State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER A-31-22
Relating to Certification of New Heavy-Duty Motor Vehicle Engines

HINO MOTORS, LTD.

Pursuant to the authority vested in the Air Resources Board by Sections 43100, 43102 and 43103 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-45-3;

IT IS ORDERED AND RESOLVED: That the following Hino Motors, Ltd. 1990 model-year diesel engines are certified for use in motor vehicles with a manufacturer's gross vehicle weight rating (GVWR) over 8,500 pounds:

Engine Family	Displacement Liters (Cubic Inches)		Exhaust Emission Control Systems
LHM03.8EAA9	3.8	(234)	Engine Modification Diesel Injection - Direct Turbocharger
LHM06.5EAA4	6.5	(396)	Engine Modification Diesel Injection - Direct Turbocharger
LHM06.5FAA7	6.5	(396)	Engine Modification Diesel Injection - Direct Turbocharger Intercooler
LHM06.7DAA9	6.7	(411)	Engine Modification Diesel Injection - Direct

Engine models and codes are listed on attachments.

The following are the certification emission standards for these engine families:

Hydrocarbons gm/bhp-hr	Carbon Monoxide gm/bhp-hr	Nitrogen Oxides gm/bhp-hr	Particulates gm/bhp-hr
1.3	15.5	6.0	0.60

The following are the certification emission values for these engine families:

Engine Family	Hydrocarbons gm/bhp-hr	Carbon Monoxide gm/bhp-hr	Nitrogen Oxides gm/bhp-hr	Particulates gm/bhp-hr
LHM03.8EAA9	0.4	2.1	5.4	0.51
LHM06.5EAA4	0.4	1.8	5.3	0.44
LHM06.5FAA7	0.6	3.2	5.7	0.52
LHM06.7DAA9	0.4	2.6	5.5	0.40

BE IT FURTHER RESOLVED: That the Executive Officer has been provided all material required to demonstrate certification compliance with the provisions of the Board's emission control system warranty regulations (California Health and Safety Code, Section 43205.5).

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 11th day of July, 1989.

K.D. Drachand, Chief
Mobile Source Division

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Manufacturer HINO MOTORS, LTD. Engine Family LHM03.8EAA9

Evaporative Family NA Engine Type L-4, 4 Stroke cycle, TC

Liters (CID) 3.839 (234)

ABBREVIATIONS

Ignition System

CA-Centrifugal Advance
ECU-Electronic Control Unit
EI-Electronic Ignition
ESAC-Electronic Spark Advance Control
VA-Vacuum Advance
VR-Vacuum Retard

Fuel System

CFI, EPFI, MPFI, SFI,
DID, DIP, HOS, OS
nV-nVenturi Carburetor
VV-Variable Venturi Carburetor

Exhaust Emissions Control System

AIP-Air Injection - Pump
AIV-Air Injection - Valve
EGR-Exhaust Gas Recirculation
EIC-Electronic Injection Control (Diesel Only)
EM-Engine Modification
SPL-Smoke Puff Limiter or Throttle Delay
TOC-Trap Oxidizer, Continual
TOP-Trap Oxidizer, Periodical
DBC-Dual Bed Catalyst
OC-Oxidation Catalyst
TWC-Three-Way Catalyst
WUOC-Warm-Up Oxidation Catalyst
WUTWC-Warm-Up Three-Way Catalyst
OS-Oxygen Sensor
HOS-Heated Oxygen Sensor

Special Features

CFI-Central Fuel Injection or Throttle Body Injection
EPFI-Electronic Port Fuel Injection
MPFI-Mechanical Port Fuel Injection
SFI-Sequential Fuel Injection
DID-Diesel Injection-Direct
DIP-Diesel Injection-Prechamber
TC-Turbocharger
SC-Supercharger
IC-Intercooler or Aftercooler
CCV-Combustion Chamber Valve
OBD-On-Board Diagnostics

VEHICLE MODELS:

Engine: Front x Mid. _____ Rear _____

Drive: FWD _____ RWD x 4WD Full Time _____ 4WD Part Time _____

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1990 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET
HEAVY-DUTY DIESEL ENGINES

LHDD

Manufacturer HINO MOTORS, LTD. Engine Family LHM03.8EAA9

Liter (CID) 3.839 (234) Eng. Type L-4, 4 stroke cycle, TC

Emission Control Sys. and (Special Features) Engine Modification (DID, TC)

Engine Model	Fuel Injection Pump Mfr. Part Number	Injector Mfr. Part Number	Maximum Rated HP at RPM	Fuel Rate mm^3/stroke (lbs/Hr)	Maximum Rated Torque at RPM	Fuel Rate mm^3/stroke (lbs/Hr)
W04C-TD	Diesel Kiki 22000-6480 (For Mechanical T/M) 22000-6460 (For Auto T/M)	Diesel Kiki 23600-1981	125 @ 3,200	72.0 (50.2)	253 @ 2,000	80.0 (34.8)

Date of Issue May 10, 1989 Revisions:

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Manufacturer HINO MOTORS, LTD. Engine Family LHM06.7DAA9

Evaporative Family NA Engine Type L-6, 4 Stroke cycle, Natural asp.

Liters (CID) 6,728 (411)

ABBREVIATIONS

Ignition System

CA-Centrifugal Advance
ECU-Electronic Control Unit
EI-Electronic Ignition
ESAC-Electronic Spark Advance Control
VA-Vacuum Advance
VR-Vacuum Retard

Fuel System

CFI, EPFI, MPFI, SFI,
DID, DIP, HOS, OS
nV-nVenturi Carburetor
VV-Variable Venturi Carburetor

Exhaust Emissions Control System

AIP-Air Injection - Pump
AIV-Air Injection - Valve
EGR-Exhaust Gas Recirculation
EIC-Electronic Injection Control (Diesel Only)
EM-Engine Modification
SPL-Smoke Puff Limiter or Throttle Delay
TOC-Trap Oxidizer, Continual
TOP-Trap Oxidizer, Periodical
DBC-Dual Bed Catalyst
OC-Oxidation Catalyst
TWC-Three-Way Catalyst
WUOC-Warm-Up Oxidation Catalyst
WUTWC-Warm-Up Three-Way Catalyst
OS-Oxygen Sensor
HOS-Heated Oxygen Sensor

Special Features

CFI-Central Fuel Injection or Throttle Body Injection
EPFI-Electronic Port Fuel Injection
MPFI-Mechanical Port Fuel Injection
SFI-Sequential Fuel Injection
DID-Diesel Injection-Direct
DIP-Diesel Injection-Prechamber
TC-Turbocharger
SC-Supercharger
IC-Intercooler or Aftercooler
CCV-Combustion Chamber Valve
OBD-On-Board Diagnostics

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HEAVY-DUTY DIESEL ENGINES

MHDD

Manufacturer HINO MOTORS, LTD. Engine Family LHM06.7DAA9

Liter (CID) 6.728 (411) Eng. Type L-6, 4 stroke cycle, Natural asp.

Emission Control Sys. and (Special Features) Engine Modification (DID)

Engine Model	Fuel Injection Pump Mfr. Part Number	Injector Mfr. Part Number	Maximum Rated HP at RPM	Fuel Rate mm^3/stroke (lbs/Hr)	Maximum Rated Torque at RPM	Fuel Rate mm^3/stroke (lbs/Hr)
H07C-F	Nippon Denso 22010-5301 (Fuel cut button system for engine stop) 22010-6040 (One key system for engine stop)	Nippon Denso 23610-1620	160 @ 3,000	67.5 (66.2)	304 @ 1,800	66.0 (38.8)

Date of Issue May 10, 1989 Revisions:

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Manufacturer HINO MOTORS, LTD. Engine Family LHM06.5EAA4

Evaporative Family NA Engine Type L-6, 4 Stroke cycle, TC

Liters (CID) 6.485 (396)

ABBREVIATIONS

Ignition System

CA-Centrifugal Advance
ECU-Electronic Control Unit
EI-Electronic Ignition
ESAC-Electronic Spark Advance Control
VA-Vacuum Advance
VR-Vacuum Retard

Fuel System

CFI, EPFI, MPFI, SFI,
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Engine: Front x Mid. ____ Rear ____

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1990 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET
HEAVY-DUTY DIESEL ENGINES

MHDD

Manufacturer HINO MOTORS, LTD. Engine Family LHM06.5EAA4

Liter (CID) 6.485 (396) Eng. Type L-6, 4 stroke cycle, TC

Emission Control Sys. and (Special Features) Engine Modification (DID, TC)

Engine Model	Fuel Injection Pump Mfr. Part Number	Injector Mfr. Part Number	Maximum Rated HP at RPM	Fuel Rate mm^3/stroke (lbs/Hr)	Maximum Rated Torque at RPM	Fuel Rate mm^3/stroke (lbs/Hr)
H06C-TJ	Nippon Denso 22010-5272	Nippon Denso 23610-1610	180 @ 3,000	73.0 (71.5)	398 @ (1,600)	85.0 (44.4)

Date of Issue May 10, 1989 Revisions:

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Page 1

Manufacturer HINO MOTORS, LTD. Engine Family LHM06.5FAA7

Evaporative Family NA Engine Type L-6, 4 Stroke cycle, TC-IC

Liters (CID) 6.485 (396)

ABBREVIATIONS

Ignition System

CA-Centrifugal Advance
ECU-Electronic Control Unit
EI-Electronic Ignition
ESAC-Electronic Spark Advance Control
VA-Vacuum Advance
VR-Vacuum Retard

Fuel System

CFI, EPFI, MPFI, SFI,
DID, DIP, HOS, OS
nV-nVenturi Carburetor
VV-Variable Venturi Carburetor

Exhaust Emissions Control System

AIP-Air Injection - Pump
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EIC-Electronic Injection Control (Diesel Only)
EM-Engine Modification
SPL-Smoke Puff Limiter or Throttle Delay
TOC-Trap Oxidizer, Continual
TOP-Trap Oxidizer, Periodical
DBC-Dual Bed Catalyst
OC-Oxidation Catalyst
TWC-Three-Way Catalyst
WUOC-Warm-Up Oxidation Catalyst
WUTWC-Warm-Up Three-Way Catalyst
OS-Oxygen Sensor
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Special Features

CFI-Central Fuel Injection or Throttle Body Injection
EPFI-Electronic Port Fuel Injection
MPFI-Mechanical Port Fuel Injection
SFI-Sequential Fuel Injection
DID-Diesel Injection-Direct
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TC-Turbocharger
SC-Supercharger
IC-Intercooler or Aftercooler
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HEAVY-DUTY DIESEL ENGINES

MHDD

Manufacturer HINO MOTORS, LTD. Engine Family LHM06.5FAA7

Liter (CID) 6.485 (396) Eng. Type L-6, 4 stroke cycle, TC-IC

Emission Control Sys. and (Special Features) Engine Modification (DID, TC, IC)

Engine Model	Fuel Injection Pump Mfr. Part Number	Injector Mfr. Part Number	Maximum Rated HP at RPM	Fuel Rate mm^3/stroke (lbs/Hr)	Maximum Rated Torque at RPM	Fuel Rate mm^3/stroke (lbs/Hr)
H06C-TH	Nippon Denso 22010-5001	Nippon Denso 23610-1590	225 @ 2,700	92.0 (81.2)	470 @ 1,600	94.5 (49.4)

Date of Issue May 10, 1989 Revisions:

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