

# A Christmas Tale from the Hangar

## The Curious Case of the Icy Carburettor

*Tw'as a mild winter's day at the airfield,  
Not frosty, not snowy, just damp and grey.  
The Bravo sat quietly, engine ticking over at idle,  
When something not quite merry came our way...*

During a routine ground test run, Bravo's engine began to run rough after about **three minutes at idle**. RPM slipped from **800 to 700**, and the engine clearly wasn't singing a happy Christmas tune!

Suspecting a familiar seasonal grinch, the engine was shut down and CAMO the cowling removed.

And there it was...

**Clear signs of carburettor icing:** condensation and ice formation, particularly on the **right carburettor**.

When the engine was restarted: Rough running returned after ~3 minutes. **Carb heat was applied**. The engine ran *worse* for 10–20 seconds. Then...smooth running was restored.

♪ Fa-la-la-la-la-la-la-lá!

A textbook carb icing story, complete with the temporary rattling jingle bells, and oh baby it's cold outside moment after carb heat!

Many pilots think carb icing is a winter-only visitor, arriving with frost and freezing temperatures. But this tale reminds us:

- **Carb icing can occur on the ground**
- **At idle**
- **In mild temperatures (OAT: 9 Dew:7)**

In fact, **idle** and **low power settings** are among the most welcoming conditions for carb ice to sneak in unnoticed.



The visible condensation seen on carb was a strong sign that icing conditions were well established.

Inside the carburettor, two cooling effects team up like mischievous elves:

### 1. Fuel vaporisation cooling

Fuel absorbs heat as it atomises.

### 2. Venturi effect

Air speeds up, pressure drops, and so does temperature.



Together, they can cause a **20–30 °C temperature drop** inside the carb!

What follows?: Air cools below its dew point → moisture condenses. Temperature drops to 0 °C or below → moisture freezes. Ice builds up on throttle plate, carburettor walls.

Result: Rough running, RPM drop, Possible engine failure if left untreated.

## “But It Ran Worse with Carb Heat...”

A classic surprise, and completely normal.

When carb heat is applied:

- Warmer, less dense air enters
- Ice begins to melt
- Water flows into the intake

For a short while:

- Mixture becomes richer
- Airflow is disturbed
- Roughness increases

Then, once the ice clears: **Smooth running returns!**

♪♪ Ding-dong-ding-dong

That brief worsening doesn't disprove carb icing, it **confirms it**.

## Carb Icing, Myths to Leave Behind This Christmas:

*“High humidity and mild temperatures aren't conducive to carb icing”* → **FALSE**

**High humidity and OAT of -5 °C to +20 °C are perfect icing conditions** (9 °C / 7 °C in this case — almost ideal) → **FACT**

*“Very humid air is hard to freeze”* → **FALSE**

**More moisture = more water available to condense and freeze once cooling occurs** → **FACT**

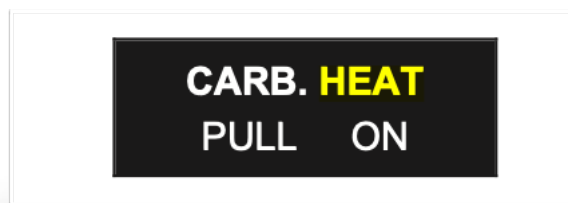
*“Carb ice only happens in cold weather”* → **FALSE**

**Carb icing has been documented up to +30 °C and beyond, especially:** At idle, during descent, on the ground → **FACT**

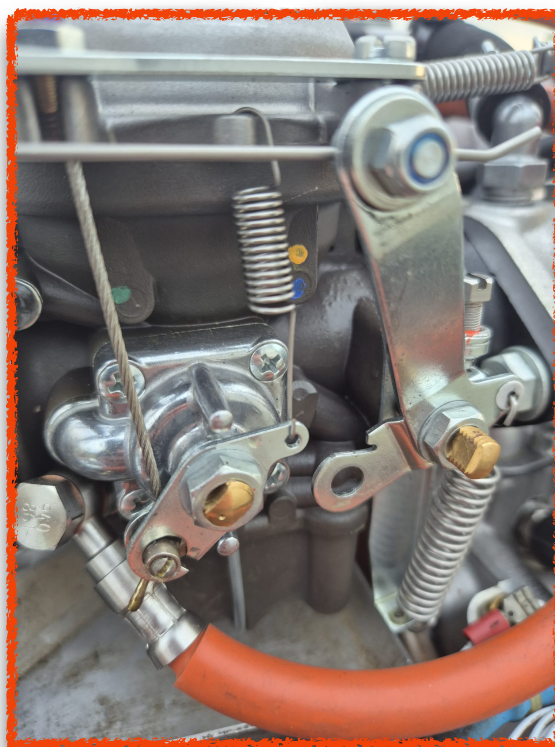


Christmas Gift for Pilots:

**When in doubt — apply carb heat!!!**



This real-world story is a timely reminder: even when conditions seem benign, carb icing should always be part of our mental model.



Stay alert, stay safe and have a very Merry (and ice-free) Christmas!

♪♪ All I want for Christmas is...



Karina van Twisk