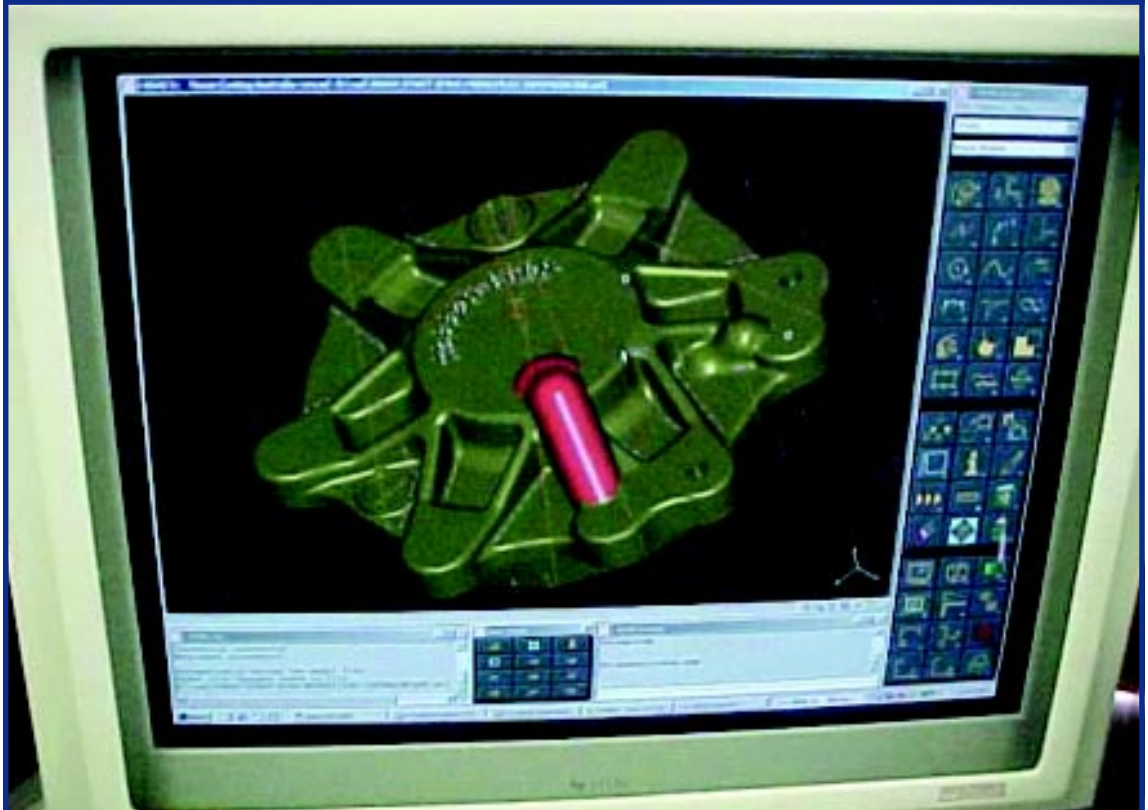


SUCCESS STORY

Nissan Casting Australia Pty Ltd
BTR Automotive Drivetrain Systems
Unique Tooling Pty Ltd



Value Chain Management Program Reduces Lead Time and Cost of Sourcing Aluminium Die-Casting Tools



A 3D model of the casting tool insert

The progress we've made in conjunction with our value chain partners has put us at the leading edge. We've been able to prove that we can significantly reduce lead time and costs in the tooling design, production and validation value chain.

*Graeme Luxford
General Manager
Nissan Casting Australia*

The Organisations

BTR Automotive (recently acquired by Ion) designs and manufactures automatic transmissions in Albury. It currently supplies Ford Australia and Ssangyong Motor Company in Korea. BTR Automotive sources many of the cast aluminium alloy components for its transmissions from Nissan Casting Australia in Dandenong. Nissan Casting sources many of the die-casting tools from Unique Tooling in Sydney. BTR Automotive, Nissan Casting and Unique Tooling have cooperated to identify and verify improvements to the tooling design, manufacture and validation value chain.

The Project

Historically, it has been found that when high pressure die-casting tools (to produce complex shapes) have been manufactured they have had to be modified one or two times before they were found to produce accurate parts. The three companies in the value chain joined the program with the objective of jointly exploring how this problem could be overcome, with consequent reductions in design-to-commission lead times and cost. On the assumption that improvements could be identified, a further objective was to prove these in practice.

VALUE CHAIN
MANAGEMENT
PROGRAM



SUCCESS STORY

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A modified approach to sharing design information between the three companies has been developed, using existing technologies. In addition, leading edge technologies are being trialled to validate the accuracy of the manufactured tool. The essence of this approach lies in using the same 3D model of the component in question for: -

- component design;
- tool manufacture; and
- tool validation

and in gaining input from all three companies at the earliest possible stage in the component design.

The features of the process include:

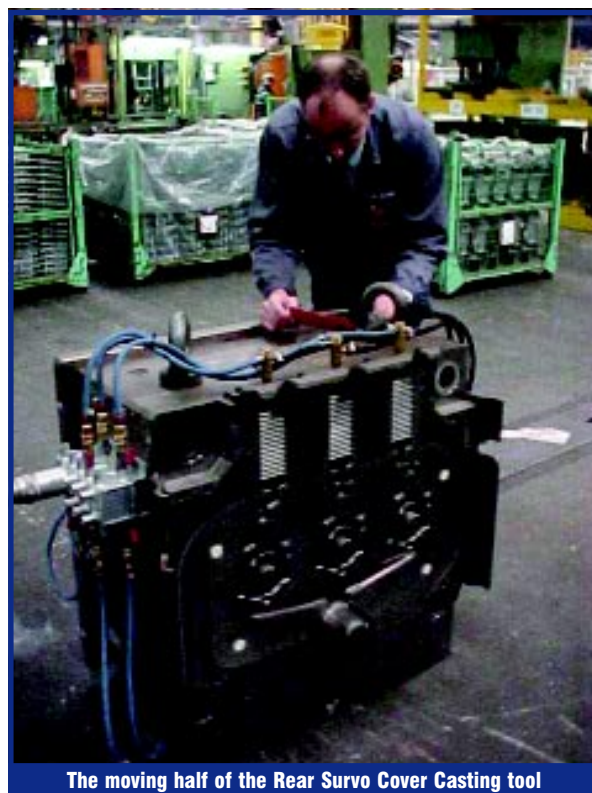
- direct use of 3D software by BTR Automotive to design the part, with input from Nissan Casting and Unique Tooling;
- use of the resulting 3D model by Unique Tooling to manufacture the casting tool;
- use of the 3D model by Nissan Casting to develop a program to drive the coordinate measuring machine to measure critical dimensions of the cast part; and
- Automatic generation of tool validation reports from the CMM program to satisfy BTR Automotive's production part approval process.

Project Methodology

A key feature of this project was the enthusiastic commitment from beginning to end by all three companies, at all levels, to share information and know-how in order to achieve the objectives. Regular meetings of the whole team were held in Sydney, Melbourne and Albury to evolve solutions.

Initially the material and information flows within and between the companies in the value chain were mapped, and reviewed using Lean Thinking principles to identify wasteful activities. Early in the project the team identified ways of reducing or eliminating such activities, in the component design and tool manufacturing and validation processes. Potential benefits were quantified.

The team then identified a tool that would be needed quickly, and applied the improved processes to the design, manufacture and validation of that tool to assess their practicability for the future.



The moving half of the Rear Survo Cover Casting tool

Benefits and Outcomes

Significant cost and lead-time benefits were achieved in the component design and tool manufacturing stages, and the processes will be used as the norm in the future. The team has identified the tool validation process to be used, but there are still software bugs to be overcome; however the team is confident that the process will be successful. It is interesting to note that Nissan Corporation have decided to adopt a similar approach for their newest projects.

Cost reductions achieved through the value chain are being passed on to the end-users. However, benefits for each participant have been identified as: -

- BTR Automotive
 - Approximately 40% reduction in component design hours;
- Nissan Casting
 - Potentially 5 % reduction in tool cost; and
- Unique Tooling
 - Approximately 60 % reduction in CAD modeling hours for cavity details

This project was facilitated by Peter Walsh of Peter Walsh Consulting Pty Ltd, a project manager accredited with the Value Chain Management Program. The Program is an initiative of the Commonwealth Government.

