



# TRACKS

## DYNAMIC LIGHT VEHICLE ROLLOVER PROPENSITY

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Maintaining the stability of any vehicle is critical for obvious reasons. Few drivers have the advanced skills that would help them maintain control on their vehicle during a severe highway situation such as an abrupt crash-avoidance maneuver. The consequences of loss of control vary and may depend on a vehicle's ability to resist rollover.

While the manufacturers of vehicles and stability control systems are developing safer products to help prevent rollovers, the US government is also working on vehicle stability concerns. As a result of the Transportation Recall Enhancement, Accountability, and Documentation Act (TREAD Act) of 2000, the National Highway Traffic Safety Administration (NHTSA) is developing a dynamic test for rollovers that will provide consumers with an additional decision-making tool. Consumer information similar to that currently provided by NHTSA for crashworthiness

through the New Car Assessment Program (NCAP) Star ratings will rate light-duty vehicles on their rollover resistance and handling performance. NHTSA has invited the auto industry to provide their input. Read more about the proposed rulemaking at: <http://www.nhtsa.dot.gov/cars/rules/rulings/Rollover/2001Standards/RolloverResistance.htm>.

TRC's professional test drivers, experienced vehicle dynamics engineers, and 50-acre asphalt Vehicle Dynamics Area combine to make TRC Inc. uniquely qualified to help you get a head start on assessing your vehicle's rollover resistance performance. For all handling tests, the TRC Inc. Safety Committee determines specific safety equipment requirements that could include inner tubes — to minimize facility damage should the tires de-bead — and outriggers, rollbars, and driver protection such as harnesses and helmets.

Automotive News



**PACE**

A W A R D

Innovation Forum

### TRC Inc. HONORS INNOVATION

Transportation Research Center Inc. is proud to announce that we will again sponsor the Automotive News PACE Awards Ceremony. This year's ceremony will honor the twenty-two finalists for the 2003 *Automotive News* PACE Awards. PACE is an acronym for Premier Automotive Suppliers' Contributions to Excellence. Recipients of the 2003 Awards will be announced on Sunday, March 2, 2003, at the Detroit Opera House.

The PACE Awards have been a natural tie-in for TRC Inc. as many of the innovations featured are ultimately validated

through testing at our proving ground. This sponsorship has also given us the opportunity to support our customers and their efforts in the marketplace by acknowledging their hard work. Information on the finalists' innovations will be featured weekly in February issues of *Automotive News*. Cap Gemini Ernst & Young also sponsor the PACE awards. Additional information on the PACE Awards and may be found on the web at [www.trcpg.com](http://www.trcpg.com), [www.automotivenews.com](http://www.automotivenews.com), and [www.cgey.com/pace](http://www.cgey.com/pace) or by calling TRC Inc.



## NEW DRIVER TRAINING VEHICLE

TRC Inc. has acquired a new training car that will revolutionize some of its driver training programs. TRC Inc.'s advanced driver training classes provide our customer's technical driving staff with enhanced driving skills to heighten understanding of vehicle dynamics.

Historically, TRC Inc.'s driver training classes have used relatively low-powered front-wheel-drive, production (stock) vehicles for most hands-on driving maneuvers. Our customers expressed an interest in expanding their experience, knowledge, and skill levels related to high performance, rear-wheel-drive cars and basic suspension tuning, so TRC Inc. decided to procure a new vehicle with special capabilities.

Our Durability and Dynamics Operations engineering staff determined that a purpose-built, tube-frame racing vehicle could be modified to meet most of the requirements. They selected a

Pontiac Grand Prix, that was the test "mule" for a leading team in the American Speed Association (ASA) stock car racing series.

Unique to a class of oval track competition, the production GM Vortech V-8 engine, slightly modified by Lingenfelter Performance Engineering, was determined to meet TRC Inc.'s specifications. Coupled to a Borg Warner 4-speed manual transmission, these 5.7 liter (350 cubic inch), all aluminum, fuel-injected engines develop 420 horsepower. Part of the package is an ECU (engine control unit) with a 6500 RPM rev limit and an OBD II (On-board Diagnostic) hookup that enhances reliability. Constructed of mild steel tubing, the car's chassis offers a high degree of safety due to an integral roll cage, relatively high strength-to-stiffness ratio, and low construction and repair costs. The bodywork, made of light gauge steel with a fiberglass hood and lexan windows, helps keep the vehicle's curb

weight under 2800 lbs.

A critical feature is a vehicle's suspension tuning capability. Front camber, front and rear roll stiffness, damper (shock absorber) settings, and rear roll center height are all easily adjustable for quick changes during training. Anti-roll bar, dampers, and brake bias settings are adjustable with in-cockpit control knobs. A second seat for instructional purposes has been added, along with an adjustable driver seat and steering wheel.

Although most usage will be at relatively low speeds, performance will be delivered with a rush, at 0-60 MPH expected in the sub 4-second range. With a fully adjustable suspension and ASA-approved driver and passenger safety systems, the training uses for this car will likely grow. Our instructors can barely wait to begin our 2003 driver training season.



### TRC INC. FORMALIZES ITS ENVIRONMENTAL, HEALTH AND SAFETY POLICY

TRC Inc. recently upgraded its ISO 9001:1994 registration to the 2000 revision. The ISO 9001 Standard is an international model for quality management systems. Organizations are required to identify and document best business practices and to implement these practices to achieve consistent quality services to meet and exceed customer expectations.

On October 29, 2002, TRC Inc. was awarded ISO 14001 registration. This standard was created from an international model for environmental management systems. In addition, TRC Inc. has incorporated health and safety management into our environmental management system. TRC Inc.'s Environmental, Health and Safety (EH&S) Policy Statement reads: "We will strive to protect the environment and assure safe and healthful working conditions."



### SAE CONGRESS 2003

The SAE International Congress and Exposition is where each year thousands of automotive engineers from all over the world gather information and exchange ideas. TRC Inc. would not miss this opportunity to meet directly with our customers to learn about their upcoming test needs and to tell them what's new at TRC Inc. Please visit with us in booth 307, located in front corner of the TEST pavilion in Wayne Hall of COBO Center in Detroit, Michigan from March 3 - 6, 2003.

As usual, TRC Inc. will be well represented in technical sessions with authors and presenters:

• "Heavy Tractor/Trailer Vehicle Dynamics Modeling for the NAD," by TRC Inc.'s Mohamed Kamel Salaani, SEA Inc.'s Gary J. Heydinger, and National Highway Traffic Safety Administration's (NHTSA) Paul A. Grygier

• "An Experimental Examination of J-Turn and Fishhook Maneuvers That May Induce On-Road, Untripped, Light Vehicle Rollover - Results from Phase IV of NHTSA's Light Vehicle Rollover

Research Program," by TRC Inc.'s Mark Heitz and Bryan C. O'Harra and NHTSA's Garrick J. Forkenbrock and W. Riley Garrott

• "An Experimental Examination of Double Lane Change Maneuvers That May Induce On-Road, Untripped, Light Vehicle Rollover - Results from Phase IV of NHTSA's Light Vehicle Rollover Research Program," by TRC Inc.'s Mark Heitz and Bryan C. O'Harra and NHTSA's Garrick J. Forkenbrock and W. Riley Garrott

• "An Examination of the Effects of Outriggers on Dynamic Rollover Resistance Maneuvers - Results from Phase V of NHTSA's Light Vehicle Rollover Research Program," by TRC Inc.'s Devin Elsasser and NHTSA's Garrick J. Forkenbrock

• "Validation of Heavy Tractor-Trailer Model Used in the NADS (written only - no oral presentation)," by TRC Inc.'s Mohamed Kamel Salaani, SEA Inc.'s Gary J. Heydinger, and NHTSA's Paul A. Grygier.

