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Honda Develops World's First Push Power Measurement System to Enhance Ability of Wheelchair Athletes – World premiere at the 43rd Oita International Wheelchair Marathon –

TOKYO, Japan, November 13, 2024 – Honda Motor Co., Ltd. has developed the world's first*1 push power measurement system to be attached to a racing wheelchair to perform multifaceted measurements of the power output of the athlete to self-propel a racing wheelchair.

This measurement system will be on public display at the 43rd Oita International Wheelchair Marathon to be held in Oita Prefecture, Japan, on November 17. In the future, Honda is planning to lend this system to a wide range of athletes inside and outside Japan to support their efforts to enhance athletic performance, as Honda strives to contribute to the further advancement of wheelchair athletics as a whole.



Push power measurement system for racing wheelchairs



Push power measurement system attached to a rear wheel

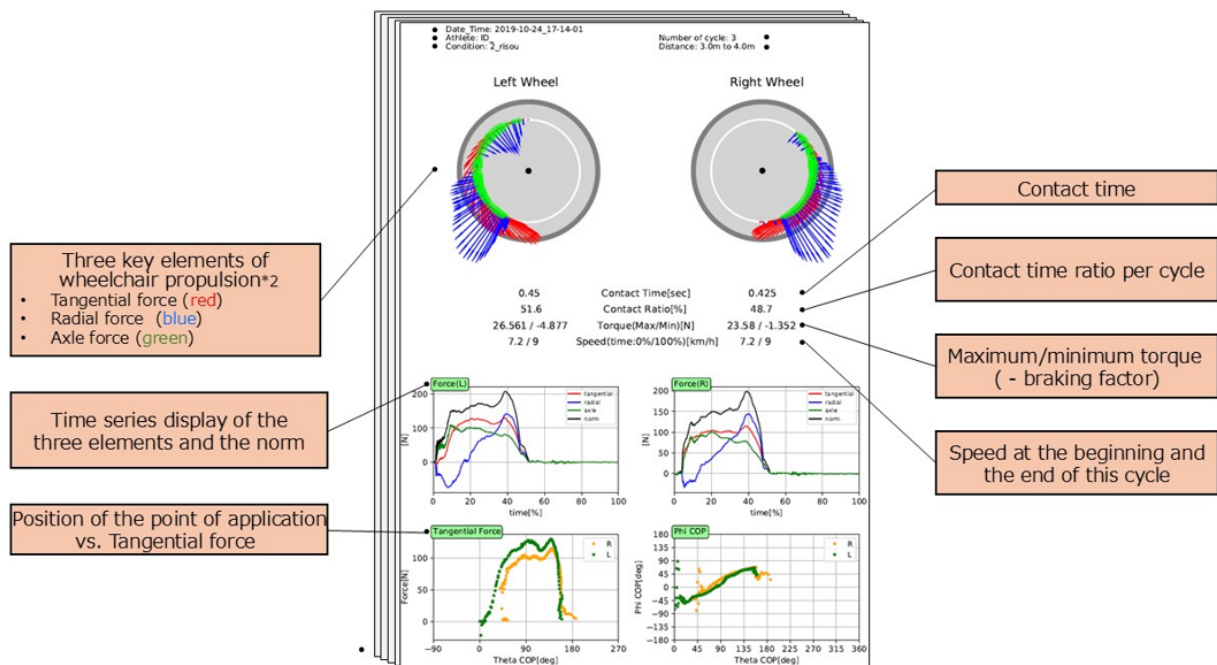
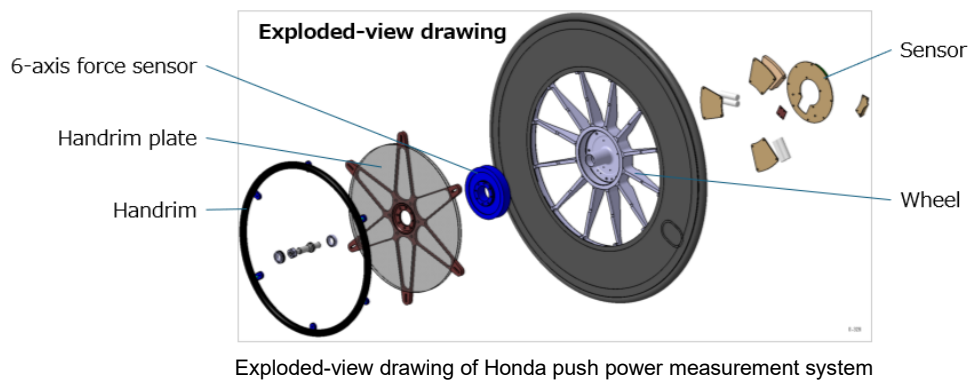
In the spirit of “Respect for the Individual,” which is a part of the company’s Fundamental Beliefs, Honda has been striving to offer the joy and freedom of mobility to all customers around the world and contribute to their efforts to realize their dreams. As a part of this initiative, Honda has been conducting research and development of racing wheelchairs since 2000. In addition to providing them to the wheelchair athletes Honda supports, Honda made its racing wheelchairs available for sale to any customers since 2019 to promote further advancement of wheelchair athletics. Through this initiative, Honda has been exploring possibilities for using its technology not only to improve the performance of racing wheelchairs, but also to contribute to the development of the abilities of athletes.

The newly-developed Honda push power measurement system will serve as a tool that supports objective analysis of athlete performance by quantifying and visualizing the power output of the athlete to propel the racing wheelchair. When attached to the wheel of the racing wheelchair, the system quantifies all information that affects racing performance, such as the difference in the amount of power applied to the right and left wheels, acceleration and deceleration factors, and the timing when the maximum speed is reached. By numerically expressing the characteristics of the riding form of each athlete, which tended to be understood intuitively, analysis based on objective data becomes possible. Moreover, by making it easier to compare measurements taken with different units of racing wheelchairs and to check how performance has improved compared to the past based on data, Honda is striving to support athletes to find more efficient training methods for themselves.

For data measurement, the system utilizes technology to detect force using a 6-axis force sensor, which enables precise, easy and quick measurements of the power output of the athlete, something Honda has amassed through its long history of robotics research, including the ASIMO humanoid robot and Walking Assist Device.

With cooperation of the University of Illinois (U.S.A.), home for many wheelchair athletics medalists, as well as several athletics organizations and athletes in Japan, including the Japan Institute of Sports Sciences (JISS), the push power measurement system has been tested to measure more than 30 athletes to date and garnered positive feedback. Honda will lend the system to organizations and schools which support wheelchair athletes all around the world to further contribute to the advancement of wheelchair athletics.

Based on its vision “to increase the number of people who take on challenges through sports activities and make the lives of all people more enjoyable,” Honda will continue to root for athletes who take on challenges toward the realization of their dreams.



Example of a report of measurement taken by Honda push power measurement system

*1 A system that can be used on a wheelchair for actual athlete training, as of November 13, 2024 (Honda internal research)

*2 In order to visualize the power output of the wheelchair athlete, the three elements that most contribute to power output to propel the racing wheelchair are drawn based on measured data.

■ About Oita International Wheelchair Marathon

The 43rd Oita International Wheelchair Marathon, to be held on Sunday, November 17, 2024, is the world's first international wheelchair-only marathon, an event Honda has been sponsoring for 35 years. More than 200 athletes, including approximately 50 from outside Japan, compete every year, making it one of the world's most prestigious wheelchair-only marathon event where the world's top athletes compete against each other.

Honda will exhibit its push power measurement system to the public at the venue of the opening ceremony, which will be held on November 16, a day before the race day. The Honda racing wheelchair, KAKERU, will also be on display. The Honda exhibit will offer an additional boost to the event by introducing how Honda develops racing wheelchairs by applying carbon technology also used for F1 machines and HondaJet, and the history of Honda involvement in supporting wheelchair athletics.

■ History of Honda involvement in wheelchair athletics

- 1978 Soichiro Honda, founder of Honda, visited Japan Sun Industries (support facility for people with disabilities) in Oita Prefecture and met Dr. Yutaka Nakamura, M.D.
- 1981 Inspired by Dr. Nakamura's activities, Honda established Honda Sun Co., Ltd.*³
- 1993 The Racing Wheelchair Study Group, a voluntary group of Honda Sun associates, was established, with an aim to develop racing wheelchairs.
- 1999 The Racing Wheelchair Study Group became an official club of Honda Sun and Honda R&D Sun*⁴ and renamed as Honda Athlete Club.
- 2000 Honda R&D Co., Ltd. began research and development of racing wheelchairs.
- 2002 Honda Sun produced the world's first full carbon body racing wheelchair with technical development support from Honda R&D. Since then, the development of racing wheelchairs has steadily progressed, and Honda racing wheelchairs provided to many athletes have been contributing to a number of wheelchair race victories.
- 2013 Honda R&D Sun, Honda R&D and Yachiyo Industry (now Motherson Yachiyo Automotive Systems) joined forces in the development and production of racing wheelchairs. The three companies jointly developed and launched KIWAMI and IDOMI racing wheelchairs in 2014 and 2015, respectively.
- 2019 KAKERU racing wheelchair was launched. The KAKERU received a Good Design Award in 2021.

*³ A special subsidiary of Honda established with the principle of facilitating social independence for people with disabilities.

*⁴ A special subsidiary of Honda R&D, which merged with Honda Sun on April 1, 2021