
# Spacecraft Develop Revolutionary Air Bag Hull "Suspension"

**Airbag suspension technology has long been proven in the mining, trucking, railway and 4WD world, but for a Lake Macquarie boat builder, the challenge was to adapt its use to build a softer riding boat – and after some years of development, it looks like they've cracked the code.**

**Airbags in one form or another have been used for many years in the mining industry in their dump trucks, in all types of trucks from B-doubles to specialist soft riding computer carrying trucks and 4WD's. Even the humble family hack can be improved by the addition of airbags installed in the rear suspension to help cushion the ride in one form or anther.**

There is nothing new about this technology at all, but for Toronto NSW, boat builder, Larry Wiltshire and his team at Spacecraft, the challenge was to adapt the technology to the marine environment.

Specifically, Larry pondered the question: was there some way he could utilise airbags to soften the ride of boats – and in particular, his own highly regarded Spacecraft range of plate aluminium boats?

That was several years ago, and a very tall mountain to climb. Spacecraft enjoy a terrific reputation in the plate boat world, and have long been regarded as one of the better engineered, better finished plate boats around. They were pioneers in the development of the 'flooded keel' principle, and were using flooded keels way back in the 1970's. They have built many craft with this "new" feature in the intervening years.

Nevertheless, Larry Wilshire is a boat builder with a difference. One of the reasons he loves aluminium boat building so much, is that it enables him too constantly improve his product, and for some years, he's been contemplating how he could make his Spacecraft ride even more softly than his deep vee, flooded keel hulls allowed.

"This wasn't something that came to me in a light bulb moment," he told F&B. "It was more of a development that took place over four or five years, starting one day when I just simply decided to cut a segment out of the bottom of one of our hulls and started fiddling with it. I wasn't 100% sure of what I was trying to achieve, so much as working out other ways of developing the hull bottom plates to form a lower keel structure"

In the intervening years from the birth of the idea, like all good inventions, the Spacecraft Airbag Suspension process suffered mightily from failures, disappointments, expense and frustration.

"I must admit, we gave up a couple of times because we just didn't seem to be able to make it work – and more often than not, just when we were getting a bit closer towards it, somebody would walk in and want another boat! So we'd have to stop the R&D, and go back to our 'proper' work, for the very necessary reason of having to make a quid to keep everybody employed and going forward.

"It was very difficult to get the R&D happening on a full time basis."

However, Larry and his team at Spacecraft persevered with everybody contributing to each little step of development.

"If there was a secret to it, it was that – everybody in the team put in their little bit; their ideas; their solutions to each specific problem. We collectively started getting more things coming together in such a way, that one idea would lead to another that would work, so we'd develop that a bit further, and so on."

Finally last year, Larry told F&B, "We knew we were on to something – we made our first prototype that offered a significantly softer ride; but we still had issues with the engineering."

Their perseverance paid off though, and finally they realised they'd nailed it. But of course, the next stage was even harder in some ways because it wasn't up to them – they had to work through the legalities of the whole Patent process, and wait impatiently until that process was legally complete. Before that happened, they had to keep the whole thing under wraps, and actually curtail its development until the paperwork was complete.

F&B can now confirm this process has been finalised, and the pictures shown here are the first pictures of the Airbag Suspended Spacecraft 5.4, in operation on Lake Macquarie.

Even at this stage though, you'll have to forgive the lack of specific detail photographs because there is only one boat, and Larry and his wife Denise are still being understandably coy about the actual make-up of the engineering until the final development is completed.

## How It Works

It's not particularly difficult to describe what it does, but you'll have to take in trust that it works as we're describing it here.

In a sense, Larry has built a boat where the bottom of the craft is actually in two sections.

The lower or inner deep vee module is separated from the outer sections of the hull towards the chine on each side, about 280mm in from each side.

Denise cleverly describes it as being a bit like a bird's beak where the lower jaw drops up and down to the fixed top section.

In this case, the lower "jaw" or what's called the inner hull section, is secured to the transom by a substantial hinging arrangement so that it is fixed within the outer hull to the transom by the hinges, and then you come forward to approximately amidships (just underneath the main cabin ring frame bulkhead in this boat in these photographs) where the two airbags connect the inner hull to the upper sections of the outer hull.

*(Got it? Imagine a catamaran hull with its two hulls – but in this case, the middle or empty part of the cat is*

**How Much?**
Hull as tested with 150hp Yamaha 4-stroke and Spacecraft aluminium poly skid trailer
$65,000

**General**
Material: 5083 aluminium. 5mm bottom, 4mm sides and 3mm topsides

Length: **5.4m**
Beam: **2.3m**
Hull weight: **980 kg (including hardtop)**
Capacities
Fuel: **170 Litres**
People: **Six (6)**
Rec. Max HP: **150hp**
Towing weight: **1800kg**
Trailer rating: **2 Tonne**