PACCAR MX-13 engines

The 12.9 litre Euro 6 PACCAR MX-13 engine uses ultra-modern common rail technology, a turbo with variable geometry and advanced controls for maximum efficiency. In order to comply with the strict Euro 6 emissions requirements, it features exhaust gas recirculation, together with SCR technology and an active soot filter.

The engines provide additional torque at low revs in the highest gear for direct drive gearboxes and in the two highest gears for overdrive gearboxes to support lower fuel consumption of the vehicle.

### Engine Output - kW (hp)

<table>
<thead>
<tr>
<th>Engine</th>
<th>Output - kW (hp)</th>
<th>Torque - Nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>MX-13 315</td>
<td>315 (428) at 1600 rpm</td>
<td>2300 at 900-1125 rpm(^1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2150 at 900-1365 rpm</td>
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<tr>
<td>MX-13 355</td>
<td>355 (483) at 1600 rpm</td>
<td>2500 at 900-1125 rpm(^1)</td>
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<td></td>
<td></td>
<td>2350 at 900-1365 rpm</td>
</tr>
<tr>
<td>MX-13 390</td>
<td>390 (530) at 1675 rpm</td>
<td>2600 at 1000-1460 rpm(^1)</td>
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<td></td>
<td></td>
<td>2500 at 1000-1425 rpm</td>
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</tbody>
</table>

\(^1\) in the highest gear for direct drive gearboxes and in the two highest gears for overdrive gearboxes

### General information

Six-cylinder in-line turbocharged diesel engine with intercooling. Ultra clean combustion with Exhaust Gas Recirculation (EGR), Diesel Particular Filter (DPF) and Selective Catalytic Reduction (SCR) aftertreatment for Euro 6 emission levels.

- **Bore x stroke**: 130 x 162 mm
- **Piston displacement**: 12.9 litres
- **Compression ratio**: 18.5 to 1
PACCAR MX-13 engines

Main construction
Cylinder block: compact graphite iron (CGI) integrated housing for the high pressure fuel pump units high strength and wear resisting liner material improved cooling
Cylinder head: compact graphite iron (CGI) one-piece cylinder head with integrated intake manifold composite valve cover
Valves: four valves per cylinder
Cylinder liners: wet liners with Anti Polishing Ring
Pistons: oil cooled piston with three piston rings each
Crankshaft: “stepped-die” forged steel crankshaft without contra-weights
Oil sump: composite oil sump for lower weight special ribbing for low noise electronically driven and monitored crankcase ventilation
Distribution gear: low-noise rear mounted distribution drive

Fuel injection and induction
Fuel feed pump: optimized delivery
Fuel unit: single cartridge filter integrated heater automatic water drain
Fuel injection: common rail with 2 high pressure pump units integrated in the engine block Smart Outlet Metering Valve (OMV)
Injectors: wide angle injectors (ATe)
Injection pressure: max. 2500 bar
Induction: turbocharged with charge cooling (intercooling)
Turbocharger: variable geometry turbocharger (VTG)
Intercooler: aluminium, single-row, transverse-type intercooler

Lubrication
Oil module: pre-assembled module, containing oil filters, oil cooler, thermostat, valves and tubing
Oil filters: full-flow main oil filter centrifugal by-pass filter for extended service intervals fully recyclable filter cartridges
Oil cooler: thermostatically controlled stainless steel heat exchanger
Oil pump: variable, high efficient oil pump
Auxiliaries and exhaust brake/engine brake

Auxiliary drive: poly-V belt drive
- low-energy air compressor with Smart Air supply Control (SAC) and combined steering pump/fuel feed pump driven from the distribution gears

Exhaust brake: electrically operated butterfly valve in the exhaust duct

MX Engine Brake:
- integrated compression release brake
- VTG and BPV for brake power control
- Smart, electronically controlled, cooled actuator

Reliability and durability

State-of-the art techniques, first class materials and extensive functional integration result in high reliability and long durability. Water and oil feeds, low pressure fuel lines and the high pressure fuel injection pump housing are integrated in the cylinder block. The cylinder block has been designed without side covers for maximum stiffness and low noise generation. The one-piece cylinder head has an integrated inlet manifold. The combined fuel filter and water separator is mounted directly on the engine for maximum ease of maintenance.

Performance

All PACCAR MX-13 engines deliver excellent torque at low engine speeds and a high performance is available over a wide rev range. The optional, very powerful MX Engine Brake offers optimum driveability on long gradients. The integration of the MX Engine Brake in the service brake operation results in improved driving safety and reduced brake lining wear.

Fuel efficiency

A well-controlled combustion process together with additional technology to achieve the ultra-low Euro 6 emission values, results in an excellent fuel efficiency. The fuel in the common rail is supplied using smart dosing controls, to ensure optimum efficiency by only compressing the amount of fuel mixture that is really needed. This reduces hydraulic losses to a minimum.

Environment

In order to meet the stringent Euro 6 emission requirements, DAF is using a combination of exhaust gas after-treatment technologies, such as an SCR catalytic converter and an active soot filter. The right exhaust gas mixture results in an optimum temperature in the filter to regenerate the collected soot particles.

To allow as much passive regeneration as possible the exhaust manifold, as well as the most essential parts of the exhaust system, have been encapsulated. Also the SCR catalytic converter benefits from the higher temperature which improves the efficiency and reduces the AdBlue consumption.
PACCAR MX-13 engines

Legend:
1. EGR valve
2. Air intake pipe
3. Seventh injector
4. Exhaust brake valve
5. VTG turbo
6. Flywheel
7. Engine block
8. Oil filter module
9. Oil sump
10. Crankshaft
11. Coolant filter
12. Water pump
13. Air condition compressor
14. Poly-V belt
15. Alternator
16. Thermostat housing
17. EGR Venturi
18. EGR Cooler
19. MX Engine Brake
20. Valve cover