

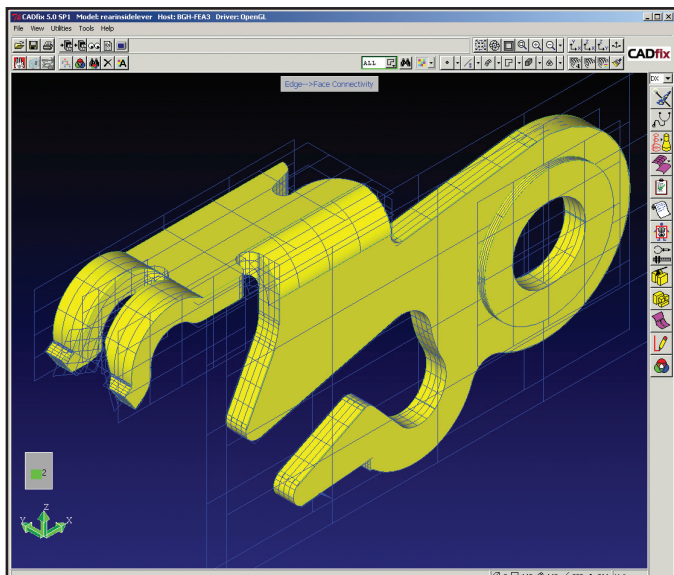


CADfix opens doors to legacy data at ArvinMeritor

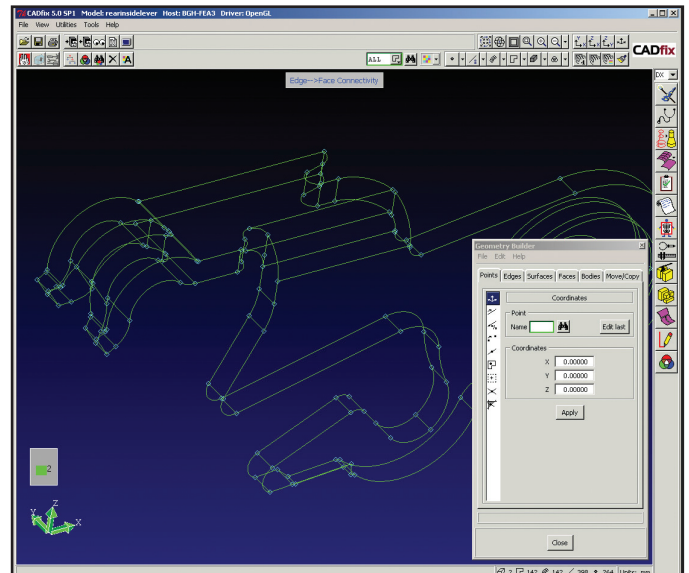
Design and engineering departments in Tier-one automotive suppliers have to be able to accept and deliver CAD data in precisely the same format as their customers. In practice, this usually means that each supplier maintains licences of those CAD systems used by each of the OEMs that it supplies (or would like to supply). This requirement should not, however, remove from suppliers like ArvinMeritor the freedom to carry out their work in whatever CAD/CAM/CAE systems they want. The OEM only cares about getting the right results and being able to use them; what goes on behind the scenes should be of little concern. If only it were that simple.

The reality is that the transfer of data from an OEM's native CAD system to the one the supplier wants to use internally is (to borrow Oscar Wilde's definition of the truth) rarely pure and never simple. Attempts to use an intermediary file format like IGES seldom go smoothly largely because different systems treat IGES, which was after all originally conceived as a 2D format, in very different ways when it comes to defining solid 3D geometry. Effective transfer of data between systems has proved so elusive that some OEMs have even set in place policies that insist on the use of the same CAD system throughout the engineering supply chain.

But while such policies are clearly beneficial to the OEM and the chosen CAD vendors, they will not suit those who want



A typical latch assembly has 40 parts, each of which required 30 minutes of preparatory surface work before translation



Geometry repair within CADfix

to be able to choose the best tool for an individual job or feel that the system they are being pushed into buying is a sledgehammer to the nut they've happily been cracking for years. Like an increasing number of automotive suppliers, ArvinMeritor has addressed this problem in one situation by implementing CADfix, the leading engineering data interoperability solution from ITI TranscenData. And as well as providing the key to freedom and flexibility in working practices, CADfix is also proving invaluable in addressing the vital need to access legacy data.

ArvinMeritor

ArvinMeritor is a major international Tier-one supplier, designing and manufacturing automotive sub-assemblies for a customer list that reads like a Who's Who of the auto-manufacturing world. Its business groups specialise in automotive components and assemblies that range from sunroofs to suspension systems, from wheels to exhaust systems. With headquarters in Troy, Michigan, ArvinMeritor employs some 32,000 people in 27 countries and has a revenue of \$7 billion.

Stirchley in Birmingham is the home of ArvinMeritor UK's Access Control Systems business. As the name implies, Access Control is responsible for the systems that allow legal entry into automobiles while ensuring safety and comfort when travelling and of course preventing illegal access when parked. In short, the company manufactures latch and actuator systems for the doors of passenger vehicles.

"Our designs must be unobtrusive – essentially invisible – while at the same time extremely secure," explained John

Osman, an application engineer at Access Control Systems. "Most modern access control systems still rely on some form of mechanical latch (albeit controlled by increasingly sophisticated actuators) and this is a potential point of weakness if someone is determined to try to break in to a car. Our job is to build in as much security as possible within a necessarily constrained environment."

CAD systems

The Access Control Systems division counts many of the world's leading OEMs among its customers. Until a couple of years ago the company performed all of its design work using CADD5, and had to work around the need to accept and deliver other CAD formats as and when such a need arose. Then, partly due to pressure from some of the OEMs and partly because CADD5 seemed destined for little or no ongoing development in the PTC stable, ArvinMeritor decided to revisit its corporate CAD policy.

ArvinMeritor's many business groups fall broadly into two primary businesses: those that manufacture parts and assemblies for heavy commercial vehicles and those – like Access Control – that concentrate on light vehicles. This latter group decided to standardise on Catia as its core CAD/CAM solution, although because of the interoperability problem, it would not be enough on its own.

"For our requirements at the time, we were convinced that Catia could provide us with the best overall mix of functionality and that it would do a great job as our standard modelling platform," said Osman. "But we could not ignore the pressure from the OEMs for direct interoperability so we have ended up with a mix of systems including Catia 4 and 5, I-DEAS and, of course, our existing seats of CADD5. So in effect we have gone from a single CAD system two years ago to using at least four now, more if you take into account our CAM and CAE tools."

Legacy data

One of the biggest challenges in this multi-CAD environment turned out to be reusing the legacy data from the CADD5 only days. Initially, the only medium available for data transfer was IGES but it quickly became clear that this method posed more problems than it solved. "It is vital for us to be able to access our legacy data," explained Osman. "This is the only way we could ensure that the work we have undertaken in the past on both historical and ongoing long-term projects would not be wasted. But using IGES to move the data from CADD5 to Catia turned out to be a long and drawn-out process."

The problems stemmed from the fact that Catia treats IGES as collections of surfaces rather than as true solid geometry. In turn this means that data transfer must begin with extensive preparatory work in CADD5, turning solid models into underlying wireframe geometry, trimming the surfaces and exporting these trimmed surfaces to be recombined into solids in Catia. Each part could account for up to 30 minutes of preparation time and with up to 40 parts in a typical latch/actuator assembly, this was causing a significant bottleneck.

To tackle this issue directly, ArvinMeritor invested in CADfix from ITI TranscenData, deployed on a floating licence system so that it is available to all CAD/CAM/CAE users. "We knew that CADfix provided a reliable intermediary

for transferring data, particularly via the IGES route," explained Osman. "So we initially took it on board to import and export IGES in such a way that the preparation work in CADD5 would no longer be needed. We have since invested in the native Catia translators, but even via the IGES route we have seen massive improvements with CADfix."

Productivity gains

Instead of half an hour of preparation for each assembly component before even thinking about going into Catia, parts can now be transferred from CADD5 to Catia in around five minutes. This alone has provided a clear business benefit as a full assembly takes no more than a couple of hours instead of days.

But the introduction of CADfix has meant more than just quick and reliable access to legacy data. It has also meant that live engineering data can be readily shared between different departments using different CAD/CAM/CAE systems: STL files, for instance, can be exported directly from CADfix for use in ArvinMeritor's dynamic analysis software (Adams). And the FEA team regularly makes use of CADfix's defeaturing functionality to remove small details that have been included by the designer but are not significant from an engineering point of view and will cause disproportionate problems when it comes to meshing for analysis. In all, some 70 percent of the components his team produces are processed in CADfix at some point in the design cycle.

The benefits that ArvinMeritor has experienced through its adoption of CADfix are typical and illustrate the importance of meeting the challenge of engineering data interoperability head-on. TranscenData's own research suggests that up to 80 percent of a typical engineering design project is wasted on reworking data. More and more manufacturers are turning to CADfix because they employ qualified engineers to engineer things not to spend their time getting to grips with the niceties of 3D file formats.



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