

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:

<u>Engine Family</u>	<u>Displacement</u>		<u>Exhaust Emission Control Systems</u>
	<u>Liters</u>	<u>(Cubic Inches)</u>	
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:

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

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

<u>Engine Family</u>	<u>Hydrocarbons gm/bhp-hr</u>	<u>Carbon Monoxide gm/bhp-hr</u>	<u>Nitrogen Oxides gm/bhp-hr</u>	<u>Particulates gm/bhp-hr</u>
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 2nd day of July, 1989.


K.D. Drachand, Chief
Mobile Source Division

01.00.00

1990 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET

Page 1

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

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

Fuel System

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

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**

LH00

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)

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Revisions:

01.00.00

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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

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

Fuel System

CFI, EPFI, MPFI, SFI,
 DID, DIP, HOS, OS
 nV-nVenturi Carburetor
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HEAVY-DUTY DIESEL ENGINESMHDD

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)

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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)

ABBREVIATIONSIgnition System

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

Exhaust Emissions Control System

AIP-Air Injection - Pump
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HEAVY-DUTY DIESEL ENGINESMH00

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 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)

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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)

ABBREVIATIONSIgnition System

CA-Centrifugal Advance
 ECU-Electronic Control Unit
 EI-Electronic Ignition
 ESAC-Electronic Spark Advance
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 VA-Vacuum Advance
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 Direct
 DIP-Diesel Injection-
 Prechamber
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 CCV-Combustion Chamber
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HEAVY-DUTY DIESEL ENGINES

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Manufacturer HINO MOTORS, LTD. Engine Family LHM06.5FAA7
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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)
406C-TH	Nippon Denso 22010- 5001	Nippon Denso 23610- 1590	225 @ 2,700	92.0 (81.2)	470 @ 1,600	94.5 (49.4)

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