



**Course Title:** Introduction to Brake Control Systems: ABS, TCS, and ESC – Online Version

**Course Length:** 10 hours

**Time Online:** 10 hours

**Time in Class:** N/A

**Time in Lab:** N/A

**Class Size:** N/A

**Price Per Student:** \$1,950.00\*

**Location:** Company Site

**Course Description:**

Once reserved for high-end luxury vehicles, electronic brake control systems are now required standard equipment on even the most inexpensive cars and trucks. Today, every new vehicle benefits from the optimized braking, enhanced acceleration, and improved stability that these systems provide. This comprehensive seminar introduces participants to the system-level design considerations, vehicle interface requirements, and inevitable performance compromises that must be addressed when implementing these technologies.

The seminar begins by defining the tire-road interface and analyzing fundamental vehicle dynamics. Following an in-depth study of system electronics, hydraulic hardware, and sensor requirements, the participants learn about the control strategies employed by anti-lock brakes (ABS), dynamic rear proportioning (DRP), traction control (TCS), and electronic stability control (ESC) with a heavy emphasis placed on the resulting vehicle dynamics. The seminar concludes with a study of unique applications, a look forward to advanced brake control system integration, and an overview of Federal Motor Vehicle Safety Standard 126. Over 500 pages of detailed course notes and illustrations are provided for on-the-job reference.

This course has been approved by the Accreditation Commission for Traffic Accident Reconstruction (ACTAR) for 13 Continuing Education Units (CEUs).

**Course Learning Objectives**

By attending this course, participants will be able to:

- Analyze brake system design parameters and their vehicle performance effects
- Evaluate the compromises between stability, steerability, and stopping distance
- Identify the discrete mechanical components required for ABS
- Specify fundamental ABS performance attributes
- Calculate dynamic brake balance and explain the benefits of DRP
- Reconcile TCS performance expectations vs. method of implementation

\* Price based on minimum enrollment, subject to change

- Define ESC performance metrics and physical limitations
- Assess features such as adaptive cruise control and brake assist
- Interpret federal requirements for the performance of ESC

### **Course Syllabus**

- Module I: Tire-Road Interface Characteristics
- Module II: Hydraulic Brake System Overview
- Module III: Stability, Steerability, Stopping Distance
- Module IV: Mechanization of ABS
- Module V: ABS Sensor Overview
- Module VI: ABS Performance
- Module VII: DRP Performance
- Module VIII: Mechanization of TCS and ESC
- Module IX: TCS Performance
- Module X: ESC Sensor Requirements
- Module XI: ESC Performance
- Module XII: Additional Features and Functionality
- Module XIII: Federal Motor Vehicle Safety Standard 126