

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 27<sup>th</sup> day of July, 1989.

  
K.D. Drachand, Chief  
Mobile Source Division

01.00.00

1990 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEETPage 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 <sup>3</sup> /stroke (lbs/Hr)	Maximum Rated Torque at RPM	Fuel Rate mm <sup>3</sup> /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

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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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 <sup>3</sup> /stroke (lbs/Hr)	Maximum Rated Torque at RPM	Fuel Rate mm <sup>3</sup> /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)

**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  
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Fuel System

CFI, EPFI, MPFI, SFI,  
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HEAVY-DUTY DIESEL ENGINESMH00

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 <sup>3</sup> /stroke (lbs/Hr)	Maximum Rated Torque at RPM	Fuel Rate mm <sup>3</sup> /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)

**ABBREVIATIONS**Ignition System

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 EI-Electronic Ignition  
 ESAC-Electronic Spark Advance  
 Control  
 VA-Vacuum Advance  
 VR-Vacuum Retard

Fuel System

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

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MH00

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 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 <sup>3</sup> /stroke (lbs/Hr)	Maximum Rated Torque at RPM	Fuel Rate mm <sup>3</sup> /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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