Introduction of 3D CAD System for Bearings and Steering Systems

In 1998, Koyo launched a project of 3D CAD system development for enhancing the service quality to customers and shortening development periods, details of which are described below.

1. 3D CAD system for bearings

1) Development of 3D model and automatic drawing system (now patent pending.)

The bearing 3D model and drawing system is based on the existing 2D CAD system, so that it allows a designer to easily prepare from 2D data a 3D model. The 3D modeling of all tapered roller bearings and ball bearings has already completed. Koyo is also working on the 3D models of other kinds of bearing drawings. This system has allowed a designer to easily prepare a 3D model without having to master complicated 3D CAD operations.

For bearing unit products, this 3D CAD has been completed in hub units, one-way clutches, and water-pump bearings, resulting in 30% to 50% reduction in the development periods including designing, development, trial manufacturing, and production preparation. Koyo plans to further expand this system for all bearings, by March 2003, and make relative relations clear among production drawings, process drawings, and jig-and-tool drawings.

2) Tripartite global PDM system

Koyo's PDM system is linked to a host computer on a real-time basis. Koyo plans to further expand this global PDM system to make it possible in 2002 to allow technical collaboration among Japan, European and U.S. technical centers. Koyo also plans to establish an engineering portal site to allow web-enabled association among the existing PDM system, knowledge DB, and technical standards.

2. 3D CAD system for steering systems

1) Koyo plans to complete 3D base model creation of all Koyo steering products within 2002.

The 3D CAD system for steering systems has been developed by the steering engineering center since January 2000. Following the completion of the 3D base model of hydraulic rack & pinion (R&P) type power steering system in October 2001, Koyo has completed 3D base models of column type electric power steering system and R&P type manual steering system.

In newly-started design projects, steering systems are designed with this 3D CAD system using above base models.

We plan to three-dimensionalize steering system drawings by completing base models of all kinds of steering system in 2002.

2) 3D modeling enables much shorter development period.

From 2002, this 3D CAD system allows Koyo to provide 3D design data, to electronically exchange 3D product information with carmakers, and to have 3D model-used design review (DR) conferences by Koyo employees or with outside suppliers, aiming at further shorter development periods. Koyo now plans to further utilize 3D models for FEM analysis in order to provide an efficient and standardized FEM analysis system by which designers can analyze their products by themselves from an FEM viewpoint without using outside tools.

3) PDM system is now under development.

In accordance with the above introduction of 3D CAD system, Koyo is also developing a PDM system. This PDM system will be able to process the data of mock-up product together with the data of associated components thereof to automatically prepare a component list based on the parent-child-relationship therebetween. This component list will be associated with a component list system in a host computer used by production sections. Koyo has also completed the computerization of an existing design change notification system and now preparing a database by which designers can share the necessary information at initial design stages.