

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER A-10-398  
Relating to Certification of New Heavy-Duty Motor Vehicle Engines

FORD MOTOR COMPANY

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 Ford Motor Company 1989 model-year diesel engines are certified for use in motor vehicles with a manufacturer's gross vehicle weight rating (GVWR) over 14,000.

| <u>Engine Family</u> | <u>Displacement<br/>Liters (Cubic Inches)</u> |       | <u>Exhaust Emission Control Systems<br/>(Special Features)</u> |
|----------------------|---|-------|--|
| KFM07.8EPC8          | 6.6   | (401) | (Diesel Injection - Direct)<br>(Turbocharger)                  |
| KFM07.8FPD1          | 7.8   | (474) | (Diesel Injection - Direct)<br>(Turbocharger)<br>(Intercooler) |
| KFM07.8FPE2          | 7.8   | (474) | (Diesel Injection - Direct)<br>(Turbocharger)<br>(Intercooler) |
| KFM07.8FPF3          | 7.8   | (474) | (Diesel Injection - Direct)<br>(Turbocharger)<br>(Intercooler) |
|                      | 6.6   | (401) |  |

Engine models and codes are listed on attachments.

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

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

\$\$\$ following are the certification emission values for these engine families.

| <u>Engine Family</u> | <u>Hydrocarbons<br/>gm/bhp-hr</u> | <u>Carbon<br/>Monoxide<br/>gm/bhp-hr</u> | <u>Nitrogen Oxides<br/>gm/bhp-hr</u> | <u>Particulates<br/>gm/bhp-hr</u> |
|----------------------|-----------------------------------|--|--------------------------------------|-----------------------------------|
| KFM07.8EPC8          | 0.8                               | 2.2                                      | 5.2                                  | 0.58                              |
| KFM07.8FPD1          | 0.6                               | 1.7                                      | 5.9                                  | 0.38                              |
| KFM07.8FPE2          | 0.7                               | 2.2                                      | 5.4                                  | 0.42                              |
| KFM07.8FPF3          | 0.6                               | 2.2                                      | 5.6                                  | 0.42                              |

BE IT FURTHER RESOLVED: That the Executive Officer has been provided all material required to demonstrate certification compliance with the Board's emission control system warranty regulations (Title 13, California Administrative Code, Section 2036).

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 19<sup>th</sup> day of August, 1988.



K. D. Drachand, Chief  
Mobile Source Division

## 1989 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET

Manufacturer Ford Motor Company Engine Family KFM07.8EPC8  
E

Evaporative Family Not applicable Engine Type I6

Liters (CID) 7.8L (474 CID) 6.6L (401 CID)

## 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

ENGINE MODELS: Reference page 17.01-1

1989 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET  
HEAVY-DUTY DIESEL ENGINES

E.O. # A-10-398

Manufacturer Ford Motor Company Engine Family KFM07.8EPC8

Liter (CID) 6.6L (401 CID) Eng. Type I6

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

| Engine Code | Fuel Injection Pump<br>BOSCH<br>(PN) | Fuel Injector<br>BOSCH<br>(PN) | Maximum Rated HP at RPM | Fuel Rate mm <sup>3</sup> /stroke<br>(lbs/hr) | Maximum Rated Torque at RPM | Fuel Rate mm <sup>3</sup> /stroke<br>(lbs/hr) |
|-------------|--------------------------------------|--------------------------------|-------------------------|---|-----------------------------|---|
| 8-80B-R00   | E6HN<br>-9A543-<br>DA                | E6HN<br>-9F593-<br>DA          | 170 @ 2600              | 86.5  | 420 @ 1800                  | 92.7  |

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## 1989 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET

Manufacturer Ford Motor Company Engine Family KFM07.8FPD1  
 Evaporative Family Not applicable Engine Type I6  
 Liters (CID) 7.8L (474 CID)

## 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

ENGINE MODELS: Reference page 17.01-1

1989 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET  
HEAVY-DUTY DIESEL ENGINES

E.O. # A-10-398

Manufacturer Ford Motor Company Engine Family KFM07,8FPD1

Liter (CID) 7.8L (474 CID) Eng. Type I6

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

| Engine Code | Fuel Injection Pump<br>(mfr/PN) | Fuel Injector<br>(mfr/PN) | Maximum Rated HP at RPM | Fuel Rate mm <sup>3</sup> /stroke<br>(lbs/hr) | Maximum Rated Torque at RPM | Fuel Rate mm <sup>3</sup> /stroke<br>(lbs/hr) |
|-------------|---------------------------------|---------------------------|-------------------------|---|-----------------------------|---|
| 8-85D-R03   | E6HN<br>-9A543-<br>BB           | E5HN<br>-9F593-<br>BA     | 210 2 2400              | 107.3   | 575 @ 1500                  | 122.1   |

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## 1989 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET

Manufacturer Ford Motor Company Engine Family KFM07.8FPE2  
 Evaporative Family Not applicable Engine Type I6  
 Liters (CID) 7.8L (474 CID)

## 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  
 TWG-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

ENGINE MODELS: Reference page 17.01-1

1989 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET  
HEAVY-DUTY DIESEL ENGINES

E.O. # A-10-398

Manufacturer Ford Motor Company Engine Family KFM07.8FPE2

Liter (CID) 7.8L (474 CID) Eng. Type I6

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

| Engine Code | Fuel Injection Pump<br>(mfr/PN) | Fuel Injector<br>(mfr/PN) | Maximum Rated HP at RPM | Fuel Rate mm <sup>3</sup> /stroke<br>(lbs/hr) | Maximum Rated Torque at RPM | Fuel Rate mm <sup>3</sup> /stroke<br>(lbs/hr) |
|-------------|---------------------------------|---------------------------|-------------------------|---|-----------------------------|---|
| 8-85F-R01   | E6HN<br>-9A543-<br>CB           | E5HN<br>-9F593-<br>BA     | 240 @ 2400              | 120.0   | 657 @ 1500                  | 134.5   |
| 8-85N-R00   | E6HN<br>-9A543-<br>FA           | E5HN<br>-9F593-<br>BA     | 215 @ 2400              | 107.3   | 588 @ 1500                  | 119.8   |

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## 1989 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET

Manufacturer Ford Motor Company Engine Family KFM07.8FPF3  
 Evaporative Family Not applicable Engine Type I6  
 Liters (CID) 7.8L (474 CID) 6.6L (401 CID)

## 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

ENGINE MODELS: Reference page 17.01-1

1989 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET  
HEAVY-DUTY DIESEL ENGINES

E.O. # A-10-398

Manufacturer Ford Motor Company Engine Family KFM07.8FPF3  
 Liter (CID) 7.8L (474 CID), 6.6L (401 CID) Eng. Type I6  
 Emission Control Sys. (Special Features) DID, TC, IC

| Engine Code | Fuel Injection Pump<br>(mfr/PN) | Fuel Injector<br>(mfr/PN) | Maximum Rated HP at RPM | Fuel Rate mm <sup>3</sup> /stroke<br>(lbs/hr) | Maximum Rated Torque at RPM | Fuel Rate mm <sup>3</sup> /stroke<br>(lbs/hr) |
|-------------|---------------------------------|---------------------------|-------------------------|---|-----------------------------|---|
| 9-80A-R00   | E7HN<br>-9A543-<br>BA           | E7HN<br>-9F593-<br>BA     | 185 @ 2400              | 91.3  | 474 @ 1500                  | 99.8  |
| 9-85B-R00   | E7HN<br>-9A543-                 | E7HN<br>-9F593-           | 270 @ 2400              | 135.0   | 735 @ 1500                  | 148.0   |

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