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State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-19-24

Relating to Certification of New Heavy-Duty Off-Road Equipment Engines

DAEWOO HEAVY INDUSTRIES, LTD.

Pursuant to the authority vested in the Air Resources Board by Sections 43000.5, 43013 and 43018 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-45-9;

IT IS ORDERED AND RESOLVED: That the following Daewoo Heavy Industries, Ltd., 1998 model-year engine, with rated power between 175 and 750 horsepower, and exhaust emission control systems are certified as described below for use in heavy-duty off-road equipment:

Typical Equipment Usage: Loader, Generator Set, and other Construction and Industrial Equipment

Fuel Type: Diesel

Engine Family	Liters (Cubic Inches)	Exhaust Emission Control Systems and Special Features
WDWXL11.1BIA (DE12TI)	11.1 (672)	Turbocharger Charge Air Cooler

Engine models and codes are listed on attachments. Production engines shall be in all material respects the same as those for which certification is granted.

The total hydrocarbons (THC), carbon monoxide (CO), oxides of nitrogen (NOx), and particulate matter (PM) certification exhaust emission standards, in grams per brake horsepower-hour (g/bhp-hr), and the opacity of smoke emission standards, in percent (%), during acceleration (Accel), lugging (Lug), and peak (Peak) modes, for this engine family are (Title 13, California Code of Regulations, Section 2423):

Exhaust Emissions (g/bhp-hr)				Smoke Opacity (%)		
THC	CO	NOx	PM	Accel	Lug	Peak
1.0	8.5	6.9	0.4	20	15	50

The THC, CO, NOx and PM exhaust emission certification values, in g/bhp-hr, and the opacity of smoke emission certification values, in percent (%), for this engine family are:

Exhaust Emission (g/bhp-hr)				Smoke Opacity (%)		
THC	CO	NOx	PM	Accel	Lug	Peak
0.1	0.5	5.5	0.1	3	3	4

BE IT FURTHER RESOLVED: That the listed engine models comply with the "Exhaust Emission Standards and Test Procedures--Heavy-Duty Off-Road Diesel Cycle Engines" (Title 13, California Code of Regulations, Section 2423) for the aforementioned model year.

BE IT FURTHER RESOLVED: That the listed engine models also comply with the "Emission Control Labels--1996 and Later Heavy-Duty Off-Road Diesel Cycle Engines" (Title 13, California Code of Regulations, Section 2424) for the aforementioned model year.

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the materials to demonstrate certification compliance with the Board's emission control system warranty provisions (Title 13, California Code of Regulations, Section 2425 et seq.).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

Executed at El Monte, California this 31st day of December 1998.

Raphael Susnowitz

for R. B. Summerfield, Chief
Mobile Source Operations Division

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U-R-19-21

LARGE ENGINE MODEL SUMMARY

Manufacturer: **Daewoo Heavy Industries, Ltd** Process Code: **New Submission**

EPA Engine Family: **WDWXL11.1BIA** Manufacturer Family Name: **DE12TI**

Engine Code	Engine Model	BHP@RPM (SAE Gross)	Fuel Rate: mm/stroke @ peak HP (for diesel only)	Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	Torque @ RPM (SEA Gross)	Fuel Rate: mm/stroke@peak torque	Fuel Rate: (lbs/hr)@peak torque	Emission Control Device Per SAE J1930
n/a	DE12TI ICA	335.5 @ 2100	169 +/-5cu.mm	116 lb/hr	978.3 @ 1260	184 +/- 5cu,mm	76 lb/hr	TC & CAC
n/a	DE12TI ILA	301.0 @ 2100	156 +/-5cu.mm	106 lb/hr	833.3 @ 1400	165 +/- 5cu,mm	74 lb/hr	TC & CAC
n/a	DE12TI IEB	287.2 @ 2000	153 +/-5cu.mm	100 lb/hr	826.1 @ 1400	159 +/- 5cu,mm	72 lb/hr	TC & CAC