The Paris International Auto Show 2004 was held in September 2004 with the theme "Road Safety" for pursuing safer and more comfortable automotive society. The show attracted as many as 1.46 million visitors which exceeded the number of visitors for any previous motor show, indicating much interest for this theme in the world.

Koyo Group companies including KSE, FAVESS, and ECO jointly participated in the exhibition under the key words "Safety, Comfort and Environment." Koyo Group exhibited a proposal for integrated vehicle control by means of advanced technology and also new environmentally friendly products developed through Koyo's endeavor for global environmental protection.

To demonstrate Koyo's efforts for integrated vehicle control, the virtual motion theater (a kind of driving simulator) was exhibited for experiencing integrated vehicle control. Full toroidal type infinite variable transmission (hereinafter referred to as IVT) and the resolver integrated hub unit were introduced as technologies to support the basic "running" and "stopping" functions of a car; the steer by wire system (hereinafter referred to as SBW) was introduced as the technology to support basic "turning" function of a car. Based on these technologies, Koyo Group proposed unique local systems for integrated vehicle control (the concept of cooperative control of "running", "stopping" and "turning").

Also, Koyo introduced its original concept of the environmental efficiency ratio that quantitatively indicates the reduction effect of CO₂ emission through the development of environmentally friendly products, which attracted a great deal of attention from visitors.

1. Outline of Paris Auto Show

<table>
<thead>
<tr>
<th>Period</th>
<th>From Sept. 23 to Oct. 10, 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place</td>
<td>Paris International Exhibition Center at Porte de Versailles in Paris</td>
</tr>
<tr>
<td>No. of participating nations</td>
<td>26</td>
</tr>
<tr>
<td>No. of participating companies</td>
<td>474 (including auto-component manufacturers, 33 from Japan)</td>
</tr>
<tr>
<td>Exhibited products</td>
<td>Passenger cars, hybrid cars, fuel cell electric cars, hydrogen engine cars, car components, other related products</td>
</tr>
<tr>
<td>Total number of visitors</td>
<td>Approx. 1.46 million</td>
</tr>
</tbody>
</table>

2. Exhibits of Koyo Group Companies

1) Motion theater simulator to experience integrated vehicle control

Koyo's exhibition featured a virtual motion theater which allows visitors to experience driving a car with integrated vehicle control. The integrated vehicle control consists of cooperative control of SBW, IVT and resolver integrated hub unit. In the virtual motion theater, a number of driving situations were simulated with and without integrated vehicle control, such as driving on μ -split road, cross-wind disturbance, emergent full braking and stop & start on uphill road. During the show, 3 500 visitors experienced the virtual motion theater.
2) SBW
The SBW ensures excellent maneuverability, stability and comfort through front wheel full active steering control that detects the vehicle movement desired by the driver. Moreover, as there is no mechanical linkage between the steering wheel and the steering gear, collision safety is improved, and the ratio of vehicle movement to steering wheel turning can be freely changed in accordance with the vehicle speed.

3) IVT variator
The IVT variator is the heart of a new generation transmission, IVT, which realizes both excellent maneuverability and fuel efficiency by the torque-controlled infinite variable transmission without using any torque converter. In comparison with conventional transmissions, the developed IVT has realized 25% size reduction and 40% weight reduction. And fuel efficiency has been improved 10% compared with 6-speed automatic transmissions.

4) Hub unit with integrated high resolution and forward and reverse motion detection sensor
The world's first automotive hub unit incorporating a high resolution VR type resolver enables the vehicle to monitor wheel rotation with high resolution to detect forward and reverse motion detection with a single sensor, or even zero speed. This is a multi-functional hub unit that can detect the rotational angle or the driving torque and transmits information more quickly than ever.

5) New generation low torque tapered roller bearings
The latest tapered roller bearing design under development is expected to have very low torque comparable to that of a ball bearing. This target is being achieved through a combination of measures to minimize the lubricant agitation resistance and the viscous rolling resistance without sacrificing the TRB's inherent benefits. During the show, the new bearing was presented on a demonstration machine that can display the difference in torque between the new and the conventional TRB on a monitor.
6) Various steering systems

Various automobile steering systems were exhibited including electric power steering systems and hydraulic power steering systems that can satisfy diverse requirements in the market such as safety, stable maneuverability, comfort and energy saving.