TRC® TRACKS

IMPORTING MOPEDS INTO THE UNITED STATES

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Can Transportation Research Center Inc. (TRC Inc.) help certify a moped for sale in the United States? How much does it cost? How many vehicles are needed? How long does it take? We hear these questions a lot from companies wanting to import motorcycles, dirt bikes, and all-terrain vehicles (ATVs) into the United States. While we will be happy to provide them with a customized testing cost proposal that will be most relevant to their applications and answer their questions, we can provide information to help to explain how this work is accomplished. TRC Inc. can serve only as the testing contractor and does not function as the manufacturer's representative for the submission of regulatory documents and paperwork.

TRC Inc. has the facilities and personnel to assist an importer with the following certification testing efforts regarding United States Environmental Protection Agency (EPA) Certification that includes Exhaust Emissions Testing, related EPA and Department of Transportation (DOT) testing, Federal Motor Vehicle Safety Standard (FMVSS) 122 Motorcycle Brake Testing and 40 Code of Federal Regulations (CFR) 250.160-4 Pass-by Noise Testing. Other DOT procedures may be applicable.

EPA On-road Motorcycle Tests: Exhaust Emissions Testing is conducted on a Horiba 20" roll electric dynamometer at the following test points: 0, 2500, 4000 (before and again after mainte-

nance) and 6000 km. CFR Title 40 Part 86, Subpart E, "Emissions Regulations for 1978 and Later New Motorcycles, General Provisions." Dilute gaseous CO2, CO, HC, NOx, and CH4 emissions are collected and analyzed via a 300 Standard Cubic Feet per Minute, Constant Volume Sampler and Horiba Instruments analytical system.

EPA and DOT-related On-road Motorcycle Tests TRC Inc. can conduct the 6,000 km of CFR compliant durability demonstration on our 12-kilometer private test track. The driving cycle is outlined in CFR Title 40, Part 86 Appendix I – c.

FMVSS 122 Motorcycle Brake Compliance Test Brake testing is conducted in accordance with FMVSS 122 CFR Title 49, Part 571.122 for mopeds and scooters. Included are burnishes, effectiveness stops, partial system failures, fade and recovery, and water recovery stops. Any motorcycle equipped with a split service brake system will require additional stops and inspection for Partial Service Brake System (S7.8.2) compliance.

Motorcycle Pass-by Noise Test Pass-by Noise Testing is conducted in accordance with CFR 205.160-4 on the TRC Environmental Protection Agency (EPA) noise pad.

EPA Dirt Bike or ATV Tests TRC Inc. uses a Horiba 20-inch roll electric dynamometer for ATV for Emissions Testing and the gravel road course for a durability demonstration. The Federal Test Procedure Exhaust Emissions Tests are conducted in accordance with California Air Resources Board and EPA guidelines applicable to Model Year 2006 ATVs. Certification protocols require the manufacturer demonstrate that the ATV has an emissions control system capable of meeting the emissions standard after 1,000 hours of operation.

On-road motorcycle certification requires two test units. One test unit is to be used exclusively for Emissions Testing and the other test unit is to be used for Brake and Noise Testing. Dirt Bike or ATV Testing requires only one test unit. TRC Inc. estimates it takes 60 days to complete the program on each test model, notwithstanding mechanical malfunctions.

Although crash tests are not required for 2-wheel vehicles, TRC Inc. has conducted a number of them for manufacturers seeking research data.

ALL-WHEEL DRIVE TESTING

In addition to the 50-acre Vehicle Dynamics Area and the Off-Road Mobility Courses for active all-wheel vehicle testing, our new 48-inch chassis dynamometer is available to test for emissions and for tractive force performance testing. The new AVL emission chassis dynamometer can test light- or medium-duty front wheel drive, rear wheel drive and four wheel drive vehicles.

The chassis dynamometer measures and controls the speed and force of the rollers to test a vehicle's powertrain through the tractive forces that the vehicle's tires transmit via the rollers. The dynamometer is also used for exhaust emission analysis by simulating the road load including the inertia of a vehicle, and to measure the exhaust emissions during dynamic speed cycles in an exhaust emission laboratory.

Standards testing includes, but is not limited to:

- Environmental Protection Agency (EPA), California Air Resource Board (CARB)
- Federal Test Procedure, Highway Fuel Economy Test, US06, Cold-CO Emissions testing
- Gasoline and diesel gaseous and Particulate Matter (PM) emissions system development
- Cold and hot temperature driveablity and powertrain evaluation

The TRC Inc. lab provides engine-based and chassis dynamometer-based Exhaust Emissions, Fuel Economy and Particulate Matter Testing to SAE, EPA, CARB or other industry standards.

The lab also conducts testing for fuel, additive, and lubricant analysis and aftermarket parts validation; evaporative systems integrity and permeation; intake valve and port fuel injector deposit testing; and EPA highway and lab fuel economy testing. The new dedicated motorcycle/ATV emissions test cell is also available for use.

This state-of-the-art dynamometer will be an excellent research tool for hybrid powertrain development, diesel PM and NOx after-treatment evaluation, OBD-II system validation and emissions durability/certification.

UPDATED IMPACT LAB DIGITAL MOTION PICTURE CAMERAS AND DATA ACQUISITION DEVICES

A picture is worth a…lot. And a crystal-clear picture tells the story best, so we are very pleased to be taking crash test pictures for you with our six new very high speed video cameras in addition to our existing digital motion picture cameras. Our new Weinberger SpeedCam MiniVis.® can record 32,000 frames per second and take a hit of 100 g's in all three axes. Since these cameras weigh only 2.4 lbs and are only 3.7 x 2.8 x 4.2 inches, we can install these cameras unobtrusively nearly anywhere that you need to capture an image during your impact test. These cameras offer you a resolution of 1280 x 1024 pixels at 500 frames per second (fps), and have an integrated gigabit ethernet interface for high data transfer rates so that you can see your images quickly after the test on the flat-screen monitors in the customer areas of our test laboratories.

With anthropomorphic test dummies (dummies) being so costly, the most recent addition to our data acquisition system inventory allows us to offer you the latest in dummy data acquisition without replacing our dummies. We have just purchased a new KT-Nxt system for use in our Hybrid III motorcycle test dummy. This new Data Acquisition Device (DAD) is so small that we have integrated it into most of the standard dummy load cells such as upper neck, lower neck, tibia, and lower leg, creating digital transducers with USB outputs.

The DAD offers you all the functionality that you know from the current crash test data acquisition systems that we use for you, such as signal conditioning, A/D-conversion, and data storage. Synchronization between DADs and triggering is done via the standard USB lines without additional lines or violation of the USB standard.

SECOND INJURY BIOMECHANICS SYMPOSIUM

The Ohio State University (Ohio State), in conjunction with Transportation Research Center Inc. (TRC Inc.), hosted the Second Annual Injury Biomechanics Symposium from May 17, 2006, through May 19, 2006. Industry partners for this event included Honda Research Americas, National Highway Transportation Safety Administration's Vehicle Research and Test Center, Nationwide Insurance, and Columbus Children's Hospital Center for Injury Research.

Continuing with the success from our first year, a full complement of attendees from both industry and 15 universities from various countries were on hand to view the nine posters and eight oral presentations.

The symposium kicked off with a welcome reception held at The Varsity Club on Ohio State's campus, then moved to an on-campus hotel for the presentations, followed by an awards banquet at the Buckeye Hall of Fame Café, and concluded with a walking tour of The Ohio State University.

An inspiring keynote address was delivered by Dr. Susan Margulies, Professor of Bioengineering, University of Pennsylvania. The symposium included eight presentations grouped into four main topics: Pediatric Biomechanics, Traumatic Brain Injury, Thoracic/Abdominal Impact Response and Injury, and Biomechanics of the Cervical Spine and Spinal Cord. Additionally, nine posters were presented that may evolve into oral presentations at future symposiums.

An additional highlight was the awards presentation of the Dr. Margaret H. Hines Award (plaque and monetary award) given to the best oral presenter and best poster presentation. Dr. Hines initiated the Injury Biomechanics Research Program at The Ohio State University over 15 years ago and was conducting research on shoulder trauma when she passed away in 2004. Two students were recognized at the awards banquet for their efforts. Amy Vincent from the University of Washington received the award for her oral presentation on Pediatric Neck Muscle Strength and Endurance. Kiel Pfefferle from The Ohio State University received the award for his poster presentation on Design and Evaluation of Measurement Instrumentation used for High Energy Tibia Impacts on Fresh Post-Mortem Human Subjects.

The Symposium is an extension of Ohio State's collaboration with TRC Inc. to create a nationally recognized center for trauma research. The new initiative is comprised of faculty of Ohio State's Injury Biomechanics Research Laboratory and their

Center for Automotive Research, along with Children's Hospital of Columbus, Ohio, and TRC Inc. Dr. John Bolte IV, assistant professor of anatomy, is leading this effort for Ohio State's state-of-the-art laboratories that are complemented by TRC Inc. laboratories to include calibration for measurement instrumentation and test dummies, along with full-scale crash testing and the HYGE impact simulator facilities. Additional information can be found at:
http://medicine.osu.edu/ibrl/

The Third Annual Injury Biomechanics Symposium will be held at Ohio State in May 2007. Questions regarding attendance and presentations should be directed to Dr. John Bolte at bolte.6@osu.edu. An official announcement regarding the date and a call for abstracts will be released in the Fall.

YOU KNOW YOU WANT TO DRIVE IT!

SAE is holding its 2006 All-Wheel Drive (AWD) Vehicle Seminar, Symposium and Ride and Drive event at Transportation Research Center in August. Joseph Palazzolo of Getrag Corporation will provide an introduction to the fundamental concepts and evolution of passenger car and light truck 4x4/all-wheel drive (AWD) systems in the seminar, "Fundamentals of Automotive All-Wheel Drive Systems," on Monday, August 21, 2006. Tuesday and Wednesday's symposium will be filled with speakers and panelists discussing component developments and performance, testing techniques, fuel economy, and torque vectoring.

The culmination of the four-day event is the Ride 'n Drive on Thursday, August 24, 2006. We are expecting a large number of vehicles and products to be demonstrated on TRC's 50-acre Vehicle Dynamics Area, the wet Basalt and Ceramic Tile Course, and the Off-Road Mobility Course. These demos will afford the attendees an opportunity to drive, ride and/or observe vehicles that employ vital AWD technologies in use today and some being developed for future introductions. Both conventional and hybrid passenger vehicles with Four Wheel Drive (FWD) and AWD will be showcased.

Contact SAE to register or to become a sponsor of this exciting event that is organized by General Motors, Dana, Ford, Ohio State and TRC Inc. If you are interested in attending, sponsoring or exhibiting at this year's event, contact SAE at www.sae.org.

TRC INC. MAINTAINS PACE™

Transportation Research Center Inc. (TRC Inc.) is proud to announce that for the fifth consecutive year, we are renewing our sponsorship of the *Automotive News* PACE™ (Premier Automotive Suppliers' Contributions to Excellence) Awards. Now in its thirteenth year, the PACE™ Award honors automotive suppliers who have embraced innovation or adapted and reinvented themselves to meet the demands of the original equipment manufacturers. This prestigious award sets the standard for innovation and excellence and is recognized around the world as the industry symbol of innovation. Annually, hundreds of automotive suppliers around the globe submit their innovation to win this distinguished award.

An independent panel of judges reviews applications, selects finalists, and conducts comprehensive site visits of finalist companies to evaluate both their innovations and management teams. Annually, during the SAE (Society of Automotive Engineers) International Exposition in Detroit, PACE™ Award winners are honored at a special ceremony.

TRC Inc. President Rick Gildow stated, "The PACE™ Awards are a natural tie-in for TRC Inc. Many of the innovations featured are ultimately validated at our proving ground. This also gives us the opportunity to support our customers and their efforts in the marketplace by acknowledging their hard work."

Company's interested in applying for the 2007 Awards may download applications on TRC Inc.'s website at www.trcpg.com/pace.htm or at www.automotivenews.com/PACE. Additional information on the PACE™ Awards can be found on the above websites or by calling TRC Inc.'s Marketing Department at (937) 666-2011, extension 349.

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