Testing dropped axles

STORY LARRY O'TOOLE, PHOTOS: THE HOFFMAN GROUP

Since the wider introduction of the National Street Rod Guidelines across most Australian states there has been increasing conjecture about the acceptability of dropped beam axles. Most such axles are imported from the USA and, until now, little has been available in the way of documented evidence that they could be certified to meet Australian registration requirements.

Recent events highlighted in Ted Robinette's Tech Workshop column in this magazine have captured the attention of rodders and authorities alike and this has led to increased scrutiny of such components.

Locally, Garry Page has been dropping original forged beam axles for some years and has had his process engineer certified, so there hasn't been a problem using his axles. However most rego authorities wouldn't accept a drilled I beam axle, no matter where it was manufactured or modified. Now we are likely to see that change too, as a result of testing done recently in NSW.

The Hoffman Group are relatively new players in the dropped axle front end market but they have been pro-active in not only having their axles tested, but their entire front end suspension kits. They had, in fact, been working on these products for two years before they were released to the market.

Greg Moon, from the Hoffman Group, relates that they looked at and tested all the known brands in the market and some of the results were not what they expected. The following tests were performed on the axles they had sourced from within the US market.

1. Spectrograph test of the material
2. Bending moment test on the axle

The spectrograph test results were quite varied, most being manufactured from ductile grey iron but of varying grades and quality. One in particular was made from a different material than claimed by the manufacturer.

The bending moment test was the real test and some axles tested well, with good yields, while others had a yield similar to warm chocolate.

Having set their own base line as the best that was currently available in the market, the Hoffman Group started work on their own front end kits.

Engineers and a foundry with known quality controls were contacted, materials analysed and a new specification for the Hoffman Group's products was established.

A test batch of beam axles were cast and heat treated, these were then sent off for spectrograph testing, hardness testing and grain structure testing. The results were great, with each axle being within the tolerances set by Hoffman's consultants.

The machining of the beam axles is completed in house in Hoffman's own factory allowing them to control the final quality of each and every axle.

The final part of the process was to have the axles independently tested and checked for compliance. ADR Compliance Service, a NSW based Automotive Engineering firm, was contracted to provide this service. With NSW being one of the toughest places in Australia to get anything engineer certified for the road, if it could be achieved in NSW, then it would meet or exceed the requirements of every other state.

Together with Greg Moon, Peter from ADR Compliance Services reviewed all of the National, State and ASRF requirements for beam axles and came up with a list of National, State and ASRF mandated tests that the axle and the components of a beam axle kit would need to pass.

These test included individual component testing/conformity to the required standards and the testing of the axle, and the axle as an assembly with its kit components (king pin kit, spindles etc.). These tests included

- Bending moment test
- 4g Gutter impact test
- 4g bump test
- Vertical load test

and more.