

A Lesson on Frost Heaves

For those of you headed to Alaska and even if you decide to travel in northern Canada, you will drive over two very unusual things. One is a frost heave. The other is permafrost.

Permafrost

Once you reach a certain distance north, you will be driving over permanently frozen ground (permafrost). It's hard to wrap your mind around the fact that the ground is permanently frozen because the landscape looks normal. There are trees, plants, rocks, lakes, streams, highways, buildings, etc.—it looks very normal. But that upper layer (I don't know how deep it is) that looks normal is providing insulation for the permafrost (the permanently frozen ground underneath).

To add to the confusion, in the winter, some of this upper layer will also freeze. Then, there is actually a temporary frozen layer on top of a permanently frozen layer.

If we could totally scrape away the top layer, this would allow the permafrost to melt. It would turn to mush. Starting in 1942, when the military built the original ALCAN highway, their original plans called for scraping away the upper layer. They scraped it away thinking they would build the highway on the permanently frozen layer (okay, that made sense). However, it didn't work. When they scraped away the top layer, everything underneath turned to mush.

Today, highways are literally built on top of the upper layer and the permafrost is not disturbed. However, there is some natural freezing/top-thawing of the permafrost. This freezing/thawing creates frost heaves in the road surface (on top of the upper layer). They've tried to solve the frost-heave problem since 1942. It's still not solved.

But First, Ruts

One 125-mile (201 km) stretch of highway in the Yukon had the poorest roads of the entire trip from Texas. We were warned that the melting and refreezing would make the highway full of ruts (parallel to the highway) and frost heaves (sunken areas and small humps perpendicular to the highway). There were immediately plenty of both. It was a real test of the shocks, air bags, and driving skills!

The ruts were 2–3 inches deep and 6–36 inches wide running a few feet to maybe 50–100 feet along the road surface. (From 5–8 cm deep and 15–91 cm wide and 15–30 meters long.) If you missed seeing them (thus allowing you to steer around it) these ruts would pull your tires/vehicle into the "groove" and you just had to fight it until the rut ended. The only answer is to watch carefully, slow down, and drive with caution. The ruts were easy to see and not hidden at all.

Frost heaves

As described above (sunken areas interspaced with small humps perpendicular to the highway), frost heaves are a real pain to drive over and you can hurt your RV. There were small orange flags marking many frost heaves but hundreds had no warning.

You couldn't take your eyes off the road. If you missed slowing down for a frost heave, it would nearly launch the front wheels of the coach off the ground—even driving about 35–45 mph (56–72 kph).

Ultimately, I set my cruise on 35 mph (56 kph) and slowed when I saw one.

Occasionally, you would see a single orange flag on one side of the road. While I could not verify this, it appeared that the frost heave would be more prominent on that side of the road (with the flag). Steering

into the other lane to cross it seemed to help. With virtually no traffic from either direction on this highway, weaving across lanes was a reasonably safe maneuver.



You are sometimes able to spot a frost heave because, in the distance, the painted center line or edge line appears to weave slightly from side to side. It looks like they painted a slightly curvy line. The flags were easier to see but there were a number of frost heaves that were not flagged. There were literally thousands of frost heaves along that 125-mile (201-km) stretch of highway.



Hitting these humps and depressions at some given speed will cause "porpoising" where the front of your RV is sort of floundering up and down. This takes place when your luck is bad enough that you (A) happen to be going the "correct" speed, (B) there are at least three frost heaves, (C) they are spaced to match your wheelbase length, and (D) you didn't see them. If/when this happens, each "dip" will be coordinated to launch the coach higher and higher. One analogy is that your coach will act like a person on a trampoline—bouncing higher and higher. Don't do this. It is not fun.

**Don't take this or any frost heave information lightly.
However, if you do, you will change your mind after
driving over the first one.**