2. When the glow plug pre-heat indicator turns off, turn the key to start and release the key as soon as the engine starts. After starting the engine, the glow plugs may remain on for a period. If you do not start the engine before the glow plug activation time ends, you will need to reset the glow plugs by turning the key to off.
3. After the engine starts, allow it to idle for about 15 seconds. This is to protect the engine. Do not increase engine speed until the oil pressure gauge indicates normal pressure.

### Cold Weather Operation

**Note:** *Idling in cold weather does not heat the engine to its normal operating temperature. Long periods of idling, especially in cold weather, can cause a buildup of deposits which can cause engine damage.*

Changing to a lighter grade engine oil also makes starting easier under these conditions. Refer to Engine oil specifications. See **Technical Specifications** (page 57).

Diesel fuel is adjusted seasonally for cold temperatures. Diesel fuel which has not been properly formulated for the ambient conditions may gel which can clog the fuel filters. One indication that the fuel filter(s) may be clogged is if the engine starts, stalls after a short time, and then does not restart. If you have been using biodiesel, you may need to use a fuel with lower biodiesel content, try another brand, or discontinue using biodiesel. Do not use alcohol based additives to correct fuel gelling. This may result in damage to the fuel injectors and system. Use the proper anti-gel and performance improvement product. See **Technical Specifications** (page 57).

Your vehicle is equipped with a fuel and water separator that recirculates fuel from the engine to help prevent fuel filter clogging. To avoid engine fuel starvation during cold weather operation of 32°F (0°C) or below, we recommended that the fuel level in your tank should not drop below 1/4 full. This helps prevent air from entering the fuel system and stalling the engine.

Your vehicle is equipped with a selective catalyst reduction system that uses Diesel Exhaust Fluid (DEF) to operate properly. You need to replenish your vehicle's DEF at certain intervals. When filling your vehicle's DEF tank in cold weather, you must take special care to prevent damage to the tank. See **Selective Catalytic Reduction System** (page 21).

In cold weather below 32°F (0°C), the engine may slowly increase to a higher idle speed if left idling in P (Park). As the engine warms-up, the engine sound level decreases due to the activation of PCM-controlled sound reduction features.

If you operate your vehicle in a heavy snowstorm or blowing snow conditions, snow and ice can clog the engine air induction. If this occurs, the engine may experience a significant reduction in power output. At the earliest opportunity, clear all the snow and/or ice away from inside the air filter assembly. Remove the air cleaner cover and the pleated paper filter, leaving the foam filter in and remove any snow or ice. Make sure you install the foam filter correctly in place. Remove any debris, snow or ice on the foam filter by brushing the surface with soft brush. Once you have cleared all of the debris, reinstall the air filter and assembly.

Do not use water, solvents, or a hard brush for cleaning the foam filter.