

I-Beam Axles & Split Radius Rods

Background:

It has become necessary for LVVTA to clarify which I-beam axles can be used in conjunction with 'split' or 'hairpin' radius rod front suspension designs. This has come about because the New Zealand Car Construction Manual (NZCCM) states in Chapter 6 – Suspension Systems, under 6.16.1 and 6.18.1, that only an I-beam axle manufactured using a forging process can be used in conjunction with 'split' or 'hairpin' radius rod front suspension designs.

This would prevent the use of axles manufactured by a casting process. However, since the development and introduction of the New Zealand Car Construction Manual, it has come to our attention that there are in fact some well-known American axle manufacturers whose axles are manufactured using a casting – rather than a forging – process. These axles have a long history and a good reputation, with no known history of failure.

Research:

LVVTA has contacted all of the well-known American I-beam axle manufacturers and asked for detailed information on the manufacturing process used in the production of their axles, together with the axle material specifications, and any relevant history on the use of their axles. The findings of this research are as follows:

- 'Superbell' and 'Magnum' I-beam axles are made from a ductile 65-45-12 specification iron, using a casting process. Although these axles are therefore in fact a casting and not a forging, the material properties are designed to allow for some twist, and such an axle would not be expected to fail unless a direct and significant impact occurred. These axles have been used in 'hairpin' and 'split' radius rod suspension designs for many years.
- 'Chassis Engineering' and 'Flatlanders/Vintage Chassis Works' I-beam axles are forged steel units, which meet the requirements of the NZCCM as written.

Conclusions:

This information was presented to the Technical Advisory Committee (TAC), and they concur that the HCTM should be amended to allow the use of 'Superbell' and 'Magnum' I-beam axles with 'hairpin' and 'split' radius rod suspension designs.

When time becomes available the NZCM will be amended. In the meantime, Category 1D LVV Certifiers should allow the use of 'Superbell' and 'Magnum' I-beam axles with 'hairpin' and 'split' radius rod suspension designs if presented with such a system.

It is important to note that 'tube' or 'tubular' axles are never to be used with a 'hairpin' or 'split' radius rod suspension design.

If you have any queries or require any further clarification relating to this Information Sheet, please feel free to contact the technical team in the LVVTA office on (04) 238 4343.