

# ENGINEERING SPECIFICATION

## 605 HP High-Output Diesel Engine

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### 1. OVERVIEW

This specification defines the engineering requirements and supporting component integration parameters for the 605 HP high-output diesel engine package. This engine is designed for heavy-haul and premium long-haul applications requiring maximum power output and sustained high-load operation capability.

The 605 HP engine represents the flagship powertrain option in the commercial truck lineup, featuring advanced turbocharging, enhanced cooling systems, and upgraded drivetrain components to handle increased torque loads.

### 2. APPLICATION SCOPE

This specification applies to the following truck models and configurations:

- Heavy-Haul Series (MDL-HEAVYHAUL) - Primary application
- Premium Long-Haul Series (MDL-PREMIUM) - Optional upgrade
- Long-Haul Series (MDL-LONGHAUL) - Special order only

*Note: Not compatible with Regional or Fleet series due to chassis weight rating limitations.*

### 3. ENGINE PERFORMANCE SPECIFICATIONS

Parameter	Specification	Tolerance
Rated Power Output	605 HP @ 1,800 RPM	+/- 2%
Peak Torque	2,050 lb-ft @ 1,200 RPM	+/- 3%
Displacement	15.0 Liters	Nominal
Compression Ratio	17.5:1	Fixed
Governed Speed	2,100 RPM	+/- 50 RPM
Idle Speed	600 RPM	+/- 25 RPM
Fuel Consumption (Peak)	0.315 lb/hp-hr	Target

## **4. SUPPORTING COMPONENT REQUIREMENTS**

The following supporting systems must meet minimum specifications for 605 HP engine installations. These requirements ensure proper thermal management, drivetrain durability, and safe operation. Configuration validation will verify compliance with these requirements.

### **4.1 Turbocharger Requirements**

The increased airflow demands of the 605 HP engine require enhanced forced induction. The turbocharger must deliver a minimum boost pressure of 45 PSI to support the engine's air mass flow requirements. The turbo system must be rated to support at least 600 horsepower. A twin variable geometry turbo (twin-VGT) configuration is strongly recommended for optimal transient response and efficiency across the operating range.

### **4.2 Radiator and Cooling System Requirements**

Heat rejection requirements increase significantly at 605 HP sustained operation. The radiator must provide a minimum cooling capacity of 350,000 BTU per hour to maintain safe coolant temperatures under full load conditions. A heavy-duty class radiator is required, with a minimum of 5 core rows to ensure adequate heat transfer surface area. Standard-duty cooling systems are not acceptable for this application.

### **4.3 Transmission Requirements**

The drivetrain must accommodate the increased torque output of the 605 HP engine. The transmission must have a torque rating of at least 1,850 lb-ft to handle peak engine torque with an appropriate safety margin. An automated manual transmission (AMT) premium class or heavy-duty manual transmission is required. A 12-speed or higher gear count is recommended to optimize fuel efficiency and performance across varied terrain and load conditions.

### **4.4 Engine Brake Requirements**

Enhanced engine braking capability is mandatory for safe operation at maximum power levels. The engine brake system must provide a minimum braking horsepower of 500 HP for adequate retardation on grades. A full engine retarder type brake is required - compression release brakes alone are not sufficient. The brake must have at least 3 stages of modulation to allow proportional braking control.

## **5. CONFIGURATION VALIDATION**

All 605 HP engine installations must pass automated configuration validation prior to production release. The validation system will analyze selected components against the requirements specified in Section 4 and flag any incompatibilities or specification gaps. Configurations that do not meet these requirements may result in warranty limitations or operational restrictions.

## **6. REFERENCE DOCUMENTS**

- SAE J1995 - Engine Power Test Code
- SAE J1349 - Engine Power Test Code (Spark Ignition and Compression Ignition)
- EPA 40 CFR Part 86 - Emissions Standards
- FMVSS 121 - Air Brake Systems
- Internal: Powertrain Integration Guidelines v4.2

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