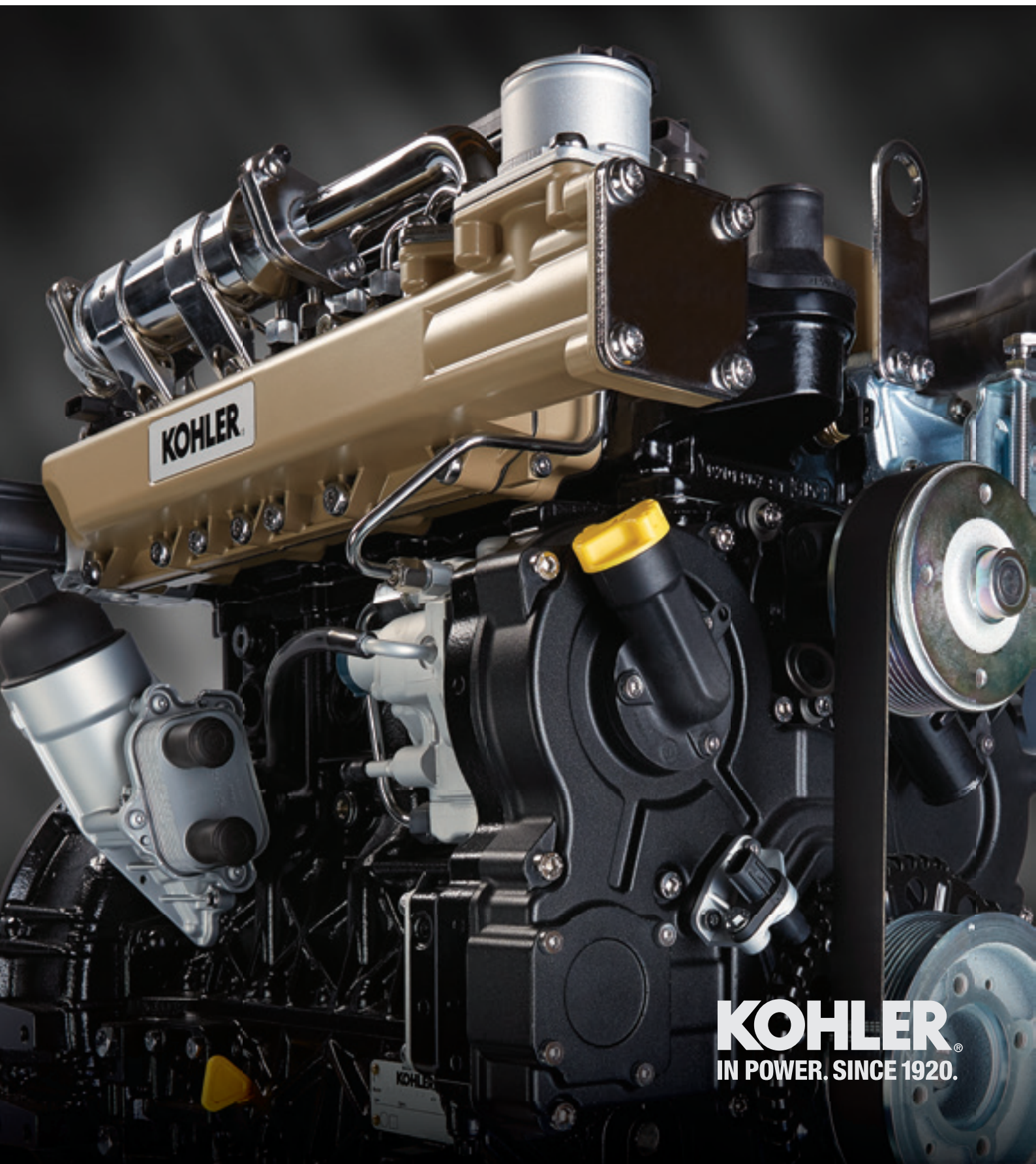


# KOHLER<sup>®</sup> DIESEL KDI

31.0–55.4 kW | 42–75 hp



**KOHLER<sup>®</sup>**  
IN POWER. SINCE 1920.

# **MORE POWER. SMALLER FOOTPRINT. THE ULTIMATE DIESEL ENGINE.**

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.

**ONE ENGINE PLATFORM  
FOR THE ENTIRE WORLD**

**SMART EMISSION  
MANAGEMENT SYSTEM**

**EXCELLENT FUEL  
EFFICIENCY**

**LONG  
SERVICE INTERVALS**

**EASY  
MAINTENANCE**

**LOW  
VIBRATIONS**

**REDUCED  
NOISE**

**COMPACT**

# 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

## AN INTEGRATED SUITE OF ENGINE SYSTEMS

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									
		EA	EB	E4	E5	U3	U4	C3	C4	U4	NE
		EUROPE				NORTH AMERICA & CANADA		CHINA		KOREA	LESS REGULATED COUNTRIES
	EMISSION STANDARD	STAGE 3A	STAGE 3B	STAGE IV	STAGE V*	TIER 3	TIER 4 FINAL/ CARB	CHINA 3	CHINA 4#	TIER 4 FINAL/ CARB	
<56kW	MECHANICAL INJECTION	•									•
	HIGH-PRESSURE COMMON RAIL		•		•	•	•	•	•	•	(•***)
	C-EGR		•		•	(•***)	•	(•**)	•	•	
	DOC		•		•		•		•	•	
	DPF				•		(•**)		•	(•**)	
>56kW	HIGH-PRESSURE COMMON RAIL			•	•	•	•	•	•	•	(•***)
	C-EGR			•		•	•	•	•	•	
	DOC			•	•		•		•	•	
	DPF				•		(•**)		•	(•**)	
	SCR			•	•		•			•	

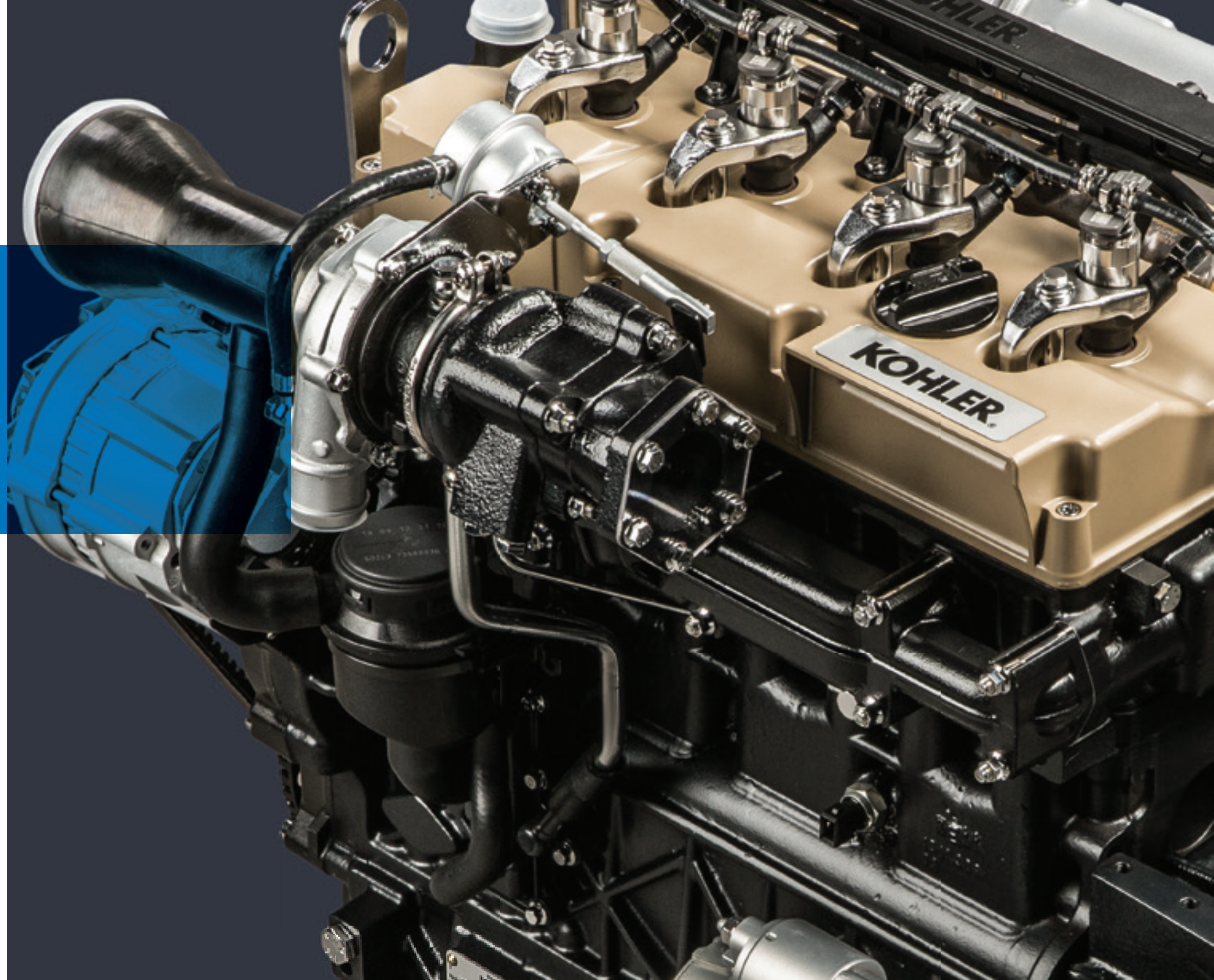
\* Effective date: January 2019 (19-56kW), January 2020 (56-130kW)  
\*\* on demand on selected model  
\*\*\* with limitation on max sulfur content in fuel  
# Indicative only. China 4 emissions limits under definition



# 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)

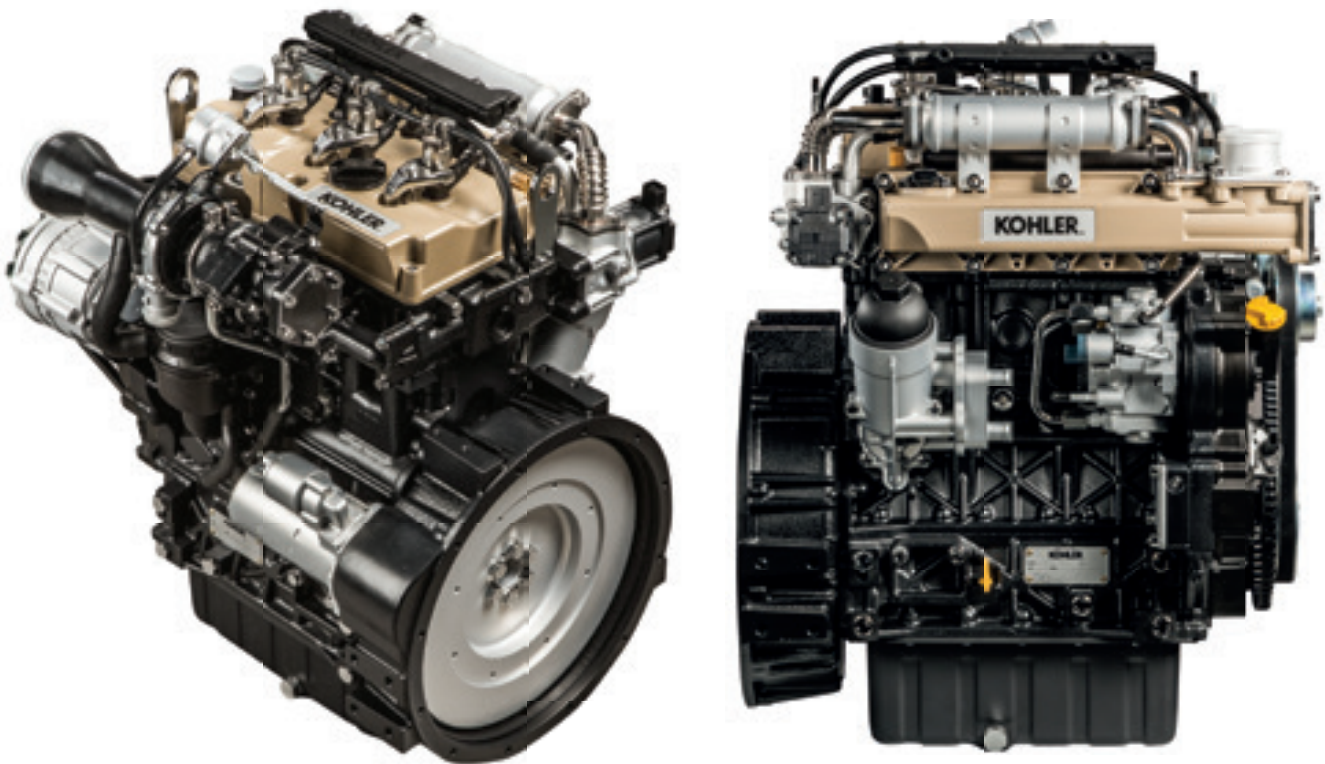


## OPTIONAL ACCESSORIES

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

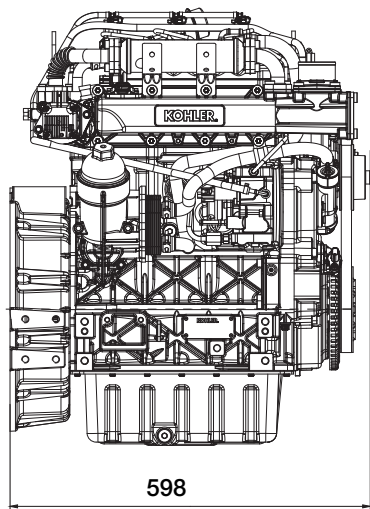
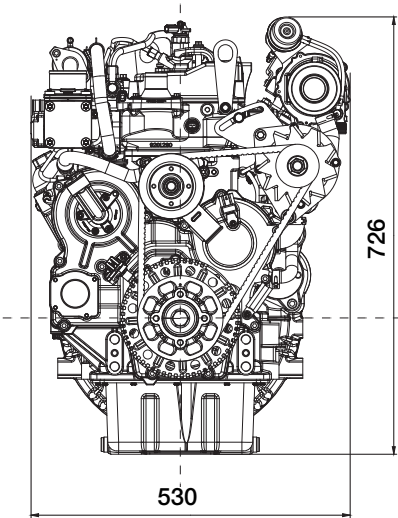


KDI  
1903



DATA

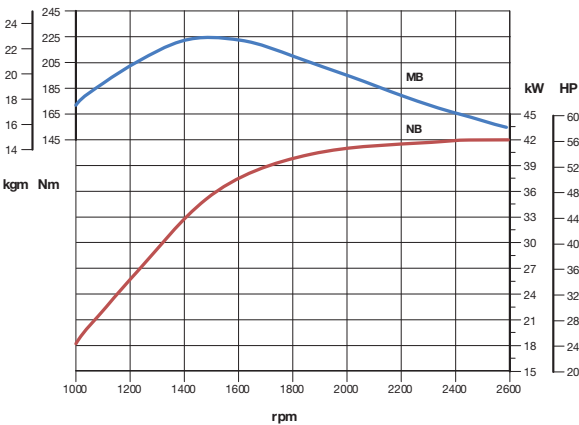
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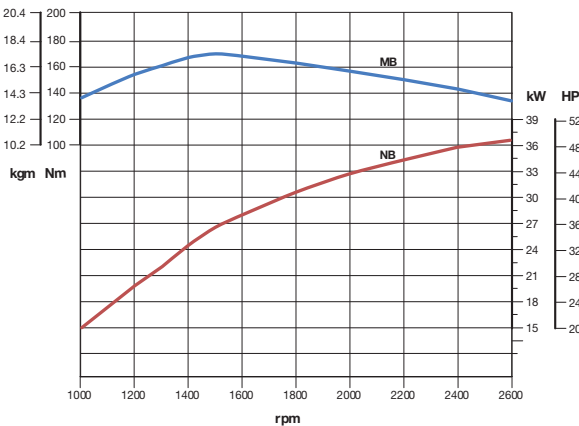
PERFORMANCE CURVES

(IFN-ACCORDING TO ISO 3046 and ISO 14396)

KDI-TCQ 1903U3/26 - KDI-TCF 1903U4/26  
KDI-TCR 1903E5/26



KDI-TC 1903E5/26



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

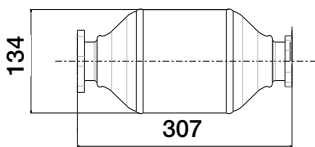
Power ratings refer to engines equipped with air filter, standard muffler, after running-in period at ambient conditions of +25°C, relative humidity 30% and 1 bar. De-rating depending on applications.

Quick specifications	KDI-TCQ 1903U3/26	KDI-TCF 1903U4/26	KDI-TCR 1903E5/26	KDI-TC 1903E5/26
CYLINDERS / FIE	3 / Turbo Common Rail	3 / Turbo Common Rail	3 / Turbo Common Rail	3 / Turbo Common Rail
MAX POWER kW (hp)@rpm	42 (56) @ 2600	42 (56) @ 2600	42 (56) @ 2600	37 (50) @ 2600
MAX TORQUE Nm@rpm	225 Nm @ 1500	225 @ 1500	225 @ 1500	170 Nm @ 1500
EMISSION COMPLIANCE	US Tier 3 Equivalent	EU Stage IIIB US TIER 4 Final	EU STAGE V US TIER 4 Final	EU STAGE V US TIER 4 Final
KOHLER Flex Emissions Management system	U3 (EGR)	U4 (EGR+DOC)	E5 (EGR+DOC+DPF)	E5 (EGR+DOC+DPF)
AFTERCOOLER	•	•	•	-

KOHLER Flex ENVELOPE

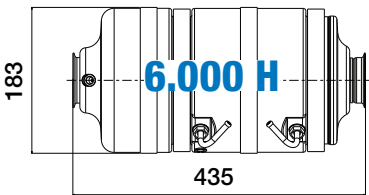
Dimensions (mm)

Flex U4



DOC

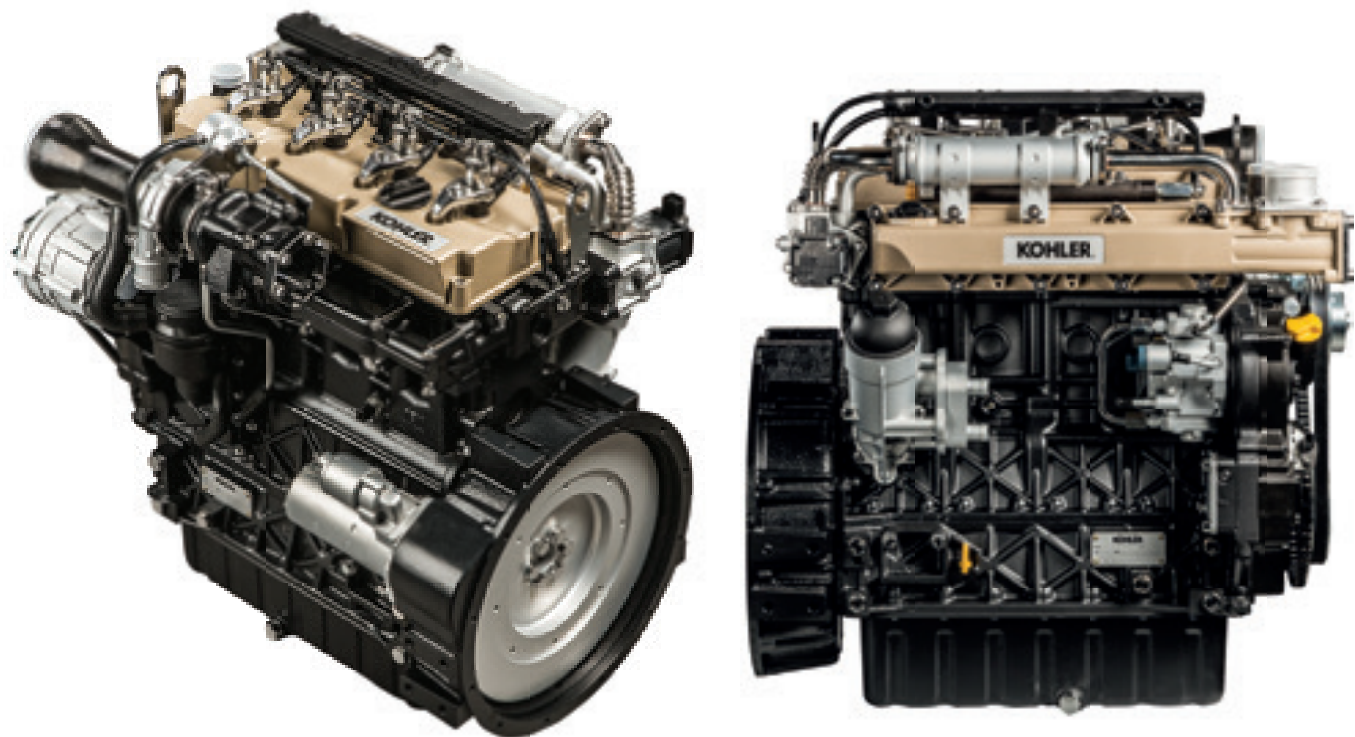
Flex E5



DOC + DPF

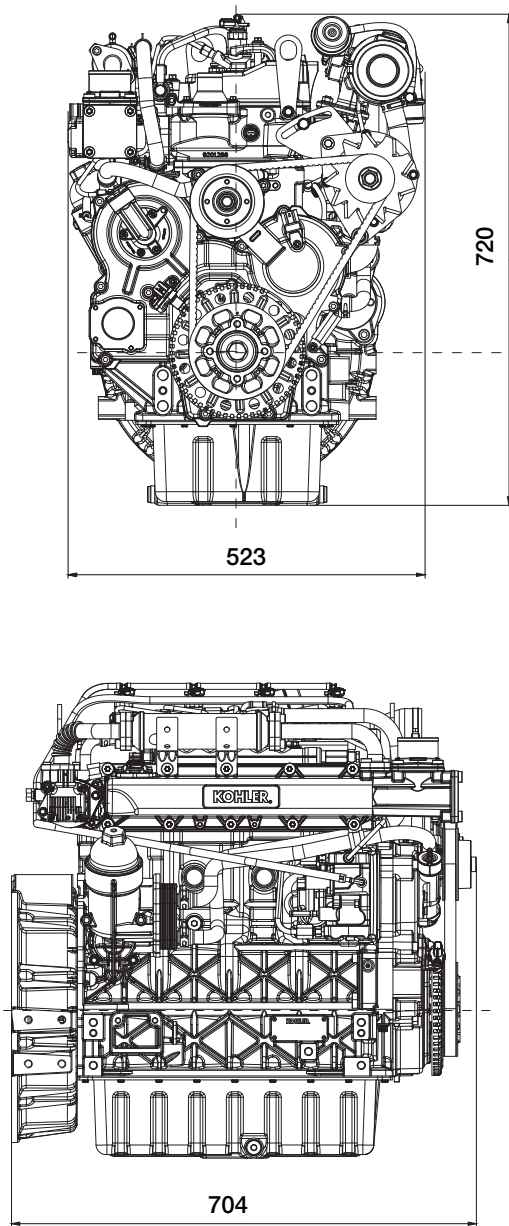
# KDI

## 2504



### DATA

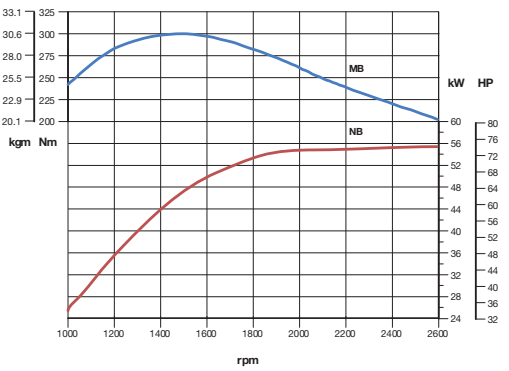
Dimensions (mm)



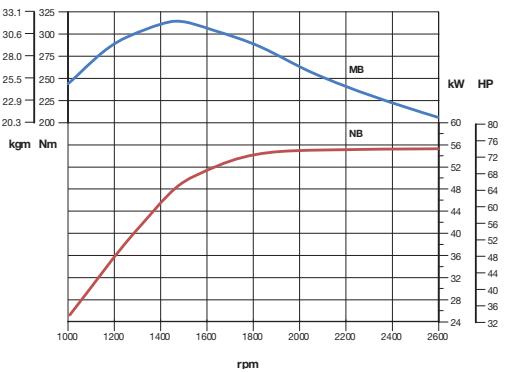
### PERFORMANCE CURVES

(IFN-ACCORDING TO ISO 3046 and ISO 14396)

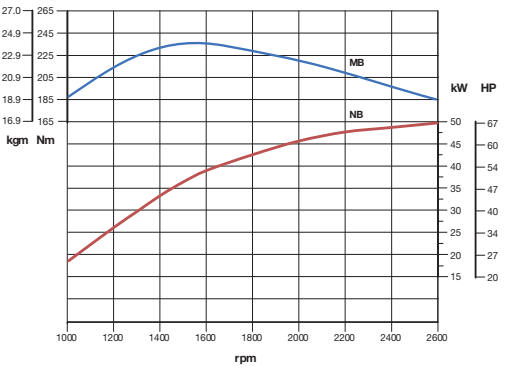
KDI-TCK 2504U3/26 - KDI-TCF 2504U4/26



KDI-TCR 2504E5/26



KDI-TC 2504E5/26



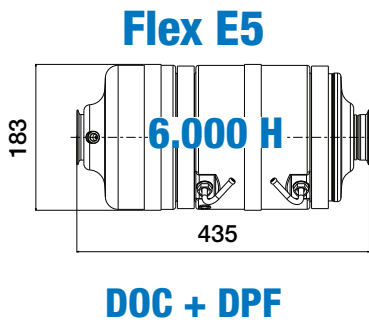
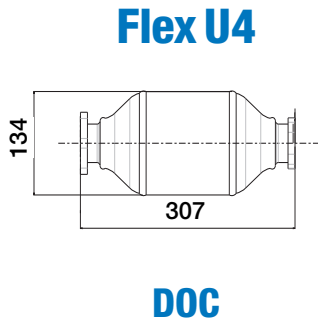
— MB - Torque curve - ISO 3046/1 - IFN  
— NB - Power curve - ISO 3046/1 - IFN

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	KDI-TCK 2504U3/26	KDI-TCF 2504U4/26	KDI-TCR 2504E5/26	KDI-TC 2504E5/26
CYLINDERS / FIE	4 / Turbo Common Rail	4 / Turbo Common Rail	4 / Turbo Common Rail	4 / Turbo Common Rail
MAX POWER kW (hp)@rpm	55.4 (74) @ 2600	55.4 (74) @ 2600	55.4 (74) @ 2600	50 (67) @ 2600
MAX TORQUE Nm@rpm	300 @ 1500	300 @ 1500	315 @ 1500	236 @ 1500
EMISSION COMPLIANCE	EU Stage IIIA US Tier 3 Equivalent	EU Stage IIIB US TIER 4 Final	EU STAGE V US TIER 4 Final	EU STAGE V US TIER 4 Final
KOHLER Flex Emissions Management system	U3 -	U4 (EGR+DOC)	E5 (EGR+DOC+DPF)	E5 (EGR+DOC+DPF)
AFTERCOOLER	•	•	•	-

### KOHLER Flex ENVELOPE

Dimensions (mm)

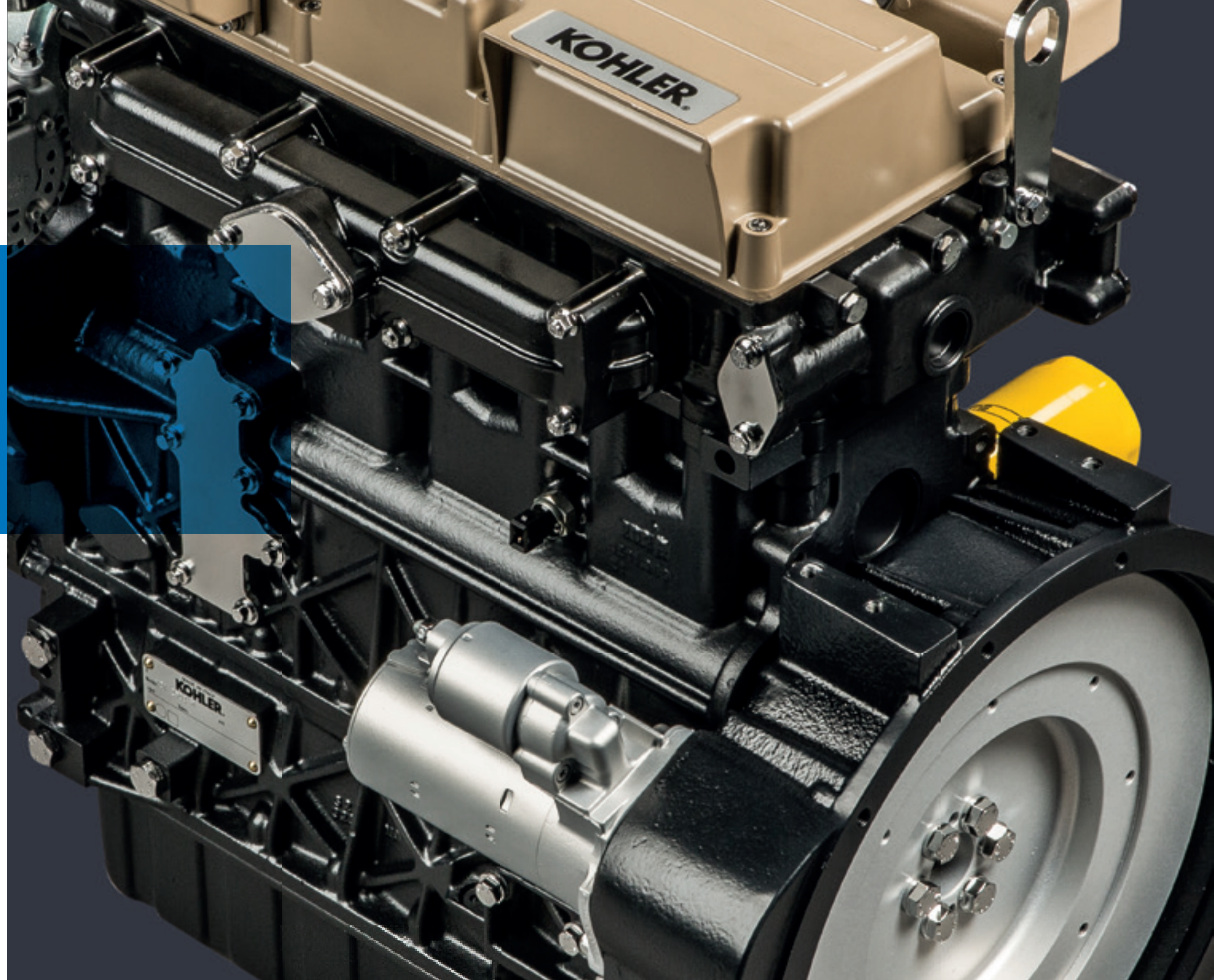




# MECHANICAL ENGINES

## STANDARD EQUIPMENT

Intake manifold  
Exhaust manifold  
Side oil refilling  
Electric starter  
55A alternator  
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)



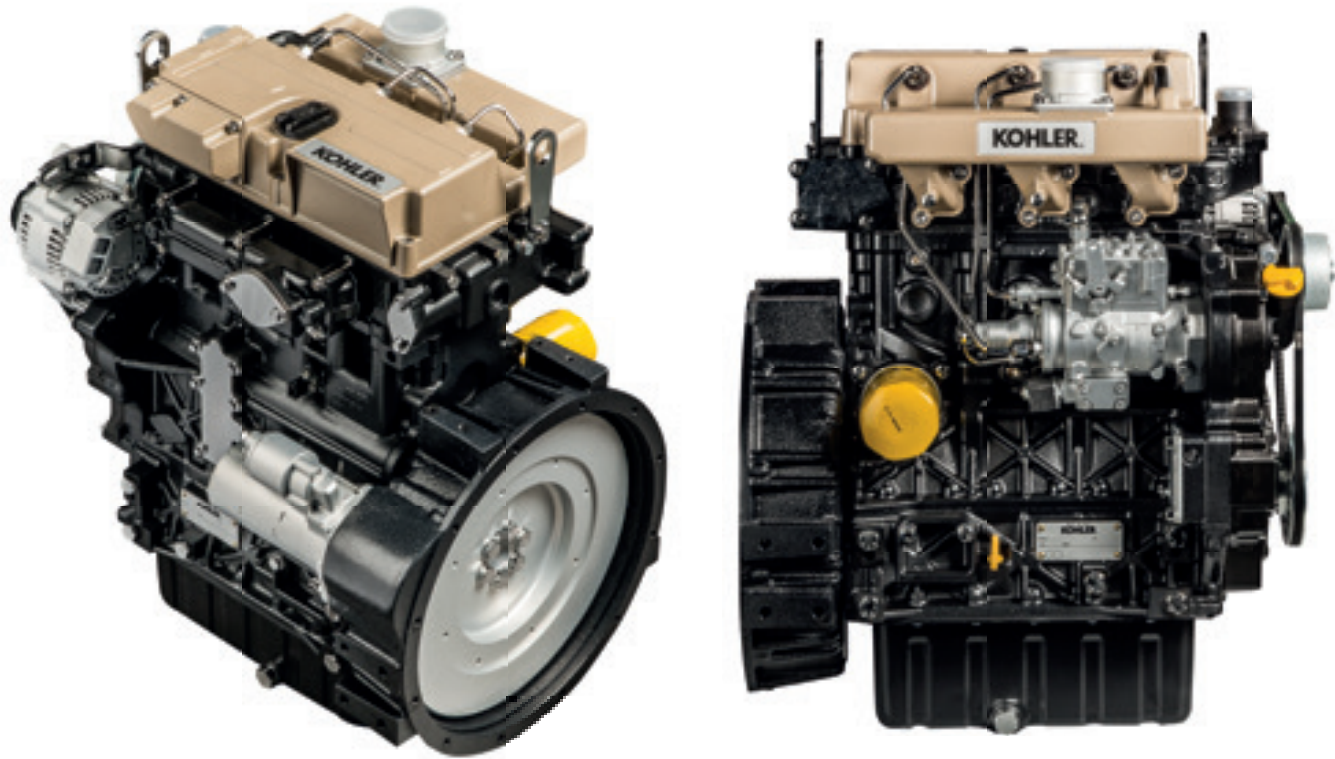
## OPTIONAL ACCESSORIES

SAE 3 (11" 1/2)	High fan configuration
Radiators	Fuel feeding pump
Hydraulic pump provision on 3rd and 4th PTO	Balancer shafts (for KDI-M 2504 only)
Structural oil sump and bell housing	100% Power take-off front PTO (for KDI-M 2504 only)
Heavy duty air cleaner	



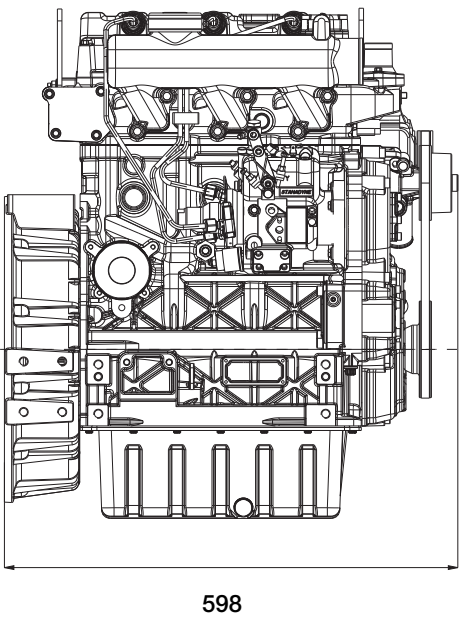
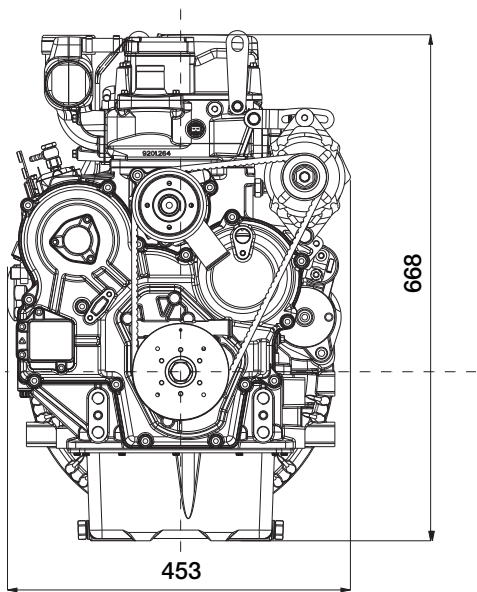
# KDI-M

## 1903



### DATA

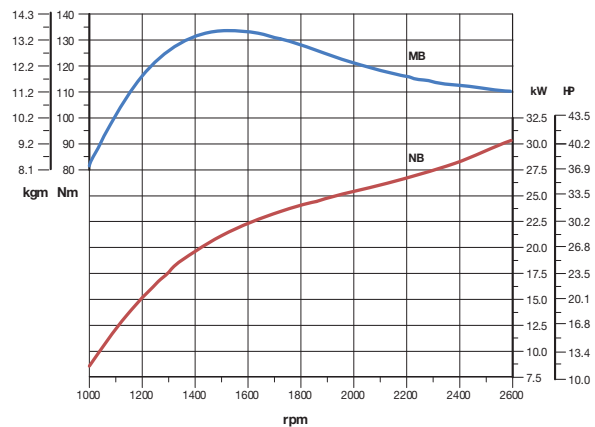
Dimensions (mm)



### PERFORMANCE CURVES

(IFN-ACCORDING TO ISO 3046 and ISO14396)

KDI-M 1903EA/26



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

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.

Quick specifications	KDI-M 1903EA/26
CYLINDERS / FIE	3 / Mechanical Rotary Pump
MAX POWER kW (hp)@rpm	31 (42) @ 2600
MAX TORQUE Nm@rpm	133 @ 1500
EMISSION COMPLIANCE	EU STAGE III A



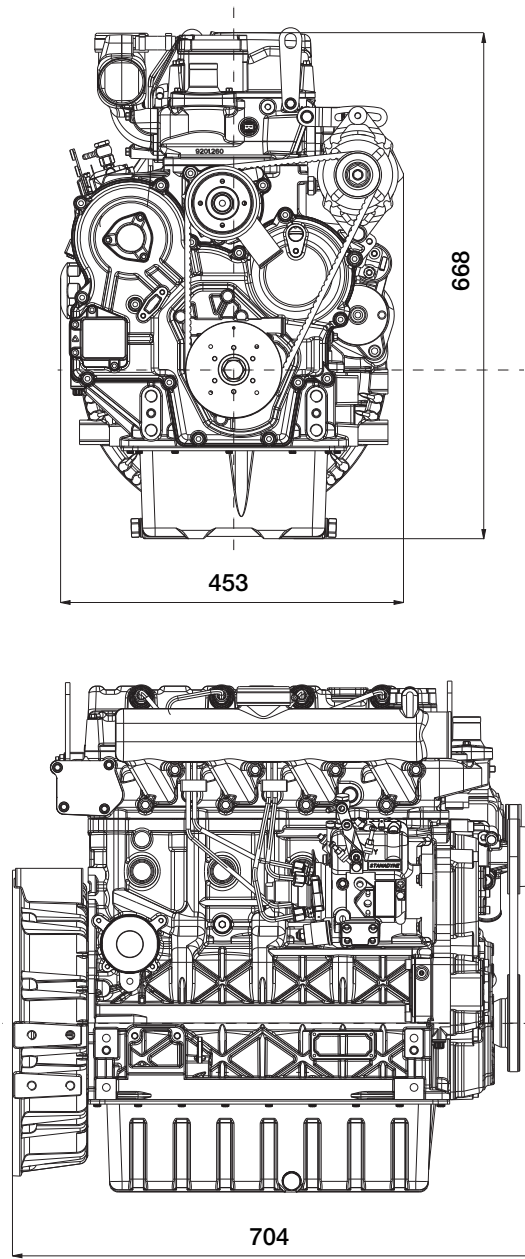
# KDI-M

## 2504



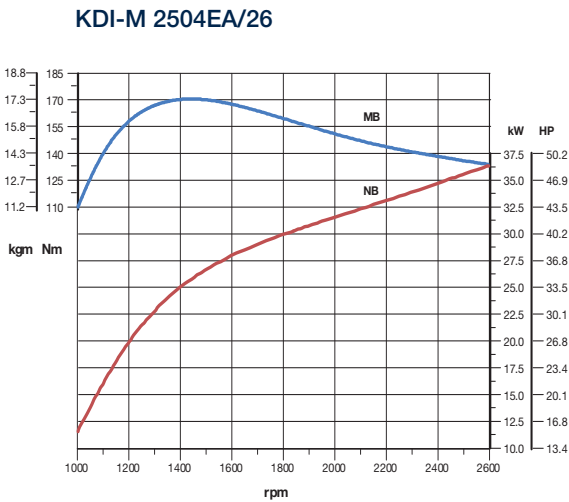
### DATA

Dimensions (mm)



### PERFORMANCE CURVES

(IFN-ACCORDING TO ISO 3046 and ISO 14396)



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

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.

Quick specifications	KDI-M 2504EA/26
CYLINDERS / FIE	4 / Mechanical Rotary Pump
MAX POWER kW (hp)@rpm	36.4 (49) @ 2600
MAX TORQUE Nm@rpm	170 @ 1500
EMISSION COMPLIANCE	EU STAGE III A

TURBO COMMON  
RAIL ENGINES



Model		KDI 1903				KDI 2504			
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	•				•			
Technical features	Cylinder	3				4			
	Bore (mm)	88				88			
	Stroke (mm)	102				102			
	Engine displ (cm³)	1861				2482			
	Injection system	DI				DI			
	Injection Equipment	Turbo high pressure common rail				Turbo high pressure common rail			
	Aftercooler	•	•	•	-	•	•	•	-
Performance	Max power (IFN - ISO 3046 and ISO 14396) (kW(hp)@rpm) @2600	42 (56)	42 (56)	42 (56)	37 (50)	55.4 (74)	55.4 (74)	55.4 (74)	50 (67)
	Max torque (IFN - ISO 3046 and ISO 14396) (Nm@rpm) @1500	225	225	225	170	300	300	315	236
	Low-end torque (Nm@1000 rpm)	172	172	172	135	242	242	242	185
	KOHLER Flex solution	U3	U4	E5	E5	U3	U4	E5	E5
KOHLER Flex Emissions Management system	EGR	•	•	•	•	-	•	•	•
	DOC	-	•	•	•	-	•	•	•
	DPF	-	-	•	•	-	-	•	•
	Emission compliance	US TIER 3 EQUIV.	EU STAGE IIIB US TIER 4 FINAL	EU STAGE V US TIER 4 FINAL	EU STAGE V US TIER 4 FINAL	US TIER 3 EQUIV.	EU STAGE IIIB US TIER 4 FINAL	EU STAGE V US TIER 4 FINAL	EU STAGE V TIER 4 FINAL
Fuel economy	Best point (g/kWh)	215				210			
	Max power (g/kWh@2600 rpm)	237				226			
Startability	Unaided (°C)	down to -19				down to -19			
	Aided (°C) [Manifold grid heater]	below -19				below -19			
	Aided (°C) [Manifold grid heater + coolant heater]	/				below -25			
Fuel compatibility	EN 590	•				•			
	No 1 Diesel (US) - ASTM D 975-09 B - Grade 1-D S 15	•				•			
	No 2 Diesel (US) - ASTM D 975-09 B - Grade 2-D S 15	•				•			
	Arctic EN 590/ASTM D 975-09 B (No petroleum added)	•				•			
	High Sulfur Fuel < 2000 ppm *	-				•	-	-	-
Service features	Oil/filter change interval std/synthetic (hr)	500-750**				500-750**			
	Alternator belt replacement	36mth				36mth			
	Coolant change	24 mth				24 mth			
	Oil consumption (% fuel)	<0.1				<0.1			
Physical characteristics	H x L x W (fan excluded) (mm)	726 x 598 x 530				720 x 704 x 523			
	Weight (kg)	233				267			
	Daily service points - positions	1 side service				1 side service			
	Ambient operating temps (°C)	-40 to +50				-40 to +50			
	Gradeability-all round (continuous) (deg)	25				25			
	Gradeability-all round (intermittent-1min) (deg)	35				35			
Lubrication	Oil type	SAE 5W 40 low SAPS/ EURO 6 API CJ-4				SAE 5W 40 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			
	Provision for a double Gr.2 tandem hydraulic pump	•				•			

\* With restrictions    \*\* According to operating conditions

MECHANICAL  
ENGINES



Model		KDI-M 1903		KDI-M 2504	
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	—		—	
Technical features	Cylinder	3		4	
	Bore (mm)	88		88	
	Stroke (mm)	102		102	
	Engine displ (cm³)	1861		2482	
	Injection system	DI		DI	
	Injection Equipment	Mech-Rotary pump		Mech-Rotary pump	
	Emission compliance	EU STAGE III A (EA)		EU STAGE III A (EA)	
Performance	Max power (IFN - ISO 3046 and ISO 14396) (kW@rpm)	31 (41.5) @2600		36.4 (48.8) @2600	
	Max torque (IFN - ISO 3046 and ISO 14396) (Nm@rpm)	133@1500		170@1500	
	Low-end torque (Nm@1000 rpm)	80		110	
	Best point (g/kWh)	223		220	
Fuel economy	Max power (g/kWh@2600)	237		234	
Startability	Unaided (°C)	down to -15		down to -15	
	Aided (°C) [Manifold grid heater]	below -15		below -15	
Fuel compatibility	EN 590	•		•	
	No 1 Diesel (US) - ASTM D 975-09 B - Grade 1-D S 15	•		•	
	No 1 Diesel (US) - ASTM D 975-09 B - Grade 1-D S 500	•		•	
	No 2 Diesel (US) - ASTM D 975-09 B - Grade 2-D S 15	•		•	
	No 2 Diesel (US) - ASTM D 975-09 B - Grade 2-D S 500	•		•	
	ARCTIC EN 590/ASTM D 975-09 B	•		•	
	High Sulfur Fuel < 2000 ppm*	•		•	
	Military NATO Fuels F34 - F35 - F44 - F63 - F64 - F65 *	•		•	
	Military US Fuels JP5 - JP8 (AVTUR) *	•		•	
	Jet Fuels - Jet A/ A1*	•		•	
Service features	Oil/filter change interval std/synthetic (hr)	500-750**		500-750**	
	Valve adjustment	—		—	
	Alternator belt replacement	36mth		36mth	
	Coolant change	24 mth		24 mth	
Physical characteristics	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	
	Gradeability-all round (continuous) (deg)	25		25	
Lubrication	Oil type	SAE 15W40 / API CH4		SAE 15W40 / API CH4	
	Max torque (Nm)	100		100	
Auxiliary PTOs (3rd & 4th) (optional)	Drive ratio	1.23 times engine speed		1.23 times engine speed	
	Provision for a double Gr.2 tandem hydraulic pump	•		•	

\* With restrictions    \*\* According to operating conditions



