

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-7-63
Relating to Certification of New Off-Road Compression-Ignition Engines

DETROIT DIESEL CORPORATION

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-45-9; and

Pursuant to the December 15, 1998 Settlement Agreement between the Air Resources Board and Detroit Diesel Corporation and any modifications to the Settlement Agreement;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engine and emission control system produced by the manufacturer are certified as described below for use in off-road equipment:

Model Year: 2001

Typical Equipment Usage: Pump and Compressor

Fuel Type: Diesel

| | | | |
|-------------------------------|------------------------|----------------|---|
| | Engine | | |
| | Displacement | Useful Life | Emission Control Systems |
| <u>Engine Family</u> | <u>(liters)</u> | <u>(hours)</u> | <u>and Special Features</u> |
| 1DDXL31.8XRE (Series 2000) | 15.9, 23.9 and 31.8 | 8000 | Direct Diesel Injection Turbocharger Engine Control module 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 exhaust emission certification standards and certification values for hydrocarbons (HC), oxides of nitrogen (NOx), or non-methane hydrocarbons plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) (units are expressed in grams per kilowatt-hour (g/kw-hr)), 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):

| | | | | | | | | | | |
|-----------------------------|----------------------|------------------------------------|-----------|------------|-----------------|-----------|--------------------------|--------------|------------|-------------|
| Engine Power Rating (kw) | Emission Standard | <u>Exhaust Emissions (g/kw-hr)</u> | | | | | <u>Smoke Opacity (%)</u> | | | |
| | <u>Category</u> | | <u>HC</u> | <u>NOx</u> | <u>NMHC+NOx</u> | <u>CO</u> | <u>PM</u> | <u>Accel</u> | <u>Lug</u> | <u>Peak</u> |
| 560<KW | Tier 1 | Standard | 1.3 | 9.2 | N/A | 11.4 | 0.54 | 20 | 15 | 50 |
| | | Certification | 0.3 | 8.9 | -- | 0.8 | 0.08 | 10 | 2 | 17 |

BE IT FURTHER RESOLVED: That the listed engine models also comply with "Emission Control Labels— 1996 and Later Off-Road Compression-Ignition 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 and 2426).

BE IT FURTHER RESOLVED: That the aforementioned engine family has been conditionally certified subject to the following conditions:

1. The Settlement Agreement is in effect.
2. The manufacturer is in compliance with all applicable certification requirements of the Settlement Agreement.

Engines certified under this Executive Order must conform to all applicable California emission regulations and to all applicable terms and conditions of the Settlement Agreement.

Executed at El Monte, California this 14th day of February 2001.


R. B. Summerfield, Chief
Mobile Source Operations Division

ATTACHMENT

Engine Model Summary Form

Manufacturer: **Detroit Diesel Corporation**
 Engine category: **Nonroad CI**
 EPA Engine Family: **1DDXL31.8XRE**
 Mfr Family Name: **SERIES 2000**
 Process Code: **New Submission**

U-R-7-63

| 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 |
|---------------|----------------|--------------------------|--|--|-------------------------------|--|--------------------------------------|--|
| 1A-21 | 16V-2000 JWCC | 1050 @2100 | 196 | 365 | 3415 @ 1350 | 249 | 298 | EC TAW |
| 1A-18 | | 1050 @ 1800 | 219 | 350 | 3415 @ 1350 | 249 | 298 | EC TAW |
| 2A-GS | 16V-2000 JWCC | 1200 @ 1800 | 254 | 405 | NA - GENSET | NA | NA | EC TAW |
| 2A-GS-TL | | 1086 @ 1800 | 225 | 359 | NA - GENSET | NA | NA | EC TAW |
| 1B-21 | 12V-2000 JWCC | 760 @ 2100 <i>564 kW</i> | 194 | 271 | 2300 @ 1200 | 227 | 181 | EC TAW |
| 2B-GS | 12V-2000 JWCC | 910 @ 1800 | 269 | 322 | NA - GENSET | NA | NA | EC TAW |
| 2B-GS-TL | | 823 @ 1800 | 239 | 286 | NA - GENSET | NA | NA | EC TAW |

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Engine Model Summary Form

Manufacturer: **DETROIT DIESEL CORPORATION**

Engine category: **Nonroad CI**

EPA Engine Family: **1DDXL31.8XRE**

Mfr Family Name: **SERIES 2000**

Process Code: **Running Change**

Revised 1/10/01

| 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 |
|---------------|----------------|--------------------------|--|--|-------------------------------|--|--------------------------------------|--|
| 1AA-21 | 16V-2000 JWCC | 1050 @ 2100 | 205 | 382 | 3415 @ 1350 | 258 | 309 | EC TAW |
| 1AA-18 | | 1050 @ 1800 | 226 | 360 | 3415 @ 1350 | 258 | 309 | EC TAW |
| 1BB-GS | 16V-2000 JWCC | 1200 @ 1800 | 252 | 403 | NA - Genset | NA | NA | EC TAW |
| 1BB-GS-TL | | 1086 @ 1800 | 225 | 359 | NA - Genset | NA | NA | EC TAW |
| 1CC-21 | 16V-2000 SCCC | 1205 @ 2100 | 225 | 419 | 3918 @ 1350 | 283 | 339 | EC TAW |
| 1CC-18 | | 1205 @ 1800 | 256 | 408 | 3918 @ 1350 | 283 | 339 | EC TAW |
| 1DD-21 | 16V-2000 SCCC | 1340 @ 2100 | 244 | 454 | 4204 @ 1500 | 301 | 400 | EC TAW |
| 1EE-GS-1 | 16V-2000 SCCC | 1495 @ 1800 | 328 | 523 | NA - Genset | NA | NA | EC TAW |
| 1EE-GS-2 | | 1495 @ 1800 | 319 | 509 | NA - Genset | NA | NA | EC TAW |
| 1FF-GS | 16V-2000 SCCC | 1350 @ 1800 | 284 | 453 | NA - Genset | NA | NA | EC TAW |
| 1GG-GS-15 | 16V-2000 SCCC | 1200 @ 1500 | 298 | 397 | NA - Genset | NA | NA | EC TAW |
| 1GG-GS-18 | 16V-2000 SCCC | 1350 @ 1800 | 284 | 453 | NA - Genset | NA | NA | EC TAW |

Engine Model Summary Form

Manufacturer: **Detroit Diesel Corporation**

Engine category: **Nonroad CI**

EPA Engine Family: **1DDXL31.8XRE**

Mfr Family Name:

Process Code: **Running Change**

3/13/01

| 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 |
|---------------|----------------|--------------------------|--|--|-------------------------------|--|--------------------------------------|--|
| 1NN21 | 12V-2000 SCCC | 1110 @ 2100 | 289.8 | 404.8 | 3200 @ 1500 | 304.1 | 303.4 | EC TAW |
| 2NN21 | 12V-2000 SCCC | 1005 @ 2100 | 256.2 | 357.8 | 3100 @ 1350 | 295.8 | 265.6 | |
| 3NN21 | 12V-2000 SCCC | 905 @ 2100 | 232.6 | 324.9 | 2890 @ 1350 | 274.5 | 246.4 | |
| 3NN18 | | 905 @ 1800 | 252.0 | 301.7 | 2890 @ 1350 | 274.5 | 246.4 | |
| 4NN21 | 12V-2000 SCCC | 850 @ 2100 | 214.5 | 299.6 | 2715 @ 1350 | 259.8 | 233.2 | |
| 4NN18 | | 850 @ 1800 | 236.2 | 282.8 | 2715 @ 1350 | 259.8 | 233.2 | |
| 5NNGS | 12V-2000 SCCC | 1120 @ 1800 | 389.2 | 325.1 | NA | NA | NA | |
| 7NN21 | 12V-2000 JWCC | 760 @ 2100 | 197.7 | 276.1 | 2440 @ 1200 | 244.9 | 195.5 | |
| 7NN18 | | 760 @ 1800 | 215.1 | 257.5 | 2440 @ 1200 | 244.9 | 195.5 | |

ATTACHMENT

Engine Model Summary Form

Manufacturer: **Detroit Diesel Corpertation**
 Engine category: **Nonroad CI**
 EPA Engine Family: **1DDXL31.8XRE**
 Mfr Family Name: **SERIES 2000**
 Process Code: **New Submission**

V-R-7-63

Revised: 10-9-01

| 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 |
|---------------|----------------|--------------------------|--|--|-------------------------------|--|--------------------------------------|--|
| 1M-21 | 16V-2000 SCCC | 1205 @ 2100 | 227 | 423 | 3918 @ 1350 | 277 | 332 | EC TAW |
| 1A18 | | 1205 @ 1800 | 254 | 405 | 3918 @ 1350 | 277 | 332 | EC TAW |
| 2M-21 | 16V-2000 SCCC | 1340 @ 2100 | 252 | 469 | 4204 @ 1500 | 297 | 395 | EC TAW |
| 3M-GS-1 | 16V-2000 SCCC | 1495 @ 1800 | 315 | 503 | GENSET - NA | NA | NA | EC TAW |
| 3M-GS-2 | | 1495 @ 1800 | 323 | 516 | GENSET - NA | NA | NA | EC TAW |
| 4M-GS | 16V-2000 SCCC | 1350 @ 1800 | 279 | 445 | GENSET - NA | NA | NA | EC TAW |
| 1N-21 | 12V-2000 SCCC | 1110 @ 2100 | 282 | 394 | 3200 @ 1500 | 303 | 302 | EC TAW |
| 2N-21 | 12V-2000 SCCC | 1005 @ 2100 | 251 | 351 | 3100 @ 1350 | 297 | 267 | EC TAW |
| 3N-21 | 12V-2000 SCCC | 905 @ 2100 | 226 | 316 | 2890 @ 1350 | 274 | 246 | EC TAW |
| 3N-18 | | 905 @ 1800 | 250 | 299 | 2890 @ 1350 | 274 | 246 | EC TAW |
| 4N-21 | 12V-2000 SCCC | 850 @ 2100 | 210 | 293 | 2715 @ 1350 | 260 | 233 | EC TAW |
| 4N-18 | | 850 @ 1800 | 233 | 279 | 2715 @ 1350 | 260 | 233 | EC TAW |
| 5N-GS | 12V-2000 SCCC | 1120 @ 1800 | 318 | 381 | GENSET - NA | NA | NA | EC TAW |
| 6N-21 | 12V-S2000 SCCC | 1250 @ 2100 | 312 | 436 | 3424 @ 1500 | 318 | 317 | EC, TAW |
| 1P-GS | 8V-2000 SCCC | 765 @ 1800 | 325 | 259 | GENSET - NA | NA | NA | EC TAW |
| 5M-GS-15 | 16V-2000 SCCC | 1200 @ 1500 | 301 | 401 | GEN SET | NA | NA | EC TAW |
| 5M-GS-18 | | 1350 @ 1800 | 284 | 453 | GEN SET | NA | NA | EC TAW |