The GRENDiA – An Electronically Controlled Forklift Truck to Improve Working Environments and Reduce Operation Costs –

GENERAL MACHINERY & SPECIAL VEHICLE HEADQUARTERS
MATERIAL HANDLING EQUIPMENT BUSINESS DEPARTMENT

The GRENDiA from MHI is developed to (1) satisfy ever stricter customer demands for optimal environmental protection, (2) reduce the causes of hazardous accidents, and (3) reduce operation costs. The design improvements are made possible through a distributed arrangement of controllers and electronic control based on the on-vehicle LAN connection. The GRENDiA debuted in Japan and Asia in June 2003, then launched in the United States and Europe. The GRENDiA of today is still evolving, taking on new functions to meet the needs of customers.

1. Characteristics

(1) The electronically controlled engine of the GRENDiA attains the best environmental performance in its class. The GRENDiA runs in soft mode at limited engine power to meet the demands of customers who require improved fuel efficiency or reduced noise at night (because they run the machines night and day). The fuel efficiency of diesel-engine vehicles is improved by 12 to 13%. The vehicle noise of diesels is reduced by 3 dB(A) (compared with standard vehicles).

(2) The GRENDiA incorporates Mitsubishi's own mast/traveling interlock function (IPS: Integrated Presence System) as standard. The vehicle can also be equipped with a speed limiter for customers who want to improve safety in their factories and workplaces. The speed limiter improves workplace safety and reduces the incidence of accidents.

(3) Several mechanisms are built into the GRENDiA to improve operation costs. The vehicle can work in "limp home" mode to keep the engine speed at or below a certain value in order to prevent engine failures due to overheating. This protection is only available through electronic control. The vehicle also incorporates a TMS (Track Management System) to quantitatively grasp the operating time, traveling time, lifting time, etc. of a forklift truck. This function is especially useful, as it allows plant managers to plan vehicle assignments and other operations based the amounts and types of work. If and when a failure occurs, various error codes will display on the meter panel to minimize the machine downtime. The vehicle also has interfaces to allow service personnel to connect service tools to the vehicle controller, enabling accurate vehicle diagnosis.

2. Major specifications

Table 1 shows the major specifications of the product.

Table 1 Major specifications of GRENDiA

Model name			FD15	FG15	FD25	FG25	FD35A	FG35A
Loading capacity		(kg)	1500	1500	2500	2500	3500	3500
Dimensions	Overall length	(mm)	3180	3180	3625	3625	3860	3860
	Overall width	(mm)	1065	1065	1150	1150	1290	1290
	Overall height	(mm)	2065	2065	2070	2070	2105	2105
Performance	Max. traveling	(km/h)	19.0	19.0	19.0	19.0	19.0	19.0
	Lifting (loaded)	(mm/s)	600	560	640	590	430	430
Engine			Diesel engine	Electronically controlled gasoline engine	Diesel engine	Electronically controlled gasoline engine	Diesel engine	Electronically controlled gasoline engine
	Displacement	(cc)	2505	1486	3331	2065	3331	2488
	Rated output	(kW)	36	31	44	42	44	47