

The Idle-Up feature uses the speed control switches to increase engine idle speed and quickly warm the vehicle's interior.

1. With the transmission in PARK, the parking brake applied, and the engine running, push the speed control switch to the ON position, then push the SET switch.
2. The engine RPM will go up to 1100 RPM. To increase the RPM, push and hold the ACCEL/RESUME switch and the idle speed will increase to approximately 1500 RPM. To decrease the RPM, push and hold the DECEL switch and the idle speed will decrease to approximately 1100 RPM.
3. To cancel the Idle-Up feature, either push the CANCEL switch, push the ON/OFF switch, or press the brake pedal.

Stopping The Engine

Idle the engine a few minutes before routine shutdown. After full load operation, idle the engine three to five minutes before shutting it down. This idle period will allow the lubricating oil and coolant to carry excess heat away from the combustion chamber, bearings, internal components, and turbocharger. This is especially important for turbocharged, charge air-cooled engines.

NOTE:

- During engine shut down on vehicles equipped with manual transmissions, it is normal for the diesel engine to resonate heavily for a moment during engine shut off. When the engine is connected to a manual transmission, this resonance causes load gear rattle from the transmission. This is commonly referred to as “shut down rattle.” The manufacturer recommends performing engine shut down with the clutch pedal pushed to the floor (clutch disengaged). When engine shut down is performed in this manner the rattle is reduced (not eliminated).
- Refer to the following chart for proper engine shutdown.

Driving Condition	Load	Turbo-charger Temperature	Idle Time (min.) Before Engine Shutdown
Stop and Go	Empty	Cool	Less than One
Stop and Go	Medium		One

Driving Condition	Load	Turbo-charger Temperature	Idle Time (min.) Before Engine Shutdown
Highway Speeds	Medium	Warm	Two
City Traffic	Maximum GCWR		Three
Highway Speeds	Maximum GCWR		Four
Uphill Grade	Maximum GCWR	Hot	Five

5

Idle Shutdown

This feature can be enabled so that the truck will automatically shutdown when the truck has been idling for a set period of time when the engine is at operating temperature. Idle time can be set in 5 minute increments between 5 and 60 minutes. See your local authorized dealer to enable this feature.

NOTE: The idle shut down timer is disabled while the PTO is active.

Programmable Maximum Vehicle Speed (Chassis Cab Only)

This feature allows the owner to set a maximum vehicle speed for the vehicle. The 3500 Series maximum vehicle speed can be set between 40 mph (64 km/h) and 87 mph (140 km/h). The 4500/5500 Series maximum vehicle speed can be set between 40 mph (64 km/h) and 85 mph (136 km/h). See your local authorized dealer to enable this feature.

NOTE: DO NOT set the maximum vehicle speed to a value greater than what the vehicle tires are rated for.

Operating Precautions

Avoid Overheating The Engine

The temperature of the engine coolant (antifreeze) (a mixture of 50% ethylene-glycol and 50% water) must not exceed the normal range of the temperature gauge 240°F (116°C) with a 21 psi (145 kPa) coolant pressure cap.

Usually the engine coolant (antifreeze) temperature indicated during operation will be to the left of center in the normal range of the gauge.

Avoid Low Coolant Temperature Operation

Continual operation at low engine coolant (antifreeze) temperature below the normal range on the gauge 140°F (60°C) can be harmful to the engine. Low engine coolant (antifreeze) temperature can cause incomplete combustion which allows carbon and varnish to form on piston rings and injector nozzles. Also, the unburned fuel can enter the crankcase, diluting the lubricating oil and causing rapid wear to the engine.

Cooling System Tips — Automatic Transmission

To reduce potential for engine and transmission overheating in high ambient temperature conditions, take the following actions:

- **City Driving** —
When stopped, shift the transmission into NEUTRAL and increase engine idle speed.
- **Highway Driving** —
Reduce your speed.
- **Up Steep Hills** —
Select a lower transmission gear.
- **Air Conditioning** —
Turn it off temporarily.

Do Not Operate The Engine With Low Oil Pressure

When the engine is at normal operating temperature, the minimum oil pressures required are:

Idle 700 to 800 RPM	10 psi (69 kPa)
Full speed and load	30 psi (207 kPa)

CAUTION!

If oil pressure falls to less than normal readings, shut the engine off immediately. Failure to do so could result in immediate and severe engine damage.

Do Not Operate The Engine With Failed Parts

All engine failures give some warning before the parts fail. Be on the alert for changes in performance, sounds, and visual evidence that the engine requires service. Some important clues are:

- Engine misfiring or vibrating severely.
- Sudden loss of power.
- Unusual engine noises.

- Fuel, oil or coolant leaks.
- Sudden change, outside the normal operating range, in the engine operating temperature.
- Excessive smoke.
- Oil pressure drop.

ENGINE BLOCK HEATER — IF EQUIPPED

The engine block heater warms engine coolant and permits quicker starts in cold weather. Connect the heater cord to a ground-fault interrupter protected 110–115 Volt AC electrical outlet with a grounded, three-wire extension cord.

The engine block heater cord is routed under the hood to the right side and can be located just behind the grille near the headlamp.

NOTE: The engine block heater cord is a factory installed option. If your vehicle is not equipped, heater cords are available from your authorized MOPAR dealer.

The block heater must be plugged in at least one hour to have an adequate warming effect on the coolant.

WARNING!

Remember to disconnect the cord before driving. Damage to the 110–115 Volt electrical cord could cause electrocution.

NOTE: The block heater will require 110 Volts AC and 6.5 Amps to activate the heater element.

Block Heater Usage

For ambient temperatures below 0°F (-18°C), engine block heater usage is recommended.

For ambient temperatures below -20°F (-29°C), engine block heater usage is required.

DIESEL EXHAUST BRAKE (ENGINE BRAKING)

The purpose of the exhaust brake (engine braking) feature is to supply negative (braking) torque from the engine. Typically, the engine braking is used for, but not limited to, vehicle towing applications where vehicle braking can be achieved by the internal engine power, thereby sparing the mechanical brakes of the vehicle.

Benefits of the exhaust brake are:

- Vehicle driving control.

- Reduced brake fade.
- Longer brake life.
- Faster cab warm-up.

The exhaust brake feature will only function when the driver toggles it on by pushing the exhaust brake button until the "Exhaust Brake Indicator" is illuminated. Normal (Full Strength) exhaust brake mode is indicated by a yellow "Exhaust Brake Indicator".

**Exhaust Brake Switch**

Once the "Exhaust Brake Indicator" is illuminated and the vehicle is moving faster than 5 mph (8 km/h); the exhaust brake will automatically operate when the driver removes

pressure from the accelerator pedal. Exhaust braking is most effective when the engine RPM is higher. The automatic transmission will downshift more aggressively in TOW/HAUL mode when the exhaust brake is enabled to increase brake performance.

CAUTION!

Use of aftermarket exhaust brakes is not recommended and could lead to engine damage

WARNING!

Do not use the exhaust brake feature when driving in icy or slippery conditions as the increased engine braking can cause the rear wheels to slide and the vehicle to swing around with the possible loss of vehicle control, which may cause an accident possibly resulting in personal injury or death.

NOTE: For optimum braking power it is recommended to use the exhaust brake while in TOW/HAUL mode.

The exhaust brake feature can also be used to reduce the engine warm up time. To use the exhaust brake as a warm-up device, the vehicle must be stopped or moving less than 5 mph (8 km/h), the "Exhaust Brake Indicator" must be on, and the coolant temperature must be below 180°F (82°C) and ambient temperature below 60°F (16°C).

Automatic Smart Exhaust Brake (Auto)

Automatic Exhaust Brake technology delivers smoother, less aggressive exhaust braking characteristics during downhill descents. Although it can apply full exhaust braking force if needed, Automatic Exhaust Brake may not apply obvious braking if the vehicle speed is not increasing. Automatic Exhaust Brake is intended to maintain vehicle speed, while Full Exhaust Brake is intended to reduce vehicle speed.

Automatic Exhaust Brake can be enabled by pushing the exhaust brake button again anytime after the normal Full Exhaust Brake has been turned on. The "Exhaust Brake Indicator" in the instrument cluster display will change from Yellow to Green when Automatic Exhaust Brake is enabled. Pushing the exhaust brake button again will toggle the exhaust brake mode to off.

AUTOMATIC TRANSMISSION — IF EQUIPPED

WARNING!

- It is dangerous to shift out of PARK or NEUTRAL if the engine speed is higher than idle speed. If your foot is not firmly pressing the brake pedal, the vehicle could accelerate quickly forward or in reverse. You could lose control of the vehicle and hit someone or something. Only shift into gear when the engine is idling normally and your foot is firmly pressing the brake pedal.
- Unintended movement of a vehicle could injure those in or near the vehicle. As with all vehicles, you should never exit a vehicle while the engine is running. Before exiting a vehicle, always apply the parking brake, shift the transmission into PARK, turn the engine OFF, and remove the key fob. When the ignition is in the LOCK/OFF (key removal) position, (or, with Keyless Enter-N-Go, when the ignition is in the OFF mode) the transmission is locked in PARK, securing the vehicle against unwanted movement.

(Continued)

WARNING! (Continued)

- When leaving the vehicle, always make sure the ignition is in the OFF mode, remove the key fob from the vehicle, and lock the vehicle.
- Never use the PARK position as a substitute for the parking brake. Always apply the parking brake fully when parked to guard against vehicle movement and possible injury or damage.
- Your vehicle could move and injure you and others if it is not in PARK. Check by trying to move the gear selector out of PARK with the brake pedal released. Make sure the transmission is in PARK before leaving the vehicle.
- Never leave children alone in a vehicle, or with access to an unlocked vehicle. Allowing children to be in a vehicle unattended is dangerous for a number of reasons. A child or others could be seriously or fatally injured. Children should be warned not to touch the parking brake, brake pedal or the transmission gear selector.

(Continued)

WARNING! *(Continued)*

- Do not leave the key fob in or near the vehicle (or in a location accessible to children), and do not leave the ignition (in a vehicle equipped with Keyless Enter-N-Go) in the ACC or ON/RUN mode. A child could operate power windows, other controls, or move the vehicle.

CAUTION!

Damage to the transmission may occur if the following precautions are not observed:

- Shift into or out of PARK or REVERSE only after the vehicle has come to a complete stop.
- Do not shift between PARK, REVERSE, NEUTRAL, or DRIVE when the engine is above idle speed.
- Before shifting into any gear, make sure your foot is firmly pressing the brake pedal.

NOTE: You must press and hold the brake pedal while shifting out of PARK.

Key Ignition Park Interlock

This vehicle is equipped with a Key Ignition Park Interlock which requires the transmission to be in PARK before the

ignition can be turned to the LOCK/OFF (key removal) position. The key fob can only be removed from the ignition when the ignition is in the LOCK/OFF position, and the transmission is locked in PARK whenever the ignition is in the LOCK/OFF position.

Brake/Transmission Shift Interlock System

This vehicle is equipped with a Brake Transmission Shift Interlock System (BTSI) that holds the transmission gear selector in PARK unless the brakes are applied. To shift the transmission out of PARK, the ignition must be turned to the ON/RUN mode (engine running or not) and the brake pedal must be pressed.

Six-Speed Automatic Transmission — If Equipped

Chassis Cab models (with automatic transmission) use the AS69RC transmission (which is equipped with a Power Take-Off [PTO] access cover on the side of the transmission case). Pickup models may use either the AS69RC transmission, or the 68RFE transmission (which has no PTO access cover).

The transmission gear position display (located in the instrument cluster) indicates the transmission gear range. The gear selector is mounted on the right side of the steering column. You must press the brake pedal to move

the gear selector out of PARK (refer to “Brake/Transmission Shift Interlock System” in this section). To drive, move the gear selector from PARK or NEUTRAL to the DRIVE position. Pull the gear selector toward you when shifting into REVERSE or PARK, or when shifting out of PARK.

The electronically-controlled transmission provides a precise shift schedule. The transmission electronics are self-calibrating; therefore, the first few shifts on a new vehicle may be somewhat abrupt. This is a normal condition, and precision shifts will develop within a few hundred miles (kilometers).

Only shift from DRIVE to PARK or REVERSE when the accelerator pedal is released and the vehicle is stopped. Be sure to keep your foot on the brake pedal when shifting between these gears.

The transmission gear selector has only PARK, REVERSE, NEUTRAL, and DRIVE shift positions. Manual downshifts can be made using the Electronic Range Select (ERS) shift control (refer to “Electronic Range Select (ERS) Operation” in this section for further information). Pressing the ERS (-/+) switches (on the gear selector) while in the DRIVE position will select the highest available transmission gear, and will display that gear limit in the instrument cluster as

1, 2, 3, etc. Some models will display both the selected gear limit, and the actual current gear, while in ERS mode.

Gear Ranges

DO NOT race the engine when shifting from PARK or NEUTRAL into another gear range.

NOTE: After selecting any gear range, wait a moment to allow the selected gear to engage before accelerating. This is especially important when the engine is cold.

PARK (P)

This range supplements the parking brake by locking the transmission. The engine can be started in this range. Never attempt to use PARK while the vehicle is in motion. Apply the parking brake when leaving the vehicle in this range.

When parking on a level surface, you may shift the transmission into PARK first, and then apply the parking brake.

When parking on a hill, apply the parking brake before shifting the transmission to PARK, otherwise the load on the transmission locking mechanism may make it difficult to move the gear selector out of PARK. As an added

precaution, turn the front wheels toward the curb on a downhill grade and away from the curb on an uphill grade.

When exiting the vehicle, always:

- Apply the parking brake.
- Shift the transmission into PARK.
- Turn the engine OFF.
- Remove the key fob.

NOTE: On four-wheel drive vehicles be sure that the transfer case is in a drive position.

WARNING!

- Never use the PARK position as a substitute for the parking brake. Always apply the parking brake fully when parked to guard against vehicle movement and possible injury or damage.
- Your vehicle could move and injure you and others if it is not in PARK. Check by trying to move the gear selector out of PARK with the brake pedal released. Make sure the transmission is in PARK before leaving the vehicle.

(Continued)

WARNING! (Continued)

- It is dangerous to shift out of PARK or NEUTRAL if the engine speed is higher than idle speed. If your foot is not firmly pressing the brake pedal, the vehicle could accelerate quickly forward or in reverse. You could lose control of the vehicle and hit someone or something. Only shift into gear when the engine is idling normally and your foot is firmly pressing the brake pedal.
- Unintended movement of a vehicle could injure those in or near the vehicle. As with all vehicles, you should never exit a vehicle while the engine is running. Before exiting a vehicle, always apply the parking brake, shift the transmission into PARK, turn the engine OFF, and remove the key fob. When the ignition is in the LOCK/OFF (key removal) position (or, with Keyless Enter-N-Go, when the ignition is in the OFF mode), the transmission is locked in PARK, securing the vehicle against unwanted movement.
- When leaving the vehicle, always make sure the ignition is in the OFF mode, remove the key fob from the vehicle, and lock the vehicle.

(Continued)

WARNING! *(Continued)*

- Never leave children alone in a vehicle, or with access to an unlocked vehicle. Allowing children to be in a vehicle unattended is dangerous for a number of reasons. A child or others could be seriously or fatally injured. Children should be warned not to touch the parking brake, brake pedal or the transmission gear selector.
- Do not leave the key fob in or near the vehicle (or in a location accessible to children), and do not leave the ignition (in a vehicle equipped with Keyless Enter-N-Go) in the ACC or ON/RUN mode. A child could operate power windows, other controls, or move the vehicle.

CAUTION!

- Before moving the transmission gear selector out of PARK, you must turn the ignition to the ON/RUN mode, and also press the brake pedal. Otherwise, damage to the gear selector could result.
- **DO NOT** race the engine when shifting from PARK or NEUTRAL into another gear range, as this can damage the drivetrain.

The following indicators should be used to ensure that you have engaged the transmission into the PARK position:

- When shifting into PARK, pull the gear selector toward you and move it all the way counterclockwise until it stops.
- Release the gear selector and make sure it is fully seated in the PARK gate.
- Look at the transmission gear position display and verify that it indicates the PARK position (P).
- With brake pedal released, verify that the gear selector will not move out of PARK.

REVERSE (R)

This range is for moving the vehicle backward. Shift into REVERSE only after the vehicle has come to a complete stop.

NEUTRAL (N)

Use this range when the vehicle is standing for prolonged periods with the engine running. The engine may be started in this range. Apply the parking brake and shift the transmission into PARK if you must leave the vehicle.

WARNING!

Do not coast in NEUTRAL and never turn off the ignition to coast down a hill. These are unsafe practices that limit your response to changing traffic or road conditions. You might lose control of the vehicle and have a collision.

CAUTION!

Towing the vehicle, coasting, or driving for any other reason with the transmission in NEUTRAL can cause severe transmission damage. Refer to "Recreational Towing" in "Starting And Operating" and "Towing A Disabled Vehicle" in "What To Do In Emergencies" for further information.

DRIVE (D)

This range should be used for most city and highway driving. It provides the smoothest upshifts and downshifts, and the best fuel economy. The transmission automatically upshifts through underdrive first, second, and third gears, direct fourth gear and overdrive fifth and sixth gears. The DRIVE position provides optimum driving characteristics under all normal operating conditions.

When frequent transmission shifting occurs (such as when operating the vehicle under heavy loading conditions, in hilly terrain, traveling into strong head winds, or while towing a heavy trailer), use the Electronic Range Select (ERS) shift control (refer to "Electronic Range Select (ERS) Operation" in this section for further information) to select a lower gear range. Under these conditions, using a lower gear range will improve performance and extend transmission life by reducing excessive shifting and heat buildup.

If the transmission temperature exceeds normal operating limits, the powertrain controller will modify the transmission shift schedule and expand the range of torque converter clutch engagement. This is done to prevent transmission damage due to overheating.

If the transmission becomes extremely hot or is in danger of overheating, the "Transmission Temperature Warning Light" may illuminate and the transmission may operate differently until the transmission cools down.

NOTE: Use caution when operating a heavily loaded vehicle at low speeds (such as towing a trailer up a steep grade, or in stop-and-go traffic) during hot weather. In these conditions, torque converter slip can impose a significant additional heat load on the cooling system. Downshifting the transmission to the lowest possible gear (when climbing a grade), or shifting to NEUTRAL (when stopped in heavy traffic) can help to reduce this excess heat generation.

During cold temperatures, transmission operation may be modified depending on engine and transmission temperature as well as vehicle speed. This feature improves warm up time of the engine and transmission to achieve maximum efficiency. Engagement of the torque converter clutch is inhibited until the transmission fluid is warm (refer to the “Note” under “Torque Converter Clutch” in this section). On Pickup models with 68RFE transmission, top overdrive gear is also inhibited until the transmission fluid is warm, and during extremely cold temperatures (-16°F [-27°C] or below), operation may briefly be limited to first and direct gears only. On trucks with AS69RC transmission, fifth and sixth gears may be inhibited briefly on cold starts below 41°F (5°C), and during very cold temperatures (-4°F [-20°C] or below), operation may briefly be limited to third gear only. During this condition, the ability of the

vehicle to accelerate under heavily loaded conditions may be reduced. In all cases, normal operation will resume once the transmission temperature has risen to a suitable level.

Transmission Limp Home Mode

Transmission function is monitored electronically for abnormal conditions. If a condition is detected that could result in transmission damage, Transmission Limp Home Mode is activated. In this mode, the transmission remains in fourth gear (for 68RFE transmission) or third gear (for AS69RC transmission) regardless of which forward gear is selected. If an AS69RC-equipped truck enters Limp Home Mode at highway speeds, it will initially engage fifth gear, until the vehicle slows to a speed where third gear can be engaged. PARK, REVERSE, and NEUTRAL will continue to operate. The Malfunction Indicator Light (MIL) may be illuminated. Limp Home Mode allows the vehicle to be driven to an authorized dealer for service without damaging the transmission.

In the event of a momentary problem, the transmission can be reset to regain all forward gears by performing the following steps:

1. Stop the vehicle.
2. Shift the transmission into PARK.

3. Turn the ignition to the OFF position.
4. Wait approximately 10 seconds.
5. Restart the engine.
6. Shift into the desired gear range. If the problem is no longer detected, the transmission will return to normal operation.

NOTE: Even if the transmission can be reset, we recommend that you visit your authorized dealer at your earliest possible convenience. Your authorized dealer has diagnostic equipment to determine if the problem could recur.

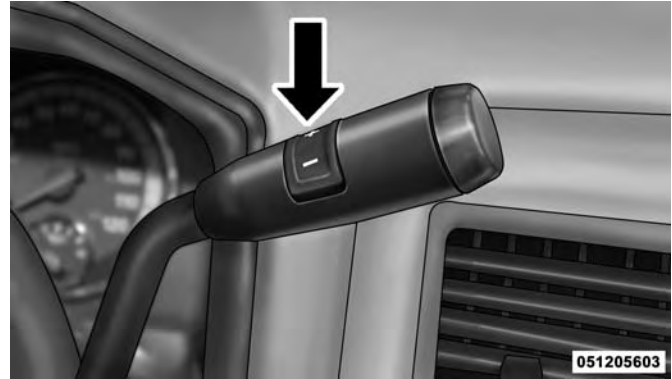
If the transmission cannot be reset, authorized dealer service is required.

Electronic Range Select (ERS) Operation

The Electronic Range Select (ERS) shift control allows the driver to limit the highest available gear when the transmission is in DRIVE. For example, if you set the transmission gear limit to 4 (fourth gear), the transmission will not shift above fourth gear, but will shift through the lower gears normally.

You can switch between DRIVE and ERS mode at any vehicle speed. When the gear selector is in the DRIVE

position, the transmission will operate automatically, shifting between all available gears. Tapping the ERS (-) switch will activate ERS mode, display the current gear in the instrument cluster, and set that gear as the top available gear. Once in ERS mode, tapping the ERS (-) or (+) switch will change the top available gear.



Column Gear Selector

To exit ERS mode, simply push and hold the ERS (+) switch until the gear limit display disappears from the instrument cluster.

WARNING!

Do not downshift for additional engine braking on a slippery surface. The drive wheels could lose their grip and the vehicle could skid, causing a collision or personal injury.

Transmission Gear Limit Display	1	2	3	4	5	6	D
Actual Gear(s) Allowed	1	1-2	1-3	1-4	1-5	1-6	1-6

NOTE: To select the proper gear position for maximum deceleration (engine braking), simply push and hold the ERS (-) switch. The transmission will shift to the range from which the vehicle can best be slowed down.

CAUTION!

When using ERS for engine braking while descending steep grades, be careful not to overspeed the engine. Apply the brakes as needed to prevent engine over-speed.

Overdrive Operation

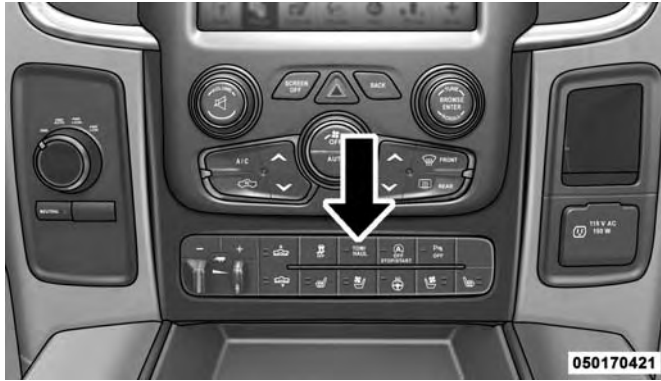
The automatic transmission includes an electronically controlled Overdrive (fifth and sixth gears). The transmission will automatically shift into Overdrive if the following conditions are present:

- The gear selector is in the DRIVE position.
- The transmission fluid has reached an adequate temperature.
- The engine coolant has reached an adequate temperature.
- The vehicle speed is sufficiently high.
- The driver is not heavily pressing the accelerator.

When To Use TOW/HAUL Mode

When driving in hilly areas, towing a trailer, carrying a heavy load, etc., and frequent transmission shifting occurs, push the TOW/HAUL switch to activate TOW/HAUL mode. This will improve performance and reduce the potential for transmission overheating or failure due to excessive shifting. When operating in TOW/HAUL mode, transmission upshifts are delayed, and the transmission

will automatically downshift (for engine braking) when the throttle is closed and/or during steady braking maneuvers.



TOW/HAUL Switch

The "TOW/HAUL Indicator Light" will illuminate in the instrument cluster to indicate that TOW/HAUL mode has been activated. Pushing the switch a second time restores normal operation. Normal operation is always the default at engine start-up. If TOW/HAUL mode is desired, the switch must be pushed each time the engine is started.

WARNING!

Do not use the "TOW/HAUL" feature when driving in icy or slippery conditions. The increased engine braking can cause the rear wheels to slide, and the vehicle to swing around with the possible loss of vehicle control, which may cause an accident possibly resulting in personal injury or death.

Torque Converter Clutch

A feature designed to improve fuel economy has been included in the automatic transmission on your vehicle. A clutch within the torque converter engages automatically at calibrated speeds. This may result in a slightly different feeling or response during normal operation in the upper gears. When the vehicle speed drops or during some accelerations, the clutch automatically disengages.

NOTE:

- The torque converter clutch will not engage (and 68RFE-equipped trucks will not shift to sixth gear), until the transmission fluid and engine coolant are warm [usually after 1 to 3 miles (2 to 5 km) of driving]. Because the engine speed is higher when the torque converter clutch is not engaged, it may seem as if the transmission is not shifting properly when cold. This is normal. Using the Electronic Range Select (ERS) shift control, when the transmission is sufficiently warm, will demonstrate that the transmission is able to shift into and out of Over-drive.
- If the vehicle has not been driven for several days, the first few seconds of operation after shifting the transmission into gear may seem sluggish. This is due to the fluid partially draining from the torque converter into the transmission. This condition is normal and will not cause damage to the transmission. The torque converter will refill within five seconds after starting the engine.

MANUAL TRANSMISSION — IF EQUIPPED

WARNING!

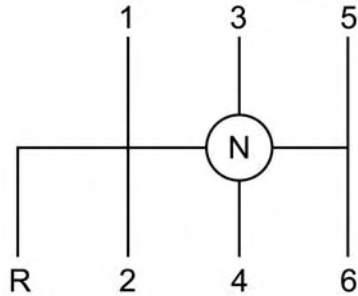
You or others could be injured if you leave the vehicle unattended without having the parking brake fully applied. The parking brake should always be applied when the driver is not in the vehicle, especially on an incline.

CAUTION!

Never drive with your foot resting on the clutch pedal, or attempt to hold the vehicle on a hill with the clutch pedal partially engaged, as this will cause abnormal wear on the clutch.

NOTE: During cold weather, you may experience increased effort in shifting until the transmission fluid warms up. This is normal.

Shifting



051740422

Shift Pattern

Truck models with manual transmission are equipped with a clutch interlocking ignition system. The clutch pedal must be fully pressed to start the vehicle.

Fully press the clutch pedal before shifting gears. As you release the clutch pedal, lightly press the accelerator pedal.

This transmission has a “creeper” first gear which should be used to start from a standing position when carrying a payload or towing a trailer. Damage to the clutch can result from starting in second or third gear with a loaded vehicle. An unloaded vehicle may be launched in second gear. Use each gear in numerical order – do not skip a gear.

NOTE: When loaded, pulling a trailer or on a grade, the truck should always start in first gear and not skip gears.

Recommended Vehicle Shift Speeds

To utilize your manual transmission efficiently for both fuel economy and performance, it should be upshifted as listed in recommended shift speed chart. Shift at the vehicle speeds listed for acceleration. When heavily loaded or pulling a trailer these recommended up-shift speeds may not apply.

Maximum Recommended Up-Shift Speeds

Gear Selection	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6
Maximum Speed	7 mph (11 km/h)	15 mph (24 km/h)	25 mph (40 km/h)	40 mph (64 km/h)	45 mph (72 km/h)

Downshifting

Moving from a high gear down to a lower gear is recommended to preserve brakes when driving down steep hills. In addition, downshifting at the right time provides better acceleration when you desire to resume speed. Downshift progressively. Do not skip gears to avoid overspeeding the engine and clutch.

WARNING!

Do not downshift for additional engine braking on a slippery surface. The drive wheels could lose their grip and the vehicle could skid.

CAUTION!

When descending a hill, be very careful to downshift one gear at a time to prevent overspeeding the engine which can cause valve damage, and/or clutch disc damage even if the clutch pedal is pressed.

Maximum Recommended Downshift Speeds**CAUTION!**

Failure to follow the recommended downshifting speeds may cause the engine to overspeed and/or damage the clutch disc even if the clutch pedal is pressed.

Maximum Recommended Downshifting Speeds

Gear Selection	6 to 5	5 to 4	4 to 3	3 to 2	2 to 1
Maximum Speed	68 mph (109 km/h)	50 mph (80 km/h)	32 mph (51 km/h)	19 mph (31 km/h)	10 mph (16 km/h)

CAUTION!

If you skip a gear while downshifting or downshift at too high of a vehicle speed, these conditions may cause the engine to overspeed if too low of a gear is selected and the clutch pedal is released. Damage to the clutch and the transmission can result from skipping a gear while downshifting or downshifting at too high of a vehicle speed even if the clutch pedal is held pressed (i.e., not released).

Reverse Shifting

To shift into REVERSE (R), bring the vehicle to a complete stop. Press the clutch and pause briefly to allow the gear train to stop rotating. Beginning from the NEUTRAL (N) position, move the gear selector in one quick smooth motion straight across and into the REVERSE (R) area (the driver will feel a firm “click” as the shifter passes the “knock-over”). Complete the shift by pulling the gear selector into REVERSE (R).

The “knock-over” prevents the driver from accidentally entering the REVERSE (R) shift area and warns the driver that they are about to shift the transmission into REVERSE (R). Due to this feature, a slow shift to REVERSE (R) can be perceived as a high shift effort.

To shift out of REVERSE bring the vehicle to a complete stop and press the clutch. Shifting out of REVERSE prior to a complete stop may cause high shift effort.

AUXILIARY SWITCHES — IF EQUIPPED

There can be up to five auxiliary switches located in the lower switch bank of the instrument panel which can be used to power various electronic devices and PTO (Power Take Off) – If Equipped. If Power Take Off is equipped, it will take the place of the fifth Auxiliary switch. Connections to the switches are found under the hood in the connectors attached to the auxiliary Power Distribution Center.

You have the ability to configure the functionality of the auxiliary switches via the instrument cluster display. All switches can now be configured for setting the switch type operation to latching or momentary, power source of either battery or ignition, and ability to hold last state across key cycles.

NOTE: Holding last state conditions are met when switch type is set to latching and power source is set to ignition.

For further information on using the auxiliary switches, please refer to the Ram Body Builders Guide by accessing www.rambodybuilder.com and choosing the appropriate links.

POWER TAKE OFF OPERATION — IF EQUIPPED (CHASSIS CAB ONLY)

This vehicle when equipped with PTO Prep and either the AS69RC automatic six-speed or G-56 manual six-speed transmissions, will allow for an aftermarket upfit with a transmission driven PTO (power take off). The customer will have the ability to operate the PTO in either a “stationary” or “mobile” mode. The vehicles will be factory set to the “stationary” mode. To select ‘mobile mode’ You will need to enter the commercial vehicle menu on the instrument cluster display and select mobile PTO mode.

Details of the PTO selection modes and further PTO information is available at the Ram Truck Bodybuilders web site. rambodybuilder.com

AS69RC Six-Speed Automatic Transmission Only

The PTO drive gear (part of the AS69RC) operates at torque converter turbine speed. The turbine speed will be less than engine speed when the torque converter clutch is not engaged and will be same as engine speed when the torque converter clutch is engaged.

Stationary Mode

To operate the PTO in this mode the vehicle must meet the following conditions:

- Transmission in PARK position (vehicles equipped with automatic transmission.)
- PTO switch has been activated.
- Parking brake applied (vehicles equipped with manual transmission).
- Brake pedal must not be applied.
- Vehicle engine must be running.
- No vehicle, brake or clutch switch faults present.

- PTO must be correctly installed using the vehicle provided circuits.

The instrument cluster will display a "PTO On" message for five seconds if the above conditions are met. Otherwise, the instrument cluster will display a message "To Operate PTO Shift To Park" indicating what operator action should be taken to engage the PTO mode.

The customer has the choice to operate the PTO by utilizing the cruise control switches or by utilizing a remote control (provided by the PTO supplier). To operate the feature using the cruise control switches, the customer must first activate the PTO switch which will turn on the PTO. In order to increase or decrease the engine idle speed, to optimize the PTO function, the "RESUME/ACCEL" and "DECEL" cruise switches can be used respectively. To disengage PTO operation and return to "standard vehicle operation" simply toggle the PTO switch to the OFF position.

The torque converter clutch (TCC) will automatically engage at engine speeds above 1,200 RPM (engine speed) in PTO stationary mode. Once engaged, the TCC will remain applied and will not disengage until the engine speed falls below 1,000 RPM. TCC engagement is desirable for certain types of PTO applications (Automatic Transmission Only).

To operate the PTO via a remote switch, the customer must make sure the above conditions are met. It is vital for proper operation that the PTO and remote have been installed correctly, paying special attention to ensure the vehicle provided wiring has been connected properly. This is the responsibility of the installer of the PTO and switches/remote system. It is the responsibility of the PTO manufacturer to ensure that their electrical (switches and remote) system is compatible with the vehicle's electrical architecture and software functionality.

NOTE: Single set speed can be programmed via the PTO menu on the instrument cluster display. Further details are available at the Ram Truck Bodybuilders web site located at rambodybuilder.com

Mobile Mode

To operate the PTO in this mode the vehicle must meet the following conditions:

- Mobile mode is activated via the menu on the instrument cluster display.
- (ON/OFF) switch has been activated.
- Vehicles with automatic transmission must be in PARK or DRIVE.

- Parking brake must not be applied.
- Brake pedal must not be applied.
- No vehicle, brake or clutch switch faults present.
- Vehicle engine must be running.
- PTO must be correctly installed using the vehicle provided circuits.

The customer may choose to use the PTO while the vehicle is moving. To do so, the PTO function must be activated prior to taking the vehicle out of PARK. This is accomplished by activating the upfitter-provided PTO on/off switch. At this point, the customer may place the vehicle in a forward or reverse gear and have PTO operation once the vehicle begins to move. To disengage PTO operation and return to “standard vehicle operation” simply toggle the on/off switch to the OFF position.

NOTE: For application specific information with respect to PTO and pump requirements and additional vehicle information (wiring schematics, preset idle values, engine speed limits, and vehicle hardware and software requirements) please refer to the Body Builders Guide by accessing rambodybuilder.com and choosing the appropriate links.

ENGINE RUNAWAY

Diesel engine runaway is a rare condition affecting diesel engines, where the engine consumes its own lubrication oil and runs at higher and higher RPM until it overspeeds to a point where it destroys itself due to either mechanical failure or engine seizure through lack of lubrication.

WARNING!

In case of engine runaway due to flammable fumes from fuel spills or turbocharger oil leaks being sucked into the engine, do the following to help avoid personal injury and/or vehicle damage:

- 1. Turn the ignition switch to the OFF position.**
 - 2. Using a CO2 or dry chemical type fire extinguisher, direct the spray from the fire extinguisher into the grille on the passenger side so that the spray enters the engine air intake.**
- The inlet for the engine air intake is located behind the passenger side headlamp and receives air through the grille.**

FUEL REQUIREMENTS

Use good quality diesel fuel from a reputable supplier in your vehicle. Federal law requires that you must fuel this vehicle with Ultra Low Sulfur Highway Diesel fuel (15 ppm Sulfur maximum) and prohibits the use of Low Sulfur Highway Diesel fuel (500 ppm Sulfur maximum) to avoid damage to the emissions control system.

For most year-round service, No. 2 diesel fuel meeting ASTM (formerly known as the American Society for Testing and Materials) specification D-975 Grade S15 will provide good performance. If the vehicle is exposed to extreme cold (below 20°F or -7°C), or is required to operate at colder-than-normal conditions for prolonged periods, use climatized No. 2 diesel fuel or dilute the No. 2 diesel fuel with 50% No. 1 diesel fuel. This will provide better protection from fuel gelling or wax-plugging of the fuel filters.

WARNING!

Do not use alcohol or gasoline as a fuel blending agent. They can be unstable under certain conditions and hazardous or explosive when mixed with diesel fuel.

Diesel fuel is seldom completely free of water. To prevent fuel system trouble, drain the accumulated water from the fuel/water separator using the fuel/water separator drain provided on both fuel filters. If you buy good quality fuel and follow the cold weather advice above, fuel conditioners should not be required in your vehicle. If available in your area, a high cetane “premium” diesel fuel may offer improved cold-starting and warm-up performance.

CAUTION!

If the “Water in Fuel Indicator Light” remains on, DO NOT START engine before you drain the water from the fuel filter(s) to avoid engine damage. Refer to “Maintenance Procedures/Draining Fuel/Water Separator Filter” in “Maintaining Your Vehicle” for further information.

5

Fuel Specifications

The Cummins diesel engine has been developed to take advantage of the high energy content and generally lower cost No. 2 Ultra Low Sulfur diesel fuel or No. 2 Ultra Low Sulfur climatized diesel fuels. Experience has shown that it also operates on No. 1 Ultra Low Sulfur diesel fuels or other fuels within specification.

NOTE:

- If you accidentally fill the fuel tank with gasoline on your diesel vehicle, Do not start the vehicle. If you restart your vehicle you risk damaging the engine and fuel system. Please call your local dealer for service.
- A maximum blend of 5% biodiesel meeting ASTM specification D-975 may be used with your Cummins diesel engine. (Chassis Cab models not configured with B20 capability.)
- A maximum blend of 20% biodiesel meeting ASTM specification D-7467 may be used with your Cummins diesel engine. (Pickup models and Chassis Cab models configured with B20 Capability.)
- In addition, commercially available fuel additives are not necessary for the proper operation of your Cummins diesel engine. However, if seasonably adjusted fuel is not available and you are operating below 20°F (-6°C), MOPAR Premium Diesel Fuel Treatment (or equivalent) may be beneficial to avoid fuel gelling.
- No. 1 Ultra Low Sulfur diesel fuel should only be used where extended arctic conditions (-10°F or -23°C) exist.

Bio-Diesel Fuel Requirements**Chassis Cab Models**

A maximum blend of 5% biodiesel meeting ASTM specification D975 may be used with your Cummins diesel engine. If operation with biodiesel blends greater than 5% but not greater than 20% (B6-B20) is desired, the truck must first be reconfigured by an authorized Ram dealer and the provisions in the following section must be adhered to.

Pickup Models And Chassis Cab Models Ordered With B20 Option

Your vehicle has been validated and approved for the use of biodiesel in blends up to 20% (B20) provided that you comply with the requirements outlined below. It is important that you understand and comply with these requirements. Failure to comply with Oil Change requirements for vehicles operating on biodiesel blends up to B20 will result in premature engine wear. Such wear is not covered by the New Vehicle Limited Warranty.

Biodiesel is a fuel produced from renewable resources typically derived from animal fat, rapeseed oil (Rapeseed Methyl Ester (RME) base), or soybean oil (Soy Methyl Ester (SME or SOME) base). Biodiesel fuel has inherent limitations which require that you understand and adhere to the

following requirements if you use blends of biodiesel greater than 5% but not greater than 20% (B6-B20). There are no unique restrictions for the use of B5. Use of blends greater than 20% is not approved. Use of blends greater than 20% can result in engine damage. Such damage is not covered by the New Vehicle Limited Warranty.

Fuel Quality — Must Comply With ASTM Standards

The quality of biodiesel fuel may vary widely. Only fuel produced by a BQ9000 supplier to the following specifications may be blended to meet biodiesel blend (B6–B20) fuel meeting ASTM specification D-7467:

- Pretrodiesel fuel meeting ASTM specification D-975 and biodiesel fuel (B100) meeting ASTM specification D-6751.

Fuel Oxidation Stability — Must Use Fuel Within Six Months Of Manufacture

Biodiesel fuel has poor oxidation stability which can result in long term storage problems. Fuel produced to approved ASTM standards, if stored properly, provides for protection against fuel oxidation for up to six months.

Fuel Water Separation — Must Use MOPAR/Cummins Approved Fuel Filter Elements

You must use MOPAR/Cummins approved fuel filter elements in both your engine mounted filter and frame mounted filter.

Biodiesel fuel has a natural affinity to water and water accelerates microbial growth. Your MOPAR/Cummins filtration system is designed to provide adequate fuel water separation capabilities.

Bio-Diesel Fuel Properties — Low Ambient Temperatures

Biodiesel fuel may gel or solidify at low ambient temperatures, which may pose problems for both storage and operation. Precautions can be necessary at low ambient temperatures, such as storing the fuel in a heated building or a heated storage tank, or using cold temperature additives.

Fuel In Oil Dilution — Must Adhere To Required Oil Change Interval

Fuel dilution of lubricating oil has been observed with the use of biodiesel fuel. Fuel in oil must not exceed 5%. To ensure this limit is met your oil change interval must be maintained to the following schedule:

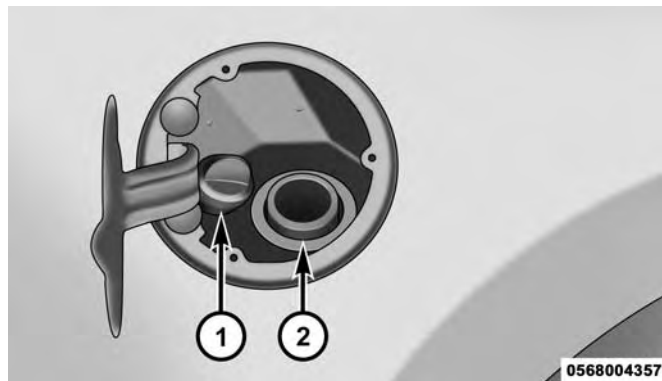
- Ram PickUp 2500/3500 Only — 15,000 Miles*
 - Ram 3500/4500/5500 Chassis Cab — 12,500 Miles*
- (*unless otherwise notified with a oil service message)

CAUTION!

- Under no circumstances should oil change intervals exceed 15,000 miles (24 000 km) pickup or 12,500 miles (20 000 km) chassis cab if operation occurs with greater than 5% biodiesel blends. Oil change intervals should not exceed 6 months in either case. Failure to comply with these Oil Change requirements for vehicles operating on biodiesel blends up to B20 may result in premature engine wear. Such wear is not covered by the New Vehicle Limited Warranty.
- B20 Biodiesel capable: The engine may suffer severe damage if operated with concentrations of Biodiesel higher than 20%.

ADDING FUEL — 2500/3500 DIESEL MODELS

1. Open the fuel filler door.



Diesel Fuel And Diesel Exhaust Fluid Fill Location

- 1 — Diesel Exhaust Fluid Fill Location
 2 — Diesel Fuel Fill Location

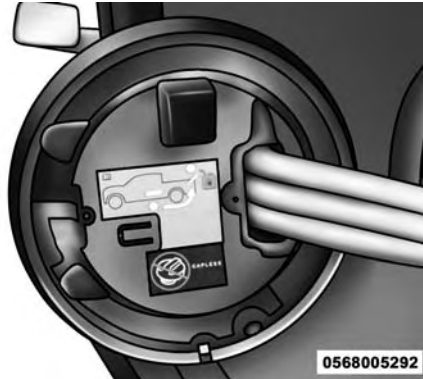
NOTE: There is no fuel filler cap. A flapper door inside the filler pipe seals the system.

2. Insert the fuel nozzle fully into the filler pipe – the nozzle opens and holds the flapper door while refueling.
3. Fill the vehicle with fuel – when the fuel nozzle “clicks” or shuts off the fuel tank is full.
4. Remove the fuel nozzle and close the fuel door.

Emergency Fuel Can Refueling

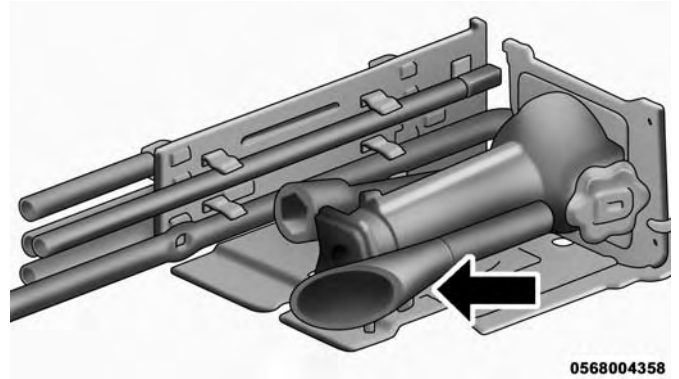
Most fuel cans will not open the flapper door.

A funnel is provided to open the flapper door to allow emergency refueling with a fuel can.



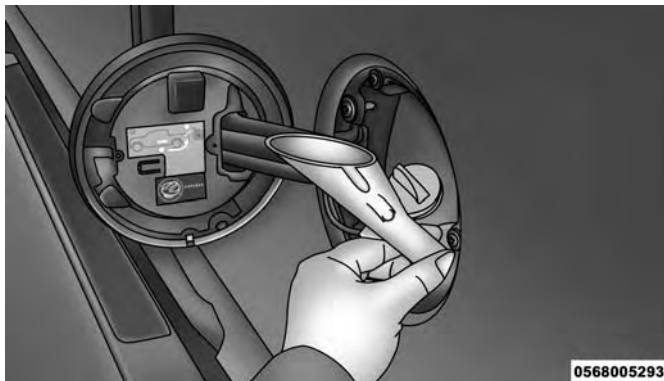
Diesel Fuel And DEF Fluid Filler Door

1. Retrieve fuel funnel from the jack kit located under the front passenger seat.



Fuel Fill Funnel Location 2500/3500 Models

2. Insert funnel into same filler pipe opening as the fuel nozzle.



Emergency Fuel Fill Location

NOTE: Ensure funnel is inserted fully to hold flapper door open.

3. Pour fuel into funnel opening.
4. Remove funnel from filler pipe, clean off prior to putting back in the jack kit.

CAUTION!

To avoid fuel spillage and overfilling, do not “top off” the fuel tank after filling.

WARNING!

- Never have any smoking materials lit in or near the vehicle when the fuel door is open or the tank is being filled.
- Never add fuel when the engine is running. This is in violation of most state and federal fire regulations and may cause the “Malfunction Indicator Light” to turn on.
- A fire may result if fuel is pumped into a portable container that is inside of a vehicle. You could be burned. Always place fuel containers on the ground while filling.

ADDING FUEL — CHASSIS CAB MODELS

CAUTION!

To avoid fuel spillage and overfilling, do not “top off” the fuel tank after filling.

NOTE:

- When the fuel nozzle “clicks” or shuts off, the fuel tank is full.

- Tighten the fuel filler cap until you hear a “clicking” sound. This is an indication that the fuel filler cap is properly tightened.
- Make sure that the fuel filler cap is tightened each time the vehicle is refueled.

WARNING!

A fire may result if fuel is pumped into a portable container that is on a truck bed. You could be burned. Always place fuel containers on the ground while filling.

Fuel Filler Cap

If the fuel filler cap is lost or damaged, be sure the replacement cap is for use with this vehicle.

CAUTION!

Damage to the fuel system or emission control system could result from using an improper fuel tank filler tube cap. A poorly fitting cap could let impurities into the fuel system.

WARNING!

- **Never have any smoking materials lit in or near the vehicle when the fuel filler cap is removed or the tank filled.**
- **Never add fuel to the vehicle when the engine is running.**

Avoid Using Contaminated Fuel

Fuel that is contaminated by water or dirt can cause severe damage to the engine fuel system. Proper maintenance of the engine fuel filter and fuel tank is essential. Refer to “Maintenance Procedures” in “Maintaining Your Vehicle” for further information.

Bulk Fuel Storage — Diesel Fuel

If you store quantities of fuel, good maintenance of the stored fuel is also essential. Fuel contaminated with water will promote the growth of “microbes.” These microbes form “slime” that will clog the fuel filtration system and lines. Drain condensation from the supply tank and change the line filter on a regular basis.

NOTE: When a diesel engine is allowed to run out of fuel, air is pulled into the fuel system.

If the vehicle will not start, refer to “Maintenance Procedures/Priming If The Engine Has Run Out Of Fuel” in “Maintaining Your Vehicle” for further information.

WARNING!

Do not open the high pressure fuel system with the engine running. Engine operation causes high fuel pressure. High pressure fuel spray can cause serious injury or death.

Diesel Exhaust Fluid Storage

Diesel Exhaust Fluid (DEF) is considered a very stable product with a long shelf life. If DEF is kept in temperatures between 10° and 90°F (-12° and 32°C), it will last a minimum of one year.

DEF is subject to freezing at the lowest temperatures. For example, DEF may freeze at temperatures at or below 12° F (-11° C). The system has been designed to operate in this environment.

NOTE: When working with DEF, it is important to know that:

- Any containers or parts that come into contact with DEF must be DEF compatible (plastic or stainless steel).

Copper, brass, aluminum, iron or non-stainless steel should be avoided as they are subject to corrosion by DEF.

- If DEF is spilled, it should be wiped up completely.

Adding Diesel Exhaust Fluid

The DEF gauge (located on the instrument cluster) will display the level of DEF remaining in the tank. Refer to “Instrument Cluster” and “Instrument Cluster Descriptions” in “Understanding Your Instrument Panel” for further information.

NOTE:

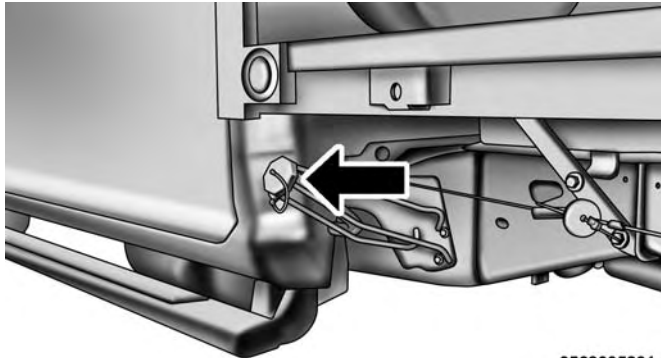
- Driving conditions (altitude, vehicle speed, load, etc.) will effect the amount of DEF that is used in your vehicle.
- Another factor is that outside temperature can affect DEF consumption. In cold conditions, 12° F (-11° C) and below, the DEF gauge needle can stay on a fixed position and may not move for extended periods of time. This is a normal function of the system.

- There is an electric heater inside the DEF tank that automatically works when necessary. And if the DEF supply does freeze, the truck will operate normally until it thaws.

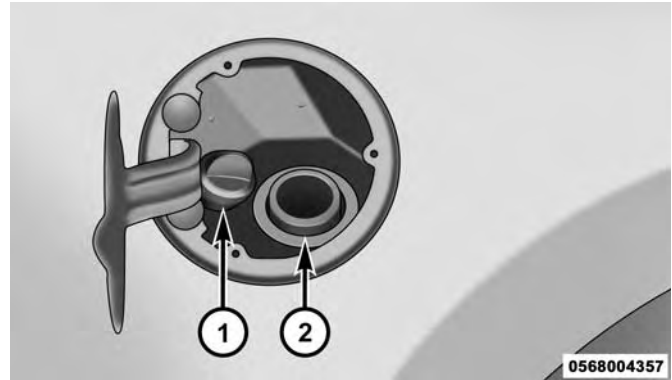
DEF Fill Procedure

NOTE: Refer to “Fluids, Lubricants, and Genuine Parts” in “Maintaining Your Vehicle” for the correct fluid type.

1. Remove cap from DEF tank (located on drivers side of the vehicle or in fuel door).

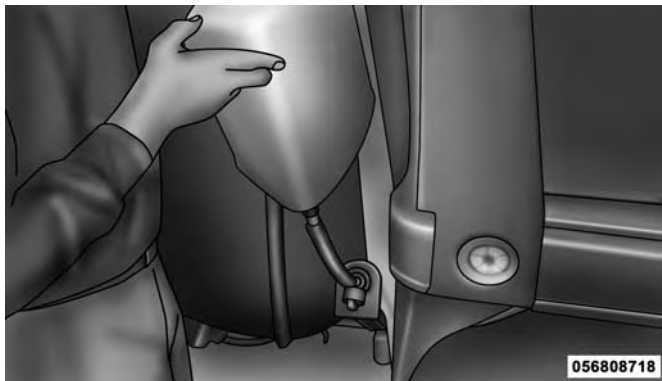


DEF Filler Cap Chassis Cab Models



DEF Filler Cap And Fuel Fill 1500/2500/3500 Models

- 1 — Diesel Exhaust Fluid Fill Location
 - 2 — Diesel Fuel Fill Location
-
2. Insert DEF fill adapter/nozzle into DEF tank filler neck.



Filling The DEF Tank

CAUTION!

- To avoid DEF spillage, and possible damage to the DEF tank from overfilling, do not “top off” the DEF tank after filling.
- **DO NOT OVERFILL.** DEF will freeze below 12°F (-11°C). The DEF system is designed to work in temperatures below the DEF freezing point, however, if the tank is overfilled and freezes, the system could be damaged.

*(Continued)***CAUTION! (Continued)**

- When DEF is spilled, clean the area immediately with water and use an absorbent material to soak up the spills on the ground.
 - Do not attempt to start your engine if DEF is accidentally added to the diesel fuel tank as it can result in severe damage to your engine, including but not limited to failure of the fuel pump and injectors.
 - Never add anything other than DEF to the tank – especially any form of hydrocarbon such as diesel fuel, fuel system additives, gasoline, or any other petroleum-based product. Even a very small amount of these, less than 100 parts per million or less than 1 oz. per 78 gallons (295 liters) will contaminate the entire DEF system and will require replacement. If owners use a container, funnel or nozzle when refilling the tank, it should either be new or one that is has only been used for adding DEF. MOPAR provides an attachable nozzle with its DEF for this purpose.
3. Stop filling the DEF tank immediately when any of the following happen: DEF stops flowing from the fill bottle into the DEF tank, DEF splashes out the filler neck, or a DEF pump nozzle automatically shuts off.

4. Reinstall cap onto DEF tank.

Filling The Def Tank In Cold Climates

Since DEF will begin to freeze at 12°F (-11°C), your vehicle is equipped with an automatic DEF heating system. This allows the DEF injection system to operate properly at temperatures below 12°F (-11°C). If your vehicle is not in operation for an extended period of time with temperatures below 12°F (-11°C), the DEF in the tank may freeze. If the tank is overfilled and freezes, it could be damaged. Therefore, do not overfill the DEF tank.

The DEF tank on these vehicles is designed with a large amount of full reserve. So the level sensor will indicate a Full reading even before the tank is completely full. To put it another way, there's additional storage capacity in the tank above the Full mark that's not represented in the gauge. You may not see any movement in the reading – even after driving up to 2,000 miles in some cases.

The difference this makes varies by vehicle. Heavy-duty pickup trucks have a 5.7-gallon (21.5 liter) tank that will display a Full reading when about 90 percent full. This means that drivers can consume at least 10 percent of a truly full DEF tank without seeing any visible change in the gauge reading. Chassis cabs have a larger 9-gallon (34 liter) tank, and will display a Full reading when about 75 percent

full. So drivers can consume 25 percent of a truly full DEF tank without seeing any visible change in the gauge reading.

Extra care should be taken when filling with portable containers to avoid overfilling. Note the level of the DEF gauge in your instrument cluster. On pickup applications, you may safely add a maximum of 2 gallons (7.5 liters) of DEF from portable containers when your DEF gauge is reading $\frac{1}{2}$ full. On Chassis Cab applications a maximum of 2 gallons (7.5 liters) may be added when the DEF gauge is reading $\frac{3}{4}$ full.

DIESEL EXHAUST FLUID

Your vehicle is equipped with a Selective Catalytic Reduction system to meet the very stringent diesel emissions standards required by the Environmental Protection Agency.

The purpose of the SCR system is to reduce levels of NOx (oxides of nitrogen emitted from engines) that are harmful to our health and the environment to a near-zero level. Small quantities of Diesel Exhaust Fluid (DEF) is injected into the exhaust upstream of a catalyst where, when vaporized, it converts smog-forming nitrogen oxides (NOx) into harmless nitrogen (N₂) and water vapor (H₂O),

two natural components of the air we breathe. You can operate with the comfort that your vehicle is contributing to a cleaner, healthier world environment for this and generations to come.

System Overview

This vehicle is equipped with a Diesel Exhaust Fluid (DEF) injection system and a Selective Catalytic Reduction (SCR) catalyst to meet the emission requirements.

The DEF injection system consists of the following components:

- DEF tank
- DEF pump
- DEF injector
- Electronically-heated DEF lines
- DEF control module
- NOx sensors
- Temperature sensors
- SCR catalyst
- UQS Sensor

The DEF injection system and SCR catalyst enable the achievement of diesel emissions requirements; while maintaining outstanding fuel economy, drivability, torque and power ratings.

Refer to "Instrument Cluster Display" in "Understanding Your Instrument Panel" for system messages and warnings.

NOTE:

- Your vehicle is equipped with a DEF injection system. You may occasionally hear an audible clicking noise. This is normal operation.
- The DEF pump will run for a period of time after engine shutdown to purge the DEF system. This is normal operation.

WHAT TO DO IN EMERGENCIES

CONTENTS

■ JUMP STARTING170	□ With Portable Starting Unit172
---------------------------	------	---	------

JUMP STARTING**WARNING!**

- To prevent personal injury or damage to clothing, do not allow battery fluid to contact eyes, skin or fabrics. Do not lean over a battery when connecting jumper cables or allow cable clamps to touch each other. Keep open flames or sparks away from battery vent holes. Always wear eye protection when working with batteries.
- Do not use a booster battery or any other booster source that has a greater than 12 Volt system, i.e., do not use a 24 Volt power source.

NOTE: Replacement batteries should both be of equal size to prevent damage to the vehicle's charging system.

Your vehicle is equipped with two 12 Volt batteries. If it becomes necessary to use a booster battery with jumper cables to start a vehicle's engine because its batteries are discharged, the following procedure should be used:

Set the parking brake and place an automatic transmission in PARK (or NEUTRAL for a manual transmission). Turn off lights, heater and other electrical loads. Observe charge indicator (if equipped) in both batteries. If the

indicator (if equipped) is light or yellow on either battery, replace that battery.

CAUTION!

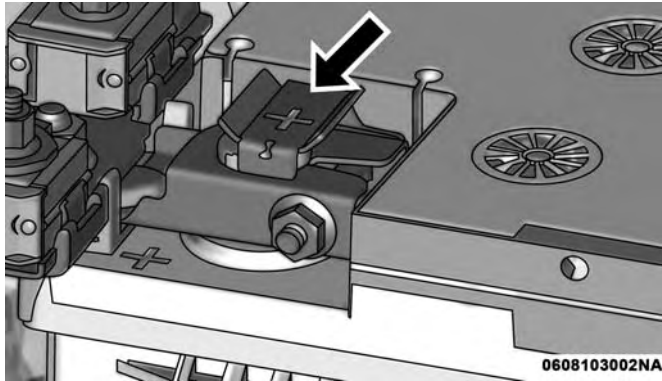
Use the jump start procedure only when the charge indicator (if equipped) in both batteries is dark in the center. Do not attempt jump starting when either battery charge indicator (if equipped) is light or yellow. If the charge indicator (if equipped) has a green dot in the center, failure to start is not due to a discharged battery and cranking system should be checked.

1. Attach one jumper cable to the positive terminal of booster battery and the other end of the same cable to the positive terminal of the discharged battery.

NOTE: Do not connect jumper cables to the fuses. Only use the jump post when connecting jumper cables.

WARNING!

Do not permit vehicles to touch each other as this could establish a ground connection and personal injury could result.



Positive Jumping Location

2. Connect one end of the other jumper cable to negative (-) post of booster battery. Connect the other end of the jumper cable to a good ground on the engine block of the vehicle with the discharged battery. Make sure a good connection is made, free of dirt and grease.

NOTE:

- Take care that the clamps from one cable do not inadvertently touch clamps from the other cable.
- Do not lean over the battery when making connection.

- The negative connection must provide good electrical conductivity and current carrying capacity.

WARNING!

- Do not connect the cable to the negative post of the discharge battery. The resulting electrical spark could cause the battery to explode.
- During cold weather when temperatures are below freezing point, electrolyte in a discharged battery may freeze. Do not attempt jump starting because the battery could rupture or explode. The battery temperature must be brought up above freezing point before attempting to jump start.

3. After the engine is started or if the engine fails to start, cables must be disconnected in the following order:
 - Disconnect the negative cable at the engine ground.
 - Disconnect the negative cable at the negative post on booster battery.
 - Disconnect the cable from the positive post of both batteries.

WARNING!

Any procedure other than above could result in:

- Personal injury caused by electrolyte squirting out the battery vent.
- Personal injury or property damage due to battery explosion.
- Damage to charging system of booster vehicle or of immobilized vehicle.

With Portable Starting Unit

There are many types of these units available. Follow the manufacturer's instructions for necessary precautions and operation.

CAUTION!

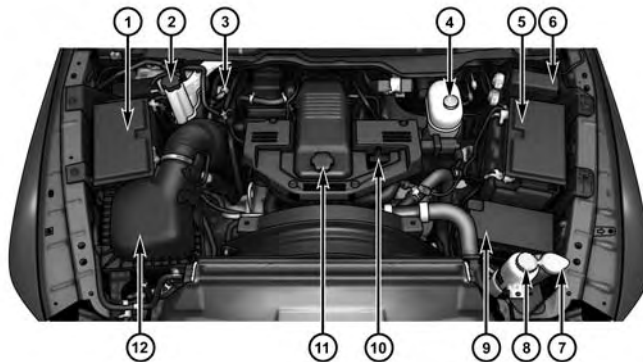
It is very important that the starting unit operating voltage does not exceed 12 Volts DC or damage to battery, starter motor, alternator, or electrical system may occur.

MAINTAINING YOUR VEHICLE

CONTENTS

■ ENGINE COMPARTMENT — 6.7L DIESEL — SIX-SPEED 68RFE (2500/3500 Models)	174	□ Maintenance-Free Batteries	190
■ ENGINE COMPARTMENT — 6.7L DIESEL — SIX-SPEED AS69RC HD (3500/CHASSIS CAB MODELS)	175	□ Cooling System	191
■ MAINTENANCE PROCEDURES	176	□ Charge Air Cooler — Inter-Cooler	195
□ Engine Oil	176	□ Brake System	195
□ Engine Air Cleaner Filter	180	□ Clutch Hydraulic System	196
□ Draining Fuel/Water Separator Filter	184	□ Transfer Case — If Equipped	197
□ Engine Mounted Fuel Filter Replacement	185	□ Manual Transmission — If Equipped	197
□ Underbody Mounted Fuel Filter Replacement	186	□ Automatic Transmission — If Equipped	197
□ Priming If The Engine Has Run Out Of Fuel	188	□ Noise Control System Required Maintenance & Warranty	200
□ Intervention Regeneration Strategy — Message Process Flow	189	■ FLUID CAPACITIES	204
□ Diesel Exhaust Fluid	190	■ FLUIDS, LUBRICANTS AND GENUINE PARTS	205
		□ Engine	205
		□ Chassis	207

ENGINE COMPARTMENT — 6.7L DIESEL — SIX-SPEED 68RFE (2500/3500 Models)

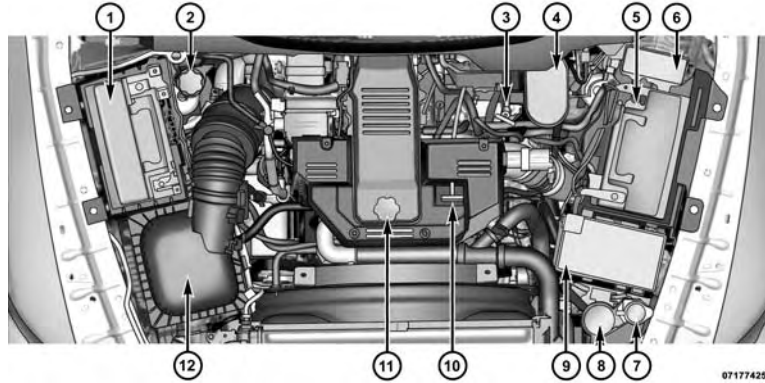


0717021343

- 1 — Battery
- 2 — Engine Coolant Reservoir
- 3 — Automatic Transmission Dipstick
- 4 — Brake Fluid Reservoir
- 5 — Battery
- 6 — Aux Power Distribution Center

- 7 — Washer Fluid Reservoir
- 8 — Power Steering Fluid Reservoir
- 9 — Power Distribution Center
- 10 — Engine Oil Dipstick
- 11 — Engine Oil Fill
- 12 — Air Cleaner Filter

ENGINE COMPARTMENT — 6.7L DIESEL — SIX-SPEED AS69RC HD (3500/CHASSIS CAB MODELS)



- 1 — Battery
- 2 — Engine Coolant Reservoir
- 3 — Automatic Transmission Dipstick
- 4 — Brake Fluid Reservoir
- 5 — Battery
- 6 — Aux Power Distribution Center

- 7 — Washer Fluid Reservoir
- 8 — Power Steering Fluid Reservoir
- 9 — Power Distribution Center
- 10 — Engine Oil Dipstick
- 11 — Engine Oil Fill
- 12 — Air Cleaner Filter

MAINTENANCE PROCEDURES

The pages that follow contain the **required** maintenance services determined by the engineers who designed your vehicle.

Besides those maintenance items specified in the fixed maintenance schedule, there are other components which may require servicing or replacement in the future.

CAUTION!

- Failure to properly maintain your vehicle or perform repairs and service when necessary could result in more costly repairs, damage to other components or negatively impact vehicle performance. Immediately have potential malfunctions examined by an authorized dealership or qualified repair center.

(Continued)

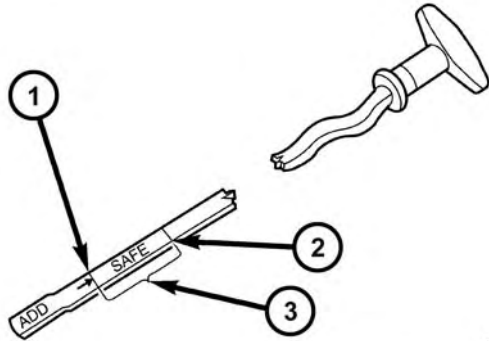
CAUTION! *(Continued)*

- Your vehicle has been built with improved fluids that protect the performance and durability of your vehicle and also allow extended maintenance intervals. Do not use chemical flushes in these components as the chemicals can damage your engine, transmission, power steering or air conditioning. Such damage is not covered by the New Vehicle Limited Warranty. If a flush is needed because of component malfunction, use only the specified fluid for the flushing procedure.

Engine Oil

Checking Oil Level

To assure proper lubrication of your vehicle's engine, the engine oil must be maintained at the correct level. Check the oil level at regular intervals. The best time to check the oil level is before starting the engine after it has been parked overnight. When checking oil after operating the engine, first ensure the engine is at full operating temperature, then wait for 30 minutes after engine shutdown to check the oil.



072606175

Engine Oil Dipstick

- 1 — ADD Range
- 2 — Full Mark
- 3 — SAFE Range

Checking the oil while the vehicle is on level ground will improve the accuracy of the oil level readings. Add oil only when the level on the dipstick is below the “ADD” mark. The total capacity from the ADD mark to the Full mark is 2 qts (1.9L).

CAUTION!

Overfilling or underfilling the crankcase will cause oil aeration or loss of oil pressure. This could damage your engine.

Never operate the engine with oil level below the “ADD” mark or above the upper “SAFE” mark.

Change Engine Oil

Refer to the “Maintenance Schedule” for the proper maintenance intervals.

Engine Oil Selection

For best performance and maximum protection under all types of operating conditions, the manufacturer only recommends engine oils that are API CJ-4 certified and meet the requirements of FCA LLC. Use MOPAR or an equivalent oil meeting FCA Material Standard MS-10902. Products meeting Cummins CES 20081 may also be used. The identification of these engine oils are typically located on the back of the oil container.

American Petroleum Institute (API) Engine Oil Identification Symbol



072610767

This symbol means that the oil has been certified by the American Petroleum Institute (API). The manufacturer only recommends API Certified engine oils.

Oils with a high ash content may produce damaging deposits on cylinder head valves and/or aftertreatment system damage. A maximum sulfated ash content of 1.00 mass % is recommended for all oil used in the engine.

The same oil change interval is to be followed for synthetic oil as for petroleum based oil. Also, synthetic oil must meet the same performance specifications as petroleum oil.

CAUTION!

Do not use chemical flushes in your engine oil as the chemicals can damage your engine. Such damage is not covered by the New Vehicle Limited Warranty.

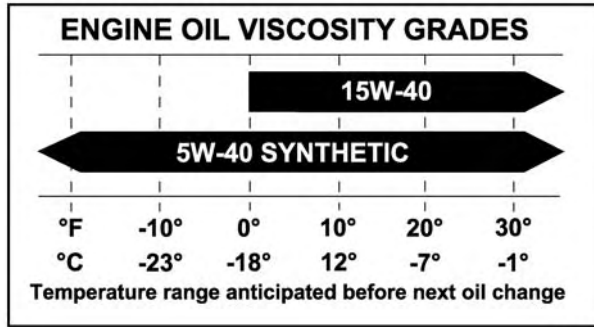
Engine Oil Viscosity (SAE Grade)

In ambient temperatures above 0°F (-18°C), we recommend you use SAE 15W-40 engine oil such as MOPAR, Shell Rotella and Shell Rimula that meets FCA Material Standard MS-10902 and the API CJ-4 engine oil category is required. Products meeting Cummins CES 20081 may also be used. The identification of these engine oils is typically located on the back of the oil container.

In ambient temperatures below 0°F (-18°C), SAE 5W-40 we recommend you use **synthetic** engine oil such as MOPAR, Shell Rotella and Shell Rimula that meets FCA Material Standard MS-10902 and the API CJ-4 engine oil category is required.

CAUTION!

Failure to use SAE 5W-40 synthetic engine oil in ambient temperatures below 0°F (-18°C) could result in severe engine damage.



80f2247d

Engine oil not designated by the FCA or Cummins Material Standards and API CJ-4 should not be used, as engine and exhaust system durability may be compromised. The engine oil filler cap also shows the recommended engine oil viscosity for your engine. For information on engine oil filler cap location, refer to “Engine Compartment” in “Maintaining Your Vehicle” for further information.

Synthetic Engine Oils

You may use synthetic engine oils if the recommended oil quality requirements are met and the recommended maintenance intervals for oil and filter changes are followed.

Materials Added To Engine Oil

The manufacturer strongly recommends against the addition of any additives (other than leak detection dyes) to the engine oil. Engine oil is an engineered product and its performance may be impaired by supplemental additives.

Engine Oil Filter

Refer to “Fluids, Lubricants, And Genuine Parts” in “Maintaining Your Vehicle” for further information. The engine oil filter should be changed at every engine oil change.

Disposing Of Used Engine Oil And Oil Filters

Care should be taken in disposing of used engine oil and oil filters from your vehicle. Used oil and oil filters, indiscriminately discarded, can present a problem to the environment. Contact your authorized dealer, service station or governmental agency for advice on how and where used oil and oil filters can be safely discarded in your area.

Engine Air Cleaner Filter

CAUTION!

All air entering the engine intake must be filtered. The abrasive particles in unfiltered air will cause rapid wear to engine components.

WARNING!

The air induction system (air cleaner, hoses, etc.) provides a measure of protection. Do not remove the air induction system (air cleaner, hoses, etc.) unless such removal is necessary for repair or maintenance. Make sure that no one is near the engine compartment before starting the vehicle with the air induction system (air cleaner, hoses, etc.) removed. Failure to do so can result in serious personal injury.

The condition of the air cleaner filter is monitored by the Engine Control Module. The “SERVICE AIR FILTER” message will display in the instrument cluster when service is required. Refer to “Instrument Cluster Display” in “Understanding Your Instrument Panel” for further information.

The “SERVICE AIR FILTER” message could be displayed periodically. This is because engine air flow requirements change based on driving conditions. As the filter becomes more restrictive and air flow requirements increase the “SERVICE AIR FILTER” message will be displayed. The message may not be displayed in subsequent drive cycles if the same conditions are not met. The air filter element should be replaced within 250 miles (402 km) from the first time this message is displayed to ensure proper engine operation during all driving conditions.

CAUTION!

Driving with a restricted air filter can cause engine damage. Driving in dusty environments for extended periods will lead to rapid air filter plugging. Action should be taken as soon as the “SERVICE AIR FILTER” message is displayed.

If the vehicle experiences a sudden loss of engine power while being driven in heavy snow or rain, or when plowing snow, and/or the “SERVICE AIR FILTER” message is displayed on the instrument cluster along with a chime that repeats every 60 seconds, visually inspect the air filter for snow/ice build up or extreme water saturation. If the air filter is not damaged, remove all snow/ice and reinstall air filter. If the air filter is damaged, replace filter element.

NOTE: The air filter housing contains a Mass Air Flow sensor. This sensor is critical to proper engine operation and component longevity. Any damage or modification to this sensor could result in major engine and/or exhaust aftertreatment damage. We recommend you use MOPAR brand parts.

Even though your vehicle is equipped with an Air Filter Monitor, a visual inspection of the air cleaner filter element is

recommended every 15,000 miles (24,000km) or 12 months – whichever occurs first. **Under no circumstances should the air cleaner filter element exceed 30,000 miles (48,000 km) or 24 months, whichever comes first.**

CAUTION!

Many aftermarket performance air filter elements do not adequately filter the air entering the engine. Use of such filters can severely damage your engine.

Engine Air Cleaner Filter Selection

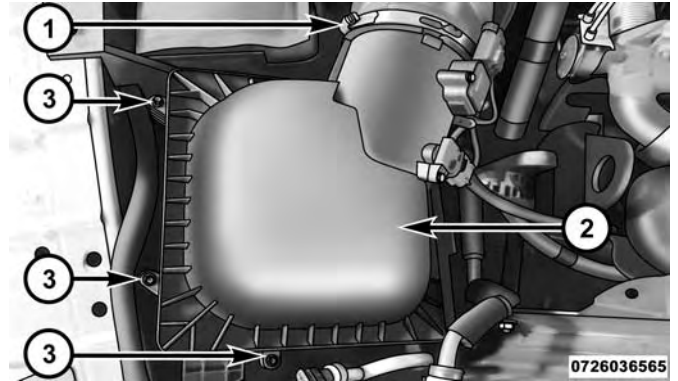
The quality of replacement engine air cleaner filters varies considerably. Only high quality filters should be used to assure most efficient service. MOPAR engine air cleaner filters are a high quality filter and are recommended.

Engine Air Cleaner Filter Inspection and Replacement

Inspect engine air cleaner filter for dirt and or debris, if you find evidence of either dirt or debris you should change your air cleaner filter.

Engine Air Cleaner Filter Removal

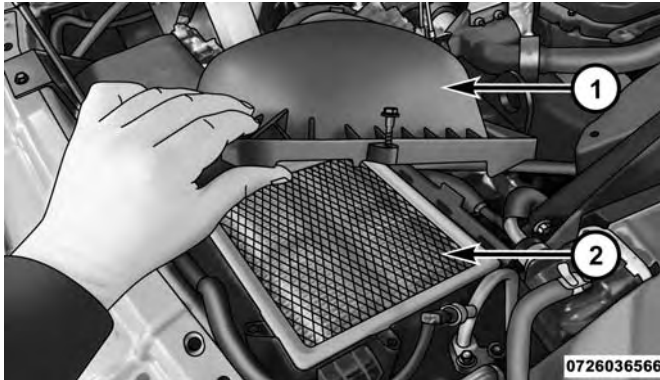
1. Remove the screws from the air cleaner cover.



Air Cleaner Filter Cover

- 1 — Clean Air Hose Clamp
- 2 — Air Cleaner Filter Cover
- 3 — Screws

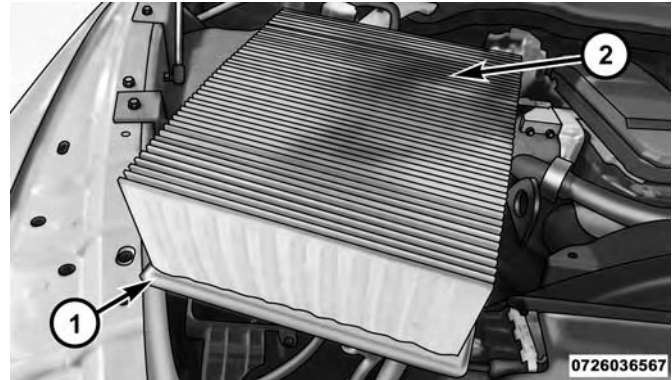
2. Lift the air cleaner cover to access the air cleaner filter.



Open Air Cleaner Filter Assembly

- 1 — Air Cleaner Cover
 2 — Air Cleaner Filter

3. Remove the air cleaner filter element from the housing assembly.



Air Cleaner Filter

- 1 — Air Cleaner Filter
 2 — Air Cleaner Filter Inspection Surface

Engine Air Cleaner Filter Installation

NOTE: Inspect and clean the housing if dirt or debris is present before replacing the air filter element.

1. Install the air cleaner filter element into the housing assembly with the air cleaner filter inspection surface facing downward.

2. Install the air cleaner cover onto the housing assembly locating tabs.
3. Install screws to secure the air cleaner cover to the housing assembly.

Draining Fuel/Water Separator Filter

There are two fuel filter assemblies. One is located on the driver's side of the engine. The best access to this water drain valve is from under the hood. The second one is on the under body, located in front of the rear axle above the drive shaft on pick-up models. The Chassis Cab models second filter location is on the frame behind the front axle. The best access to this water drain valve is from under the vehicle.

CAUTION!

- Do not drain the fuel/water separator filter when the engine is running.
- Diesel fuel will damage blacktop paving surfaces. Drain the filter into an appropriate container.

If water is detected in the water separator while the engine is running, or while the ignition switch is in the ON position, the "Water In Fuel Indicator Light" will illuminate and an audible chime will be heard five times. At this

point you should stop the engine and drain the water from both of the filters.

CAUTION!

If the "Water In Fuel Indicator Light" remains on, DO NOT START the engine before you drain water from the fuel filters to avoid engine damage.

If the "Water In Fuel Indicator Light" comes on and a single chime is heard while you are driving, or with the ignition switch in the ON position, there may be a problem with your water separator wiring or sensor. See your authorized dealer for service.

Upon proper draining of the water from both fuel filters, the "Water In Fuel Indicator Light" will remain illuminated for approximately 10 seconds. If the water was drained while the engine was running, the "Water In Fuel Indicator Light" may remain on for approximately three minutes.

NOTE: Care should be taken in disposing of used fluids from your vehicle. Used fluids, indiscriminately discarded, can present a problem to the environment. Contact an authorized dealer, service station, or government agency for advice on recycling programs and for where used fluids and filters can be properly disposed of in your area.

Drain the fuel/water separator filters when the “Water In Fuel Indicator Light” is ON. Within 10 minutes of vehicle shutdown, turn the engine mounted filter drain valve (located on the side of the filter assembly) counterclockwise 1/4 turn, and turn the under body mounted filter drain valve (located on the bottom of the filter assembly) counterclockwise 1 full turn. Then turn the ignition switch to the ON position, and allow any accumulated water to drain. Leave the drain valve open until all water and contaminants have been removed. When clean fuel is visible, close the drain valves by turning them fully clockwise, and turn the ignition switch to OFF.

If more than a couple ounces/milliliters of fuel have been drained, follow the directions for “Priming If The Engine Has Run Out Of Fuel.”

Engine Mounted Fuel Filter Replacement

NOTE:

- Using a fuel filter that does not meet the manufacturer’s filtration and water separating requirements can severely impact fuel system life and reliability.
- The engine mounted filter housing is equipped with a No-Filter-No-Run (NFNR) feature. Engine will not run if:

1. No filter is installed.
2. Inferior/Non-approved filter is used. Use of OEM filter is required to ensure vehicle will run.



072607698

Engine Mounted Fuel Filter Assembly

1 — Drain Valve

CAUTION!

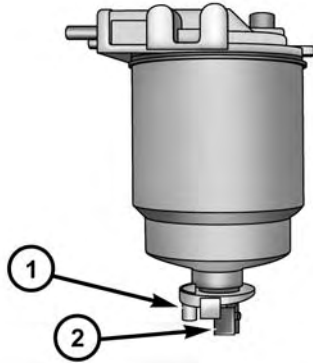
- Diesel fuel will damage blacktop paving surfaces. Drain the filter into an appropriate container.
- Do not prefill the fuel filter when installing a new fuel filter. There is a possibility debris could be introduced into the fuel filter during this action. It is best to install the filter dry and allow the in-tank lift pump to prime the fuel system.

1. Ensure engine is turned off.
 2. Place drain pan under the fuel filter drain hose.
 3. Open the water drain valve 1/4 turn counterclockwise and completely drain fuel and water into the approved container.
 4. Close the water drain valve.
 5. Remove lid using a socket or strap wrench. Rotate counterclockwise for removal. Remove used o-ring and discard it.
 6. Remove the used filter cartridge from the housing and dispose of according to your local regulations.
 7. Wipe clean the sealing surfaces of the lid and housing.
 8. Install new o-ring back into ring groove on the filter housing and lubricate with clean engine oil.
 9. Remove new filter cartridge from plastic bag and install into housing.
- NOTE:** Do not remove cartridge from bag until you reach this step in order to keep cartridge clean.
10. Push down on the cartridge to ensure it is properly seated. **Do not pre-fill the filter housing with fuel.**
 11. Install lid onto housing and tighten to 22.5 ft lbs (30.5 N.m). Do not overtighten the lid.
 12. Prime the engine using the procedure in "Priming If The Engine Has Run Out Of Fuel." Then start the engine and confirm there are no leaks.

Underbody Mounted Fuel Filter Replacement**NOTE:**

- Using a fuel filter that does not meet the manufacturer's filtration and water separating requirements can severely impact fuel system life and reliability.
- The underbody mounted filter housing will cause the engine not to run if:

1. No filter is installed.



073774273

Underbody Mounted Fuel Filter Assembly

1 — Drain Valve

2 — WIF Sensor

CAUTION!

- Diesel fuel will damage blacktop paving surfaces. Drain the filter into an appropriate container.

(Continued)

CAUTION! (Continued)

- Do not prefill the fuel filter when installing a new fuel filter. There is a possibility debris could be introduced into the fuel filter during this action. It is best to install the filter dry and allow the in-tank lift pump to prime the fuel system.

1. Ensure engine is turned off.
2. Place drain pan under the fuel filter drain hose.
3. Open the water drain valve 1 full turn counterclockwise and completely drain fuel and water into the approved container.
4. Close the water drain valve.
5. Remove lid using a socket or strap wrench. Rotate counterclockwise for removal. Remove used o-ring and discard it.
6. Remove the used filter cartridge from the housing and dispose of according to your local regulations.
7. Wipe clean the sealing surfaces of the lid and housing.
8. Install new o-ring back into ring groove on the filter housing and lubricate with clean engine oil.

NOTE: WIF sensor is re-usable. Service kit comes with new o-ring for filter canister and WIF sensor.

Priming If The Engine Has Run Out Of Fuel

WARNING!

Do not open the high pressure fuel system with the engine running. Engine operation causes high fuel pressure. High pressure fuel spray can cause serious injury or death.

1. Add a substantial amount of fuel to the tank, approximately 2 to 5 gal (8L to 19L).
2. Turn ignition switch to the start position to engage starter for one second, return ignition switch to run position. This will activate in tank fuel pump for approximately 15 seconds. Repeat this process twice.
3. Start the engine using the "Normal Starting" procedure. Refer to "Starting Procedures" in "Starting and Operating" for further information.

CAUTION!

Do not engage the starter motor for more than 15 seconds at a time. Allow two minutes between the cranking intervals.

NOTE: The engine may run rough until the air is forced from all the fuel lines.

WARNING!

Do not use alcohol or gasoline as a fuel blending agent. They can be unstable under certain conditions and be hazardous or explosive when mixed with diesel fuel.

CAUTION!

Due to lack of lubricants in alcohol or gasoline, the use of these fuels can cause damage to the fuel system.

NOTE:

- A maximum blend of 5% biodiesel, meeting ASTM specification D-975 may be used with your Cummins diesel engine. (Chassis Cab models not configured with B20 capability.)

- A maximum blend of 20% biodiesel, meeting ASTM specification D-7467 may be used with your Cummins diesel engine. (Pickup models and Chassis Cab models configured with B20 capability.)
- Use of biodiesel mixture in excess of 20% can negatively impact the fuel filter's ability to separate water from the fuel, resulting in high pressure fuel system corrosion or damage.
- Ethanol blends are not recommended or approved for use with your Cummins diesel engine.
- In addition, commercially available fuel additives are not necessary for the proper operation of your Cummins diesel engine.

Intervention Regeneration Strategy — Message Process Flow

The Cummins diesel engine meets all EPA Heavy Duty Diesel Engine Emissions Standards, resulting in one of the lowest emitting diesel engines ever produced.

To achieve these emissions standards, your vehicle is equipped with a state-of-the-art engine and exhaust system. The engine and exhaust after-treatment system work together to achieve the EPA Heavy Duty Diesel Engine

Emissions Standards. These systems are seamlessly integrated into your vehicle and managed by the Cummins Powertrain Control Module (PCM). The PCM manages engine combustion to allow the exhaust system's catalyst to trap and burn Particulate Matter (PM) pollutants, with no input or interaction on your part.

If the engine is allowed to idle or the truck is driven on low engine speed drive cycles for more than 2 hours, the system will automatically enter an emissions operating mode that will increase the engine idle speed to 900 RPM (1050 RPM for Chassis Cab). While in this mode, which is designed to help maintain the diesel particulate filter, the engine idle speed will return to normal when the brake pedal is applied. A small change in engine tone or a slight change in engine performance while accelerating may also be noticeable at speeds below 20 mph (32 kmh). This operating mode may last for up to an hour of idle time, or around 20 minutes of driving time.

Additionally, your vehicle has the ability to alert you to additional maintenance required on your truck or engine.

Refer to "Instrument Cluster Display" in "Understanding Your Instrument Panel" for further information.

WARNING!

A hot exhaust system can start a fire if you park over materials that can burn. Such materials might be grass or leaves coming into contact with your exhaust system. Do not park or operate your vehicle in areas where your exhaust system can contact anything that can burn.

Diesel Exhaust Fluid

Diesel Exhaust Fluid (DEF) sometimes known simply by the name of its active component, UREA—is a key component of selective catalytic reduction (SCR) systems, which help diesel vehicles meet stringent emission regulations. DEF is a liquid reducing agent that reacts with engine exhaust in the presence of a catalyst to convert smog-forming nitrogen oxides (NOx) into harmless nitrogen and water vapor.

Refer to “Fluids, Lubricants, and Genuine Parts” in “Maintaining Your Vehicle” for further information.

You can receive assistance in locating DEF in the United States by calling 866-RAM-INFO (866-726-4636). In Canada call 1-800-465-2001 (English) or 1-800-387-9983 (French)

Maintenance-Free Batteries

The top of the maintenance-free batteries are permanently sealed. You will never have to add water, nor is periodic maintenance required.

NOTE: Replacement batteries should both be of equal capacity to prevent damage to the vehicle’s charging system.

CAUTION!

It is essential when replacing the cables on the battery that the positive cable is attached to the positive post and the negative cable is attached to the negative post. Battery posts are marked (+) positive and negative (-) and are identified on the battery case. Also, if a “fast charger” is used while the battery is in vehicle, disconnect both vehicle battery cables before connecting the charger to the battery. Do not use a “fast charger” to provide starting voltage.

WARNING!

Battery posts, terminals, and related accessories contain lead and lead compounds. Always wash hands after handling the battery.

Battery Blanket Usage

A battery loses 60% of its cranking power as the battery temperature decreases to 0°F (-18°). For the same decrease in temperature, the engine requires twice as much power to crank at the same RPM. The use of 120 Volt AC powered battery blankets will greatly increase starting capability at low temperatures. Suitable battery blankets are available from your authorized MOPAR dealer.

Cooling System**WARNING!**

You or others can be badly burned by hot engine coolant (antifreeze) or steam from your radiator. If you see or hear steam coming from under the hood, do not open the hood until the radiator has had time to cool. Never try to open a cooling system pressure cap when the radiator is hot.

Engine Coolant Checks

Check the engine coolant (antifreeze) protection every 12 months (before the onset of freezing weather, where applicable). If the engine coolant (antifreeze) is dirty or rusty in appearance, the system should be drained, flushed and refilled with fresh coolant. Check the front of the A/C condenser (if equipped) or radiator for any accumulation of bugs, leaves, etc. If dirty, clean by gently spraying water from a garden hose vertically down the face of the A/C condenser (if equipped) or the back of the radiator core.

Check the engine cooling system hoses for brittle rubber, cracking, tears, cuts and tightness of the connection at the coolant recovery bottle and radiator. Inspect the entire system for leaks.

With the engine at normal operating temperature (but not running), check the cooling system pressure cap for proper vacuum sealing by draining a small amount of engine coolant (antifreeze) from the radiator drain cock. The radiator drain cock is located in the lower radiator tank. If the cap is sealing properly, the engine coolant (antifreeze) will begin to drain from the coolant expansion bottle. **DO NOT REMOVE THE COOLANT PRESSURE CAP WHEN THE COOLING SYSTEM IS HOT.**

Cooling System — Drain Flush And Refill

If the engine coolant (antifreeze) is dirty or contains a considerable amount of sediment, clean and flush with a reliable cooling system cleaner. Follow with a thorough rinsing to remove all deposits and chemicals. Properly dispose of old engine coolant (antifreeze).

Refer to the “Maintenance Schedule” for the proper maintenance intervals.

Selection Of Coolant

Refer to “Fluids, Lubricants, And Genuine Parts” in “Maintaining Your Vehicle” for further information.

CAUTION!

- Mixing of engine coolant (antifreeze) other than specified Organic Additive Technology (OAT) engine coolant (antifreeze), may result in engine damage and may decrease corrosion protection. Organic Additive Technology (OAT) engine coolant is different and should not be mixed with Hybrid Organic Additive Technology (HOAT) engine coolant (antifreeze) or any “globally compatible” coolant (antifreeze). If a non-OAT

CAUTION! (Continued)

engine coolant (antifreeze) is introduced into the cooling system in an emergency, the cooling system will need to be drained, flushed, and refilled with fresh OAT coolant (conforming to MS.90032), by an authorized dealer as soon as possible.

- Do not use water alone or alcohol-based engine coolant (antifreeze) products. Do not use additional rust inhibitors or antirust products, as they may not be compatible with the engine coolant and may plug the radiator.
- This vehicle has not been designed for use with propylene glycol-based engine coolant (antifreeze). Use of propylene glycol-based engine coolant (antifreeze) is not recommended.

Adding Coolant

Your vehicle has been built with an improved engine coolant (OAT coolant conforming to MS.90032) that allows extended maintenance intervals. This engine coolant (antifreeze) can be used up to ten years or 150,000 miles (240,000 km) before replacement. To prevent reducing this extended maintenance period, it is important that you use

(Continued)

the same engine coolant (OAT coolant conforming to MS.90032) throughout the life of your vehicle.

Please review these recommendations for using Organic Additive Technology (OAT) engine coolant (antifreeze) that meets the requirements of FCA Material Standard MS.90032. When adding engine coolant (antifreeze):

- We recommend using MOPAR Antifreeze/Coolant 10 Year/150,000 Mile Formula OAT (Organic Additive Technology) that meets the requirements of FCA Material Standard MS.90032.
- Mix a minimum solution of 50% OAT engine coolant that meets the requirements of FCA Material Standard MS.90032 and distilled water. Use higher concentrations (not to exceed 70%) if temperatures below -34°F (-37°C) are anticipated. Please contact your authorized dealer for assistance.
- Use only high purity water such as distilled or deionized water when mixing the water/engine coolant (antifreeze) solution. The use of lower quality water will reduce the amount of corrosion protection in the engine cooling system.

NOTE:

- It is the owner's responsibility to maintain the proper level of protection against freezing according to the temperatures occurring in the area where the vehicle is operated.
- Some vehicles require special tools to add coolant properly. Failure to fill these systems properly could lead to severe internal engine damage. If any coolant is needed to be added to the system, please contact your local authorized dealer.
- Mixing engine coolant (antifreeze) types is not recommended and can result in cooling system damage. If HOAT and OAT coolant are mixed in an emergency, have a authorized dealer drain, flush, and refill with OAT coolant (conforming to MS.90032) as soon as possible.

Cooling System Pressure Cap

The cap must be fully tightened to prevent loss of engine coolant (antifreeze), and to ensure that the engine coolant (antifreeze) will return to the radiator from the coolant expansion bottle.

The cap should be inspected and cleaned if there is any accumulation of foreign material on the sealing surfaces.

WARNING!

- **Do not open hot engine cooling system. Never add engine coolant (antifreeze) when the engine is overheated. Do not loosen or remove the cap to cool an overheated engine. Heat causes pressure to build up in the cooling system. To prevent scalding or injury, do not remove the pressure cap while the system is hot or under pressure.**
- **Do not use a pressure cap other than the one specified for your vehicle. Personal injury or engine damage may result.**

Disposal Of Used Engine Coolant

Used ethylene glycol-based engine coolant (antifreeze) is a regulated substance requiring proper disposal. Check with your local authorities to determine the disposal rules for your community. To prevent ingestion by animals or children, do not store ethylene glycol-based engine coolant (antifreeze) in open containers or allow it to remain in puddles on the ground. If ingested by a child or pet, seek emergency assistance immediately. Clean up any ground spills immediately.

Points To Remember

NOTE: When the vehicle is stopped after a few miles/kilometers of operation, you may observe vapor coming from the front of the engine compartment. This is normally a result of moisture from rain, snow, or high humidity accumulating on the radiator and being vaporized when the thermostat opens, allowing hot engine coolant (antifreeze) to enter the radiator.

If an examination of your engine compartment shows no evidence of radiator or hose leaks, the vehicle may be safely driven. The vapor will soon dissipate.

- Do not overfill the coolant expansion bottle.
- Check the coolant freeze point in the radiator and in the coolant expansion bottle. If engine coolant (antifreeze) needs to be added, the contents of the coolant expansion bottle must also be protected against freezing.
- If frequent engine coolant (antifreeze) additions are required, the cooling system should be pressure tested for leaks.
- Maintain engine coolant (antifreeze) concentration at a minimum of 50% OAT coolant (conforming to

MS.90032) and distilled water for proper corrosion protection of your engine which contains aluminum components.

- Make sure that the coolant expansion bottle overflow hoses are not kinked or obstructed.
- Keep the front of the radiator clean. If your vehicle is equipped with air conditioning, keep the front of the condenser clean.
- Do not change the thermostat for Summer or Winter operation. If replacement is ever necessary, install ONLY the correct type thermostat. Other designs may result in unsatisfactory engine coolant (antifreeze) performance, poor gas mileage, and increased emissions.

Charge Air Cooler — Inter-Cooler

The charge air cooler is positioned below the radiator and the air conditioner condenser. Air enters the engine through the air cleaner and passes through the turbo-charger, where it is pressurized. This pressurized air rapidly reaches high temperature. The air is then directed through a hose to the charge air cooler and through another hose to the intake manifold of the engine. The air entering

the engine has been cooled by about 50° to 100°F (10° to 38°C). This cooling process enables more efficient burning of fuel resulting in fewer emissions.

To guarantee optimum performance of the system, keep the surfaces of the charge air cooler, condenser and radiator clean and free of debris. Periodically check the hoses leading to and from the charge air cooler for cracks or loose clamps resulting in loss of pressure and reduced engine performance.

Brake System

Brake Master Cylinder — Brake Fluid Level Check

The fluid level of the master cylinder should be checked when performing under the hood service, or immediately if the “Brake System Warning Light” indicates system failure.

The brake master cylinder has a translucent plastic reservoir. On the outboard side of the reservoir, there is a “MAX” mark and a “MIN” mark. The fluid level must be kept within these two marks. Do not add fluid above the full mark because leakage may occur at the cap.

With disc brakes, the fluid level can be expected to fall as the brake linings wear. However, an unexpected drop in fluid level may be caused by a leak and a system check should be conducted.

Refer to “Fluids, Lubricants, And Genuine Parts” in “Maintaining Your Vehicle” for further information.

WARNING!

- Use only manufacturer’s recommended brake fluid. Refer to “Fluids, Lubricants, and Genuine Parts” in “Maintaining Your Vehicle” for further information. Using the wrong type of brake fluid can severely damage your brake system and/or impair its performance. The proper type of brake fluid for your vehicle is also identified on the original factory installed hydraulic master cylinder reservoir.

(Continued)

WARNING! (Continued)

- To avoid contamination from foreign matter or moisture, use only new brake fluid or fluid that has been in a tightly closed container. Keep the master cylinder reservoir cap secured at all times. Brake fluid in a open container absorbs moisture from the air resulting in a lower boiling point. This may cause it to boil unexpectedly during hard or prolonged braking, resulting in sudden brake failure. This could result in an accident.
- Overfilling the brake fluid reservoir can result in spilling brake fluid on hot engine parts, causing the brake fluid to catch fire. Brake fluid can also damage painted and vinyl surfaces, care should be taken to avoid its contact with these surfaces.
- Do not allow petroleum based fluid to contaminate the brake fluid. Brake seal components could be damaged, causing partial or complete brake failure. This could result in an accident.

Clutch Hydraulic System

The clutch hydraulic system is a sealed maintenance-free system. In the event of leakage or other malfunction, the system must be replaced.

Transfer Case — If Equipped

Drain And Refill

Refer to the “Maintenance Schedule” for the proper maintenance intervals.

Selection of Lubricant

Refer to “Fluids, Lubricants, and Genuine Parts” in “Maintaining Your Vehicle” for fluid specifications.

Fluid Level Check

This fluid level can be checked by removing the filler plug. The fluid level should be to the bottom edge of the filler plug hole with the vehicle in a level position.

Manual Transmission — If Equipped

Selection of Lubricant

Refer to “Fluids, Lubricants, and Genuine Parts” in “Maintaining Your Vehicle” for fluid specifications.

Fluid Level Check

The fluid level can be checked by removing the filler plug. If the level of the lubricant is more than 1/2 in (12 mm) below the bottom of the filler hole while the vehicle is on

level ground, enough lubricant should be added to bring the level to 1/4 in (6 mm) below the bottom of the filler hole.

Automatic Transmission — If Equipped

Selection of Lubricant

It is important to use the proper transmission fluid to ensure optimum transmission performance and life. Use only the manufacturer’s specified transmission fluid. Refer to “Fluids, Lubricants, and Genuine Parts” in this section for fluid specifications. It is important to maintain the transmission fluid at the correct level using the recommended fluid.

No chemical flushes should be used in any transmission; only the approved lubricant should be used.

CAUTION!

Using a transmission fluid other than the manufacturer’s recommended fluid may cause deterioration in transmission shift quality and/or torque converter shudder, and will require more frequent fluid and filter changes. Refer to “Fluids, Lubricants, and Genuine Parts” in this section for fluid specifications.

Special Additives

The manufacturer strongly recommends against using any special additives in the transmission. Automatic Transmission Fluid (ATF) is an engineered product and its performance may be impaired by supplemental additives. Therefore, do not add any fluid additives to the transmission. The only exception to this policy is the use of special dyes for diagnosing fluid leaks. Avoid using transmission sealers as they may adversely affect seals.

CAUTION!

Do not use chemical flushes in your transmission as the chemicals can damage your transmission components. Such damage is not covered by the New Vehicle Limited Warranty.

Fluid Level Check

It is best to check the fluid level when the transmission is at normal operating temperature (170-180°F / 77-82°C for 68RFE transmission, or 158-176°F / 70-80°C for AS69RC transmission). This normally occurs after at least 15 miles (25 km) of driving. At normal operating temperature the fluid cannot be held comfortably between the fingertips. You can read the transmission sump temperature in the

instrument cluster display (refer to “Instrument Cluster Display” in “Understanding Your Instrument Panel” for further information).

Use the following procedure to check the transmission fluid level properly:

1. Monitor the transmission temperature using the instrument cluster display, and operate the vehicle as required to reach the normal operating temperature. If the transmission is not functioning properly, or the vehicle cannot be driven, see the NOTE and CAUTION below about checking the fluid level at colder temperatures.
2. Park the vehicle on level ground.
3. Run the engine at normal idle speed for at least 60 seconds, and leave the engine running for the rest of this procedure.
4. Fully apply the parking brake and press the brake pedal.
5. Place the gear selector momentarily into each gear position (allowing time for the transmission to fully engage in each position), ending with the transmission in PARK.
6. Remove the dipstick, wipe it clean and reinsert it until seated.

7. Remove the dipstick again and note the fluid level on both sides. The fluid level reading is only valid if there is a solid coating of oil on both sides of the dipstick. Note that the holes in the dipstick will be full of fluid if the actual level is at or above the hole. The fluid level should be between the "HOT" (upper) reference holes on the dipstick at normal operating temperature. If the fluid level is low, add fluid through the dipstick tube to bring it to the proper level. **Do not overfill.** Use ONLY the specified fluid (see "Fluids, Lubricants, and Genuine Parts" for fluid specifications). After adding any quantity of oil through the dipstick tube, wait a minimum of two minutes for the oil to fully drain into the transmission before rechecking the fluid level.

NOTE: If it is necessary to check the transmission **below** the operating temperature, the fluid level should be between the two "COLD" (lower) holes on the dipstick with the fluid at 60-70°F / 16-21°C for 68RFE transmission, or 68-86°F / 20-30°C for AS69RC transmission. Only use the COLD region of the dipstick as a rough reference when setting the fluid level after a transmission service or fluid change. Re-check the fluid level, and adjust as required, once the transmission reaches normal operating temperature.

CAUTION!

If the fluid temperature is below 50°F (10°C) it may not register on the dipstick. Do not add fluid until the temperature is elevated enough to produce an accurate reading. Run the engine at idle, in PARK, to warm the fluid.

8. Reinsert the dipstick. Check for leaks. Release the parking brake.

NOTE: To prevent dirt and water from entering the transmission after checking or replenishing fluid, make sure that the dipstick cap is properly reseated. It is normal for the dipstick cap to spring back slightly from its fully seated position, as long as its seal remains engaged in the dipstick tube.

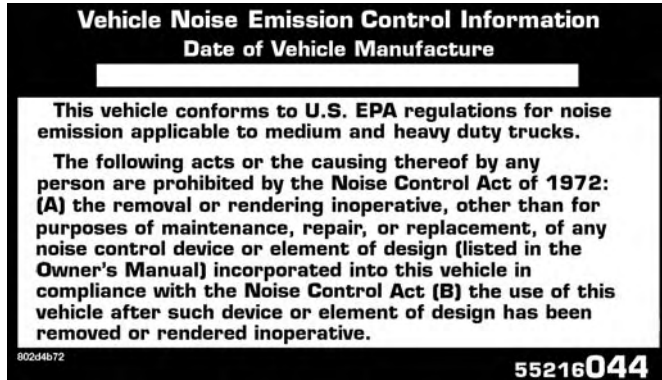
Fluid And Filter Changes

Refer to the "Maintenance Schedule" for the proper maintenance intervals.

In addition, change the fluid and filter(s) if the fluid becomes contaminated (with water, etc.), or if the transmission is disassembled for any reason.

Noise Control System Required Maintenance & Warranty

All vehicles built over 10,000 lbs. (4 535 kg) Gross Vehicle Weight Rating and manufactured for sale and use in the United States are required to comply with the Federal Government's Exterior Noise Regulations. These vehicles can be identified by the Noise Emission Control Label located in the operator's compartment.



Required Maintenance For Noise Control Systems

The following maintenance services must be performed every six months or 7,500 miles (12 000 km) whichever comes first, to assure proper operation of the noise control

systems. In addition, inspection and service should be performed anytime a malfunction is observed or suspected. Proper maintenance of the entire vehicle will help the effectiveness of the noise control systems.

Exhaust System

Inspect the entire exhaust system for leaks and damaged parts. Devices such as hangers, clamps, and U-bolts should be tight and in good condition. Damaged components, burned or blown out mufflers, burned or rusted out exhaust pipes should be replaced according to the procedures and specifications outlined in the appropriate service manual.

Air Cleaner Assembly

Inspect air cleaner housing for proper assembly and fit. Make certain that the air cleaner is properly positioned and that the cover is tight. Check all hoses leading to the air cleaner for tightness. The air filter element must also be clean and serviced according to the instructions outlined in the Maintenance Schedule section of this manual.

Tampering With Noise Control System Prohibited

Federal law prohibits the following acts or the causing thereof: (1) the removal or rendering inoperative by any person, other than for purposes of maintenance, repair, or

replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use, or (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

Among those acts presumed to constitute tampering are the acts listed below.

AIR CLEANER

- Removal of the air cleaner.
- Removal of the air cleaner filter element from the air cleaner housing.
- Removal of the air ducting.

EXHAUST SYSTEM

- Removal or rendering inoperative exhaust system components including the muffler or tailpipe.

ENGINE COOLING SYSTEM

- Removal or rendering inoperative the fan clutch.
- Removal of the fan shroud.

Noise Emission Warranty

The manufacturer warrants that this vehicle as manufactured by the manufacturer, was designed, built and equipped to conform at the time it left the manufacturer's control with all applicable U.S. EPA Noise Control Regulations.

This warranty covers this vehicle as designed, built and equipped by the manufacturer, and is not limited to any particular part, component or system of the vehicle manufactured by the manufacturer. Defects in design, assembly or in any part, component or system of the vehicle as manufactured by the manufacturer, which, at the time it left the manufacturer's control, caused noise emissions to exceed Federal standards, are covered by this warranty for the life of the vehicle.

Noise Systems Maintenance Chart and Service Log — Insert Month, Day, Year under column mileage closest to the mileage at which service was performed.

MILES	67,500	75,000	82,500	90,000	97,500	105,000	112,500	120,000
KILOMETERS	108 000	120 000	132 000	144 000	156 000	168 000	180 000	192 000
Exhaust system-inspect								
Air cleaner assembly-inspect								
ODOMETER READING								
PERFORMED BY								
PERFORMED AT								

FLUID CAPACITIES

	U.S.	Metric
Fuel (Approximate)		
2500/3500 Standard Cab Longbed Models	28 Gallons	106 Liters
2500/3500 Crew/Mega Cab Shortbed Models	31 Gallons	129 Liters
2500/3500 Crew Cab Longbed Models	32 Gallons	132 Liters
Standard Rear Tank – Chassis Cab Only	52 Gallons	197 Liters
Optional Midship Tank – Chassis Cab Only	22 Gallons	83 Liters
Diesel Exhaust Fluid Tank (Approximate) – 2500/3500 Models	5.5 Gallons	21 Liters
Diesel Exhaust Fluid Tank (Approximate) – Chassis Cab	9 Gallons	34 Liters
Engine Oil With Filter		
6.7L Turbo Diesel Engine	12 Quarts	11.4 Liters
Cooling System		
6.7L Turbo Diesel Engine (MOPAR Engine Coolant/Antifreeze 10 Year/150,000 Mile Formula)	5.7 Gallons	21.4 Liters

FLUIDS, LUBRICANTS AND GENUINE PARTS

Engine

Component	Fluid, Lubricant, or Genuine Part
Engine Coolant	We recommend you use MOPAR Antifreeze/Coolant 10 Year/150,000 Mile Formula OAT (Organic Additive Technology).
Engine Oil	In ambient temperatures above 0°F (-18°C), we recommend you use 15W-40 engine oil such as MOPAR, Shell Rotella and Shell Rimula that meets FCA Material Standard MS-10902 and the API CJ-4 engine oil category is required. Products meeting Cummins CES 20081 may also be used. The identification of these engine oils is typically located on the back of the oil container. In ambient temperatures below 0°F (-18°C), we recommend you use 5W-40 synthetic engine oil such as MOPAR, Shell Rotella and Shell Rimula that meets FCA Material Standard MS-10902 and the API CJ-4 engine oil category is required.
Engine Oil Filter	We recommend you use MOPAR Engine Oil Filters.
Fuel Filters	We recommend you use MOPAR Fuel Filter. Must meet 3 micron rating. Using a fuel filter that does not meet the manufacturers filtration and water separating requirements can severely impact fuel system life and reliability.
Crankcase Ventilation Filter	We recommend you use MOPAR CCV Filter.

Component	Fluid, Lubricant, or Genuine Part
Fuel Selection	<p>Use good quality diesel fuel from a reputable supplier in your vehicle. Federal law requires that you must fuel this vehicle with Ultra Low Sulfur Highway Diesel fuel (15 ppm Sulfur maximum) and prohibits the use of Low Sulfur Highway Diesel fuel (500 ppm Sulfur maximum) to avoid damage to the emissions control system.</p> <p>For most year-round service, No. 2 diesel fuel meeting ASTM specification D-975 Grade S15 will provide good performance.</p> <p>If climatized or diesel Number 1 ULSD fuel is not available, and you are operating below (20°F/-6°C), in sustained arctic conditions, Mopar Premium Diesel Fuel Treatment (or equivalent) is recommended to avoid gelling.</p> <p>This vehicle is fully compatible with biodiesel blends up to 5% biodiesel meeting ASTM specification D-975. Pickup models, and Chassis Cab models configured with optional B20 capability, are additionally compatible with 20% biodiesel meeting ASTM specification D-7467.</p>
Diesel Exhaust Fluid	<p>MOPAR Diesel Exhaust Fluid (API Certified) (DEF) or equivalent that has been API Certified to the ISO 22241 standard. Use of fluids not API Certified to ISO 22241 may result in system damage. You can receive assistance in locating DEF in the United States by calling 866-RAM-INFO (866-726-4636). In Canada call 1-800-465-2001 (English) or 1-800-387-9983 (French).</p>

Chassis

Component	Fluid, Lubricant, or Genuine Part
Automatic Transmission – If Equipped 6.7L Diesel with (Six-Speed 68RFE) – 2500/3500 Pickup models without PTO	Only use ATF+4 Automatic Transmission Fluid. Failure to use ATF+4 fluid may affect the function or performance of your transmission. We recommend MOPAR ATF+4 fluid.
Automatic Transmission – If Equipped 6.7L Diesel with (Six-Speed AS69RC) – Pickup models with PTO and All Chassis Cab models	Only use MOPAR ASRC Automatic Transmission Fluid or equivalent. Failure to use the proper fluid may affect the function or performance of your transmission.
Transfer Case	We recommend you use MOPAR BW44–44 Transfer Case Fluid.
Front and Rear Axle Fluid (2500/3500)	We recommend you use SAE 75W-85 HD Ram GL-5 Synthetic Axle Lubricant. Limited slip additive is not required for Limited-Slip Rear Axles.
Front and Rear Axle Fluid (4500/5500)	We recommend you use GL-5 SAE 75W-90 Synthetic (MS-9763). Limited slip additive is not required for Limited-Slip Rear Axles.
Clutch Linkage	We recommend you use MOPAR Multi-Purpose Grease, NLGI Grade 2 E.P. or equivalent.
Manual Transmission (G-56) – If Equipped	We recommend you use MOPAR ATF+4 Automatic Transmission Fluid or equivalent licensed ATF+4 product.

MAINTENANCE SCHEDULE

CONTENTS

■ MAINTENANCE SCHEDULE — DIESEL		
ENGINE . . . . .	.210	
□ Oil Change Indicator System — Cummins		
Diesel . . . . .	.210	
□ Perform Service Indicator — Cummins		
Diesel . . . . .		.211
□ Maintenance Chart — Cummins Diesel		
Engine . . . . .		.212

MAINTENANCE SCHEDULE — DIESEL ENGINE**CAUTION!**

Failure to perform the required maintenance items may result in damage to the vehicle.

At Each Stop For Fuel

Check the engine oil level at least 30 minutes after a fully warmed engine is shut off. Checking the oil level while the vehicle is on level ground will improve the accuracy of the oil level reading. Add oil only when the level is at or below the ADD or MIN mark.

Once A Month

- Inspect the batteries, and clean and tighten the terminals as required.
- Check the fluid levels of the coolant reservoir, brake master cylinder, and automatic transmission (if equipped), and add as needed.

At Each Oil Change

- Change the engine oil filter.
- Inspect the exhaust system.
- Inspect engine air filter.

- Check the coolant level, hoses, and clamps.
- Lubricate outer tie rod ends.

Inspection and service should also be performed anytime a malfunction is observed or suspected. Retain all receipts.

Oil Change Indicator System — Cummins Diesel

Your vehicle is equipped with an engine oil change indicator system. This system will alert you when it is time to change your engine oil by displaying the words “Oil Change Due” in your instrument cluster display. The oil change reminder will remind the owner to change the engine oil every 15,000 miles or 500 hours, whichever comes first, except for the Chassis Cab models and Pickup models configured with optional B20 capability that are using B20 biodiesel, which are 12,500 miles or 400 hours, whichever comes first. Failure to change the engine oil per the maintenance schedule can result in internal engine damage.

Your authorized dealer will reset the oil change indicator message after completing the scheduled oil change. If a scheduled oil change is performed by someone other than your authorized dealer, the message can be reset by

referring to the steps described under “Instrument Cluster Display” in “Understanding Your Instrument Panel” for further information.

Replace the engine oil and oil filter every 15,000 miles (24 000 km) or six months, or sooner if prompted by the oil change indicator system. Under no circumstances should oil change intervals exceed 15,000 miles (24 000 km) or six months, whichever comes first.

NOTE:

- Under no circumstances should oil change intervals exceed 15,000 miles (24,000 km) or six months or 500 Hours, whichever comes first.
- Replace the engine oil and oil filter every 12,500 miles (20 000 km) when running B20 fuel (Chassis Cab Only).

If Chassis Cab models and Pickup models configured with optional B20 capability are operated with greater than 5% levels of biodiesel, the oil change interval must not exceed 12,500 miles (20 000 km) under any circumstances. See the Fuel Requirements section for more information regarding operation of Chassis Cab models and Pickup models configured for use with biodiesel blend (B6-B20) fuel meeting ASTM specification D-7467.

Perform Service Indicator — Cummins Diesel

Your vehicle will require emissions maintenance at a set interval. To help remind you when this maintenance is due, the instrument cluster will display “Perform Service”. When the “Perform Service” message is displayed on the instrument cluster it is necessary to have the emissions maintenance performed. Emissions maintenance may include replacing the Closed Crankcase Ventilation (CCV) filter element. The procedure for clearing and resetting the “Perform Service” indicator message is located in the appropriate Service Information.

Mileage or time passed (whichever comes first):	7,500	15,000	22,500	30,000	37,500	45,000	52,500	60,000	67,500	75,000	82,500	90,000	97,500	105,000	112,500	120,000	127,500	135,000	142,500	150,000
Or Months:	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
Or Kilometers:	12,000	24,000	36,000	48,000	60,000	72,000	84,000	96,000	108,000	120,000	132,000	144,000	156,000	168,000	180,000	192,000	204,000	216,000	228,000	240,000
Inspect the front suspension, tie rod ends and boot seals for cracks or leaks and all parts for damage, wear, improper looseness or end play; replace if necessary.		X		X		X		X		X		X		X		X		X		X
Inspect the brake linings.			X			X			X			X			X			X		
Inspect and adjust parking brake.			X			X			X			X			X			X		
Inspect drive belt; replace as necessary.			X			X			X			X			X			X		
Inspect wheel bearings.				X				X				X				X				X
Additional Maintenance																				
Replace cabin air filter.			X			X			X			X			X			X		
Replace engine fuel filter element.		X		X		X		X		X		X		X		X		X		X

Mileage or time passed (whichever comes first):	7,500	15,000	22,500	30,000	37,500	45,000	52,500	60,000	67,500	75,000	82,500	90,000	97,500	105,000	112,500	120,000	127,500	135,000	142,500	150,000
Or Months:	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
Or Kilometers:	12,000	24,000	36,000	48,000	60,000	72,000	84,000	96,000	108,000	120,000	132,000	144,000	156,000	168,000	180,000	192,000	204,000	216,000	228,000	240,000
Replace chassis mounted fuel filter element.		X		X		X		X		X		X		X		X		X		X
Inspect the front and rear axle surfaces. If gear oil leakage is suspected, check the fluid level. If using your vehicle for police, taxi, fleet, off-road or frequent trailer towing change the axle fluid. *																				
Inspect the transfer case fluid (4x4), change for any of the following: police, taxi, fleet, or frequent trailer towing.				X				X				X				X				X
Change the transfer case fluid (4x4).								X								X				
Change automatic transmission fluid (AS69RC transmission only).				X				X				X				X				X
Change the automatic transmission fluid and sump filter (AS69RC transmission only).								X								X				

Mileage or time passed (whichever comes first):	7,500	15,000	22,500	30,000	37,500	45,000	52,500	60,000	67,500	75,000	82,500	90,000	97,500	105,000	112,500	120,000	127,500	135,000	142,500	150,000
Or Months:	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
Or Kilometers:	12,000	24,000	36,000	48,000	60,000	72,000	84,000	96,000	108,000	120,000	132,000	144,000	156,000	168,000	180,000	192,000	204,000	216,000	228,000	240,000
Change automatic transmission fluid and filter(s) if using your vehicle for any of the following: police, fleet, or frequent trailer towing (68RFE transmission only).								X								X				
Change automatic transmission fluid and filter(s).																X				
Change the manual transmission fluid if using your vehicle for any of the following: police, fleet, or frequent trailer towing.								X								X				
Replace Crankcase Ventilation Filter (CCV).									X									X		
Flush and replace power steering fluid.													X							
Flush and replace engine coolant. ***																				X
Adjust valve lash clearance.																				X

Inspection and service should also be performed anytime a malfunction is observed or suspected. Retain all receipts.

* Inspect the front and rear axle surfaces every 20,000 miles (32,000 km). If gear oil leakage is suspected, check the fluid level. If using your vehicle for police, taxi, fleet, off-road or frequent trailer towing change the axle fluid every 20,000 miles (32,000 km).

** Under no circumstances should oil change intervals exceed 15,000 miles (24 000 km) or six months or 500 Hours, whichever comes first.

*** The manufacturer highly recommends that all cooling system service, maintenance, and repairs be performed by your local authorized dealer.

**** Under no circumstances should the air cleaner filter element exceed 30,000 miles (48,000 km) or 24 months, whichever comes first.

WARNING!

- You can be badly injured working on or around a motor vehicle. Do only service work for which you have the knowledge and the right equipment. If you have any doubt about your ability to perform a service job, take your vehicle to a competent mechanic.
- Failure to properly inspect and maintain your vehicle could result in a component malfunction and effect vehicle handling and performance. This could cause an accident.

CAUTION!

***The manufacturer highly recommends that all cooling system service, maintenance, and repairs be performed by your local authorized dealer.

INDEX

Adding Engine Coolant (Antifreeze) . . . . .	.66	Coolant Capacity . . . . .	.71
Adding Fuel . . . . .	.45	Coolant Level . . . . .	.65
Air Cleaner, Engine (Engine Air Cleaner Filter) . . . . .	.57	Disposal Of Used Coolant . . . . .	.68
Antifreeze (Engine Coolant) . . . . .	.65	Drain, Flush, And Refill . . . . .	.65
Capacities . . . . .	.71	Points To Remember . . . . .	.68
Disposal . . . . .	.68	Pressure Cap . . . . .	.67
Automatic Transmission		Radiator Cap . . . . .	.67
Fluid Type . . . . .	.75	Selection Of Coolant (Antifreeze) . . . . .	.65 , 72
Axle Fluid . . . . .	.75		
		Diesel Fuel . . . . .	.40
Battery . . . . .	.64	Diesel Fuel Requirements . . . . .	.40
Brake Fluid . . . . .	.75	Bulk Storage Of . . . . .	.48
Brake System . . . . .	.69	Diesel Fuel System, Re-Priming . . . . .	.62
Fluid Check . . . . .	.69	Disposal	
Master Cylinder . . . . .	.69	Antifreeze (Engine Coolant) . . . . .	.68
		Draining Fuel/Water Separator Filter . . . . .	.60
Capacities, Antifreeze (Engine Coolant) . . . . .	.71		
Capacities, Fluid . . . . .	.71	Engine . . . . .	.54
Caps, Filler		Air Cleaner . . . . .	.57
Oil (Engine) . . . . .	.56	Block Heater . . . . .	.34 , 40
Radiator (Coolant Pressure) . . . . .	.67	Break-In Recommendations . . . . .	.11
Charge Air Cooler . . . . .	.69	Compartment . . . . .	.54
Coolant Pressure Cap (Radiator Cap) . . . . .	.67	Coolant (Antifreeze) . . . . .	.72
Cooling System . . . . .	.65	Identification . . . . .	.54
Adding Coolant (Antifreeze) . . . . .	.66	Idling . . . . .	.38

Oil . . . . .	.55 , 72	Intervention Regeneration Strategy . . . . .	.25
Oil Filler Cap . . . . .	.56	Keyless Enter-N-Go . . . . .	.33
Filters		Maintenance Procedures . . . . .	.55
Air Cleaner . . . . .	.57	Maintenance Schedule . . . . .	.78
Engine Fuel . . . . .	.60	New Vehicle Break-In Period . . . . .	.11
Engine Oil . . . . .	.57 , 72	Oil, Engine . . . . .	.55
Engine Oil Disposal . . . . .	.57	Capacity . . . . .	.71
Fluid Capacities . . . . .	.71	Change Interval . . . . .	.56
Fluid Level Checks		Dipstick . . . . .	.55
Brake . . . . .	.69	Disposal . . . . .	.57
Fluid, Brake . . . . .	.75	Filter . . . . .	.57 , 72
Fluids, Lubricants And Genuine Parts . . . . .	.72	Filter Disposal . . . . .	.57
Fuel . . . . .	.40	Materials Added To . . . . .	.57
Adding . . . . .	.45	Recommendation . . . . .	.55
Diesel . . . . .	.40 , 72	Viscosity . . . . .	.56
Filter . . . . .	.60	Radiator Cap (Coolant Pressure Cap) . . . . .	.65
Requirements . . . . .	.40	Remote Starting System . . . . .	.10
Specifications . . . . .	.41	Schedule, Maintenance . . . . .	.78
Tank Capacity . . . . .	.71	Selection Of Coolant (Antifreeze) . . . . .	.72
Fueling . . . . .	.45		
Gauges			
Voltmeter . . . . .	.35		
Instrument Cluster . . . . .	.14		

Starting . . . . .	.32
Automatic Transmission . . . . .	.33
Engine Block Heater . . . . .	.34 , 40
Remote . . . . .	.10
Starting Procedures . . . . .	.32
Starting Procedures (Diesel Engines) . . . . .	.32
Tip Start. . . . .	.33
Transfer Case	
Fluid . . . . .	.75
Transmission	
Viscosity, Engine Oil . . . . .	.56
Voltmeter . . . . .	.35
Water Separator, Diesel Fuel. . . . .	.60

Adding Engine Coolant (Antifreeze)192

Adding Fuel160

Air Cleaner, Engine (Engine Air Cleaner Filter).180

Air Filter180

Antifreeze (Engine Coolant)192

 Capacities204

 Disposal194

Automatic Transmission

 Adding Fluid199

 Fluid Level Check198

 Fluid Type207

 Shifting141

Axle Fluid207

Battery190

 Blanket132 , 191

 Emergency Starting170

Brake System195

 Fluid Check195

 Master Cylinder195

Brake/Transmission Interlock141

Capacities, Antifreeze (Engine Coolant)204

Capacities, Fluid204

Caps, Filler

 Oil (Engine)178

 Radiator (Coolant Pressure)193

Charge Air Cooler195

Coolant Pressure Cap (Radiator Cap).193

Cooling System191

 Adding Coolant (Antifreeze)192

 Coolant Capacity204

 Coolant Level191

 Disposal Of Used Coolant194

 Drain, Flush, And Refill192

 Points To Remember194

 Pressure Cap193

 Radiator Cap193

 Selection Of Coolant (Antifreeze)192 , 205

Diesel Exhaust Brake138

Diesel Fuel157

Diesel Fuel Requirements157

 Bulk Storage Of163

Diesel Fuel System, Re-Priming.188

Disposal

 Antifreeze (Engine Coolant)194

Draining Fuel/Water Separator Filter.184

Electronic Range Select (ERS)	147	Fluid Level Checks	
Electronic Speed Control (Cruise Control)	96	Brake	195
Emergency, In Case Of		Manual Transmission	197
Jump Starting	170	Transfer Case	197
Engine	174	Fluids, Lubricants And Genuine Parts	205
Air Cleaner	180	Fuel	157
Block Heater	125 , 137	Adding	160 , 162
Break-In Recommendations	94	Diesel	157 , 162 , 205
Compartment	174 , 175	Filter	184
Coolant (Antifreeze)	205	Requirements	157
Identification	174 , 175	Specifications	157
Idling	133	Tank Capacity	204
Jump Starting	170	Fueling	160
Oil	176 , 205	Gauges	
Oil Filler Cap	178	Voltmeter	130
Oil Synthetic	179		
Runaway	156	Gear Ranges	142
Exhaust Brake	138		
Exhaust System	200	Idle Up Feature	134
Filters		Instrument Cluster	102
Engine Fuel	184	Intervention Regeneration Strategy	113
Engine Oil	179 , 205		
Engine Oil Disposal	179	Jump Starting	170
Fluid Capacities	204		

Keyless Enter-N-Go	122	Synthetic	179
Maintenance Procedures.	176	Viscosity	178
Maintenance Schedule	210	Overdrive	148
Manual Transmission.	150	Overdrive OFF Switch	148
Fluid Level Check	197	Perform Service Indicator, Reset	211
Shift Speeds	151	Power	
New Vehicle Break-In Period	94	Take-Off Adapter	154
Noise Control		Take-Off Operation	154
Maintenance	200	PTO (Power Take-Off)	154
Tampering Prohibited	200	Radiator Cap (Coolant Pressure Cap).	191
Noise Emission Warranty	200	Remote Starting System	92
Oil Change Indicator	210	Resetting Perform Service Indicator	211
Oil, Engine	176	Selection Of Coolant (Antifreeze)	205
Capacity	204	Shifting	140
Change Interval	177	Automatic Transmission	141
Dipstick	176	Manual Transmission	150
Disposal	179	Speed Control	
Filter	179 , 205	Accel/Decel	99
Filter Disposal	179	Cancel	97
Identification Logo	178	Speed Control (Cruise Control).	96
Materials Added To	179	Starting	121
Recommendation	177	Automatic Transmission	121

Engine Block Heater . . . . .	.125 , 137
Manual Transmission . . . . .	.121
Remote . . . . .	.92
Starting Procedures . . . . .	.121
Starting Procedures (Diesel Engines) . . . . .	.121
Synthetic Engine Oil . . . . .	.179
Tip Start . . . . .	.121
Torque Converter Clutch . . . . .	.149
Traction Control . . . . .	.197
Transfer Case	
Fluid . . . . .	.207
Transmission	
Automatic . . . . .	.141
Fluid . . . . .	.207
Manual . . . . .	.121 , 150
Shifting . . . . .	.140
Viscosity, Engine Oil . . . . .	.178
Voltmeter . . . . .	.130
Water Separator, Diesel Fuel . . . . .	.184

INSTALLATION OF RADIO TRANSMITTING EQUIPMENT

Special design considerations are incorporated into this vehicle's electronic system to provide immunity to radio frequency signals. Mobile two-way radios and telephone equipment must be installed properly by trained personnel. The following must be observed during installation.

The positive power connection should be made directly to the battery and fused as close to the battery as possible. The negative power connection should be made to body sheet metal adjacent to the negative battery connection. This connection should not be fused.

Antennas for two-way radios should be mounted on the roof or the rear area of the vehicle. Care should be used in mounting antennas with magnet bases. Magnets may affect the accuracy or operation of the compass on vehicles so equipped.

The antenna cable should be as short as practical and routed away from the vehicle wiring when possible. Use only fully shielded coaxial cable.

Carefully match the antenna and cable to the radio to ensure a low Standing Wave Ratio (SWR).

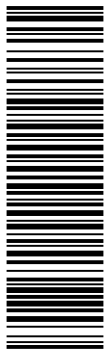
Mobile radio equipment with output power greater than normal may require special precautions.

All installations should be checked for possible interference between the communications equipment and the vehicle's electronic systems.



RAM

STICK WITH THE SPECIALISTS®



17D241-226-AA

©2016 FCA US LLC. ALL RIGHTS RESERVED.

RAM IS A REGISTERED TRADEMARK OF FCA US LLC.



**FIRST EDITION
PRINTED IN U.S.A.**