Anybody can add more power to an engine. That’s not the hard part. The challenge is increasing the performance without increasing the body size.

With the KOHLER KDI diesel engine, we started from scratch to build an entirely new engine experience. Using state-of-the-art technology to control the combustion process, we created a diesel that delivers more power and more torque in a smaller frame. So you can keep your performance and downsize your engine.

But we didn’t stop there. The KDI lineup is a comprehensive platform of engines equipped to meet all emission regulations worldwide. Our engineers created a specific aftertreatment solution for every continent on earth in the smallest size possible. So wherever you are, we offer the most compact solution for your machine.
INNOVATIONS AND BENEFITS

COMMON-RAIL SYSTEM

Kohler has selected the most advanced common-rail system available on the market and specifically engineered for extreme durability and longevity within arduous agricultural, industrial and construction equipment applications. The 2000 bar high-pressure pump, together with the advanced multiple injection control of the solenoid-injectors, allows an excellent fuel rate control during the injection process.

TURBOCHARGER AND CHARGE AIR COOLER

The waste-gated turbocharger has been specifically tuned to minimize the turbo-lag response and provide the precise volume of air for an excellent low-end torque capability. The special design of the lubrication system guarantees extended durability of the turbocharger. The use of a charge air cooler is required to ensure the correct air inlet temperature for the optimal engine performance whilst achieving emissions compliance.

4 VALVES

The 4 valves per cylinder design has been selected to enable the installation of the injectors precisely on the cylinder axis and centered with the combustion bowl. This solution allows for a symmetrical fuel atomization and distribution within the combustion bowl ensuring optimal mixing of fuel and air. The design of the combustion bowl itself together with the inlet ports shaping, have been studied and developed with CFD analysis to complete the absolute optimization of the combustion process.

ECU

The engine electronic control unit (ECU), together with the common rail injection system, is a part of the most advanced automotive style engine management system and has been specifically developed for agricultural, industrial and construction equipment applications. It allows a full control of the engine calibration parameters to achieve the engine performances and emissions targets.

A CAN Bus link allows the ECU to interface with other electronic systems within the final application in order to optimize the engines operating parameters. Options of specific functionalities have been enabled within the ECU in order to provide OEMs with different governing characteristics ensuring total compatibility with individual equipment.

EGR SYSTEM

The Exhaust Gas Recirculation (EGR) system has been designed with CFD analysis and the use of comprehensive research and development resources. The chosen design of a “hot side” EGR layout will avoid valve-sticking problems that are historically the most common failures seen within these systems. Exhaust gas routing across the cylinder head ensures a beneficial preliminary gas cooling before entering the EGR valve to reduce the overall dimensions of the unit to assist installation parameters.

DOC (Diesel Oxidation Catalyst)

The DOC reacts with exhaust gases to reduce carbon monoxide, hydrocarbons, and some particulate matter (PM). It promotes oxidation of several exhaust gas components by oxygen, which is present in ample quantities in diesel exhaust. When passed over an oxidation catalyst, diesel pollutants – carbon monoxide (CO), gas phase hydrocarbons (HC), organic fraction of diesel particulates (SOF) – can be oxidized to CO2.

Kohler strategy is to offer a maintenance free DOC using the latest available technology to extend service intervals and reduce fuel consumption.

DPF (Diesel Particulate Filter)

The DPF is a soot trap, which physically captures diesel particulate matter (PM) and prevents release into the atmosphere. The DPF traps soot particles but at the same time accumulates ashes from engine oil combustion and particles from engine wear. The DPF is kept clean from the soot during normal engine operation through a process called filter regeneration. The regeneration strategy has been designed to maintain optimal machine operation, even at low load and low temperatures. This limits downtime due to forced regeneration events, and consequently increases machine productivity. We offer two DPF versions. The first reaches a maximum service interval of 10,000 hours, the whole engine lifecycle; whereas the second is the most compact of the market and ensures a maintenance interval of 6,000 hours.

KOHLER Flex is the range of solutions for emission control that we have designed to enable each configuration of the KDI platform to comply with all emissions standards and regulations worldwide.

At the heart of KOHLER Flex is the clean combustion of KDI engines that enables the adoption of a compact DPF to meet more stringent emission standard. KOHLER Flex combines in-cylinder combustion of KDI engines, made possible by state-of-the-art High Pressure Common Rail (2000 bar), 4 Valves head, Turbocharger, cooled-EGR, and the ultra-compact aftertreatment devices (DOC, DPF and SCR) to comply with all emission requirements. Each combination of KOHLER Flex has been designed with an all-in-one philosophy, with the objective to minimize change for OEMs while fitting into existing packages. These systems are efficient and reliable, and can be deployed in many combinations to achieve effective emissions solutions for the different markets.

KOHLER Flex solutions

<table>
<thead>
<tr>
<th>KOLHER Flex solutions</th>
<th>EA</th>
<th>EB</th>
<th>E4</th>
<th>E5</th>
<th>U3</th>
<th>U4</th>
<th>C3</th>
<th>C4</th>
<th>U4</th>
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<tbody>
<tr>
<td>EMISSION STANDARD</td>
<td>STAGE 3A</td>
<td>STAGE 3B</td>
<td>STAGE IV</td>
<td>STAGE V*</td>
<td>TIER 3</td>
<td>TIER 4 FINAL/ CARB</td>
<td>CHINA 3</td>
<td>CHINA 4#</td>
<td>TIER 4 FINAL/ CARB</td>
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<td>MECHANICAL INJECTION</td>
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* Effective date: January 2019 (19-56kW), January 2020 (56-130kW)
** on demand on selected model
*** with limitation on max sulfur content in fuel
# indicative only. China 4 emissions limits under definition
TURBO COMMON RAIL ENGINES

STANDARD EQUIPMENT

- Intake manifold
- Exhaust manifold
- Side oil refilling
- Electric starter
- 80A alternator
- SAE 4 (7 1/2"
- Cabin heating provision
- Oil filter engine mounted
- Fuel filter with water sensor Environmentally friendly oil filter
- ECU
- Oil sump capacity 8.5 L (KDI 1903) and 11.3 L (KDI 2504)

OPTIONAL ACCESSORIES

- SAE 3 (11" 1/2"
- Radiators with integral charge air cooler
- Heavy duty air cleaner
- Hydraulic pump provision on 3rd and 4th PTO
- 100A alternator
- Balancer shafts (for KDI 2504 only)
- High fan configuration
- Structural oil sump and bell housing
- 100% Power take-off front PTO (KDI 2504 only)
- Engine-mounted DPF (when applicable)
- ATS insulation
**Quick specifications**

<table>
<thead>
<tr>
<th></th>
<th>KDI-TCQ 1903U3/26</th>
<th>KDI-TCF 1903U4/26</th>
<th>KDI-TCR 1903E5/26</th>
<th>KDI-TC 1903E5/26</th>
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<tbody>
<tr>
<td>CYLINDERS / FIE</td>
<td>3 / Turbo Common Rail</td>
<td>3 / Turbo Common Rail</td>
<td>3 / Turbo Common Rail</td>
<td>3 / Turbo Common Rail</td>
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<tr>
<td>MAX POWER</td>
<td>42 (56) @ 2600</td>
<td>42 (56) @ 2600</td>
<td>42 (56) @ 2600</td>
<td>37 (50) @ 2600</td>
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<tr>
<td>MAX TORQUE</td>
<td>225 Nm @ 1500</td>
<td>225 @ 1500</td>
<td>225 @ 1500</td>
<td>170 Nm @ 1500</td>
</tr>
<tr>
<td>EMISSION COMPLIANCE</td>
<td>US Tier 3 Equivalent</td>
<td>EU Stage IIIIB</td>
<td>EU STAGE V US TIER 4 Final</td>
<td>EU STAGE V US TIER 4 Final</td>
</tr>
<tr>
<td>KOHLER Flex Emissions Management system</td>
<td>US (EGR)</td>
<td>U4 (EGR+DOC)</td>
<td>E5 (EGR+DOC+DPF)</td>
<td>E5 (EGR+DOC+DPF)</td>
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<tr>
<td>AFTERCOOLER</td>
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**KOHLER Flex ENVELOPE**

**DATA**

Dimensions (mm)

**PERFORMANCE CURVES**

(IFN-ACCORDING TO ISO 3046 and ISO 14396)

Power ratings refer to engines equipped with air filter, standard muffler, after running-in period at ambient conditions of +25°C, relative humidity 30% and 1 bar. De-rating depending on applications.
### Quick specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>CYLINDERS / FIE</th>
<th>MAX POWER</th>
<th>MAX TORQUE</th>
<th>EMISSION COMPLIANCE</th>
<th>KOHLER Flex Emissions Management system</th>
<th>AFTERCOOLER</th>
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<tbody>
<tr>
<td>KDI-TCX 2504U3/26</td>
<td>4 / Turbo Common Rail</td>
<td>55.4 (74) @ 2600</td>
<td>300 @ 1500</td>
<td>EU Stage IIIB</td>
<td>U3 (EGR+DOC)</td>
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<tr>
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<td>4 / Turbo Common Rail</td>
<td>55.4 (74) @ 2600</td>
<td>300 @ 1500</td>
<td>EU Stage IIII</td>
<td>U4 (EGR+DOC+DPF)</td>
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<tr>
<td>KDI-TCR 2504E5/26</td>
<td>4 / Turbo Common Rail</td>
<td>55.4 (74) @ 2600</td>
<td>315 @ 1500</td>
<td>EU STAGE V</td>
<td>E5 (EGR+DOC+DPF)</td>
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<tr>
<td>KDI-TC 2504E5/26</td>
<td>4 / Turbo Common Rail</td>
<td>50 (67) @ 2600</td>
<td>236 @ 1500</td>
<td>EU STAGE V</td>
<td>E5 (EGR+DOC+DPF)</td>
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### Data

#### Dimensions (mm)

- **KDI-TCX 2504U3/26**: 704 x 523
- **KDI-TCF 2504U4/26**: 704 x 523
- **KDI-TCR 2504E5/26**: 704 x 523
- **KDI-TC 2504E5/26**: 704 x 523

### Performance Curves

- **MB - Torque curve - ISO 3046/1 - IFN**
- **NB - Power curve - ISO 3046/1 - IFN**

Performance curves refer to engines equipped with air filter, standard muffler, after running-in period at ambient conditions of +25°C, relative humidity 30% and 1 bar. De-rating depending on applications.
SAE 3 (11" 1/2)
Radiators
Hydraulic pump provision on 3rd and 4th PTO
Structural oil sump and bell housing
Heavy duty air cleaner

SAE 4 (7" 1/2)
Cabin heating provision
Engine mounted oil filter
Fuel filter
Oil sump capacity 8.5 L (KDI-M 1903) and 11.3 L (KDI-M 2504)

OPTIONAL ACCESSORIES
High fan configuration
Fuel feeding pump
Balancer shafts (for KDI-M 2504 only)
100% Power take-off front PTO (for KDI-M 2504 only)
**KDI-M 1903**

**Quick specifications**

<table>
<thead>
<tr>
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<th>KDI-M 1903EA/26</th>
</tr>
</thead>
<tbody>
<tr>
<td>CYLINDERS / FIE</td>
<td>3 / Mechanical Rotary Pump</td>
</tr>
<tr>
<td>MAX POWER</td>
<td>31 (42) @ 2600</td>
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<tr>
<td>MAX TORQUE</td>
<td>133 @ 1500</td>
</tr>
<tr>
<td>EMISSION COMPLIANCE</td>
<td>EU STAGE III A</td>
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</table>

**DATA**

Dimensions (mm)

**PERFORMANCE CURVES (IFN-ACCORDING TO ISO 3046 and ISO14396)**

Power ratings refer to engines equipped with air filter, standard muffler, after running-in period at ambient conditions of +25°C, relative humidity 30% and 1 bar. Power drops by 1% every 100 m altitude and by 2% every 5°C above +25°C.
KDI-M 2504

**Quick specifications**

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<th>Feature</th>
<th>KDI-M 2504EA/26</th>
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<tr>
<td>CYLINDERS / FIE</td>
<td>4 / Mechanical Rotary Pump</td>
</tr>
<tr>
<td>MAX POWER</td>
<td>36.4 (49) @ 2600</td>
</tr>
<tr>
<td>MAX TORQUE</td>
<td>170 @ 1500</td>
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<tr>
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<td>EU STAGE III A</td>
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</table>

**DATA**

Dimensions (mm)

**PERFORMANCE CURVES**

(IFN-ACCORDING TO ISO 3046 and ISO 14396)

Power ratings refer to engines equipped with air filter, standard muffler, after running-in period at ambient conditions of +25°C, relative humidity 30% and 1 bar. Power drops by 1% every 100 m altitude and by 2% every 5°C above +25°C.
**RAIL ENGINES**

- **Turbo Common Rail Engines**

**Technical features**

- Cylinder: 3, 4
- Bore (mm): 88, 88
- Stroke (mm): 102, 102
- Engine displ (cm³): 1861, 2462
- Injection system: DI DI
- Injection Equipment: Turbo high pressure common rail Turbo high pressure common rail
- Oil consumption (% fuel): <0.1, <0.1
- Alternator belt replacement: 36mth, 36mth
- Oil/filfilter change interval std/synthetic (hr): 500-750, 500-750
- Coolant change: 24mth, 24mth
- Oil consumption (% fuel): <0.1, <0.1
- H x L x W (fan excluded) (mm): 720 x 598 x 530, 720 x 704 x 523
- Weight (kg): 235, 267
- Daily service points - positions: 1 side service 1 side service
- Ambient operating temps (°C): -40 to +50 -40 to +50
- Gradedensity-all round (continuous) (deg): 25, 25
- Gradedensity-all round (intermittent-1mm) (deg): 35, 35
- Oil type: SAE 5W40 low SAPS/ EURO 6 API CJ-4 SAE 5W40 low SAPS/ EURO 6 API CJ-4
- Auxiliary PTOs (3rd & 4th) (optional): Max torque (Nm): 100, 100
- Drive ratio: 1.23 times engine speed 1.23 times engine speed

**Performance**

- Max power (IFN - ISO 3046 and ISO 14396) @2600: 31 (41.5), 36.4 (48.8)
- Low-end torque (Nm@1000 rpm): 133@1500, 170@1500
- Max torque (IFN - ISO 3046 and ISO 14396) (Nm@rpm): 172, 225
- Low-end torque (Nm@1000 rpm): 242, 242
- Max power (g/kWh@2600 rpm): 237, 234
- Low-end torque (g/kWh): 223, 244
- Max torque (g/kWh@2600): 234, 236
- High Sulfur Fuel: < 2000 ppm*
- Military NATO Fuels: F34 - F35 - F44 - F63 - F64 - F65 *
-bearing (°C): down to -19
- Oil consumption (% fuel): <0.1, <0.1
- Alternator belt replacement: 36mth, 36mth
- Oil/filfilter change interval std/synthetic (hr): 500-750, 500-750
- Coolant change: 24mth, 24mth
- Oil consumption (% fuel): <0.1, <0.1
- H x L x W (fan excluded) (mm): 667.5 x 598.3 x 452.5, 667.5 x 704.3 x 452.5
- Weight (kg): 210, 244
- Daily service points - positions: 1 side service 1 side service
- Ambient operating temps (°C): -40 to +50 -40 to +50
- Gradedensity-all round (continuous) (deg): 25, 25
- Gradedensity-all round (intermittent-1mm) (deg): 35, 35
- Oil type: SAE 15W40 / API CH4 SAE 15W40 / API CH4
- Auxiliary PTOs (3rd & 4th) (optional): Max torque (Nm): 100, 100
- Drive ratio: 1.23 times engine speed 1.23 times engine speed

**MECHANICAL ENGINES**

**Performance**

- Max power (IFN - ISO 3046 and ISO 14396) (kW@rpm): 172, 225
- Low-end torque (Nm@1000 rpm): 242, 242
- Max torque (IFN - ISO 3046 and ISO 14396) (Nm@rpm): 133@1500, 170@1500
- Low-end torque (g/kWh@2600 rpm): 80, 110
- High Sulfur Fuel: < 2000 ppm*
- Military NATO Fuels: F34 - F35 - F44 - F63 - F64 - F65 *
- Oil consumption (% fuel): <0.1, <0.1
- Alternator belt replacement: 36mth, 36mth
- Oil/filfilter change interval std/synthetic (hr): 500-750, 500-750
- Coolant change: 24mth, 24mth
- Oil consumption (% fuel): <0.1, <0.1
- H x L x W (fan excluded) (mm): 667.5 x 598.3 x 452.5, 667.5 x 704.3 x 452.5
- Weight (kg): 210, 244
- Daily service points - positions: 1 side service 1 side service
- Ambient operating temps (°C): -40 to +50 -40 to +50
- Gradedensity-all round (continuous) (deg): 25, 25
- Gradedensity-all round (intermittent-1mm) (deg): 35, 35
- Oil type: SAE 15W40 / API CH4 SAE 15W40 / API CH4
- Auxiliary PTOs (3rd & 4th) (optional): Max torque (Nm): 100, 100
- Drive ratio: 1.23 times engine speed 1.23 times engine speed

**Fuel consumption**

- Max power (IFN - ISO 3046 and ISO 14396) (kW@rpm): 31 (41.5), 36.4 (48.8)
- Low-end torque (Nm@1000 rpm): 80, 110
- Max torque (IFN - ISO 3046 and ISO 14396) (Nm@rpm): 133@1500, 170@1500
- Low-end torque (g/kWh@2600 rpm): 80, 110
- High Sulfur Fuel: < 2000 ppm*
- Military NATO Fuels: F34 - F35 - F44 - F63 - F64 - F65 *
- Jet Fuels – Jet A A1*

**Gradeability**

- Ambient operating temps (°C): -40 to +50 -40 to +50
- Max torque (Nm): 100, 100
- Drive ratio: 1.23 times engine speed 1.23 times engine speed
- Provision for a double Gr.2 tandem hydraulic pump • •

**Model**

- KOI-M 1863
- KOI-M 2024

**Engine specs**

- 4 stroke diesel with cylinder in line
- Liquid cooling • •
- 4 valves per cylinder • •
- In crankcase camshaft, gear train driven • •
- Pushrod - rocker arms timing with hydraulic tappets • •
- Cast iron crankcase with bed-plate • •
- Cast iron cylinder head • •
- Closed crankcase ventilation system • •
- Waste-gate turbocharger - -

**Model**

- KOI-M 1903
- KOI-M 2024

**Engine specs**

- 4 stroke diesel with cylinder in line
- Liquid cooling • •
- 4 valves per cylinder • •
- In crankcase camshaft, gear train driven • •
- Pushrod - rocker arms timing with hydraulic tappets • •
- Cast iron crankcase with bed-plate • •
- Cast iron cylinder head • •
- Closed crankcase ventilation system • •
- Waste-gate turbocharger - -