From FWD to AWD
Rear Axle Development in 20 Months

ZF Lemförder as system supplier developed on behalf of Saab Automobil an All-Wheel Drive (AWD) rear axle for an existing Front-Wheel Driven (FWD) vehicle within 20 months and describes under which conditions and with which tools and methods. The new Saab 9-3 XWD was launched spring 2008.
1 Introduction

Reacting quickly to changing market or competitive situations has always been important, particularly in the automobile industry; however, in light of the continually increasing diversity of vehicles, the reduction of development times has now acquired a new significance. This trend is particularly apparent in the area of chassis development, where the characteristics of derivative models frequently require a complete redevelopment. While changes from a standard to a sports chassis remain relatively limited in scope, changing a front-wheel drive vehicle so that it has an all-wheel drive rear suspension in most cases requires new development. In order to avoid the necessity of establishing additional capacity, such variant developments are often awarded to systems suppliers.

2 Technical and Scheduling Conditions

The goal of the project was to develop an all-wheel drive rear suspension within 20 months in order to realise an all-wheel drive variant of an existing front-wheel drive vehicle. The 20 months extended from the initial handover of the concept to the start of production, and thus included all of the time required for tool production, Figure 1.

Since the all-wheel drive rear suspension was only a variant for an already existing vehicle, in addition to predefined carryover parts, one of the factors that most severely restricted the degrees of freedom for the development was the already predefined assembly process on the existing line. Accordingly, the objective was to carry over as many interfaces as possible, as well as to take into account the freedom of movement of preexisting assembly tools in the installation space, Figure 2.

The (supplier) project team was integrated into the Original Equipment Manufacturer’s (OEM) organisation with “all rights and obligations”. This eliminated the necessity of dedicated customer personnel that would normally be required to serve as an interface with the system supplier. This measure not only saved resources and hence costs, but also had a significant positive effect on both the information flow and lead times for decisions; both played an important role due to the tight schedule, as explained below.

3 Factors Affecting Development Time

In general, it can be said that an essential factor affecting development time is the experience of the development team or organisation. This is reflected in the development tools used and in the basic and technical solution approaches. A systems supplier generally has the advantage of being able to gain experience in various projects with different OEMs.

However, there are other equally decisive factors that directly affect the development time. One such factor is the decisions that are made and that must be made by various committees and authorities in order not to impede the progress of the project. Another factor is the interconnection of the various organisational functions, defined by interfaces that may be subject to change over time.

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