

File

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-1-1

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

CATERPILLAR, INC.

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 Caterpillar, Inc. 1996 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: Industrial Equipment, Track-type Tractor, Motor Grader

Fuel Type: Diesel

| <u>Engine Family</u> | <u>Liters (Cubic Inches)</u> | <u>Exhaust Emission Control Systems and Special Features</u> |
|----------------------|------------------------------|--|
| TCP10.RZDBRF | 10.5 (638) | Turbocharger Smoke Puff Limiter |

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), nitrogen oxides (NOx), and particulate matters (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):

| <u>Exhaust Emissions (g/bhp-hr)</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> |
| 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:

| <u>Engine Family</u> | <u>Exhaust Emission (g/bhp-hr)</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> |
| TCP10.RZDBRF | 0.4 | 0.8 | 5.7 | 0.1 | 13 | 1 | 33 |

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.

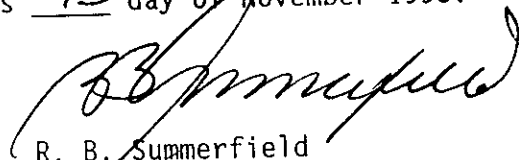
BE IT FURTHER RESOLVED: That the listed engine models also comply with the "Emission Control Labels--1996 and Later Heavy-Duty Off-Road Diesel Cycle Engines" (Title 13, California Code of Regulations, Section 2424) for the aforementioned model year.

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.

The Bureau of Automotive Repair will be notified by copy of this order and attachments.

Executed at El Monte, California this 13th day of November 1995.



R. B. Summerfield
Assistant Division Chief
Mobile Source Division

**1996 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET
HEAVY-DUTY OFF-ROAD DIESEL ENGINES**

Manufacturer Caterpillar Inc. Engine Family TCP10.RZDBRF
 Displacement 10.5 / 638 Liters/Cubic Inches Engine Configuration: I6
 All Codes in Eng. Family: CA 49S 50S XX Cert Test Procedures: ARB XX EPA XX
 Valves/Ports per Cylinder 2 valves/cyl. Strokes per Combustion Cycle: 4
 Maximum Rated Power: 225 HP (168 KW) @ 2000 RPM
 Ignition: Compression XX Compression with Glow Plug _____ Spark _____
 Fuel Type (s): Dedicated _____ Flex-Fuel _____ Dual-Fuel _____ Diesel XX M100 _____ M85 _____
 CNG _____ LNG _____ LPG _____ Other (specify) _____
 Diesel Cert Fuel: 40 CFR 86.1313-94 XX Other (specify) _____
 Primary Service Equipment: Industrial, Track-type Tractors, Motor Graders
 Exhaust ECS (e.g., MFI, TC, CAC): EM, DI, SPL, TC
 (Use abbreviations per SAE J1930 JUN93)

| Engine Model (Eng. Code) | Rated HP @ RPM | Fuel Rate @ Rated HP mm ³ /stroke (lbs/hr) | Fuel Pump & Injector Part No. | ECM/PCM Part No. | EGR Valve Part No. | PTOX / Catalytic Converter Part No. |
|-----------------------------|-------------------|--|-------------------------------------|---------------------|--------------------------|--|
| 3306 | 225 @ 2000 | MAX 134 (90.2) | 1312652/7W7038 | --- | --- | --- |
| | 200 @ 2100 | 116 (82.3) | 1312652/7W7038 | --- | --- | --- |
| | 175 @ 1800 | 104 (62.8) | 1312652/7W7038 | --- | --- | --- |
| | 164 @ 1900 | 98 (62.8) | 1312652/7W7038 | --- | --- | --- |
| | 150 @ 1800 | MIN 90 (54.2) | 1312652/7W7038 | --- | --- | --- |
| | (1) | | | | | |

(1) See the attached Section 13.01.02.00, Page No. 13.01.02.00 - TCP10.RZDBRF - 1, for a complete rating listing.

| | | | | | | | |
|-----------------|-----------|---------|--|--|--|--|--|
| ISSUE DATE | 16 JUN 95 | | | | | | |
| REVISION NUMBER | 1 | 2 | | | | | |
| REVISION DATE | 02NOV95 | 15OCT96 | | | | | |