

NASCAR Race Teams Tune Suspension to Navigate Curves

Accelerating Developments
International, Inc. (ADI)



At a Glance

- **Project:** Improving NASCAR vehicle performance through off track testing.
- **Company:** Accelerating Developments International (ADI)
- **Location:** Concord, North Carolina
- **Challenges:** To make their test stand simulate the position and force experienced by race cars on the track
- **Solution:** Delta's RMC150 allowed ADI to control position and force/pressure for up to eight motion axes simultaneously.
- **Benefits:** Their KD-Rig test stand allows ADI customers to reduce track test time and costs.

Summary:

NASCAR teams use test stands to simulate and measure how a race car chassis flexes in response to road and aerodynamic forces on the track using a "KD-Rig" (K stands for kinematic and D stands for dynamics). The KD-Rig uses eight motion axes; in addition to one linear motion system for each of the car's four wheels, three aerodynamic load actuators can simulate the effects of aerodynamic down forces and an eighth axis can be used to simulate steering inputs.

Challenge:

ADI engineers spent about three months trying to make their existing controls do the correct force and position control before upgrading their K-Rig testing to KD-Rig testing.

Solutions:

Delta controllers can run individual motion instructions that produce very sophisticated motion profiles with no discontinuities, just like the real motion of a race car on the track. ADI test rigs are being used by about 90 percent of NASCAR racing teams.

Benefits:

Test stands made possible by KD-Rig save money by minimizing the expense of track time. By using the RMC150 eight-axis motion controller, ADI had the system working flawlessly within a couple weeks. ADI's solution delivers testing profiles that closely match live test lap motion of a race car.

"We haven't come close to hitting any limitations with the Delta controller."

-Jay Drake, general manager of Accelerating Developments International, Inc. (ADI) of Concord, North Carolina.