

Automotive

Off Road

Heavy  
Duty

Power  
Gen



## Stop Idling. Engine, Oil and Battery Heaters Warm Up Your Engine Before You Start It.

Still warming up your vehicle on cold days? When it's cold outside, idling your vehicle before driving causes damage to the engine, increases fuel consumption and pollutes the environment. A five- to 10-minute warm-up was needed when engines had carburetors. Since the 1980s, carburetors were phased out in favor of fuel injection. Modern engines with fuel injection systems only need a brief idling time of 10 to 30



seconds. Vehicles warm up quicker by gently being driven, which heats up the inside and under the hood faster. When temperatures dip below freezing, the engine, oil and battery may require preheating before the engine is started.

### Under the Hood

Internal combustion engines use pistons to compress a mixture of air and vaporized fuel within the cylinders. That mixture is then ignited to create a combustion event. When an engine is cold, the fuel is less likely to evaporate and create the correct ratio of air and vaporized fuel. To compensate, more fuel is injected into the mixture. The engine continues to run rich until it heats up to about 40°F (4°C). That extra gasoline injected into the combustion chamber can get onto the



cylinder walls and wash off the oil. This can significantly reduce the life of piston rings and cylinders. Idling can also increase fuel consumption by decreasing your engine's efficiency and causing corrosion in the exhaust system.



### **Diesel Engines**

Diesel engines are even harder to start in cold weather. In diesel engines, the air is compressed first to heat it up, then the fuel is injected and ignites. Diesel engines require much higher temperatures to fire the fuel. In cold temperatures, fuel injected into the chamber and onto the glow plugs can gel and adhere to the parts. Cold temperature starts result in inefficient combustion with the potential for damage to plugs and cylinder heads.

### **Oil and Batteries**

Oil is thicker when it is cold. Thicker oil increases the amount of work required by the starter to turn the engine, creating longer starting times. When oil is too thick, it can't get where it's needed to lubricate crucial components. Without the necessary lubricant, parts wear against each other. If the engine's running with cold parts that haven't been able to warm up and expand to the right size, they can get damaged. As temperatures go down, so does battery capacity. A battery that has 100 percent power at 80°F (27°C) will have about 46 percent available power at -4°F (-20°C).

### **The Cost of Idling**

Idling your car is illegal in 31 states. Anti-idling measures and penalties, including potential fines, vary depending on the state, city or county. Five minutes of daily idling of a vehicle with a V8 engine every day for a year can waste as much as 20 gallons (76 liters) of gasoline and produce 440 pounds (200 kg) of hydrocarbons. The Environmental Protection Agency (EPA) and Energy.gov state that a vehicle should not idle for more than 30 seconds at a time.



Idling for 30 seconds uses more fuel than restarting the car. And the money you save by not idling will more than offset any cost for wear and tear on your vehicle. In the winter, idling burns more fuel by decreasing the engine's efficiency, produces more tailpipe emissions and causes corrosion in the exhaust system. Preheating the engine oil or the battery eliminates the need to idle an engine.

### **Block, or Coolant, Heaters**

In the coldest environments, block heaters, or coolant heaters, create heat balance in the engine to prevent catastrophic engine damage. Block heaters, such as Zerostart from Phillips and Temro, create engine heat balance, distributing heat to coolant, oil and key engine components in four to six hours, depending on the ambient temperature. They also reduce wear and tear on engine components, minimize emissions and make for a more comfortable environment inside the vehicle.



Heat radiates from the heating element through the coolant in the engine block. This prevents the coolant from gelling or freezing if the coolant mix is incorrect. In a worst-case scenario, frozen coolant could crack the engine block, which is tremendously expensive to repair. The engine oil will typically be warmed to a certain degree as well. Warming the coolant before the engine is started also allows the cab to be heated much sooner.

Installed at the factory in some vehicles, block heaters can also be added to most engines by aftermarket dealers and repair shops. Several block heater models are available. Offered for automotive, heavy-duty truck, agricultural, industrial, construction, mining and forestry equipment and vehicles, Phillips and Temro block heaters:

- Ensure quick winter starts
- Reduce engine wear
- Warm the coolant
- Plug into a standard electrical outlet

### Silicone Pad Heaters

Fast and efficient, pad heaters, such as Zerostart heaters from Phillips and Temro, are applied directly to the source—fuel or fluid reservoirs, diesel fuel filters and batteries—allowing direct heat transfer. Ideal for cars, sport utility vehicles (SUVs), light- and heavy-duty trucks, tractors, water tanks, mining, marine, snowmobiles, hydraulics and other applications with flat cast iron or aluminum oil pans, silicone pad heaters:

- Provide easier cold weather starting
- Reduce cold-start engine wear
- Minimize condensation, exhaust smoke and harmful emissions
- Are energy-efficient solutions with low wattage
- Are offered in a variety of models with thermostats that meet CSA requirements



### Battery Heaters

Blanket, pad and battery box heaters are offered by Phillips and Temro. Battery heaters:

- Provide more reliable cold weather starts
- Offer efficient, direct heat transfer
- Improve battery capacity in cold-weather
- Can be installed in subzero temperatures
- Extend battery life



During the winter, having the right heating solution for your engine can be vital. In extremely cold conditions, a combination of heaters may be needed to improve cold starts, minimize wear on the engine, save fuel and decrease emissions.

Contact us to learn which Phillips and Temro engine, oil or battery heater is right for your application.

**Phillips & Temro Industries**  
9700 West 74<sup>th</sup> Street  
Eden Prairie, MN 55344  
+1 952-941-9700 or 1-800-328-6108  
[sales@phillipsandtemro.com](mailto:sales@phillipsandtemro.com)  
[www.phillipsandtemro.com](http://www.phillipsandtemro.com)

© 2018 Phillips & Temro Industries. All rights reserved.