

**DETROIT DIESEL**  
DEMAND PERFORMANCE™



## MBE 900

MBE 900 grows to 7.2 liters to deliver exceptional durability, excellent performance and fuel economy at current emission levels.

### Excellent Performance and Fuel Economy

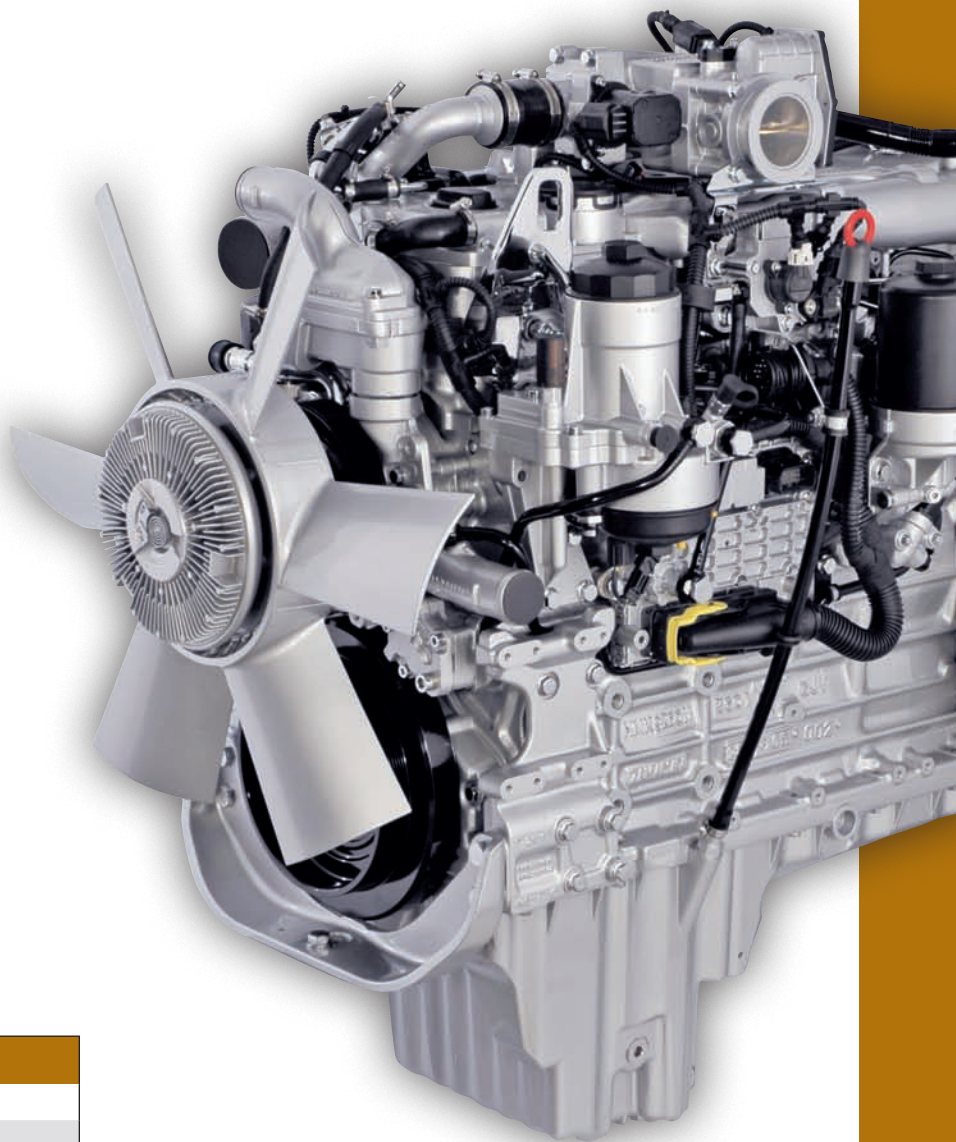
- SMART Fuel System maintains fuel economy and performance at reduced emissions
- DDEC® VI electronics monitor and control the engine and Aftertreatment System for peak efficiency
- Dual-stage turbo on high performance model provides maximum throttle response and combustion efficiency

### Low maintenance

- Extended maintenance intervals
- Maintenance-free electrostatic breather separator
- New easy-to-access multi-functional fuel filter

### Low Emissions

- Optimized Exhaust Gas Recirculation (EGR) system reduces nitrogen oxide (NOx) emissions by over 50%
- Aftertreatment system consisting of an Oxidation Catalyst and Diesel Particulate Filter reduces particulate matter emissions by 90%
- Maintenance-free electrostatic breather separator



#### MBE 900 Specifications

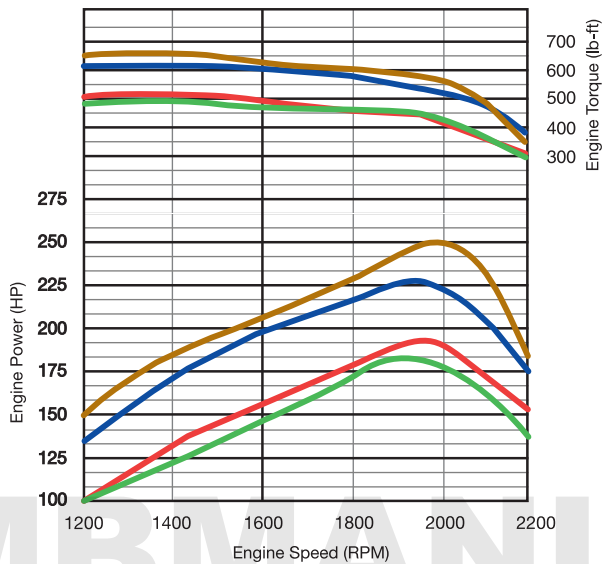
Configuration	Inline 6 Cylinder
Displacement	439 cu. in. (7.2 L)
Compression Ratio	18:1
Bore	4.17 in. (106 mm)
Stroke	5.35 in. (136 mm)
Weight (Dry)	Single: 1392 lb. (619 kg) Dual: 1428 lb. (649 kg)
Electronics	DDEC VI

## MBE 900 POWER RATINGS

### STANDARD CONFIGURATION

- Single-Stage Turbo
- Cast Iron Cylinder Head and Blocks

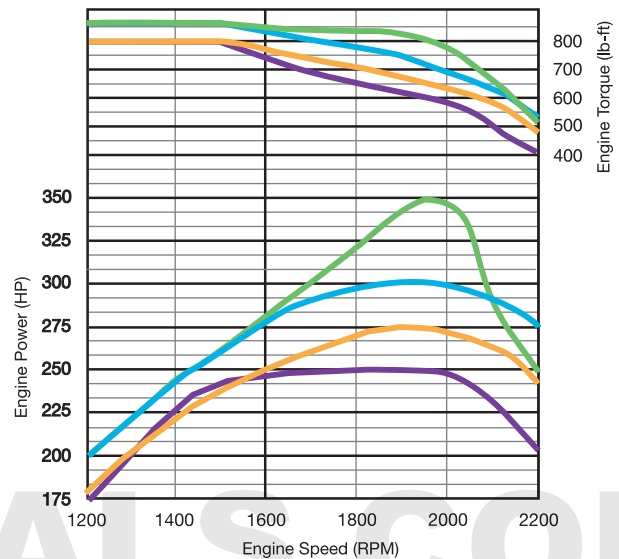
190 HP @ 2200 RPM 520 lb-ft @ 1200 RPM  
 210 HP @ 2200 RPM 520 lb-ft @ 1200 RPM  
 230 HP @ 2200 RPM 620 lb-ft @ 1200 RPM  
 250 HP @ 2200 RPM 660 lb-ft @ 1200 RPM



### HIGH PERFORMANCE CONFIGURATION

- Dual-Stage Turbo
- Compact Graphite Iron Cylinder Head and Blocks

260 HP @ 2200 RPM 800 lb-ft @ 1200 RPM  
 280 HP @ 2200 RPM 800 lb-ft @ 1200 RPM  
 300 HP @ 2200 RPM 860 lb-ft @ 1200 RPM  
 350 HP @ 2200 RPM 860 lb-ft @ 1200 RPM\*



\* Fire, emergency and recreational vehicle applications only.

### Maintenance Intervals (Miles)

Maintenance Item	Severe-Duty	Short-Haul	Long-Haul
Engine Oil and Filter Change	6,000	15,000	30,000
Fuel Filter Change	18,000	30,000	60,000
Valve Lash Adjustment	24,000	75,000	80,000

Severe-Duty: Less than 6,000 annual miles. Short-Haul: 6,000 to 40,000 annual miles. Long-Haul: Over 40,000 annual miles.

### Standard Warranty<sup>1</sup>

Warranty Limitations (Whichever Occurs First)			Repair Charge to be Paid by Owner	
MBE 900	Months	Miles / Kilometers	Parts	Labor
Engine	0 - 36	0 - 150,000 mi. 0 - 240,000 km	No Charge	No Charge
Accessories	0 - 24	0 - 100,000 mi. 0 - 160,000 km	No Charge	No Charge

<sup>1</sup> See your Authorized Detroit Diesel service outlet for a copy of the warranty parchment for complete details.



For more information, call 1-800-445-1980. [www.DetroitDiesel.com](http://www.DetroitDiesel.com)

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## STARTING THE ENGINE

Before operating the engine, do the work described under "Preparation for a First-Time Start." Start the engine as follows.

### Notice

Never attempt to start MBE 900 engine using ether or any other starting fluid. Serious engine damage could result.

1. Turn on the ignition switch.
2. With the accelerator pedal in the idle position, start the engine.
3. Check the engine for leaks. Check all hoses, hose clamps and pipe unions on the engine for tightness. Shut down the engine and tighten them if necessary. Check the oil feed and return lines at the turbocharger for tightness. Shut down the engine and tighten them if necessary.
4. Shut down the engine.
5. Approximately five minutes after shutdown, check the engine oil level. If necessary, add oil up to the maximum fill level on the oil dipstick. Do not overfill.
6. Check all mounting fasteners and belts on the engine for tightness.

## OPERATIONS

The following sections cover normal operations.

### Battery Charge

The battery charge indicator light must go out once the engine starts.

If the indicator light comes on while the engine is running, do the following.

1. Shut down the engine.
2. Check the poly-V belt for tightness.
3. Do a load test on the batteries. Charge or replace the batteries as needed.
4. If necessary, visit the nearest authorized dealer to have the alternator voltage and output checked.

### Oil Pressure

When the engine has reached its normal operating temperature, the engine oil pressure must not drop below the following values:

- 250 kPa (36 psi) at rated speed
- 50 kPa (7 psi) at idling speed

If oil pressure drops below these values, stop the engine and determine the cause.

## FUEL

Only use Ultra Low Sulfur Diesel (USLD, 15 ppm sulfur max).

Fuel additives are not required. Using fuel additives may affect your warranty.

## LUBRICATING OIL

The engine is delivered from the factory filled with an approved engine oil.

### Notice

The use of non-approved engine oils could affect warranty rights and cause engine damage.

To ensure long and trouble-free service, it is important to select oil of the correct viscosity and service designation. Only multigrade oils of American Petroleum Institute service designation CJ-4 will achieve proper performance.

## COOLANT

Coolant is a mixture of water and antifreeze. Under normal conditions, it is a mixture of 50 percent water and 50 percent antifreeze but, under extreme cold weather conditions, as much as 60 percent antifreeze may be added. Mixtures above 60 percent may reduce cooling effectiveness and reduce heat transfer capability of the coolant. For anticorrosion protection and to raise the boiling point, the coolant must remain in the cooling system all year round.

Regardless of mileage, replace the coolant every two years, since the degree of corrosion protection gradually drops with time.

	Description	Capacity 6 Cylinder Quarts (Liters)
Engine Coolant Capacity (All Vehicles)	Engine Capacity	12.7 (12.0)
	Total Capacity	25.0 (23.7)
Business Class Coolant System Capacity	Antifreeze Quantity @ 50%	12.5 (11.8)
	Antifreeze Quantity @ 55%	13.8 (13.1)

### Fully-Formulated Antifreeze

Antifreeze approved for use in the MBE 900 engine is a mixture of ethylene glycol and corrosion inhibitors. Antifreeze containing ethylene glycol and corrosion inhibitors is known as fully-formulated antifreeze.

**NOTE:** Do not use propylene glycol.

Fully-formulated antifreeze has the following properties:

- It protects the radiator and engine from freezing.
- It provides protection against corrosion and cavitations for all components in the cooling system.
- It raises the boiling point of the coolant. This slows the rate of evaporation, avoiding coolant loss at high temperatures.

## STORAGE

Required protective measures for the MBE 900 engine depend on the following:

- The length of time the engine will be out of service
- The climate and conditions where the engine is stored

If the engine is to be out of service 12 months or less, anticorrosion measures are not necessary, provided the place of storage is dry and well-ventilated as described above.

If the engine is to be out of service for more than 12 months, or under extraordinary storage or transportation conditions, special protective measures are necessary.

Maintenance Operation Description	M1	M2	M3
Engine Inspecting		✓	✓
Valve Lash Checking and Adjusting			✓
Fuel Pre-Filter Element Cleaning		✓	✓
Main Fuel Filter Element Changing		✓	✓
Engine Oil and Filter Changing	✓	✓	✓
Oil Centrifuge Cartridge	✓	✓	✓
Coolant Concentration Checking		✓	✓
Coolant Flushing and Changing			✓
Cooling System Inspecting		✓	✓

## SCHEDULED INTERVALS

When performed on a regular basis, changing the engine oil and filters is the least costly way to ensure safe and reliable vehicle operation. Added benefits and savings occur when you check that the valves, fuel injectors and oil and cooling circuits are in good working order during oil changes.

All service intervals and maintenance operations are based on the parts and accessories expressly approved for your engine.

Maintenance Schedule	Maintenance Interval Operation	Maintenance Intervals		
		Frequency	Miles	km
Vehicles that annually travel up to 60,000 mi. (96,000 km)	Maintenance 1 (M1)	Every	15,000	24,000
	Maintenance 2 (M2)	Every	60,000	96,500
	Maintenance 3 (M3)	Every	75,000	121,000

## VEHICLE INSPECTION

Check the following concerns before starting any troubleshooting.

- Walk around the vehicle and look for obvious problems such as leaks (air or liquid).
- Check fuel filters to ensure they are secure and tight.
- Check for a restricted air filter.
- Ensure the fuel tank level is at least 1/4 full.
- Look for any vehicle damage that could affect vehicle performance or fuel economy.
- Investigate any prior repairs that could affect vehicle performance.
- Verify that alternator and battery grounds are clean and making good contact.
- Wiggle wires and harnesses to try to make the concern active, or recur.

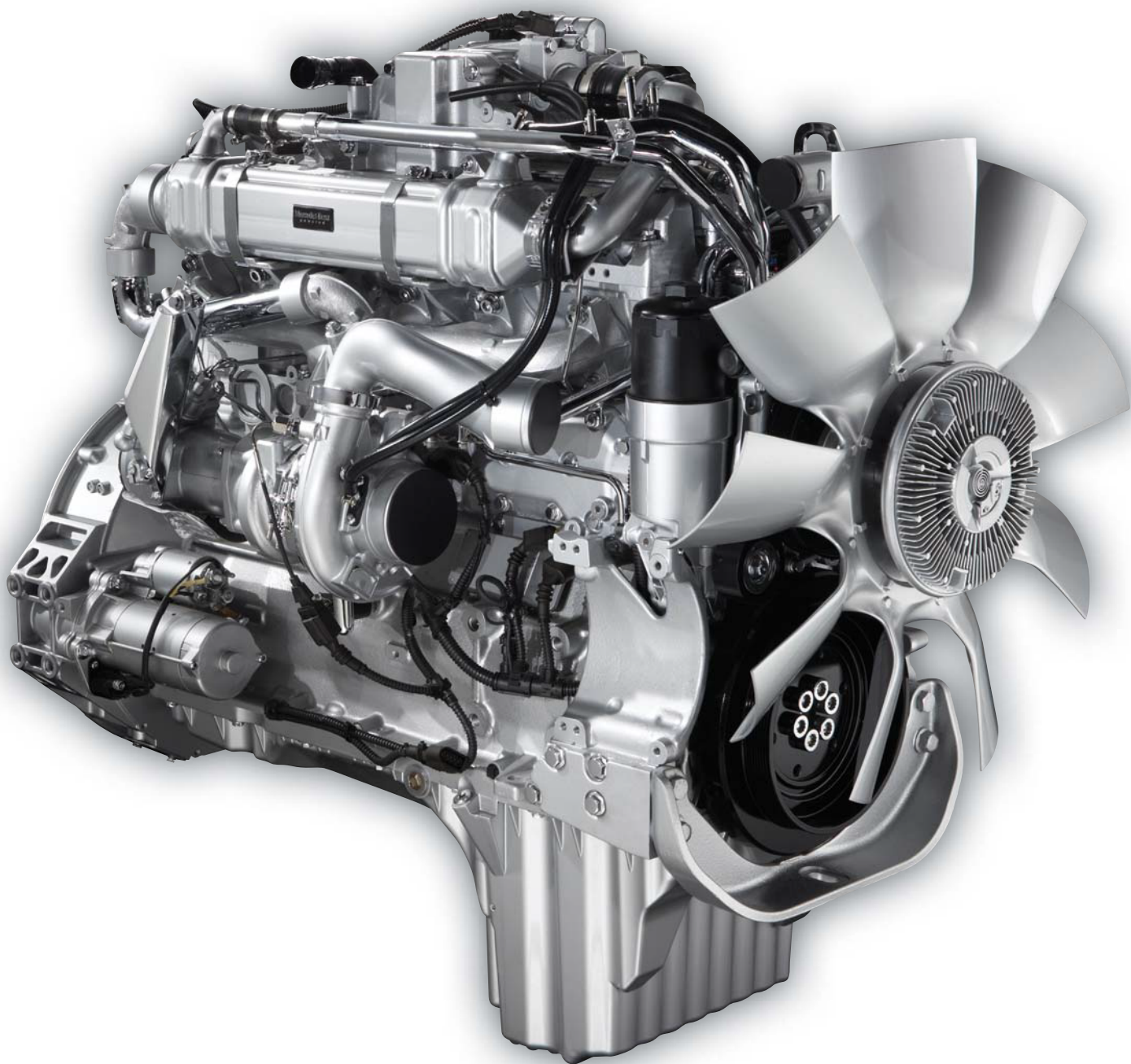
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## **NO QUESTION ABOUT IT.**

The 2007 EPA diesel-emissions mandate was one of the most challenging engineering tasks Detroit Diesel has confronted, demanding more time, effort and resources than any other single program in the past several decades. The MBE 900 engine not only is far cleaner than its predecessors, it's stronger, too.

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## UNALTERED MAINTENANCE SCHEDULES. UNMATCHED SERVICE AND WARRANTY.

### Maintenance Intervals (Miles)

Maintenance Item	Severe-Duty	Short-Haul	Long-Haul
Engine Oil and Filter Change*	6,000	15,000	20,000
Fuel Filter Change	18,000	60,000	60,000
Valve Lash Adjustment	24,000	75,000	80,000

\* Based on using Detroit Diesel approved lube oil.  
Severe-Duty: Less than 6,000 annual miles. Short-Haul: 6,000 to 60,000 annual miles. Long-Haul: Over 60,000 annual miles.

### Parts, Service and Warranty

Parts and service for the MBE 900 engine are available at more than 800 Detroit Diesel authorized service locations throughout North America. Factory certified technicians know your MBE 900 inside and out and are ready to help. For roadside assistance, technical support or locating the nearest service center, contact the Detroit Diesel hotline at 1-800-445-1980.

### Fire Truck, Bus and RV Warranty<sup>1</sup>

Application	Years	Miles
Fire Truck and EMS	5	150,000
School Bus and RV*	5	Unlimited*

\* Coverage is limited to 6,000 hours of operation.

### On-Highway Warranty Period for Trucks<sup>1</sup>

Item	Warranty Limitations (Whichever Occurs First)		Repair Charge to be Paid by Owner	
	Months	Miles / Kilometers	Parts	Labor
Engine	0 - 36	0 - 150,000 mi. 0 - 240,000 km	No Charge	No Charge
Accessories	0 - 24	0 - 100,000 mi. 0 - 160,000 km	No Charge	No Charge

<sup>1</sup> Refer to the Detroit Diesel warranty parchment for full warranty details, terms and conditions.

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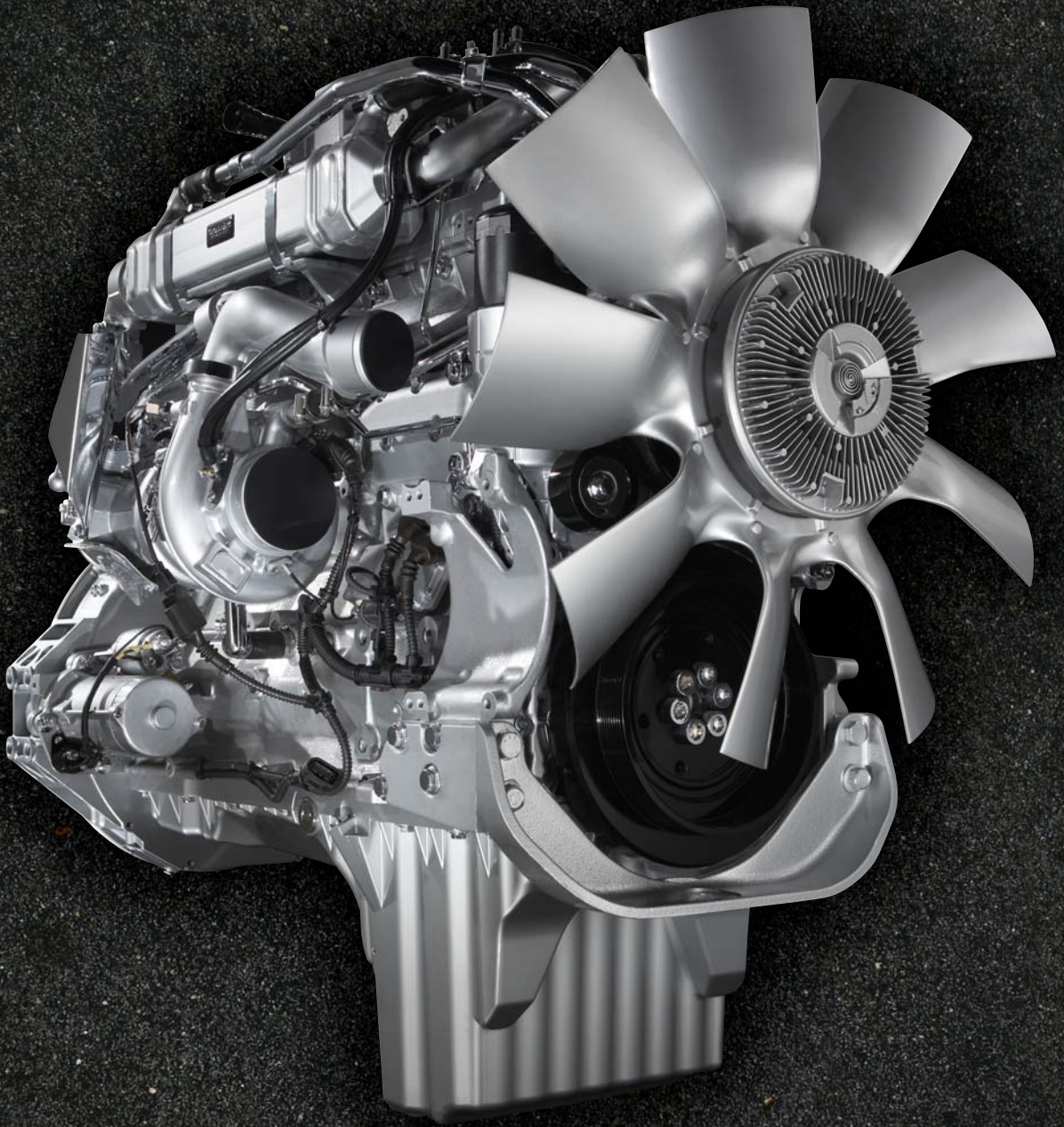
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ENGINE

MBE 900

**DETROIT DIESEL**  
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# DETROIT DIESEL: DRIVING TECHNOLOGY.

The Mercedes-Benz 900 series engine (MBE 900) has been going strong since we introduced it to the NAFTA medium-duty truck market in 1998. With more than 150 years of Detroit Diesel and Mercedes-Benz collective experience designing, testing and manufacturing diesel engines behind it, it's no wonder.

Through the years, customers have turned to our engines for reliability, fuel economy, weight advantage and ease of service. That's never changed. But, when Environmental Protection Agency's '07 requirements grew more stringent to protect the environment, Detroit Diesel combined our long heritage and industry-leading innovation with the resources of our parent company, Daimler – the world's largest commercial vehicle manufacturer. Together, we did more than just meet emissions standards. We took our engines to the next level.

With an investment of hundreds of millions of dollars and the work of the world's top engineers, Detroit Diesel produced a new line of engines that are the most advanced and environmentally-friendly generation of Detroit Diesel engines ever built. We've lowered oil consumption. Increased response times. Reduced emissions. And achieved SMART Fuel Systems.

After countless laboratory tests and more than 24 million miles in testing across our three engine lines, one thing clear: Detroit Diesel meeting standards. We're driving technology.

## The MBE 900

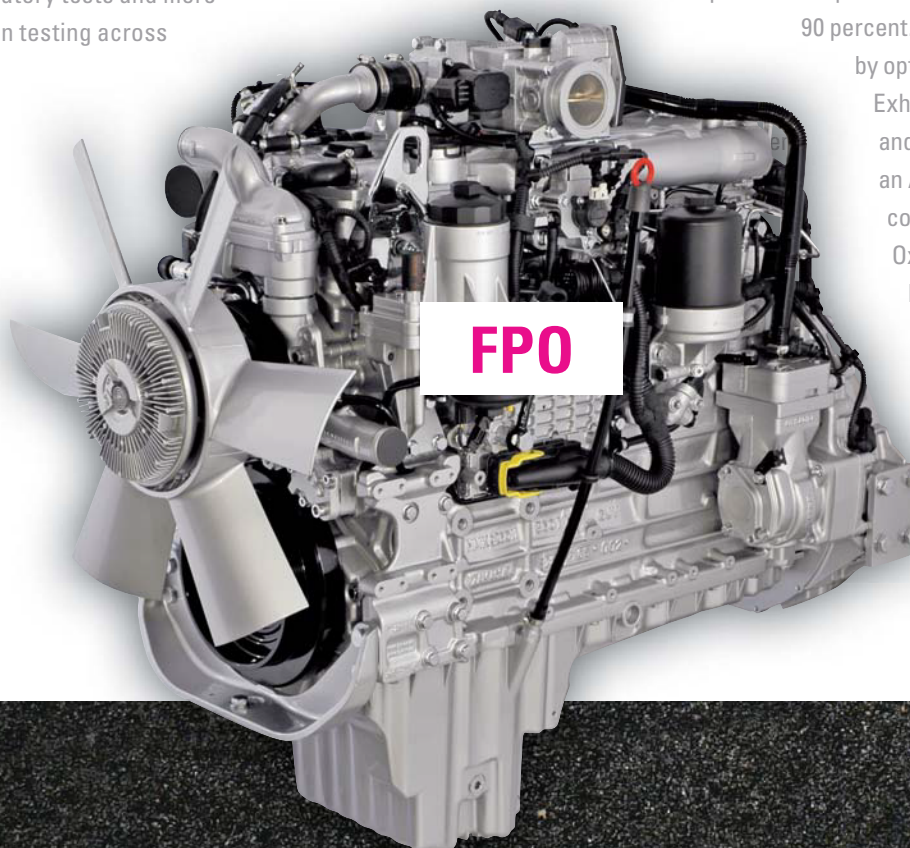
The MBE 900 has been the premium engine choice for a wide range of medium-duty and vocational vehicle buyers, powering the needs of food and beverage distributors, pick-up and delivery, fire and rescue departments, school bus fleets, tow truck operators, construction companies and others. Nearly 600,000 MBE 900 engines are in service today, more than 100,000 in North America alone.

With the changes required to meet the EPA's 2007 diesel-emissions mandate, the new MBE 900 – now a full 7.2 liters – continues to serve its diverse customer base, offering a wide range of power ratings. With this broad spectrum of choices, buyers can spec the most economical and best matched components to fit their specific applications. Less money invested plus lower operational costs equal a better bottom line.

## Tightening Emissions Standards

The EPA has been reducing diesel emissions for the past 30 years. The latest regulations, which took effect in 2007, demand changes in both fuel and engine technology. The new regulations will dramatically reduce oxides of nitrogen (NOx) by 55 percent and particulate matter (soot and ash) 90 percent. We achieved the first

by optimizing the existing Exhaust Gas Recirculation and the second by adding an Aftertreatment System, comprised of a Diesel Oxidation Catalyst and a Diesel Particulate Filter.





# REFINED ENGINE COMPONENTS

## Exhaust Gas Recirculation (EGR)

The Exhaust Gas Recirculation system has been optimized to dramatically cut NOx formation by routing a measured amount of exhaust flow to the cylinders to lower combustion temperatures. Lower temperatures result in lower NOx levels without the negative effects of retarding engine timing. The EGR valve has been moved to the top of the engine for improved serviceability.

## SMART Fuel System

The new SMART Fuel System adds to the performance and cleanliness of the MBE 900. It features electronically controlled injection nozzles capable of multiple injections per combustion cycle.

## Detroit Diesel Electronic Control (DDEC®) VI

Detroit Diesel set the benchmark for diesel engine electronics. Now, we’re raising the bar with the sixth generation DDEC VI electronic engine management system. It employs a more powerful microprocessor, increased memory and enhanced diagnostics. The DDEC VI is capable of monitoring and managing all engine functions, including the Aftertreatment Systems required for emissions. DDEC VI is a key part of the strategy to achieve greater operating efficiency and cleaner exhaust emissions.

## High Tech Grid Heater

The MBE 900 is capable of starting unassisted in temperatures as low as 10 degrees Fahrenheit. For colder temperature operation, down to –13 degrees Fahrenheit, an optional high tech grid heater controlled by DDEC VI is available. The high tech grid heater pre-heats air in the intake system before it enters the engine during starting and initial warm-up. This device reduces cranking time in cold weather to increase starter life, reduces white smoke and offers peace of mind.

## Maintenance-Free Electrostatic Breather

A new electrostatic breather system removes oil from crankcase vapor before it’s vented into the atmosphere. The system sends oil droplets back to the sump, where they continue to serve the engine, reducing oil consumption. And, it requires no maintenance.

MBE 900 Engine Power Ratings	
Standard	
190 HP @ 2200 RPM	520 lb-ft @ 1200 RPM
210 HP @ 2200 RPM	520 lb-ft @ 1200 RPM
230 HP @ 2200 RPM	620 lb-ft @ 1200 RPM
250 HP @ 2200 RPM	660 lb-ft @ 1200 RPM

# REFINED FUELS AND LUBRICANTS

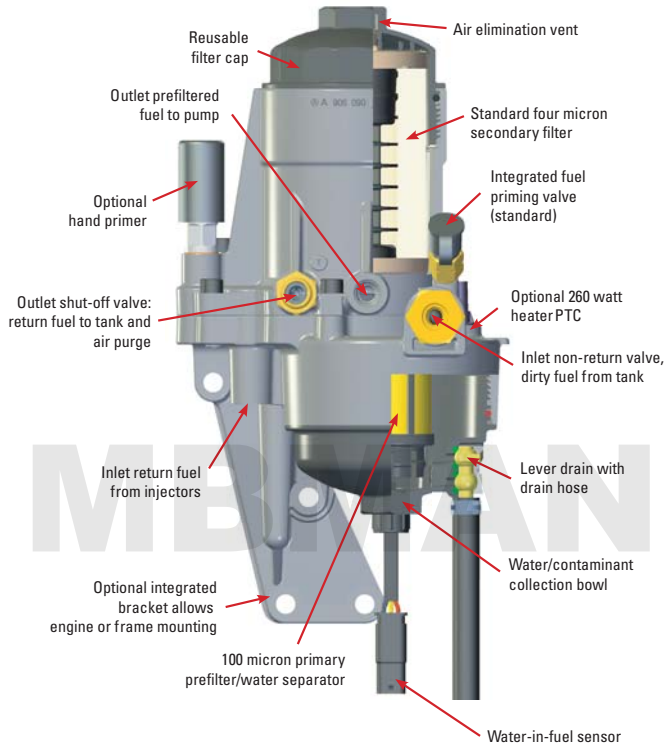
## ULTRA LOW SULFUR DIESEL (ULSD) Fuel and CJ-4 Oil

The MBE 900 is designed to run on ULSD fuel, which can contain no more than 15 PPM sulfur. Previously the sulfur content for on-highway diesel fuel was 500 PPM. ULSD fuel is necessary to avoid fouling the engine’s Aftertreatment System.

CJ-4, a low ash oil formulation, is recommended in current engines. CJ-4 oil contains less than 1.0 wt. % sulfated ash. Use of high ash engine oils reduce the cleaning interval on the Diesel Particulate Filter (DPF) system.

## Multi-Functional Fuel Filter

The MBE 900 now features an all-new multi-functional fuel filter containing primary and secondary filtration, a fuel priming valve and a fuel-water separator in one compact assembly as standard equipment. The unit also may be ordered with a hand priming pump, a water-in-fuel sensor and/or a fuel heater as optional equipment.



## Engine Brakes

The MBE 900 engine has two engine brake options available: a compression brake and an exhaust brake. Both engine brake options offer quiet operation, increased service brake life, improved driver safety and increased resale value.

MBE 900 Engine Brake Options	
	Single Stage
Compression Brake	155 HP @ 2500 RPM
Exhaust Brake	140 HP @ 2500 RPM
Both	180 HP @ 2500 RPM

## REFINED EXHAUST SYSTEM

### Exhaust Aftertreatment System

The biggest change to our engines is the addition of an exhaust Aftertreatment System, which replaces the muffler assembly in the exhaust system. The unit's defining components are a Diesel Oxidation Catalyst and a Diesel Particulate Filter that oxidize – or burn – soot. During normal highway operation, exhaust temperatures alone usually are high enough to burn off accumulating soot, a process known as “passive regeneration.” In low ambient temperatures, however, or in some stop-and-go applications, the system needs a little help to regenerate or clean itself. This process is called “active regeneration.”

### Doser

The Aftertreatment System uses a “doser” to initiate active regeneration. When the amount of soot inside reaches a certain level, the doser injects a measured amount of diesel fuel into the exhaust flow, which reacts with the catalyst to raise the temperature to a point that enables regeneration.

There are two types of active regeneration: in-transit and stationary. In-transit regeneration occurs when the truck is in motion. When the truck's driving cycle is insufficient for in-transit active regeneration, stationary active regeneration is required. This is performed when the truck is parked and monitored by the driver or a service technician.

### Intake Throttle

The intake throttle also assists in the regeneration process. When necessary, this device limits the amount of air entering the engine, raising the exhaust temperature and facilitating regeneration.