

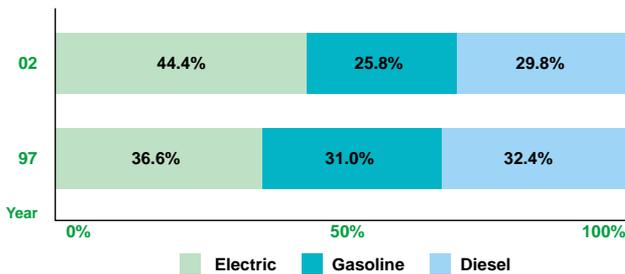
Environmentally Conscious Products

Toyota Industries is incorporating environmentally conscious designs in all of its products.

Environmentally Conscious Forklift Trucks

The forklift truck manufacturing industries has continued to witness growing demand for environmentally conscious forklift trucks and electric forklift trucks that produce less vibration, noise and exhaust gas emissions. Toyota Industries recently developed the new GENE0-E (7FBE outside Japan) forklift truck, as part of its best-selling GENE0 series (7 series) of forklift trucks. The GENE0-E forklift truck is a three-wheel, electric counterbalanced forklift that is designed to meet a wide range of needs. The GENE0-E was released in January 2003 and is equipped with the SAS-AC¹ system, a combined safety system, and an AC (alternating current) power system.

Domestic Forklift Truck Sales by Engine Type Data from the Japan Industrial Vehicles Association (JIVA)



Development of Low Emission^{*2} Diesel Engine

Diesel engines operate at a high thermal efficiency for better fuel efficiency, which makes them effective in preventing global warming. However, increasingly strict regulations are being placed on exhaust gas emissions from diesel engines, which has prompted Toyota Industries to place great emphasis on achieving regulatory compliance with exhaust gas emission standards as part of its development efforts for diesel engines.

Toyota Industries recently redesigned its 2Z direct injection diesel engine in order to comply with Japanese 2003 exhaust gas emission standards for forklift trucks and other special vehicles. The 2Z diesel engine is used in the company's GENE0 series (7 series outside Japan) of diesel forklift trucks, which are available in capacities ranging from 2.0 to 3.5 tons. The redesigned 2Z engine uses an improved injection pump that delivers optimal injection timing performance and secondary injection suppression, as well as an improved injection nozzle that offers fine misting performance. As a result of these changes, the redesigned 2Z diesel engine delivers reduced traces of NOx, total hydrocarbon (THC) and particulate matter (PM) emissions in exhaust gas emissions.



2Z Direct Injection Diesel Engine

In addition, Toyota Industries expanded its line of GENE0-B electric counterbalanced forklift trucks (7FB outside Japan) by adding 3.5-4.5 ton capacity units. The company also added a new 0.9 ton capacity unit to the GENE0-R series of electric reach trucks (7FBR outside Japan). All of the above models were released together in the Japanese market in December 2002.

Toyota Industries also enhanced its line of gas-powered forklift trucks by reducing exhaust gas emissions and adding versions that run on compressed natural gas (CNG). The CNG-powered forklift trucks help to reduce the CO₂ emissions that contribute to global warming, and have almost completely eliminated SO_x emissions, which can cause acid rain.



GENE0-B
Electric Counterbalanced
Forklift Truck
(7FB outside Japan)

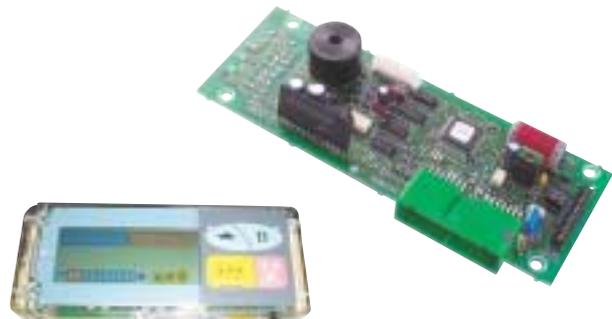


GENE0-E
Three-Wheel Electric
Counterbalanced
Forklift Truck
(7FBE outside Japan)

Lead-Free Circuit Boards

Lead contained in solder used in circuit boards has been noted for polluting the environment when it is not properly disposed of. Consequently, Toyota Industries is trying to switch to lead-free solder in its circuit boards for its industrial machinery, automobiles and textile machinery products.

When designing circuit boards with lead-free solder, Toyota Industries had to overcome various issues such as the high melting point of lead-free solder, which made it difficult to control soldering temperatures while ensuring that parts could stand the heat. However, Toyota Industries was successful in overcoming these issues and in January 2003 began producing lead-free circuit boards for use in the displays for one of its electric reach truck models.



Display with Lead-Free Circuit Board

^{*1} SAS-AC System of Active Stability and AC Power Control: A safety system that uses an electric-hydraulic control system to prevent operating errors and lateral tipping during rapid maneuvering.
^{*2} Low emission: Indicates exhaust gas emissions low in CO, NO_x and particulate matter (PM).

2 Environmental Conservation Activities

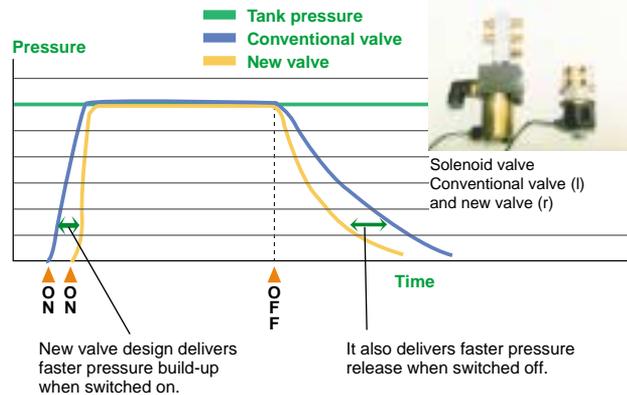
Energy Conservation

Textile machinery has a tendency to consume large amounts of energy during operation. When Toyota Industries set about developing an environmentally conscious air jet loom, the company had to reduce the consumption of air used to insert weft yarn. Toyota Industries was eventually successful in developing the new JAT710 Air Jet Loom, which boasts greater energy efficiency and 20% less air consumption. The new air jet loom was made possible by the company's development of a new air solenoid valve* that is smaller and offers faster pressure build-up and better release performance than its predecessors.



JAT710 Air Jet Loom

Pressure Characteristics of New Air Solenoid Valve



Subsidiary Spotlight

Tokyu Co., Ltd.

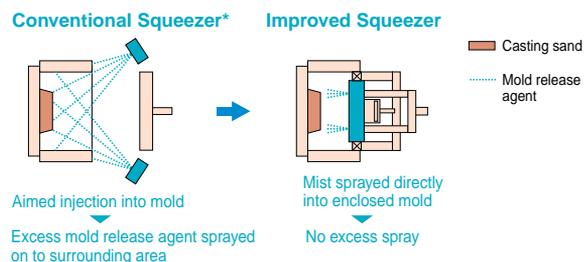
New Flaskless Molding Machine Consumes 20% Less Power and Is 10 dB Quieter than Conventional Machines

Tokyu Co., Ltd. develops and manufactures forging machinery. Since acquiring ISO 14001 certification in November 2001, Tokyu has been actively working to reduce the environmental impact of its manufacturing activities. In addition, the company has also taken steps to reduce the environmental impact of its products.

One area that Tokyu is involved in is the design and manufacturing of flaskless molding machines. In FY 2002, the company released the new AMF V flaskless

molding machine, which is 10 dB quieter and consumes 20% less power than conventional machines. The reduced power consumption was achieved by redesigning the sand feed system and using a new injection method for mold release agents. The latter change helped to reduce the power consumption in the hydraulic unit and the amount of air consumed by the machine. Noise reduction was achieved by decreasing the size of the hydraulic pump and by improving the air blow system.

Improved Injection Method for Mold Release Agents



*Squeezer: Device used to squeeze casting sand into mold



New AMF V Flaskless Molding Machine

Advanced Logistics Solutions Co., Ltd.

Subsidiary Specializes in Logistics Solutions that Combine Logistics Efficiency and Environmental Efficiency

In March 2002, Toyota Industries established a new subsidiary, Advanced Logistics Solutions Co., Ltd. (ALSO), which plans overall logistics operations (including distribution) and operates distribution centers. We aim to respond to increasing market needs for streamlined logistics by utilizing our longstanding experience in the production and sale of materials handling equipment, such as forklift trucks and automated storage and retrieval systems.

ALSO seeks to provide logistics solutions that are both logistically efficient and environmentally conscious. The company's expertise is rooted in the Toyota Production System, which was originally formulated by

Toyota Motor Corporation. ALSO applies these concepts to logistics operations to reduce overburden, waste, and unevenness existing in operations, and consequently helping preserve the environment.

ALSO currently manages both a parts distribution center for industrial vehicles that is located in Toyota Industries' Takahama Plant, and distribution centers for pharmaceutical products and convenience store products providing efficient logistics solutions. The company will seek further growth by providing optimized logistics solutions for a wide range of firms involved in manufacturing food, distribution, and other business areas.

*Solenoid valve: A direction control valve used to control the flow of air or hydraulic fluid. When a current is supplied to the internal magnetic coil, the valve is operated using magnetic force.