| California Environmental Protection Agency AIR RESOURCES BOARD | QUANTUM TECHNOLOGIES, INC. | EXECUTIVE ORDER A-328-0038 New Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles |
|---|---|---|

Pursuant to the authority vested in the Air Resources Board by Health and Safety Code (HSC), Div. 26, Part 5, Chap. 2; and pursuant to the authority vested in the undersigned by HSC Sections 39515-39516 and Executive Order G-02-003;

**IT IS ORDERED AND RESOLVED:** That the following exhaust and evaporative emission control systems produced by the manufacturer are certified as described below. Production vehicles shall be in all material respects the same as those for which certification is granted.

| MODEL YEAR | TEST GROUP | VEHICLE TYPE (PC=passenger car; LDT=light-duty truck; MDV=medium-duty vehicle; LVW=loaded vehicle weight; ALVW=adjusted LVW) | EXHAUST EMISSION STANDARD CATEGORY (LEV=low emission vehicle; TLEV= transitional LEV; ULEV=ultra LEV; SULEV=super ULEV) | EXHAUST / EVAPORATIVE USEFUL LIFE (UL) (miles) | FUEL TYPE (CNG/LNG=compressed/ liquefied natural gas; LPG=liquefied petroleum gas) |
|---|---|---|---|---|---|
| 2004 | 4TJXT06.0188 | MDV: 5,751-8,500 pounds ALVW | ULEV | 120K / 120K | Dual Fuel CNG or Gasoline (Tier 2 Unleaded) |

| No. | EVAPORATIVE FAMILY (EVAF) | No. | SPECIAL FEATURES & EMISSION CONTROL SYSTEMS (ECS) | * = not applicable |
|---|---|---|---|---|
| 1 | 4TJXR0223841 | 1 | SFI, 2WUTWC, 2TWC, 2HO2S(2), OBD (F) | |
| 2 | * | 2 | * | |
| 3 | * | 3 | * | |
| 4 | * | 4 | * | |

OC/TWC=oxidizing/3-way cat. ADSTWC=adsorbing TWC WU= warm-up cat. O2S/HO2S=oxygen sensor/heated O2S AFS/HAFS=air-fuel ratio sensor/heated AFS EGR=exhaust gas recirculation AIR/PAIR=secondary air injection/pulsed AIR MFI/SFI= multiport fuel injection/sequential MFI TBI= throttle body injection TC/SC=turbo /super charger CAC=charge air cooler OBD (F) / (P)=full /partial on-board diagnostic prefix 2=parallel (2) suffix=series

| EVAF No. | ECS No. | ENGINE SIZE (L) | VEHICLE MAKES & MODELS | VEHICLES SUBJECT TO SFTP STANDARDS ARE UNDERLINED |
|---|---|---|---|---|
| 1 | 1 | 6.0 | Chevrolet: C2500 HD DUAL-FUEL SILVERADO 2WD, K2500 HD DUAL-FUEL SILVERADO 4WD; GMC: C2500 HD DUAL-FUEL SIERRA 2WD, K2500 HD DUAL-FUEL SIERRA 4WD | |
| * | * | * | * | |
| * | * | * | * | |
| * | * | * | * | |

ABBREVIATIONS: *

The exhaust and evaporative emission standards (STD) and certification emission levels (CERT) for the listed vehicles are as follows (compliance with the 50 °F testing requirement (for TLEV, LEV, ULEV, SULEV) may have been met based on the manufacturer's submitted compliance plan in lieu of testing). Any debit in the manufacturer's "NMOG Fleet Average" (PC and LDT) or "Vehicle Equivalent Credit" (MDV) compliance plan shall be equalized as required. (For bi-, dual- or flexible-fueled vehicles, the STD and CERT in parentheses are those applicable to testing on gasoline test fuel.)

| NMOG FLEET AVERAGE [g/mi] | | NMOG @RAF = 0.43 (*); CH4 RAF = 0.0047 (*) | | NMOG or NMHC STD [g/mi] | CH4=methane NMOG=non-CH4 organic gas NMHC=non-CH4 hydrocarbon CO=carbon monoxide NOx=oxides of nitrogen HCHO=formaldehyde PM=particulate matter RAF=reactivity adjustment factor 2/3 D [g/test]=2/3 day diurnal+hot-soak RL [g/mi]=running loss ORVR [g/gallon dispensed]=on-board refueling vapor recovery g=gram mg=milligram mi=mile K=1000 miles F=degrees Fahrenheit SFTP=supplemental federal test procedure | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CERT | STD | NMOG CERT [g/mi] | NMHC CERT [g/mi] | | CO [g/mi] | | NOx [g/mi] | | HCHO [mg/mi] | | PM [g/mi] | | Hwy NOx [g/mi] | |
| | | | | | CERT | STD | CERT | STD | CERT | STD | CERT | STD | CERT | STD |
| * | * | | | | | | | | | | | | | |
| | @ 50K | 0.017 (0.084) | * | 0.117 (0.195) | 1.0 (1.6) | 5.0 (5.0) | 0.1 (0.2) | 0.6 (0.6) | 1 (1) | 11 (11) | * | * | 0.1 (0.1) | 1.2 (1.2) |
| | @ UL | 0.017 (0.084) | * | 0.167 (0.280) | 1.0 (1.6) | 7.3 (7.3) | 0.1 (0.2) | 0.9 (0.9) | 1 (1) | 16 (16) | * | * | 0.1 (0.1) | 1.8 (1.8) |
| | @ 50°F & 4K | * | * | * | * | * | * | * | * | * | * | * | * | * |

| CO [g/mi] @ 20°F & 50K | | SFTP 1 = @ 4K (SULEV, ULEV, LEV) or 50K (Tier 1, TLEV) SFTP 2 = @ UL (Tier 1, TLEV) | | NMHC+NOx [g/mi] (composite) | | CO [g/mi] (composite) | | NMHC+NOx [g/mi] [US06] | | CO [g/mi] [US06] | | NMHC+NOx [g/mi] [SC03] | | CO [g/mi] [SC03] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | CERT | STD | CERT | STD | CERT | STD | CERT | STD | CERT | STD | CERT | STD |
| CERT | * (4.1) | | SFTP @4k | * | * | * | * | * (0.16) | * (0.60) | * (1.0) | * (11.8) | * (0.14) | * (0.44) | * (0.8) | * (4.0) |
| STD | * (12.5) | | SFTP @UL | * | * | * | * | * | * | * | * | * | * | * | * |

| @ UL | EVAPORATIVE FAMILY 1 | | | | EVAPORATIVE FAMILY 2 | | | | EVAPORATIVE FAMILY 3 | | | | EVAPORATIVE FAMILY 4 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3-D | 2-D | RL | ORVR | 3-D | 2-D | RL | ORVR | 3-D | 2-D | RL | ORVR | 3-D | 2-D | RL | ORVR |
| CERT | 0.6 (0.6) | 0.5 (0.5) | 0.00 (0.00) | * (0.14) | * | * | * | * | * | * | * | * | * | * | * | * |
| STD | 2.5 (2.5) | 3.0 (3.0) | 0.05 (0.05) | * (0.20) | * | * | * | * | * | * | * | * | * | * | * | * |

**BE IT FURTHER RESOLVED:** That for the listed vehicle models, the manufacturer has attested to compliance with Title 13, California Code of Regulations, (13 CCR) Sections 1965 [emission control labels], 1968.1 [on-board diagnostic, full or partial compliance], 2035 et seq. [emission control warranty], 2235 [fuel tank fill pipes and openings] (gasoline and alcohol fueled vehicles only), and "High-Altitude Requirements" and "Inspection and Maintenance Emission Standards" (California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model PC, LDT and MDV).

Vehicles certified under this Executive Order shall conform to all applicable California emission regulations.
The Bureau of Automotive Repair will be notified by copy of this Executive Order.

Executed at El Monte, California on this 23RD day of July 2003.

Allen Lyons, Chief
Mobile Source Operations Division