

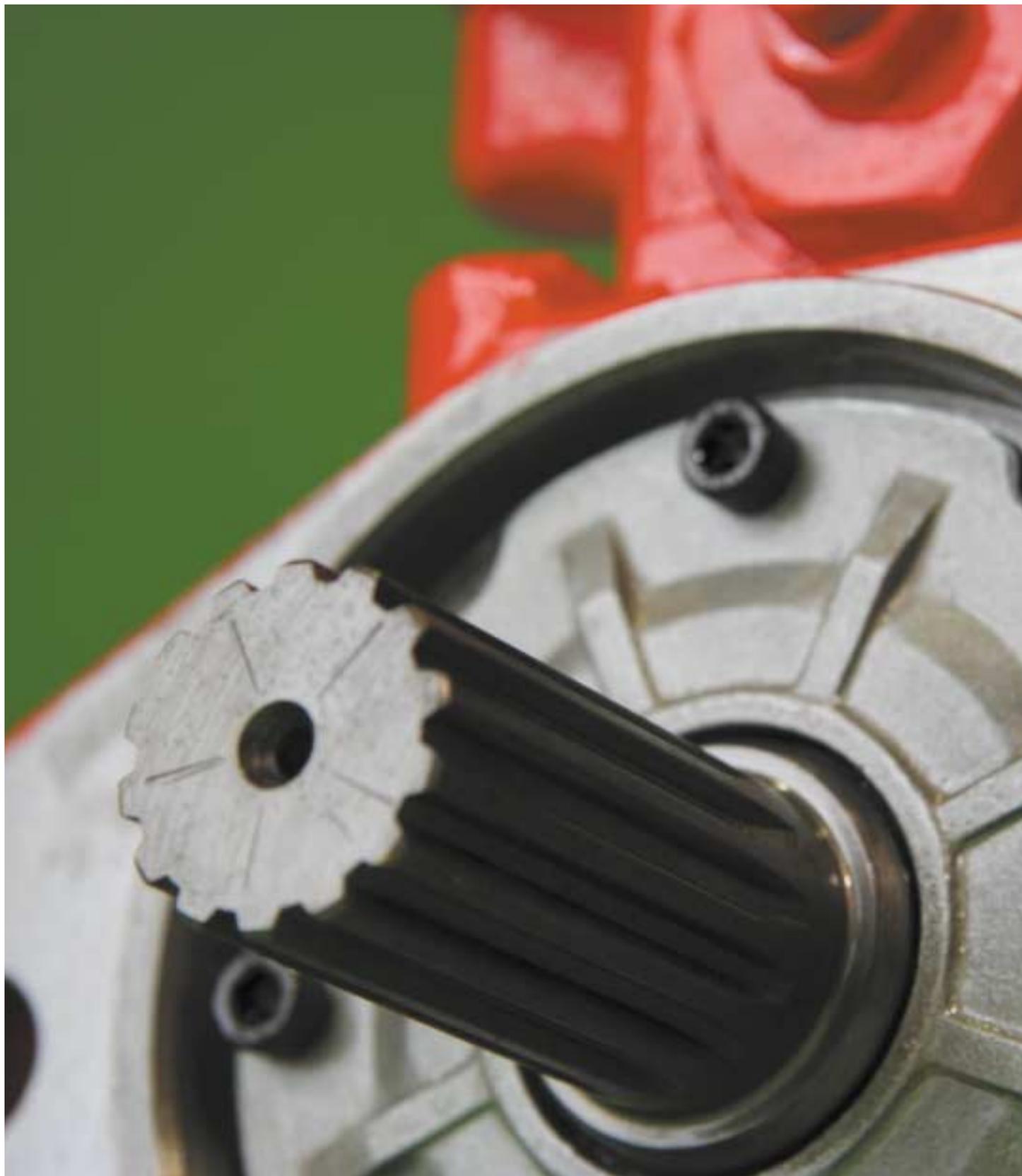
# Scope

*Kawasaki Heavy Industries* Quarterly Newsletter

August 2006

NO.68

**Kawasaki**



## Kawasaki Precision Machinery:

# Leveraging Fluid Power Technology for Global Growth

*Fluid power technology was conceived and developed in Europe. One well-known example of its heritage is the Eiffel Tower's elevator, which was built in 1889 and originally powered by hydraulic energy from water. The technology evolved significantly after oils with enhanced tribological properties came into use.*

*Kawasaki's hydraulic business began with the production of radial piston pumps in 1916. Demonstrating its pioneering spirit, the Company continued expanding its list of product developments for the next 90 years of its history—from such hydraulic equipment as pumps, motors and control valves, to industrial hydraulic machinery, marine deck equipment, marine steering gears, camera stabilizers for ships and train ventilation systems.*

*In 2002, Kawasaki separated its hydraulic business and established a subsidiary, Kawasaki Precision Machinery, Ltd. (KPM). This issue's Frontline covers the international expansion and technological wealth of this global hydraulic industry leader.*



KPM (U.K.), a production and sales base located in Plymouth, U.K.

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#### About the Cover

The K7V63DTP swash plate axial piston pump featured on the cover is based on the K3V and K5V hydraulic pumps for construction machinery. Boasting the most advanced technologies, the K7V63DTP achieves greater space savings, higher reliability and efficiency, and lower noise levels.

#### KAWASAKI HEAVY INDUSTRIES, LTD.

### Scope

Editor-in-Chief: Kenji Watanabe  
Public Relations Department  
World Trade Center Bldg., 4-1  
Hamamatsu-cho 2-chome, Minato-ku  
Tokyo 105-6116, Japan  
Phone: 81-3-3435-2132  
Fax: 81-3-3432-4759  
URL: <http://www.khi.co.jp>

Printed on recycled paper.

#### ● A NETWORK SPANNING THE U.S., EUROPE, KOREA, CHINA AND JAPAN

Long before KPM came into existence in October 2002, Kawasaki embarked on the globalization of its network, which has now become one of KPM's most significant competitive advantages.

The global expansion began in December 1993, when Kawasaki acquired a production base for Staffa motors in Plymouth, U.K., from Vickers, Inc., which was then a subsidiary of Trinova Corp. After KPM transferred its production of the motors from Japan to the new base, it established Kawasaki Precision Machinery (U.K.) Ltd. to serve as a production, sales and servicing center for Kawasaki's hydraulic products in Europe. Just one month later, Kawasaki Precision Machinery of America, now Kawasaki Precision Machinery (U.S.A.), Inc., was established to manufacture, sell and service Kawasaki's hydraulic products in the U.S.

Currently, KPM (U.K.) provides knock-down hydraulic equipment for excavators to European construction machinery manufacturers such as Caterpillar (Cat), JC Bamford Excavators Ltd. (JCB), Volvo Construction Equipment and New Holland Kobelco (NHK)-Keskus Oy. It works closely with these companies, often joining new model development projects in the early stages.

KPM (U.S.A.), on the other hand, is focusing on the construction, forestry and oil equipment industries, with sales of hydraulic equipment for machinery including excavators, backhoe loaders, skid-steer loaders, log loaders, skidders and drilling motors for oil wells.



Clean room for pump assembly in KPM (U.K.)

With its bases in the U.K. and the U.S.A., and its main factory in Kobe as the hub, KPM has established a tripolar production and marketing structure. The sales of Kawasaki-brand hydraulic machinery for construction equipment account for 55% of total sales at KPM (U.K.) and 80% at KPM (U.S.A.). Sales of Staffa motors, the most popular radial piston motors, are still strong, led by solid demand for winches and injection-molding machines. KPM (U.K.) exports them to 33 countries, including Japan.

In Korea, KPM concluded a service agreement with Flutek Ltd. for KPM's hydraulic machinery in June 2000, followed by the licensing of production of its K3V hydraulic pump the next year. KPM acquired majority ownership of Flutek in April 2003, making it a sales and service subsidiary for hydraulic equipment. In 2005, Flutek built a new plant for electro-hydraulic steering gears for ships. KPM (China) was established in Suzhou and began operations in July 2006 to produce, sell and service Kawasaki hydraulic equipment for local construction machinery manufacturers.

With the tripolar structure, the acquisition of Flutek and the establishment of KPM (China), KPM can now effectively serve global customers and further enhance customer satisfaction by paying closer attention to their needs and providing superior technology and cutting-edge products in a more timely manner. KPM's main factory in Japan is the center for new product and technology development, as well as for advanced production technologies, and works to optimize global production.



Korean subsidiary Flutek's hydraulic pump factory



KPM (China)

#### ● STRONG DEMAND PROPELLED BY CHINESE MARKET

After experiencing a business slowdown triggered by the Asian financial crisis and diminishing public works investment in Japan for four years, KPM saw a favorable upturn in 2002. This milestone was marked by rising demand in China for hydraulic excavators and other construction machinery on which KPM had been concentrating its development efforts, to be used for megaprojects such as the 2008 Beijing Olympic Games and 2010 Shanghai World Expo. In 2004, North American sales remained strong and offset the significant dip in China's construction machinery sales following the country's implementation of economic macro-control.

One factor that played a pivotal role in boosting hydraulic excavator sales was the exceptional quality of KPM products, made possible by its relentless efforts since 1968—when the business first took root in Kawasaki's hydraulic machinery department—to meet



Preshipment test run



KPM (U.S.A.)

manufacturers' demands for higher pressure, longer life models. The global Kawasaki brand gained wider recognition when excavators upgraded by Japanese construction machinery manufacturers earned worldwide reknown.

Product developments for overseas markets are also actively pursued at KPM. Hydraulic pumps and valves for load-sensing systems are one target. The systems are popular in the U.S. and Europe for their ability to stabilize the speed of hydraulic machinery even when loads fluctuate, which is done by sensing the load pressure and delivering the required amount of fluid from the pumps. KPM is working on lowering noise and increasing the variety of control systems available to meet specific requirements overseas.

KPM's strategy for global growth is to master local requirements so that it can offer products that cater to the local needs of all its customers.

● **CUTTING-EDGE TECHNOLOGICAL DEVELOPMENT SYSTEM**

The history of Kawasaki's hydraulic business is one of technological development. Constant improvements and new product developments are required to keep pace with client upgrades, especially for hydraulic excavators, and to increase brand recognition. When a hydraulic excavator engine is improved to meet stricter emissions standards, for example, installation space may decrease and KPM must then develop a shorter pump to conform to the space-saving design. Other challenges include raising fuel efficiency and reducing pressure loss, as well as lowering noise to make the exca-

vators more eco-friendly.

The call for low-noise designs is not limited to hydraulic excavators. Supported by the Technical Institute of Kawasaki's Corporate Technology Division, KPM has made noise reduction the company's highest priority. While pursuing noise reductions in its overall hydraulic systems and deploying state-of-the-art electro-hydraulic control technology, KPM has commercialized the Kawasaki Eco Servo electro-hydraulic hybrid system. Because the electric motors and hydraulic pumps run only when needed, both noise reduction and energy savings are achieved.

Since the debut of its electro-hydraulic rotary servo regulator (ROTAS) for industrial machinery in 1967, Kawasaki has been enhancing electro-hydraulic control technology by refining fluid power and control technologies, which now differentiates the Company from



Repair and conversion of KPM products at National Service Center of KPM (U.S.A.)

others in the industry.

KPM has also been developing advanced control technology in cooperation with the System Technology Development Center of Kawasaki's Corporate Technology Division. Commercialized products include a variety of electronic controllers for sophisticated hydraulic systems used in machinery for steelmaking plants and press machines.

Leveraging its expertise in electro-control technology and hydraulic machinery production, KPM is branching out into non-hydraulic products as well. One such example is a camera stabilizer for monitoring unidentified ships, which KPM refined using the spatial stabilizing technology it developed for compact observation helicopters. The product has been commercialized already and is now being further downsized for wider application.

A ventilation system used in the Shinkansen bullet train is based on a servo motor and advanced electro-control technology developed jointly with the System Technology Development Center.

Gas is another "fluid power." KPM is deploying high-pressure gas control technology that it developed to create control valves for vehicles powered by compressed natural gas, as part of its efforts to lower the environmental burden.

KPM acquired certification for ISO 9001 quality standards and ISO 14001 environmental standards in 1994 and 1998, respectively. As cited in its company management philosophy, KPM's goal is to be a truly global company and to pursue sustainable business development through the provision of products and engineering services that satisfy its customers around the world.

**KPM in Japan:**

**Leading Global Growth with Diverse Products and Advanced Factories**

Boasting floor space of 68,000 m<sup>2</sup> and highly advanced facilities, KPM's main factory is located on a vast 175,000 m<sup>2</sup> plot in Kobe. It is one of the largest and most sophisticated factories in the industry in Japan. Its product lineup is diverse, ranging from such hydraulic equipment as pumps, motors and control valves, to hydraulic units for industrial machinery and plants, hydraulic marine deck equipment, electro-hydraulic steering gears, hydraulic fishing machinery, and other equipment that uses precision machinery and electronic control technologies.



A pilot valve for hydraulic shovels

KPM holds large market shares in all its product categories. About 60 to 70 percent of products are for construction machinery, of which 70 percent is for hydraulic excavators. With the exception of track motors and some other products, KPM maintains market shares

above 50% in Japan for all the components comprising hydraulic excavators: powerful pumps, motors, multiple control valves and pilot valves.

High durability and reliability are necessary for hydraulic excavators to perform heavy-duty jobs. KPM's leading market shares and greatly reduced downtime attest to the superior performance and quality of its products, high enough to satisfy the most demanding customers. In the Chinese market, utilizing its business partnership with KYB Corp., a market leader in hydraulic cylinders

and track motors, KPM is increasing its presence by offering total hydraulic equipment packages.

**PRODUCTIVITY TRIPLED WITH INNOVATIVE CELL PRODUCTION SYSTEM**

To meet rising demand, KPM renovated its factories, resulting in improved production capacity and efficiency. Old equipment and facilities were replaced and production flow was enhanced by improving the layout. On one unusual control valve production line, nine machining centers

have since been working around the clock with the help of an automated parts-feeding system.

The cell production system also plays a crucial role in raising efficiency. As an industry front-runner, KPM introduced a cell production system in December 2004 to assemble large hydraulic pumps for large hydraulic excavators.

One cell comprises a numerically controlled (NC) part-turnover attachment, NC nutrunners and preset parts unit. One worker can complete an entire unit by watching step-by-step instructions on an LCD monitor. The digital manual explains which parts and tools to use, thus completely eliminating human error. As a result, one unit can now be assembled in 15 minutes, one-third the time required on a conventional production line.

Over the past nine decades, KPM has built an expertise in the hydraulic equipment sector that is enabling it to expand into new fields. These include camera stabilizers that can provide clearer images from helicopter-mounted cameras with ultra-zoom lenses, and high-pres-



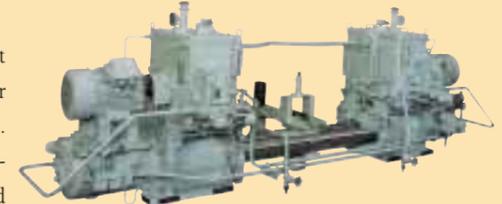
KPM's main factory is located near Akashi City where the Japan Standard Time meridian passes through at 135° E



An FMS contributes to enhanced productivity

sure hydrogen gas valves that can provide a stable supply of 1 MPa hydrogen gas from a 70 MPa high-pressure cylinder.

KPM is currently considering further expansions of its main factory to improve productivity, capacity and quality. KPM's dynamic workforce looks forward to embarking on this latest endeavor.



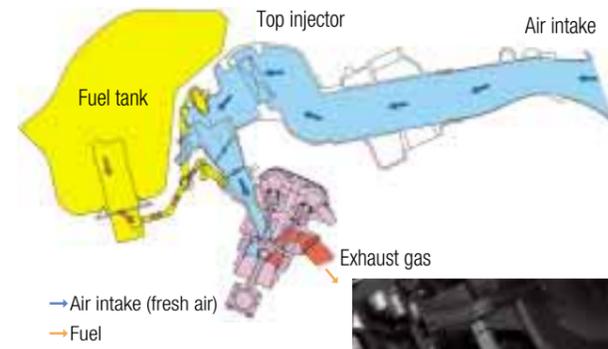
An electro-hydraulic marine steering gear is ready to be shipped



1 Cell production for the assembly of large hydraulic pumps. An LCD monitor on the left displays the step-by-step procedure. 2 A hydraulic pump undergoes a 30-min. preshipment test run, which is conducted on all products. 3 Products are also assembled on production lines. 4 Leak tests using helium gas are conducted on all control valves. 5 Dexterity contributes to efficient assembling of pilot valves.



# Behind the Ultrahigh Performance of the New Ninja ZX-6R



## Completely redesigning the mechanics and appearance of the Ninja Series—Kawasaki's legendary supersport motorcycles

The new midclass model for 2005, the Ninja ZX-6R, represents a peerless leveraging of the cutting-edge technologies deployed in the ZX-RR MotoGP racers and ZX-10R.

The ZX-6R is equipped with oval-shaped subthrottle valves, a first for a commercial motorcycle, and a new 636 cm<sup>3</sup> engine that utilizes dual injectors for higher intake efficiency. The motorcycle features a complete body redesign and achieves ultrahigh performance. Additional features, such as turn-signal lamps integrated into the front cowl and an underseat muffler, contribute to a compact, dynamic model with stunning aerodynamic efficiency.

With its extraordinary performance on both racing circuits and public roads, it's no wonder the Ninja ZX-6R is a popular choice among motorcyclists the world over.

### SPECIFICATIONS

- **Engine type:** 4-stroke, liquid-cooled, DOHC, 4-valve cylinder head, transverse in-line 4-cylinder
  - **Displacement:** 636 cm<sup>3</sup>
  - **Fuel injection:** digital fuel injection (dual injectors)
  - **Max. power:** 95.5 kW (130 ps)/14,000 rpm
  - **Max. power (Ram Air):** 100 kW (136 ps)/14,000 rpm
  - **Max. torque:** 70.5 N•m (7.1 kgf•m)/11,500 rpm
  - **Dry weight:** 164 kg
  - **Fuel tank capacity:** 17 liters
  - **Length:** 2,065 mm
  - **Width:** 715 mm
  - **Height:** 1,110 mm
- (Export model specifications)



● **Underseat muffler**  
This state-of-the-art design contributes to compact, dynamic styling.



● **Exhaust valve**  
An exhaust valve integral with the muffler optimizes exhaust pulses in the exhaust system, improving low- to midrange engine performance. It is especially effective going uphill.



● **GP-style swingarm**  
Cast, pressed and extrusion molded materials are used to achieve higher rigidity.



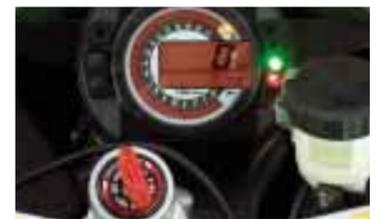
● **Back-torque limiter**  
Rear-wheel hop that may occur when aggressively downshifting at high rpm's can make cornering difficult. During hard braking, the back-torque limiter reduces the clutch capacity, allowing the clutch to slip a little to prevent rear-wheel hop. Kawasaki was the first to adopt this technology in a mass-produced consumer model.



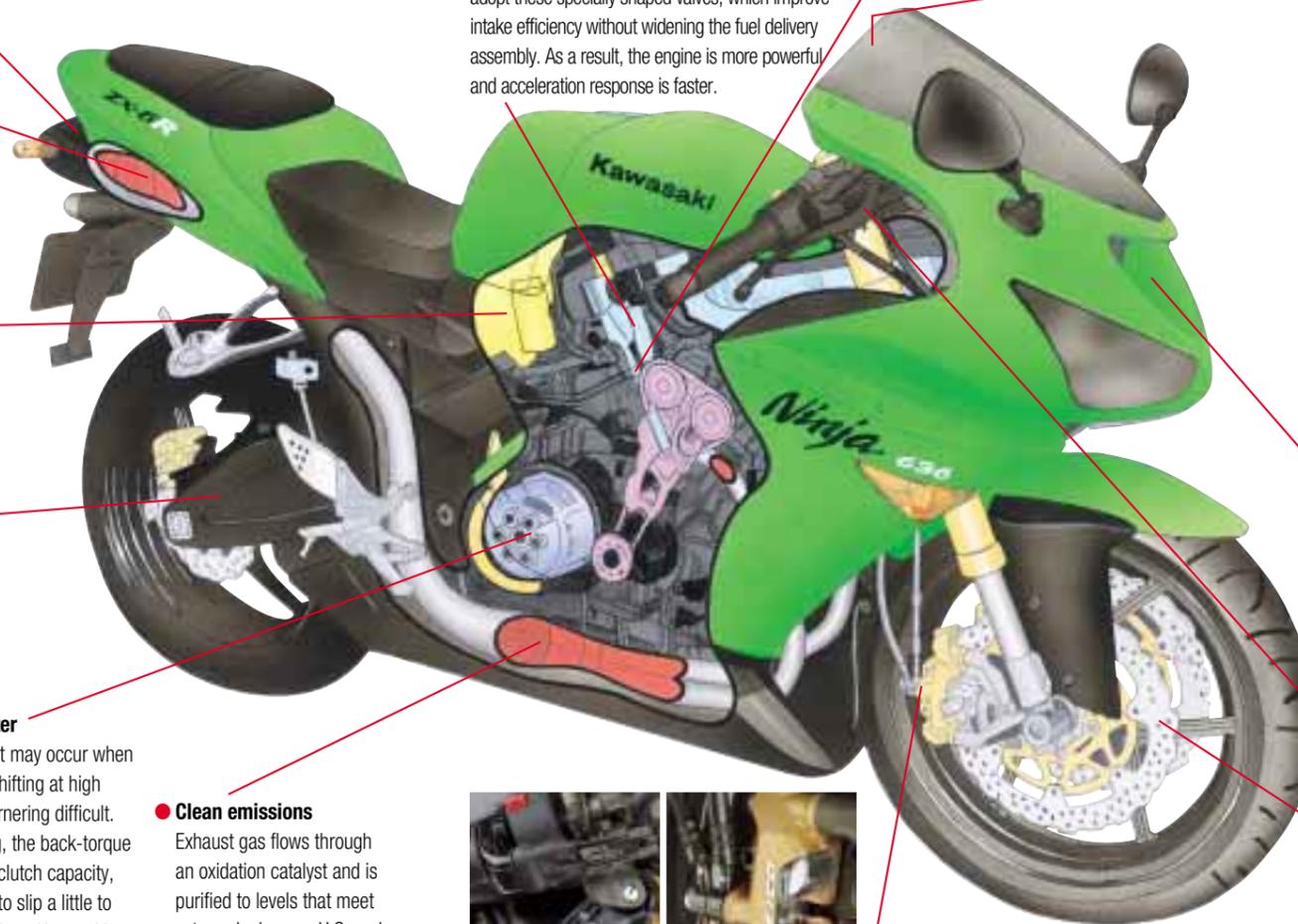
● **Oval-shaped subthrottle valves**  
Kawasaki is the only motorcycle manufacturer to adopt these specially shaped valves, which improve intake efficiency without widening the fuel delivery assembly. As a result, the engine is more powerful and acceleration response is faster.



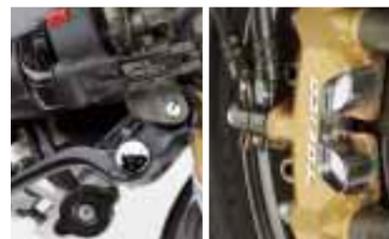
● **Dual injection (fuel injection)**  
The high-performance digital fuel injection system employs two injectors per cylinder. The secondary injectors (positioned upstream) contribute to a feeling of more intense power in the high rpm range.



● **Instrument panel**  
The Ninja ZX-6R's instrument panel features a highly legible bar-type LCD tachometer and a digital LCD speedometer.



● **Aerodynamic bodywork**  
The Ninja ZX-6R is a product of the relentless pursuit of functional beauty. From its front fender to its under-seat muffler, all its bodywork has been fashioned to create a streamlined, stylish profile. Aerodynamics have also been thoroughly enhanced in the pursuit of speed. Even the turn-signal lamps are integrated into the front cowl. As a result, the Ninja ZX-6R has the best C<sub>dA</sub> (coefficient of aerodynamic drag) value of any Ninja model. The motorcycle now requires 10 ps less power than the previous model to achieve a top speed of 268 km/h (and also boasts better gas mileage).



● **Brakes**  
The Ninja ZX-6R was the first in its class to be equipped with powerful, petal-style disc brakes. These also contribute to a lighter bike.

● **Ram Air system**  
This system provides high-pressure air to the engine. Entering through the inlet on the front cowl, it first passes through ducting and an air filter that prevents the ingress of rainwater and other impurities.

● **Radial piston master cylinder**

● **Petal-style disc**

## First Full Turnkey Order for LNG Terminal

In February, Kawasaki received its first full turnkey order for an LNG terminal in Sakaide, Kagawa Prefecture. The order is from Sakaide LNG Co., Inc., a joint venture of Shikoku Electric Power Co., Inc. (70%), Cosmo Oil Co., Ltd. (20%) and Shikoku Gas Co., Ltd. (10%). Kawasaki is responsible for the engineering, procurement and construction of LNG receiving/regasification/gas shipping facilities, as well as for the

mechanical, civil and electrical work on an aboveground, prestressed concrete (PC) storage tank with a capacity of 180,000 m<sup>3</sup>.

The new LNG terminal, which will begin operations in 2010, will receive, store, gasify and ship out LNG, as well as supplying gas to Shikoku Electric Power's Sakaide Power Plant.

Since the delivery of its first underground LNG tank in 1982 and an above-

ground tank in 1983, Kawasaki has built every type of LNG tank in Japan, including full/double/single containment tanks, in-pit tanks, membrane inground and underground tanks. In Korea, Kawasaki has worked on aboveground and inground LNG tank construction projects. To date, 26 LNG tanks worldwide have been completed and are operating successfully. ::

## Large Flue Gas Desulphurization Systems Delivered to China

Kawasaki Plant Systems, Ltd. (K Plant) has recently delivered two large flue gas desulphurization systems to Hebei Guohua Dingzhou Power Plant in Dingzhou, Hebei Province, China.

The two units comprise one of the largest flue gas desulphurization systems to be introduced in China. They will be installed with two 600,000 kW coal-fired power generation systems. Built to cope with rising power

demand in Hebei, the plant is considering a further expansion to a total power generation capacity of 2.4 million kW.

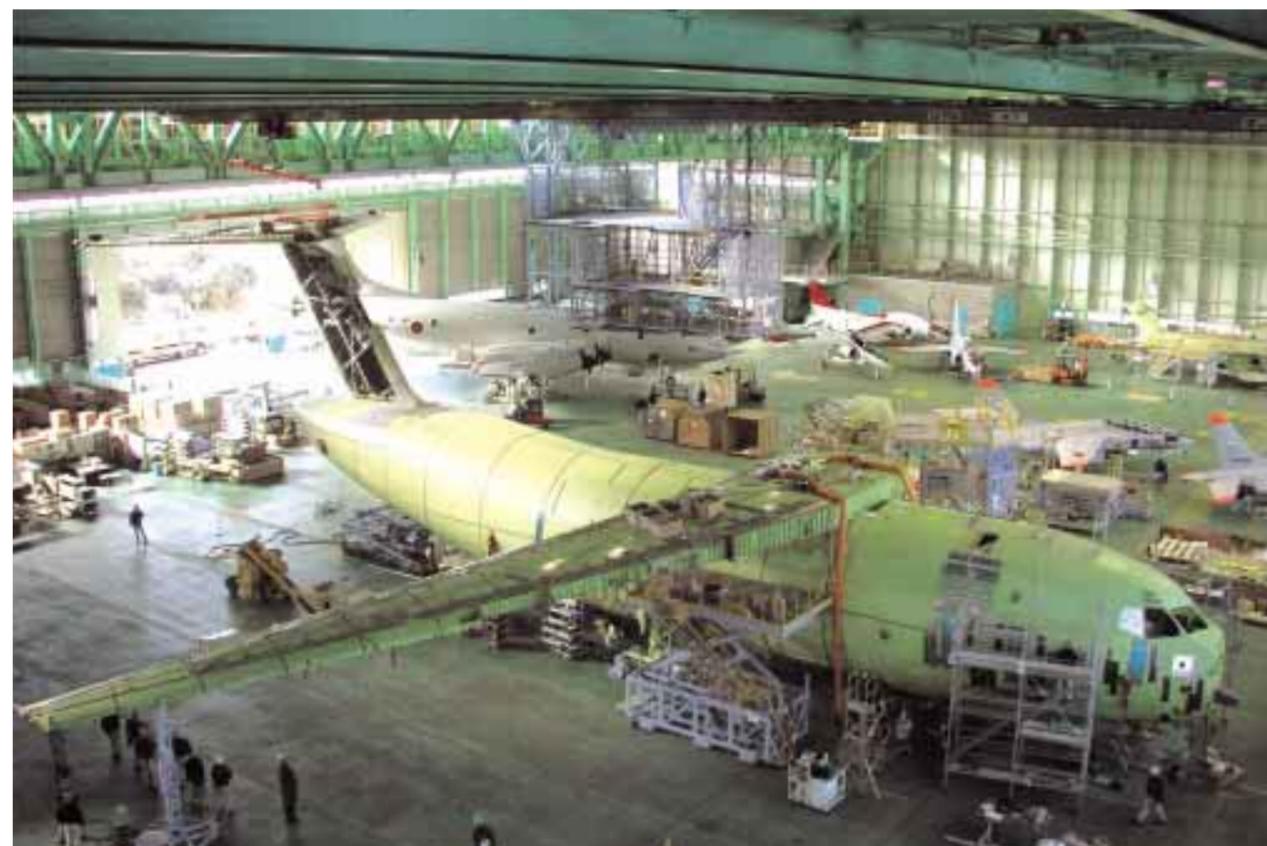
For this project, K Plant executed the basic and process engineering, supplied the main equipment, installed an absorber, supervised commissioning and trained operators. Using Kawasaki's proprietary wet limestone-gypsum process with a spray tower absorber, which is the world's most popular

flue gas desulphurization process, the system provides easy maintenance and stable operations.

Kawasaki has delivered six units of the flue gas system to China, starting with the 1995 delivery of a simplified version to the Nanning Chemical Industrial Group in the Guangxi Zhuang Autonomous Region. It is currently providing technical assistance on eight units under construction. ::



## C-X Static Test Plane Delivered to Japan Defense Agency



In March, Kawasaki delivered the #01 test aircraft of the C-X, which will be used for full-scale static tests, to the Japan Defense Agency's (JDA) Technical Research and Development Institute (TRDI).

In December 2005, the test plane of this next-generation transport aircraft was transferred from Kawasaki's Gifu Works to the

strength test center of the Japan Air Self-Defense Force Gifu Air Base for assembly. Now delivered to TRDI, a variety of tests will be conducted by JDA using load frames, load actuators and measuring instruments.

In fiscal 2001, ended March 31, 2002, the JDA began concurrently developing the P-X fixed-wing patrol aircraft and the C-X

transport aircraft to put them into operation in fiscal 2007. In November 2001, Kawasaki earned prime contractor status to develop these planes with airframe manufacturers and other participating companies. Currently, the Company is assembling the P-X #01 test plane for static tests and the P-X #1 and C-X #1 test planes for flight tests. ::

## Gas Turbine Generators Ordered for New York City

Kawasaki received an order for two 7,000 kW-class gas turbine generator sets from Cummins Power Generation, a division of leading U.S. engine manufacturer Cummins Inc., in January.

The GPB70D power generators will be installed at the Manhattan Pump Station as part of an upgrade of the aging station being conducted by the New York City Department of Environmental Protection. The largest sewage pump station in the city

has operated since the early 1960s, pumping sewage from southern Manhattan to the Newtown Creek Water Pollution Control Plant across the East River in Brooklyn. The gas turbines are to be used mainly as standbys in case of blackouts. Using light oil as fuel and dry low emission (DLE) technology, the generators feature low NOx emissions.

The order marks the first through Cummins since Kawasaki's U.S. sales affiliate, Kawasaki Gas Turbines-Americas (KGT-A),

and Cummins Power Generation signed an agreement in December 2002 for Cummins to sell Kawasaki gas turbines. The delivery will be made by KGT-A to Cummins, which received the order for the pump station's emergency power generation facilities from a local construction firm, Silverite Construction Company, Inc. The delivery and startup of the generators are scheduled for November 2007 and late 2008, respectively. ::

## Trains for Hong Kong's Kowloon-Canton Railways Corporation

In cooperation with Itochu Corporation and The Kinki Sharyo Co., Ltd., Kawasaki recently won an 8 billion yen contract from Kowloon-Canton Railways Corporation (KCRC) for 34 train cars to go on the Hong Kong West Rail and new line. Deliveries are scheduled to begin at the end of September 2007.

The cars will go on the West Rail and the 4 km long new line, the Kowloon Southern Link, which connects East Tsim Sha Tsui Station on the East Rail and Nam Cheong Station on the West Rail. The new train connection in the Kowloon district, scheduled for completion in 2009, is expected to greatly enhance passenger convenience. The order includes four new sets of trains with seven cars, two sets of three middle cars to support an expected increase in passenger volume on the new line, and modification work on existing West Rail cars

that will go into operation on the new line.

Since receiving the first order for 250 train cars from KCRC in 1999, the three-company consortium has supplied 322 train

cars to date. The 34 cars in the latest order are the same model as the stainless steel cars previously delivered, featuring quiet operation and passenger comfort. ::



## Methane Fermentation Facility for Biomass Resources

Kawasaki recently received an order from Suzu City, Ishikawa Prefecture, for a methane fermentation facility for biomass resources. This is the first biomass utilization project jointly promoted by Japan's Ministry of Land, Infrastructure and Transport (MLIT) and the Ministry of the Environment, and is one of MLIT's designated projects to improve the nation's sewage systems.

The facility, to be built in the Suzu City

Sewage Treatment Plant, consists of systems for biomass receiving and pretreatment, sludge concentration, methane fermentation, sludge dehydration, sludge drying and others. It is designed to treat 51.5 wet tons/day of mixed biomass resources: sewage sludge, human waste, kitchen waste and raw fish waste discharged from seafood processing. It will utilize the methane gas generated during treatment to heat and dry sewage sludge,

which will be used as an organic fertilizer by the city. The facility provides the waste recycling system in Suzu City.

Compared with conventional facilities, in which each biomass resource is treated individually, Kawasaki's mixed-resource fermentation facility achieves a significant reduction in lifecycle costs and guarantees stable operations without being affected by the quantity or quality of each biomass resource. ::

PERSONNEL CHANGES

On April 1, Executive Officer Shinichi Tamba succeeded Senior Vice President Shinichi Morita as President of the Consumer Products & Machinery Company.

Tamba was appointed Senior Vice President on June 27, after being elected as a Director at the Kawasaki General Shareholders' Meeting.

Morita became a Director on April 1, and on June 27 resigned that position to become an Advisor.

Shinichi Tamba  
President, Consumer Products & Machinery Company



## Kawasaki Good Times World Opens



A new museum showcasing Kawasaki's pioneering technology and history, and allowing visitors to experience some of the products, opened in May at the Kobe Maritime Museum in Kobe.

With a floor area of 1,998 m<sup>2</sup>, Kawasaki Good Times World is divided into three zones, three areas and a range of special exhibits to fully demonstrate the Company's cutting-edge products and the technologies behind them, as well as its rich history. Here are the highlights:

- 1 **Meet the Founders Area:** This introduces Kawasaki founder Shozo Kawasaki and the first president, Kojiro Matsukata.
- 2 **History Area:** This area takes visitors through more than a century of the Kawasaki Heavy Industries Group's history—tracing its growth from a ship-building company into a comprehensive heavy industry leader—through photographs and models.
- 3 **Kawasaki World Theater:** Six large screens and impressive acoustics bring a vast array of Kawasaki products to life.
- 4 **Motorcycle Gallery:** This showcases vintage Kawasaki motorcycles, racing models and many others. Visitors can touch and climb on some of the motorcycles.
- 5 **Land Zone:** Visitors can explore the passenger area and cab space of the Series 0 Shinkansen. In the Model Train Area, they can operate HO-gauge model trains.
- 6 **Sea Zone:** A triple-screen audiovisual system in the Ship Theater shows a ship being built and launched at Kawasaki Shipbuilding Corporation's Kobe Shipyard. Visitors can try their skill at the exciting personal watercraft game.
- 7 **Air Zone:** Board a Kawasaki-Vertol KV-107II helicopter to see the cockpit and cabin area. Experience a takeoff and landing at Kobe Airport with a flight simulator.
- 8 **Environment and Safety Area:** View Kawasaki's innovative environmental and safety technologies, such as renewable energy sources and landmine detection and clearance systems.
- 9 **Performing Robot:** Industrial robots take on the challenge of the Rubik's Cube. ::



**Hours:** 10:00 am–5:00 pm (enter before 4:30 pm)  
Closed on Mondays (or the following day if Monday is a national holiday) and December 29–January 3

**Entrance fee:** Tickets for Kobe Maritime Museum include entrance to Kawasaki Good Times World  
Adults: 500 yen  
Elementary/junior high school students: 250 yen

**Note:** Tickets that include entrance to Kobe Port Tower and other discount arrangements are also available.

Contact Kobe Maritime Museum for further information.  
Tel.: 81-78-327-8983 Fax: 81-78-332-4739  
[www.khi.co.jp/kawasakiworld/](http://www.khi.co.jp/kawasakiworld/)

# Achieving Green Goals



*With one of the world's highest thermal efficiencies for 20,000 kW-class gas turbines, Kawasaki's L20A has found a wide range of applications in a variety of industries around the globe. These are the ultimate energy-efficient, eco-friendly Green gas turbines.*



The most advanced Kawasaki gas turbine, backed by nearly 30 years of development know-how, the L20A is a core element of power generation systems everywhere. Boasting the world's highest level of thermal efficiency for its class, extremely low NO<sub>x</sub> emissions and other eco-friendly features, the L20A, driven by proprietary technologies, is a popular choice for customers around the world. Kawasaki's industrial turbines now bear the name GREEN Gas Turbines—underscoring our commitment to raising energy efficiency and reducing environmental impact. Leveraging our wealth of technologies, we will continue to work toward building a sustainable society.

## **Kawasaki**

Kawasaki Heavy Industries, Ltd. <http://www.khi.co.jp>