

BLOWING IN THE WIND

Never fails, does it, that when you need a lot of wind for a test that it will be a calm day? Well, TRC can help outsmart that old Murphy's law! About a year ago, the Crosswind Test Facility Team was formed with staff from TRC Inc., a manufacturer and The Ohio State University. The team's mission was to re-power, refurbish, design and build a computer-based engine control system that could be adapted to six old crosswind generators (CWGs) that TRC purchased from the U.S. government in a sealed-bid auction. The goal was to upgrade those 15- to 20-year-old generators into new systems that would generate high winds for noise and pass-by effects testing.

New controls are being designed so that the fan speeds can be controlled for use of any combination of one to all six of the CWGs during tests from their location alongside the 7.5-Mile Test Track. The outlet of the CWGs is equipped with horizontal and vertical flow control vanes to control the wind profiles. Wind profiles can be developed to match the needs of specific vehicle types for optimum (flattest) wind profiles. When the work is completed by late September 2002, the TRC "Crosswind Generator Facility" will be capable of generating average wind speeds of 25 mph, 35 mph, and 50 mph at a lane-center distance of 20 feet from the CWG outlet. These winds will be available for vehicle path lengths from 4 meters (13 ft.) up to approximately 21.3 meters (70 ft.). Yes, there is a stiff breeze blowing up around here!

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New 6-cylinder industrial gasoline engines are replacing the original 4-cylinder industrial gasoline engines.

TRC INC. SALUTES OUR ARMED FORCES MEMBERS

In the middle of our Ohio cornfields, we sometimes feel a little isolated and removed from the bustling activities of the rest of the world. The tragedy of September 11, 2001, also shook our quiet environment and drew us very close to the rest of the country. We watched in horror the tragic events that took place in New York, Washington and Pennsylvania. We are keeping in our thoughts and prayers all those touched by our national tragedy.

We are also greatly encouraged and immensely proud of the sacrifices being made by the service men and

women who are helping to protect our world from terror. With our sincerest admiration and appreciation, we salute the members of the staff of TRC Inc. who are also members of the U.S. Armed Forces:

- Matt Hostetler – TRC Inc. Photographer, US Navy
- Don Ledley – TRC Inc. Test Technician, Ohio Army National Guard
- Chris Mundy – TRC Inc. Engineering Technician, Ohio Army National Guard
- Jim Patterson – TRC Inc. Engineering Technician, US Army Reserve
- Rick Waldeck – TRC Inc. Test Technician, US Air Force



WE ARE PRETTY PUSHY

TRC Inc. has equipment that is so powerful it can nearly push you into tomorrow — which is where you might like to be to understand how your product will perform in-service. To test the strength and integrity of your automotive interiors and roofs, TRC Inc.'s Static Test Laboratory provides the test results you can trust for development and government compliance testing. With capabilities far in excess of government requirements, development work can be accomplished using the equipment and procedures for the following government-specified tests:

- FMVSS 202 Head Restraints
- FMVSS 206 Door Locks and Door Retention Components
- FMVSS 207 Seating Systems
- FMVSS 210 Seat Belt Assembly Anchorages
- FMVSS 214 Side Door Strength (static)
- FMVSS 216 Roof Crush Resistance

Talk about brute strength! A 24-foot by 10-foot test bed plate provides rigid attachment of the test vehicle or component. For FMVSS 202, 207, and 210 tests, a load-reaction frame,

with a bank of eight servohydraulic actuators mounted on four vertically adjustable crossbeams, is capable of applying up to eight simultaneous loads of up to 10,000 pounds each. Each actuator uses its own servovalve and operator input load profile to allow individualized application of the load.

We're mighty, but we're versatile too. TRC Inc. can test a single occupant seat per FMVSS 202 for performance of the displaced torso reference line and the head restraint load test. An auxiliary A-frame fixture with pulleys allows in-vehicle FMVSS 207 testing. The equipment has three lap belt and two shoulder belt blocks that meet the specifications of FMVSS 210.

Vehicles measuring up to approximately 90 inches high and weighing up to 20,000 pounds can be tested in accordance with FMVSS 214S/216. The FMVSS 214 test device consists of two servohydraulic actuators pushing a 12-inch diameter semi-cylindrical load device. Each 30-inch stroke actuator has its own load cell and internal displacement transducer for parallel synchronization and control.

FEELING A LITTLE DIZZY?

If not, TRC can assist you through our recent implementation of four (4) rollover tests modes: a soil trip, curb trip, "J" turn, and a corkscrew ramp. These tests were developed to supplement the existing FMVSS 208 rollover standard for passenger vehicles. You may be asking why were four new tests developed when we already have the current 208 rollover? Well, with the wide variety of accident types and injury mechanisms, the National Highway Traffic Safety Administration believes that it is impractical to define a single test or a series of tests to reasonably assess a vehicle's rollover crashworthiness, resulting in the addition of the new test modes.

You also might be asking how do the current tests work, and can I ride

along? Well, we can help you out with the first part but our lawyers will frown upon the second. In accordance with SAE Paper #2000-01-164, a soil-trip surface and a curb-trip rollover work by propelling the test vehicle sideways on the asphalt, causing it to rollover from a friction change as it makes a transition from asphalt to a high friction soil mixture. The curb trip is the same as the soil trip except the vehicle hits a curb instead of soil to initiate the roll.

For the SAE J857 rollover procedures, the vehicle is placed into a "J" turn, which induces a rollover event by using small ramps to achieve the vehicle's rollover threshold. The corkscrew ramp por-

SeatTEST® and CrashTEST NT® software is configured to set up and control test operation and acquire, process and report the load, deflection and time data, including:

- Test control header information identifying test conditions, operator, date and test type;
- Test sequence control;
- Computer PID (Proportional, Integral, Derivative) control of all selected actuators in either load or position control including automatic mode swapping;
- English, Metric and SI (meter-kilogram-second +) units;
- Manual Control Screen for individual activation of user-provided load or displacement of actuators; and
- TMSI amplifier with computer control of gain, shunt calibration, hardware auto zero and excitation voltage.

Although designed for both research and government compliance testing of automotive components, the powerfully pushy equipment can be used to help prove the load limits of a wide range of materials, anchorages, and applications.



tion of the testing induces a rollover event while the vehicle's direction of travel remains linear.

With the addition of these new test modes, TRC Inc. hopes to partner with many of our current and future customers to develop safer and better vehicle for our families and friends. Watch our website at www.trcpg.com for the upcoming premier of a short video of the corkscrew ramp under the "What's New" section. For additional information, please feel free to contact John Phillips, Vice President of the Impact Laboratory Operations, at 937-666-2011 x270.

