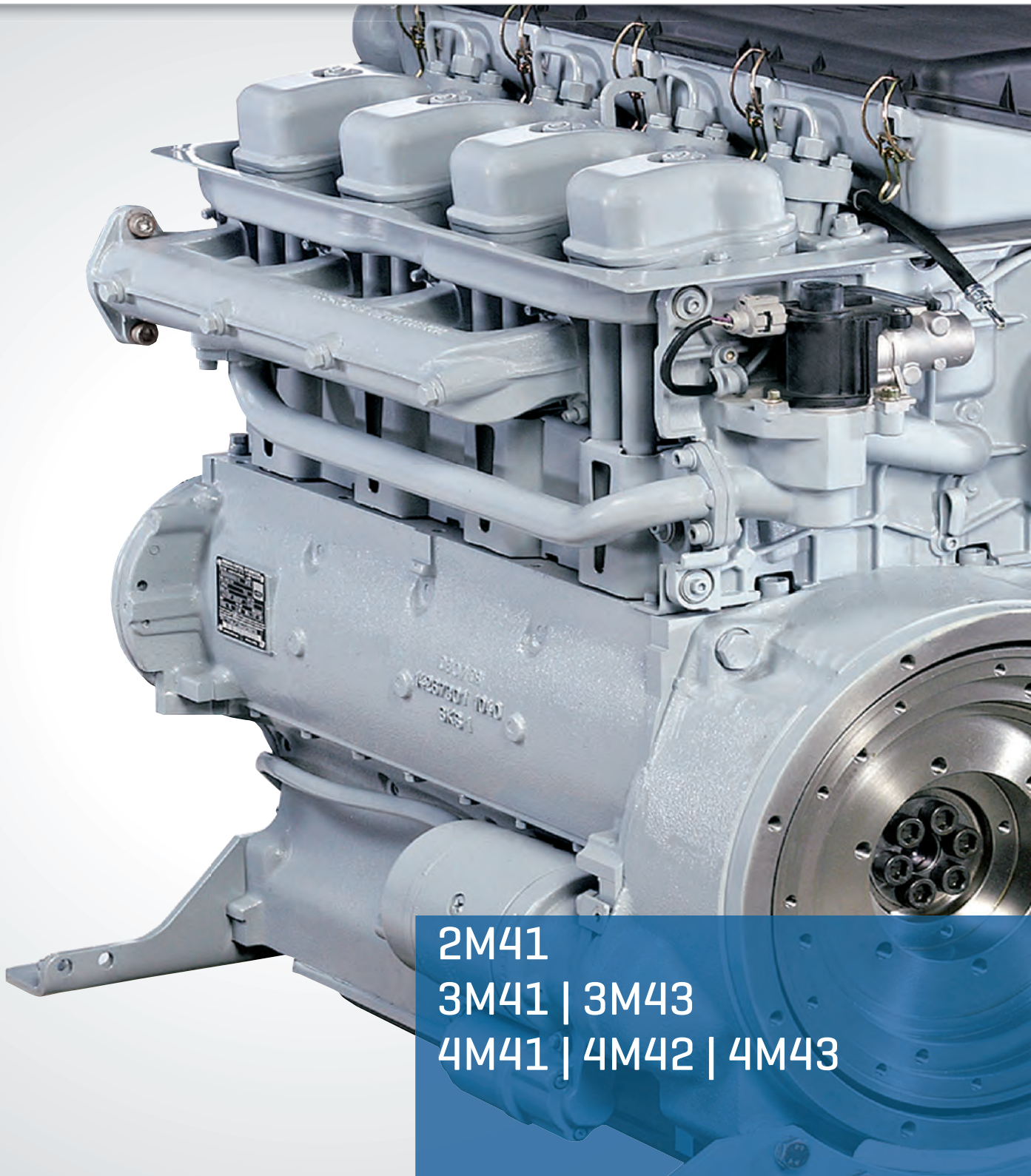
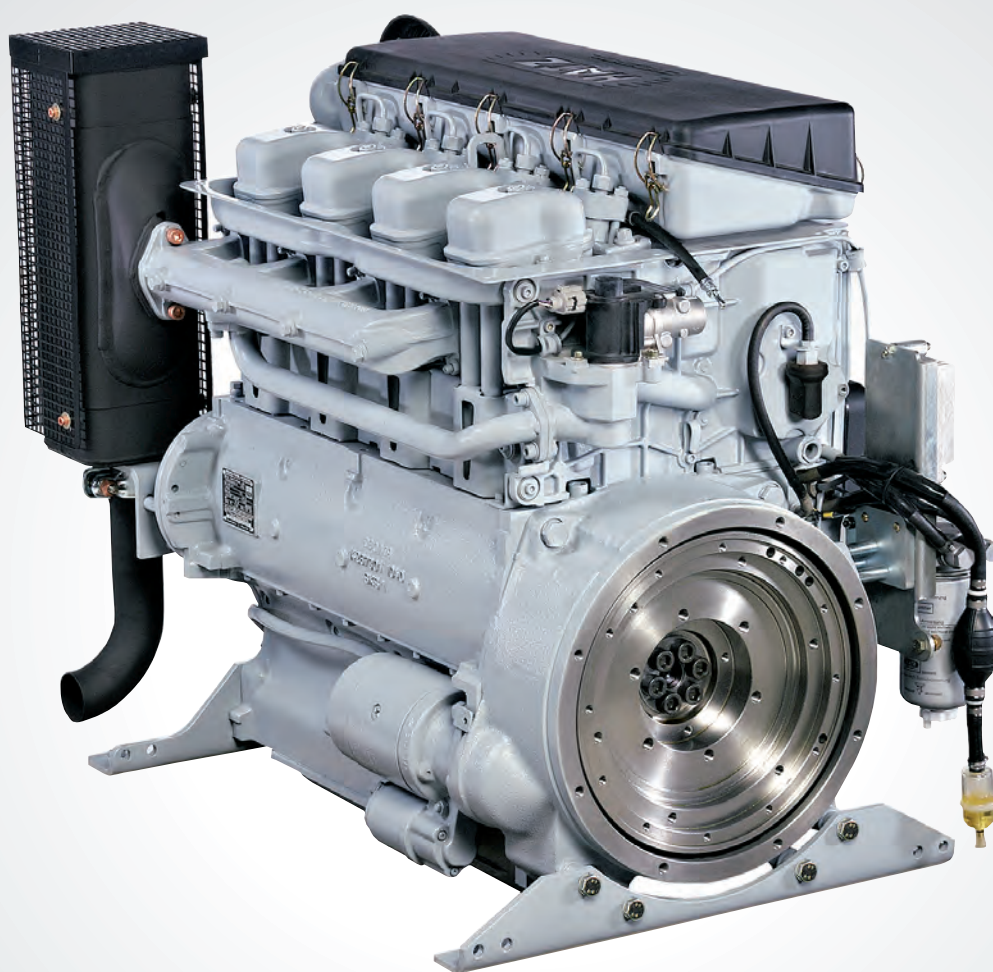


CREATING POWER SOLUTIONS.



2M41  
3M41 | 3M43  
4M41 | 4M42 | 4M43

**Hatz Diesel**



#### Simple operation

The M-series engines are fitted with an automatic hydraulic belt tensioner, self-bleeding injection pump, automatic cold start feed, and a signal transmitter for air filter maintenance as standard. Operation is also therefore easy even for non-specialists without long familiarization.



#### Diesel particulate filter

Hatz has developed a closed diesel particulate filter system with active regeneration in operation to give maximum flexibility to its customers. When the filter needs cleaning, it is fitted with quick fasteners for fast and non-destructive dismantling.

# Hatz M-series:

## Always ready for operation

The M-series is the long-running success among the industrial diesel engines. The 2, 3 and 4 cylinder engines have been successfully established in the market for about 30 years - and they are still considered to be unbeatable. The rugged basic power train, above all the strongest crankshaft of all engines in the market, has remained unchanged since the market launch. So running times of many tens of thousands of hours are no problem for the engines in the M-series.

### Environmental aspects

Hatz diesel engines in the L/M-series are the only exhaust-reduced, air-cooled engines available in this power range. The 4M42 with exhaust gas recirculation, the 3M43 as well as the 4M43 are also fitted with an electronic speed regulator and separable diesel particulate filter. Engines in the M43-series fulfill the strict emission standards of EU regulation 97/68/EC Stage IIIB as well as the regulations of the US EPA Tier 4 final.

### Fuel consumption and cold start

M-series engines are among the most efficient in the market. Fuel consumptions of 212 g/kWh testify to the optimized combustion process. 6-hole VCO nozzles, as well as the monoblock single pumps, and the optimized combustion chamber geometry all make their contribution to this. Without a pre glow system the engines start reliably as low as -10°C; with a pre glow system and corresponding resources even -32°C is no problem.

### Unique automatic engine protection

The integrated, intelligent, mechanical automatic engine protection protects the engine. When a cooling fan malfunctions, there is not enough oil, or the inclination is too high, the engine is automatically stopped to prevent engine damage.

### Maintenance and repair with little effort

Maintenance of the M-series does not cause any great effort, because it has easy outside accessibility for all points necessary for oil checks, oil refill, oil change, and oil filter change as well as for valve adjustment and cleaning/changing of the integrated air filter. The M-series is built with a modular construction principle. Length-independent components such as cylinder heads, cylinders, conrods, bearing shells, injection nozzles, injection pumps, air filters, engine regulators, starter, and alternator are identical for all engines. Engine repair is easier and more cost effective. Furthermore, storekeeping for wearing parts is much easier to organize.

### Robust and durable design



Hatz engines are designed for an exceptionally long service life. The best possible materials and components coupled with uncompromising quality assurance contribute to the fact that Hatz engines have been setting the benchmark in the industry for many years when it comes to robustness and service life. And should, contrary to expectations, a spare part actually be needed, more than 500 service partners in 115 countries are available quickly and dependably with advice and assistance as well as original spare parts.

IFN rating ICFN rating F/IFN/ICFN rating

| Sales area<br>[exhaust certificate]    | 2M41      | 3M41      | 3M43      | 4M41      | 4M42      | 4M43      |
|----------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| USA [EPA/CARB constant speed] [r.p.m.] | 1500-2000 | -         | 1500-3000 | -         | -         | 1500-3000 |
| USA [EPA 2-speed] [r.p.m.]             | 1500-2000 | -         | -         | -         | -         | -         |
| USA [EPA variable speed] [r.p.m.]      | 2000      | -         | 1500-3000 | -         | -         | 1500-3000 |
| EU [constant speed] [r.p.m.]           | 1500-3000 | 1500-3000 | -         | 1500-1800 | 1800-3000 | -         |
| EU [variable speed] [r.p.m.]           | 1500-3000 | 1500-3000 | -         | 1500-1800 | -         | 2200-3000 |
| India CPCB I [Genset] [r.p.m.]         | 1500      | 1500      | -         | 1500      | -         | -         |
| All others [non-EPA] [r.p.m.]          | 1500-3000 | 1500-3000 | -         | 1500-3000 | -         | -         |

## Technical data, Performance Table

| Technical data                 |                                                                                        | 2M41                                    | 3M41                     | 3M43                     | 4M41                     | 4M42                     | 4M43                     |
|--------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Type                           | Air-cooled 4-stroke diesel engine with direct injection                                |                                         |                          |                          |                          |                          |                          |
| Number of cylinders            |                                                                                        | 2                                       | 3                        | 3                        | 4                        | 4                        | 4                        |
| Exhaust gas after-treatment    |                                                                                        | —                                       | —                        | EGR & DPF                | —                        | EGR                      | EGR & DPF                |
| Bore x stroke<br>[mm / inches] |                                                                                        | 102 x 105<br>4.02 x 4.13                | 102 x 105<br>4.02 x 4.13 | 102 x 105<br>4.02 x 4.13 | 102 x 105<br>4.02 x 4.13 | 102 x 105<br>4.02 x 4.13 | 102 x 105<br>4.02 x 4.13 |
| Displacement [l / cu.in.]      |                                                                                        | 1.716 / 104.7                           | 2.574 / 157              | 2.574 / 157              | 3.432 / 209.4            | 3.432 / 209.4            | 3.432 / 209.4            |
| Engine                         | Mean piston speed at<br>3000 rpm [m/s / ft/min]                                        | 10.5 / 2.067                            |                          |                          |                          |                          |                          |
|                                | Compression ratio                                                                      | 20.0 : 1                                | 20.0 : 1                 | 20.8 : 1                 | 20.0 : 1                 | 20.8 : 1                 | 20.8 : 1                 |
|                                | Lub. oil consumption,<br>related to full load                                          | max. 1 % of fuel consumption            |                          |                          |                          |                          |                          |
|                                | Oil filling<br>max / min [l / US qts]                                                  | 5.5 / 3.0<br>5.8 / 3.2                  | 8.5 / 5.0<br>9.0 / 5.3   | 8.5 / 5.0<br>9.0 / 5.3   | 14.0 / 5.0<br>14.8 / 5.3 | 14.0 / 5.0<br>14.8 / 5.3 | 14.0 / 5.0<br>14.8 / 5.3 |
|                                | Speed control<br>• Lowest idle speed r.p.m.                                            | 900                                     | 900                      | 1.000                    | 900                      | 1.000                    | 1.000                    |
|                                | • Static speed droop                                                                   | approx. 5% at 3000 r.p.m.               |                          |                          |                          |                          |                          |
|                                |                                                                                        |                                         |                          |                          |                          |                          |                          |
| Installation information       | Amount of combustion air at<br>3000 rpm approx. <sup>1)</sup><br>[m³/min / cu.ft./min] | 2.6 / 92                                | 3.9 / 138                | 3.9 / 138                | 5.2 / 184                | 5.2 / 184                | 5.2 / 184                |
|                                | Amount of cooling air at<br>3000 rpm approx. <sup>1)</sup><br>[m³/min / cu.ft./min]    | 29 / 1.024                              | 39 / 1.377               | 39 / 1.377               | 49 / 1.730               | 49 / 1.730               | 49 / 1.730               |
|                                | Mass moment of inertia J<br>[kgm² / lb.ft²]                                            |                                         |                          |                          |                          |                          |                          |
|                                | • SAE-flywheel 8"                                                                      | 0.64 / 15.2                             | 0.65 / 15.4              | 0.65 / 15.4              | 0.67 / 15.9              | 0.67 / 15.9              | 0.67 / 15.9              |
|                                | • flywheel for F+S clutch                                                              | 0.49 / 11.6                             | 0.50 / 11.9              | 0.50 / 11.9              | 0.51 / 12.1              | 0.51 / 12.1              | 0.51 / 12.1              |
|                                | Starter                                                                                | 12 V - 2.7 kW — 24 V - 4.0 kW           |                          |                          |                          |                          |                          |
|                                | Alternator charging current at<br>3000 / 1500 r.p.m.                                   | 14 V - 60 A / 42 A — 28 V - 40 A / 28 A |                          |                          |                          |                          |                          |
| Weight                         | Battery capacity<br>[min / max Ah]                                                     | 12 V - 88 / 143 Ah — 24 V - 55 / 110 Ah |                          |                          |                          |                          |                          |
|                                | Engine with heavy flywheel<br>[kg / lbs.]                                              | 294 / 648                               | — / —                    | — / —                    | — / —                    | — / —                    | — / —                    |
|                                | Engine with electric start<br>12 V or 24 V [kg / lbs.]                                 | 258 / 569                               | 308 / 679                | 310 / 683 <sup>2)</sup>  | 373 / 822                | 378 / 833                | 378 / 833 <sup>2)</sup>  |

<sup>1)</sup> For other speeds there is a linear reduction in the air requirement.

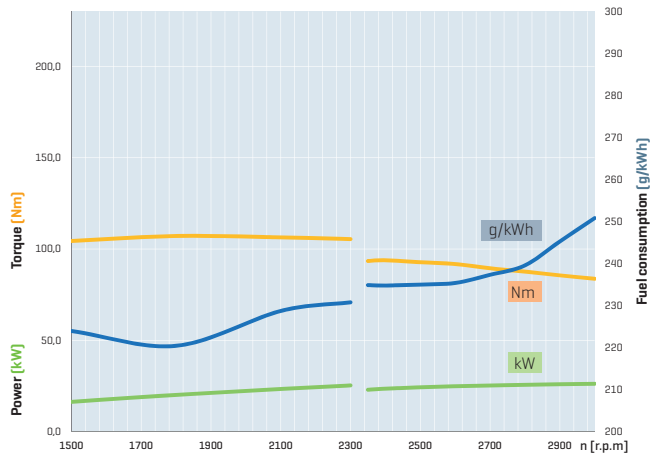
<sup>2)</sup> Weight without diesel particulate filter.

| Performance Table <sup>3)</sup>                                                                                                                   | [r.p.m.] | 2M41        | 3M41        | 3M43        | 4M41        | 4M42        | 4M43        |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|-------------|-------------|-------------|-------------|-------------|
| Vehicle power acc. to<br>DIN ISO 1585 [kW / hp]                                                                                                   | 3000     | 28.3 / 38.5 | 43.3 / 58.9 | — / —       | 57.5 / 78.2 | — / —       | — / —       |
|                                                                                                                                                   | 2600     | 26.9 / 36.6 | 40.6 / 55.2 | — / —       | 53.8 / 73.2 | — / —       | — / —       |
|                                                                                                                                                   | 2300     | 25.3 / 34.4 | 38.1 / 51.8 | — / —       | 51.0 / 69.4 | — / —       | — / —       |
| Blocked<br>ISO brake horsepower [IFN]<br>for heavily intermittent<br>loading acc. to ISO 3046-1<br>[kW / hp]                                      | 3000     | 26.3 / 35.8 | 39.8 / 54.1 | 36.6 / 49.8 | 53.1 / 72.2 | 51.5 / 70.0 | 49.9 / 67.9 |
|                                                                                                                                                   | 2600     | 25.0 / 34.0 | 37.8 / 51.4 | 34.9 / 47.5 | 50.6 / 68.8 | 48.0 / 65.3 | 46.1 / 62.7 |
|                                                                                                                                                   | 2300     | 25.4 / 34.5 | 38.9 / 52.9 | 35.1 / 47.7 | 52.0 / 70.7 | 47.6 / 64.7 | 45.7 / 62.1 |
|                                                                                                                                                   | 2000     | 22.4 / 30.5 | 34.5 / 46.9 | 31.4 / 42.7 | 46.0 / 62.6 | 42.4 / 57.7 | 41.2 / 56.0 |
|                                                                                                                                                   | 1800     | 20.2 / 27.5 | 31.1 / 42.3 | 28.4 / 38.6 | 41.3 / 56.2 | 38.6 / 52.5 | 37.2 / 50.6 |
|                                                                                                                                                   | 1500     | 16.4 / 22.3 | 25.0 / 34.0 | 23.2 / 31.5 | 34.0 / 46.2 | — / —       | 30.5 / 41.5 |
| ISO standard power output [ICXN]<br>[10% overload permissible]<br>[kW / hp]                                                                       | 3000     | 23.7 / 32.2 | 35.8 / 48.7 | — / —       | 47.8 / 65.0 | — / —       | — / —       |
|                                                                                                                                                   | 2600     | 22.5 / 30.6 | 34.0 / 46.2 | — / —       | 45.5 / 61.9 | — / —       | — / —       |
|                                                                                                                                                   | 2300     | 22.9 / 31.1 | 35.0 / 47.6 | — / —       | 46.8 / 63.6 | — / —       | — / —       |
| Blocked ISO standard power<br>output (no overload permissible)<br>acc. to ISO 3046-1. [kW / hp]<br>For constant speed and constant<br>load [ICFN] | 2000     | 20.2 / 27.5 | 31.1 / 42.3 | — / —       | 41.4 / 56.3 | — / —       | — / —       |
|                                                                                                                                                   | 1800     | 18.2 / 24.8 | 28.0 / 38.1 | — / —       | 37.2 / 50.6 | — / —       | — / —       |
|                                                                                                                                                   | 1500     | 14.8 / 20.1 | 22.5 / 30.6 | — / —       | 30.6 / 41.6 | — / —       | — / —       |

<sup>3)</sup> Version „Z“ with counter balance shaft: power reduction about 0.3–1.5 kW depending on cylinder and speed.

# Power, torque and fuel consumption

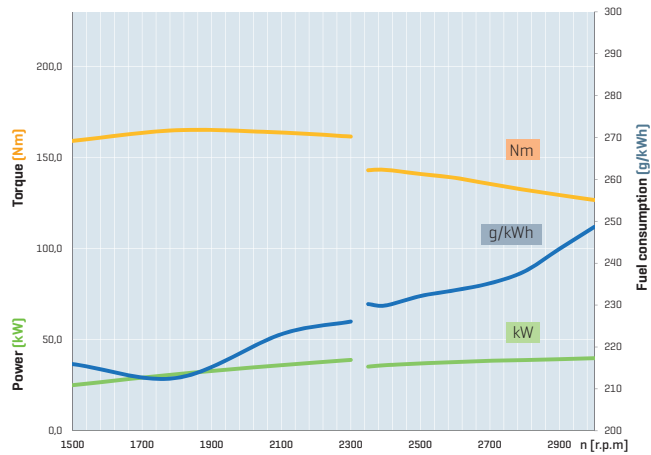
## 2M41



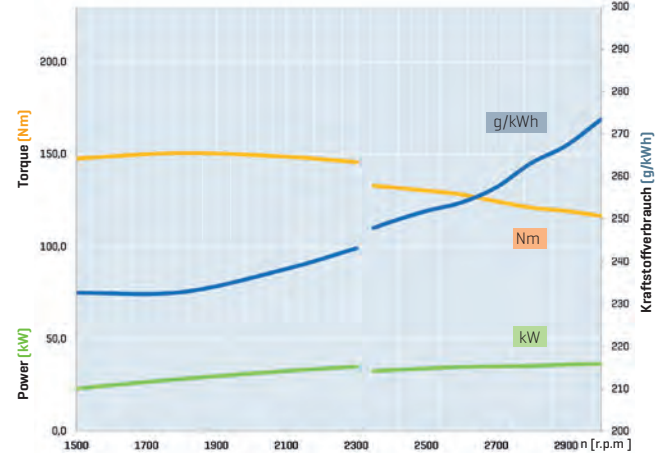
### Power ratings

For the power ratings, refer to standard reference conditions of ISO 3046-1 (IFN):  
 + 25 °C (77 °F), 100 kPa, relative humidity 30 %. The specified power is reached during the running-in period, and can be 5 % less on delivery. Power reduction acc. to ISO 3046-1. Standard values: More than 100 m above sea level approx. 1 % per 100 m. Above 25 °C approx. 4 % per 10 °C. The power taken from the alternator also has to be added to the power calculation.

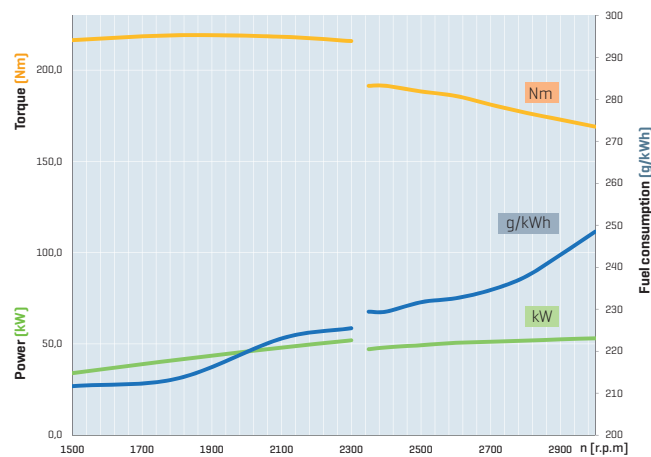
## 3M41



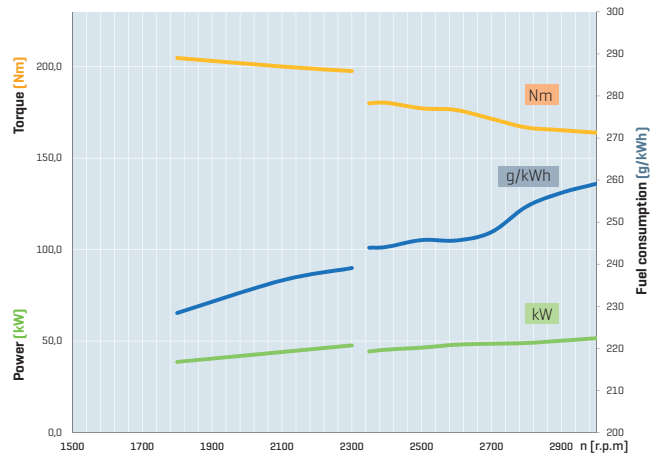
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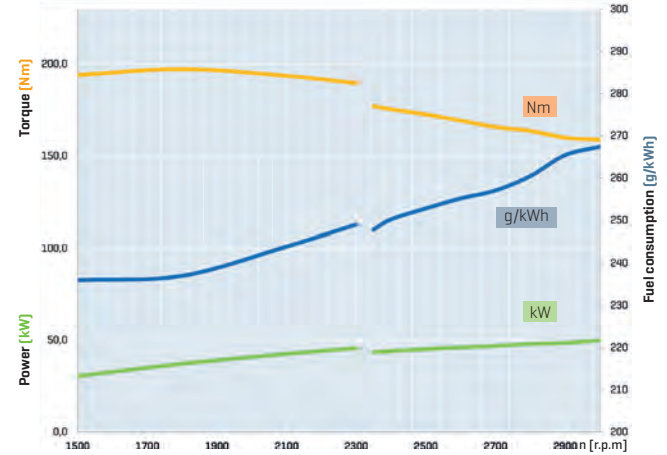
## 4M41



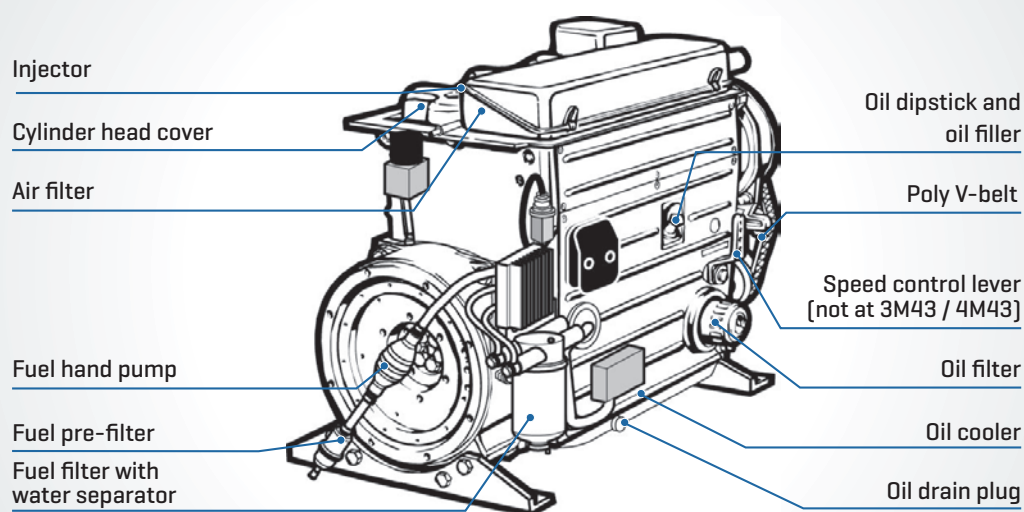
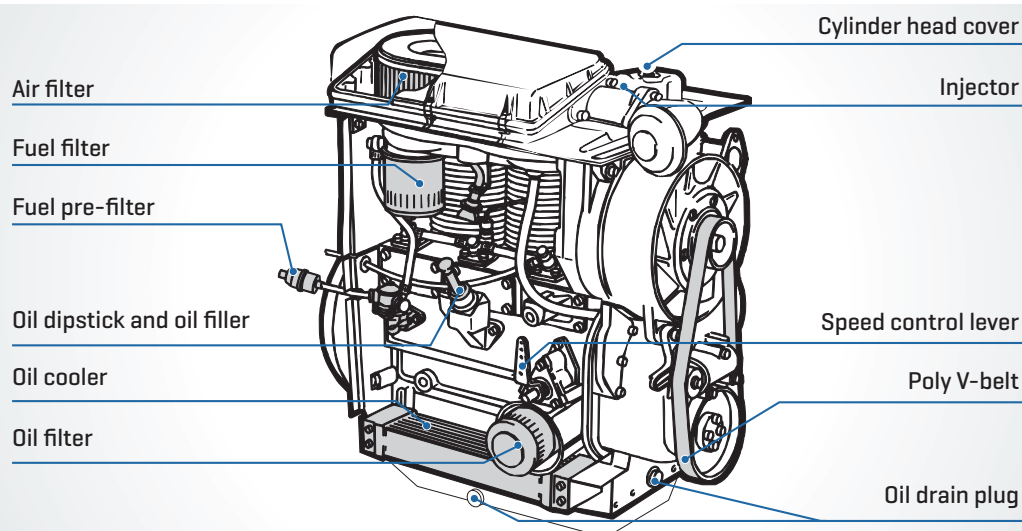
## 4M42



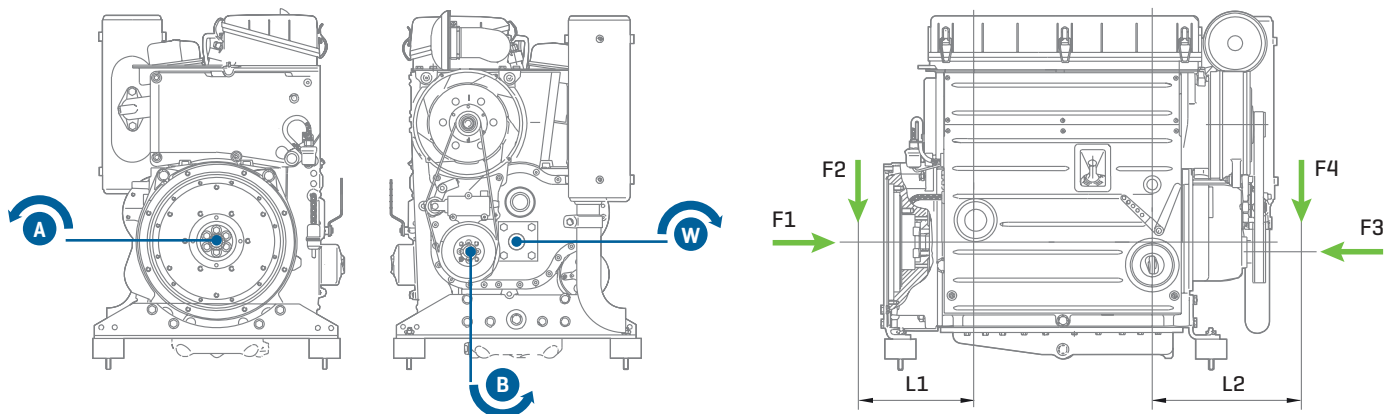
## 4M43



## Maintenance and operating points



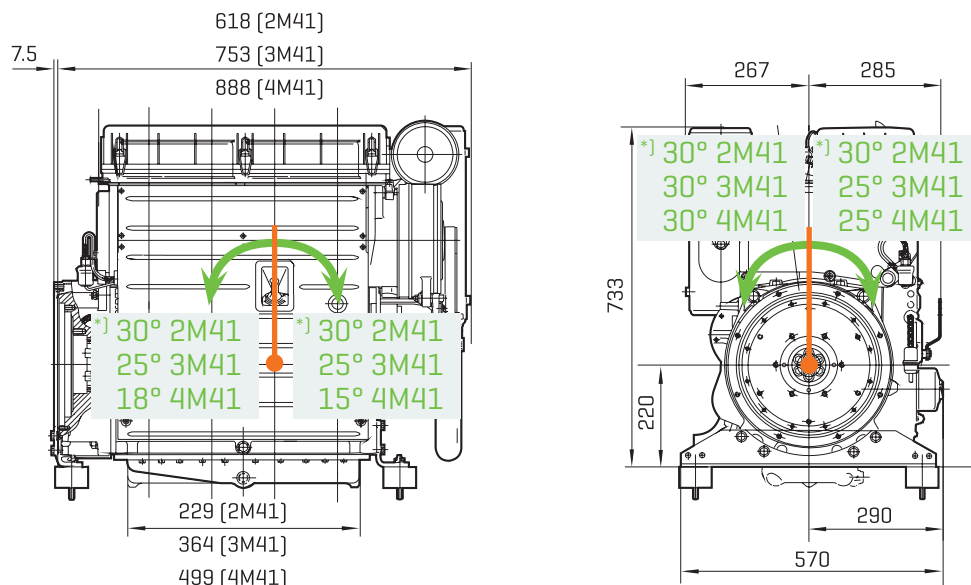
## Power take off



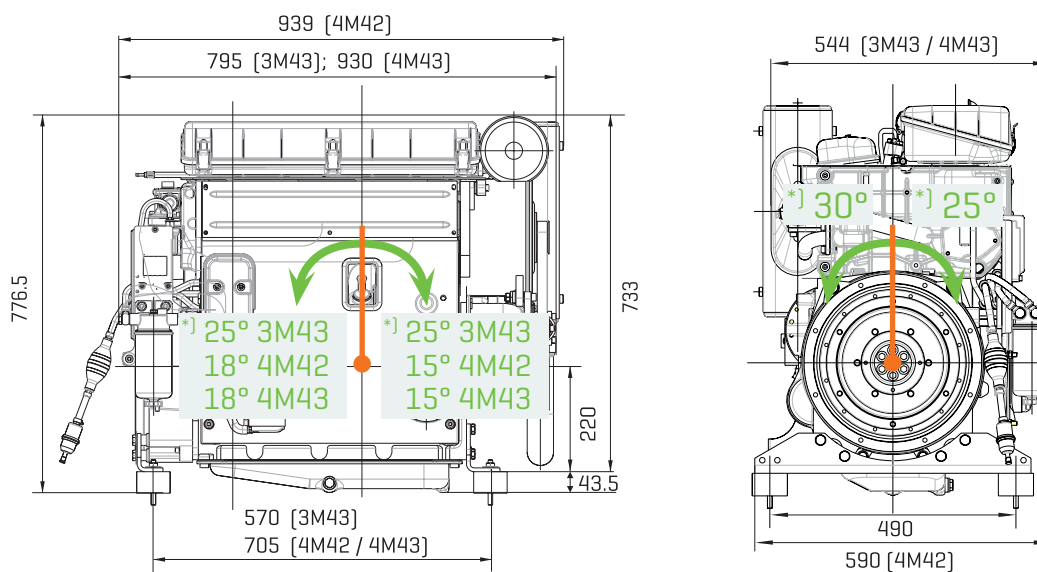
| Power take off       |    | 2-4M41                                                  | 4M42                                                    | 3-4M43                                                  |
|----------------------|----|---------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|
| Transmittable torque | A  | Full torque                                             | Full torque                                             | Full torque                                             |
|                      | B  | 32 Nm with engine speed                                 | 32 Nm with engine speed                                 | 32 Nm with engine speed                                 |
|                      | W  | 70 Nm with engine speed                                 | 70 Nm with engine speed                                 | 70 Nm with engine speed                                 |
|                      | F1 | 2700 N                                                  | 2700 N                                                  | 2700 N                                                  |
| Permissible load     | F2 | $F2 = \frac{400\,000}{L1[\text{mm}] - 73} \text{ [N]}$  | $F2 = \frac{400\,000}{L1 [\text{mm}] - 73} \text{ [N]}$ | $F2 = \frac{400\,000}{L1 [\text{mm}] - 73} \text{ [N]}$ |
|                      | F3 | 1770 N                                                  | 1770 N                                                  | 1770 N                                                  |
|                      | F4 | $F4 = \frac{228\,330}{L2 [\text{mm}] - 76} \text{ [N]}$ | $F4 = \frac{228\,330}{L2 [\text{mm}] - 76} \text{ [N]}$ | $F4 = \frac{228\,330}{L2 [\text{mm}] - 76} \text{ [N]}$ |
|                      |    |                                                         |                                                         |                                                         |

## Dimensions

### 2M41 | 3M41 | 4M41

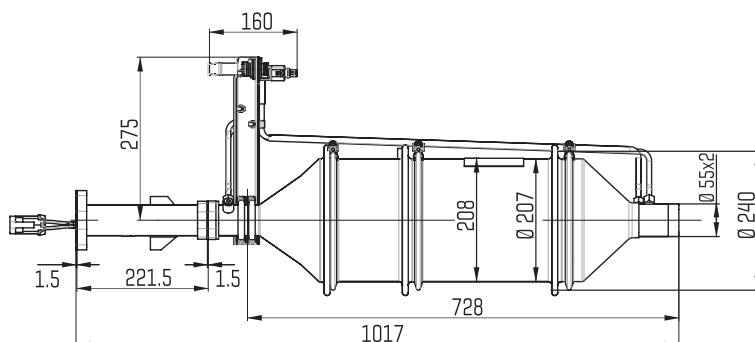


### 3M43 | 4M42 | 4M43



Flexible mounting is normally recommended for M series engines. This mounting keeps the noise level of the driven unit low. Another possibility is the flexible mounting with elevated engine brackets (not shown here). Rigid mounting is only possible up to an operating speed of 2300 r.p.m.

### Diesel particulate filter (DPF)



Spread of box dimensions  $\pm 3$  mm due to tolerance. Drawings with detail and connection dimensions as PDF and DXF can be found at [www.HATZ-DIESEL.com](http://www.HATZ-DIESEL.com).

Dimensions 3M43 and 4M43 without DPF and exhaust muffler.

\*] Max. tilt position

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