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Under the train floor

Air brake equipment supporting on-schedule train stops and departures

The approaching train arrives on time and stops precisely at the correct spot along the platform, partly thanks to its air brakes. MHI started manufacturing air brakes in 1924, and since then, the company has supplied many trains with air brakes, capturing a domestic market share of around 50%. The scroll compressor system is especially known for its noise reduction and low vibration and is equipped on high-speed and other express trains, around the world. Excellent brake performance ensures safety, security and a fast stop with a short braking distance, all contributing to on-time operations. As a leading player, MHI's air brakes are actively supporting the *Shinkansen* network, boasting world-class speed and safety, and also the modern urban infrastructure where timetables are met with clockwork precision.



Air brakes equipped on state-of-the-art vehicles support scheduled train services with high safety and reliability.

Air brake "stop technology" promotes railway development

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Skies of the world

Wings of new lighter and stronger materials soar across the sky

The Boeing 787 Dreamliner cruises the skies of the world with its larger windows, LED cabin lighting, and unrivalled passenger space and comfort. MHI, responsible for design and development of the composite-material wing boxes, opted for carbon fiber reinforced plastic (CFRP) materials, a carbon fiber and resin composite lighter than aluminum or titanium alloys that offers superior strength, rigidity, and corrosive resistance. CFRP is difficult to process, and manufacturing the enormous wings with their 30-meter length and 60-meter wingspan was extremely challenging. Nevertheless, MHI overcame numerous technical problems to deliver the highest level of environmental performance, and combined with superior aerodynamics achieved a substantial reduction in airframe weight and improvement in fuel efficiency. In 2012, with shipment of the composite material wing box for the 100th Boeing 787, MHI established its position as the global center of aircraft wing production. And today, many more commercial aircraft are safely and economically crisscrossing the skies, thanks to the strength and flexibility of MHI CFRP wing boxes.



Light and sturdy CFRP wings significantly improve fuel efficiency.

In August 2014, All Nippon Airways became the world's first airline to operate the new stretch version of the Boeing 787 Dreamliner (787-9 variant) with scheduled flights on its Haneda-Fukuoka route.

Meet MHI

Life with MHI

MHI's innovative technologies and outstanding products surround us, expanding across land, sea, air, and even out into space. The company is quietly supporting every aspect of our daily lives — technologies from Japan across the world and far beyond.

Commercial Aviation & Transportation Systems

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Seas of the world

Energy-saving LNG carriers meet an increasing demand for natural gas

In present-day Japan, demand for natural gas is steadily increasing as a fuel for thermal power generation. Responding to this trend, MHI developed the LNG*1 carrier "Sayaendo" to efficiently transport natural gas. The carrier features a peapod-shaped continuous cover over the spherical LNG tanks — a structure that reduces ship weight and air resistance, resulting in dramatic cuts in fuel consumption. So far, MHI has received orders for 8 carriers*2. Due to the U.S. led development of shale gas, massive natural gas production is expected; in 2014, MHI completed development of the next-generation LNG carrier "Sayaringo STaGE,"*3 engineered for the New Panamax specifications with even better performance. Increasingly these eco-carriers will be busily crisscrossing the world's oceans.



"Sayaendo" an eco-ship with a continuous cover over 4 LNG tanks

Low fuel consumption resulting in reduced CO₂ emissions and ballast water treatment system enhance environmental performance.

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Seto Inland Sea & other sea routes

New fully equipped ferry with large-class loading capacity and low fuel consumption enters service

Ferries are a convenient means of sea transport and in 2015, for the first time in 12 years on the Seto Inland Sea route between Kyushu and Osaka, a new ferry will go into service — the "Izumi" operated by Hankyu Ferry. One of the largest ferries on the Inland Sea, it boasts a load capacity of 643 passengers, 191 trucks and 177 cars*4. The improved hull form, the introduction of MALS*5 and waste heat utilization reduce fuel consumption by as much as 20 to 30% compared to conventional ships. Enhanced facilities include a panoramic view from the bow and the open-air bath. MHI has manufactured a number of ferries, including the "Izumi," for sea routes throughout Japan. While meeting the needs of this era with its focus on environmental performance and impact, MHI continues offering comfortable "sea voyages."



Comfortable voyage with the Japanese cultural concept of wa (harmony)

MALS and a reaction rudder providing greater thrust by rectifying the propeller slipstream have been introduced as energy-saving devices.

*1 Liquefied natural gas *2 As of January 6, 2015
*3 A carrier with apple-shaped tanks introduced in Domain News (P.15).

*4 Based on a truck length of 12 m. *5 Mitsubishi Air Lubrication System. Carpet-like layer of fine air bubbles produced beneath the ship bottom reduces hull resistance.