

NewsStand - Cold Weather, Revisited

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When I was younger I lived in Mexico for a year. One of the questions we were asked from time to time was, "How cold does it get in Minnesota?" For some reason, Minnesota's winters had a measure of fame even south of the border. We'd reply by opening the freezer and placing the inquirer's hand on the ice there, which pretty much told the story in any language.

When I Googled the same question online, Wiki Answers offered up this response as its best answer: "In the winter, Minnesota can get down to about -20 degrees."

If you've ever lived here for a winter or two that estimate would certainly give you a chuckle. My first winter in Minnesota had one cold snap of -30 for 10 days straight. And any weather channel watcher will routinely see Minnesota cities achieve "coldest place in the country" status more times than you can count. I've seen -42 on my own thermometer on two different occasions (in different winters) and on one occasion, with the assistance of a wind chill, it was so cold that if someone were inclined to spit, it would be a marble before it hit the ground.

In response to these brutally cold conditions many Minnesotans installed engine heaters in their Northland cars. Having grown up in New Jersey, I found it quite surprising to see people plug their cars into outlets in order for the engine to be warm when the ignition was cranked. There were a variety of devices that helped Minnesotans accommodate their vehicles to the weather.

There were other solutions for dealing with the cold. If you started your car every four hours, you could keep the engine warm enough to make starting easier. So if you had a one car garage and had to park the other in the street, you might need to wake in four hours, then start and run the engine for a bit before going back to sleep.

The problem of extreme cold temps is two-fold. First, battery strength is reduced. And second, the waxy molecules in conventional motor oils become a drag on moving parts as they crystallize and oil gels. These are serious problems, but people who live here learn to deal with it in the same way they learn to wear extra layers of clothing.

Once synthetic motor oils for passenger cars were developed and brought to market in the seventies by companies like AMSOIL (1972) and Mobil (1974-5) the problem of cold starts was radically reduced for those aware of this solution. Some people never needed to plug their cars in after that.

Changes

But what's interesting to me, and the reason I have taken all this time to set up my point, is that this habit of plugging in our cars has disappeared. I look out on a parking lot on the coldest days and I do not see people starting their cars every four hours, nor do I see the plugs sticking out of car grills that were once such a part of our Northland automotive styling. What's changed?

How did it happen that we don't plug in our vehicles anymore and when did it happen? No, it wasn't global warming that changed the picture. You can still die out there and be just another accident statistic.

Here's what happened. Although various forms of fuel injection had been used for decades on a limited basis it wasn't until the late 70's, when the government began to impose stricter exhaust system regulations, that carburetors began to be replaced with the new technology. In the early 1980's newer EFI fuel injection systems were in widespread use in the U.S. and in Europe. The new EFI systems did more than satisfy the increasingly stringent emission control requirements. These engines would start easily in colder temperatures and stay running, unlike their carbureted predecessors which might start but needed a little babying to keep from stalling. It was a huge step forward for cold weather starts, but as in many advances there were unintended consequences. In this case, cars would start, but the thickened oil was still down in the pan and not flowing until friction heated it enough to become fluid. This resulted in oil starvation, burned bearings and a lot of engine failures.

In his paper *Understanding the SAE Motor Oil Viscosity Standard* Ag editor Stan Toepfer writes, "One year... there were several outbreaks of catastrophic engine failures in both the USA and Europe due to unusually cold weather. Some engine oils thickened and gelled in these conditions. Engines would start but their pumping systems were incapable of pulling the cold oil out of the oil pans. The result was a rash of engine failures, warranty claims, and motor oil recalls."

He went on to note, "Extremely low temperatures are not necessarily required to produce gelation. Depending on the rate at which the oil is cooled gelation may occur at higher temperatures. To address this problem the J300 cold weather specification was modified to require cold temperature pumping tests. These tests simulate the slow cooling of the oil over the space of several days to subfreezing temperatures. After the oil has attained the required test temperature it is tested in a special test apparatus, the Cold Cranking Simulator (CCS)."

Things to Think About

Advances in engine technology are wonderful, but after a while we've noticed another problem cropping up. It's just like all the computerizing that has been developed. Motorists are increasingly less aware of what is going on with their cars and how to take care of them. They turn the key, it starts, that's all they care about. It doesn't have as much repair and they think it doesn't need any maintenance. Many young people don't even know how to check their oil levels any more.

It is increasingly on our shoulders to help motorists to be informed of maintenance needs and aware of better products. Cheap filters, inferior oils and lack of maintenance will have negative consequences on our customers' engines. And in extreme cold weather, the best protection is always a premium synthetic solution.