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State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-19-30-A
Relating to Certification of New Heavy-Duty Off-Road Equipment Engines

DAEWOO HEAVY INDUSTRIES CO., LTD.

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

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

IT IS ORDERED AND RESOLVED: That the following diesel engines and exhaust emission control systems produced by the manufacturer are certified as described below for use in heavy-duty off-road equipment:

Model Year: 2000

Typical Equipment Usage: Loader and Generator Set

Engine Power Ratings Range: 175 – 750 horsepower, inclusive

Fuel Type: Diesel

| <u>Engine Family</u> | <u>Displacement</u> | | <u>Exhaust Emission Control Systems and Special Features</u> |
|----------------------------------|---------------------|---------------------|--|
| | <u>Liters</u> | <u>Cubic Inches</u> | |
| YDWXL08.1APA (D1146TI/D1146T) | 8.1 | 494 | Turbocharger Charge Air Cooler (Model D1146TI only) |

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

| | <u>Exhaust Emissions (g/hp-h)</u> | | | | <u>Smoke Opacity (%)</u> | | |
|---------------|-----------------------------------|-----------|------------|-----------|--------------------------|------------|-------------|
| | <u>THC</u> | <u>CO</u> | <u>NOx</u> | <u>PM</u> | <u>Accel</u> | <u>Lug</u> | <u>Peak</u> |
| Standard | 1.0 | 8.5 | 6.9 | 0.4 | 20 | 15 | 50 |
| Certification | 0.3 | 1.2 | 5.4 | 0.3 | 10 | 5 | 20 |

BE IT FURTHER RESOLVED: That the engine models listed on the attachments with engine power ratings less than 175 horsepower are not covered by this Executive Order.

BE IT FURTHER RESOLVED: That the listed engine models comply with "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 "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, Sections 2425 *et seq.*).

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

Executed at El Monte, California this 13th day of July 2000.



R. B. Summerfield, Chief
Mobile Source Operations Division

Engine Model Summary Form

U-R-14-30, 1-

Manufacturer: Daewoo Heavy Industries Co. Ltd
Engine category: Nonroad CI
EPA Engine Family: YDWXL08.1APA
Mfr Family Name: D1146TI / D1146T
Process Code: New Submission

Attachment (models above 175HP only)

| 1. Engine Code | 2. Engine Model | 3. BHP@RPM (SAE Gross) | 4. Fuel Rate: mm/stroke @ peak HP (for diesel only) | 5. Fuel Rate: (lbs/hr) @ peak HP (for diesels only) | 6. Torque @ RPM (SEA Gross) | 7. Fuel Rate: mm/stroke@peak torque | 8. Fuel Rate: (lbs/hr)@peak torque | 9. Emission Control Device Per SAE J1930 |
|----------------|-----------------|---------------------------|---|---|--------------------------------|---|---------------------------------------|---|
| D1146TIPEA | | 200.3@1900 | 120.3 | 74.2 | 608.9@1400 | 126.8 | 57.6 | TC & CAC |
| D1146TDPI | | 187.5@2200 | 110.5 | 80.4 | 549.2@1400 | 116 | 53.7 | TC |
| D1146TDLA | | 172.0@2200 | 93.0 | 67 | 511.6@1300 | 102 | 43.5 | TC |
| D1146TDGA | | 184.5@1800 | 110.1 | 65.3 | N/A | N/A | N/A | TC |
| D1146TDGA | | 167.8@1800 | 104.3 | 61.9 | N/A | N/A | N/A | TC |
| D1146TDGA | | 145.1@1500 | 104.8 | 51.8 | N/A | N/A | N/A | TC |
| D1146TDGA | | 139.1@1500 | 100.0 | 49.4 | N/A | N/A | N/A | TC |
| D1146TDOA | | 184.5@1800 | 110.1 | 65.3 | N/A | N/A | N/A | TC |
| D1146TDOA | | 167.8@1800 | 104.3 | 61.9 | N/A | N/A | N/A | TC |
| D1146TDOA | | 145.1@1800 | 104.8 | 51.8 | N/A | N/A | N/A | TC |
| D1146TDOA | | 139.1@1500 | 100.0 | 49.4 | N/A | N/A | N/A | TC |

EPA Cert DWX - NR6 - 00-09