

DAEWOO HEAVY INDUSTRIES & MACHINERY LTD.

EXECUTIVE ORDER U-R-019-0084 New Off-Road Compression-Ignition Engines

Pursuant to the authority vested in the Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 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-02-003;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engines and emission control system produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

| MODEL YEAR | ENGINE FAMILY | DISPLACEMENT (liters) | FUEL TYPE | USEFUL LIFE (hours) |
|---------------|---------------------------|-----------------------|--------------------------------|-------------------------|
| 2005 | 5DWXL05.8COA | 5.8 | Diesel | 8000 |
| SPECIAL | FEATURES & EMISSION | CONTROL SYSTEMS | TYPICAL EQUIPMENT | APPLICATION |
| Direct Die | sel Injection, Turbocharg | er, Charge Air Cooler | Loaders, Compressor, Generator | Set, Other OEM Products |

The engine models and codes are attached.

The following are the exhaust certification standards (STD) and certification levels (CERT) for hydrocarbon (HC), oxides of nitrogen (NOx), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kW-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

| RATED | EMISSION | | | E | XHAUST (g/kW- | hr) | | OF | ACITY (% | •) |
|----------------|----------------------|------|-----|-----|---------------|-----|------|---------|----------|------|
| POWER CLASS | STANDARD CATEGORY | | нс | NOx | NMHC+NOx | CO | 244 | ,0,CCEL | LUG | PEAK |
| 75 ≤ kW < 130 | Tier 2 | STD | N/A | N/A | 6.6 | 5.0 | 0.30 | 20 | 15 | 50 |
| | | CERT | | | 5.9 | 1.3 | 0.26 | 18 | 5 | 46 |

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

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

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

Annette Hebert, Chief

Mobile Source Operations Division

Engine Model S smary Form

Daewoo Heavy Industries & Machinery Ltd. turer:

ategory: Nonroad CI ine Farrity. 5DWXL05.8COA

ily Name: DB58TIS

New Submission Code:

Attachment 1 et 1 EDHWR-CH-COSH

| ine Code 2. Engine Model | Engine Model | 3.BHP@RPM (SAE Gross) | mm/stroke @ peak HP (for diesel only) | (lbs/hr) @ peak HP (for diesels only) | 6.Torque @ RPM (SEA Gross) | mm/stroke@peak torque | 8.Fuel Rate: (tbs/hr)@peak torque | 8.Fuel Rate: 9.Emission Control (bs/hr)@peak torque Device Per SAE J1930 |
|--------------------------|--------------------|--------------------------|--|--|-------------------------------|--------------------------|--------------------------------------|--|
| □ * | DB58TIS OEA | 170 @ 2000 | 92 | 61 | 507 @ 1400 | 100 | 46 | DDI, TC, CAC |
| | DB58TIS OEB | 155 @ 1950 | 85 | 55 | 457 @ 1400 | 88 | 41 | |
| ۵ | DB58TIS OEC | 161 @ 2200 | 86 | 63 | 471 @ 1600 | 93 | 49 | |
| Q | DB58TIS OED | 133 @ 2200 | 73 | | 399 @ 1600 | 80 | 42 | |
| Q | DB58TIS OÈE | 153 @ 2000 | 85 | 26 | 457 @ 1500 | 6 | 45 | |
| Q | JB58TIS OEF | 122 @ 1950 | 70 | 45 | 370 @ 1450 | 75 | 36 | |
| | DB58TIS OEG | 156 @ 2100 | 84 | 58 | 449 @ 1500 | 91 | 45 | |
| ۵ | DB58TIS OLA | 163 @ 2200 | 88 | | 533 @ 1400 | 103 | 48 | |
| Ω | DB58TIS OLB | 143 @ 2200 | 77 | 56 | 464 @ 1600 | 92 | 49 | |
| Ω | DB58TIS OLC | 163 @ 2200 | 88 | 64 | 533 @ 1400 | 103 | 48 | ⊣ |