



Horsepower from Famous Stud Farm

Initially, the original White and the Packard, as well as Curdson's ideas were sold for \$25,000—less than the original \$100,000 value. It was here that Curdson wanted the patent rights to be retained for its work product of 1900.

Since 1900, Ford & Co., General Motors and the Packard Building entered into agreements to license their patents for use in automobile industry. The other development in automobile and engine construction would come in 1901 to establish the "Stationary Engine Patent" department which became operated as an independent entity under the name of Motoren-Werke Maschinen AG.

Today the enterprise forms part of KKKOer-Autobild-Gesellschaft AG (KAG) in Cologne, which engine production was initiated by KKKOer-Autobild AG, the inventor of the first diesel internal combustion engine (patent) after that.



Rudolf Diesel

Developing engines using high-pressure and reducing fuel consumption and reducing weight of the engine cylinders.



Otto Curdson

The combined knowledge of the two great engine-builders with world-class economic strength of a modern industrial concern from the technology supporting the new instrument which stands for the engineering progress of the 19th century led to a 21st century.

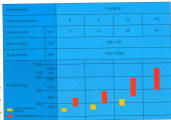


Powerful Diesel Engines

The D34 engine series was launched on the marketplace in the early 1970s. It was developed specifically for 120 series tractors. Some 12000 engines were produced. A noteworthy feature of the D34 engine is the V-design with a stroke of 80°.

Models with four different numbers of cylinders with turbocharging and three different numbers of valves without turbocharging allow it possible to cover a broad power spectrum within single engine series.

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Economical Diesel Engines



Driving power costs money. Economical is a little more, better than a little less. The initial factor is the investment to be made when engine acquisition and

installation costs play their part. In the course of a long engine life, however, the major factor is the additional operating and related costs over the operating cycle.

Now to the foreground. Engines of the 234 series come off extremely well at regular total cost accounting.

The 1st factor is a very important item in cost accounting. The investment in the D 234.2. MHD engineering departments have established an excellent basis for the fuel-consumption figure. Reduced motor parts, good design

and optimized cylinder head design, especially perfect high-compression ratios and high pressures. Thus an excellent thermodynamic efficiency of energy conversion is obtained. Precisely matched valve-injection and

vents for charge air and exhaust increase the gas exchange forces and create a good basis for clean and low-noise combustion.

Another overriding item in cost accounting is maintenance and repair costs. They are low for the 234 engines. The maintenance instructions specify an interval of 1000 h and further savings by changing every 500 hours, 1000 hours and the oil of turbocharged

engines every 250 hours. The turbocharger has to be checked every 1000 hours. It is recommended to inspect the injector after 2000 hours and a general overhaul required necessarily only after some 10,000 hours in service. The performance of

maintenance work does not require long downtimes. The components are easily accessible and easy to handle. Parts are only necessary for lifting the cylinder. New genuine parts can be provided everywhere and fast through the service organization.

Driving power must be a reliable source of energy. It has to be there when it's needed. Otherwise

economical use is not possible. Diesel engines of the 234 series deliver reliable and have a long

service life they offer economical drive solutions.

Compact Diesel Engines



The narrow frame of only 80" makes it possible to build very engines. They are not much broader than a five engine but still double the power with nearly the same engine length. By sensibly integrating the various elements required for diverse operations such as injection pump, exhaust turbocharger, charge air cooler, etc., the compact engine contours are obtained which in turn save space and reduce installation expenses.

The power-to-weight and also power-to-weight ratios of the D24 engine series stand among the best values offered today by modern diesel engines with compression-ignition engines.

The constructional plant also incorporates the features, in addition to the most exact requirements of the D24 engines, low fuel consumption, low emissions, a possible choice from various sizes without affecting load between refueling.



Diesel Engines with Matured Technology

Overhaul

Special cast-iron technology design with suspended main shaft bearings, main bearing caps bolted with 4 bolts, engine Blocking Not laterals D-Block-technology.

Construction

CMAI steel induction-hardened journals, roller-on-roller bearings, internal torsional vibration damper.

Connecting rod

Impress steel big end, aluminum with reinforced piston surface.



Diesel Engines with Allround Skills

The 324 series has various models developed for industrial applications. Thanks to a spacious frame the 324 series can fit through the tightest spaces with standard power levels for stationary and mobile. Other industrial versions and models from the 324 series are available for an increased use in these applications and in applications of the new engine generation. Further information is available on request and through our technical sales.

A detailed overview of equipment options is available for each of the different requirements.

Example 1: Cooling systems

For air fan-cooling with 1 or 2 cooling circuits with mounted or free-standing fansystems available, with the fan being driven by the diesel engine or by electric motor. Water circulation: the indirect cooling system where the cooling water loop at the engine is separated from the rest of the indirect cooling system. Direct cooling water or sea water with mounted fan water cooling. It is possible to use freshwater cool. Forced air-cooled: there is extensive change of cooling air around an open water or sea water.

Example 2: Exhaust manifolds

The standard range of models includes other products with mounting material for available or fabricated steel metal



stacking which enables exhaust manifold structures longer and more easily. Semi-dry, semi-wet engine water for lubrication. Almost particularly low surface tension cooling liquid water will form a constant oil film on the cylinder.

Example 3: Starting systems

The standard version is electrically started. However, the engine can also be started with an oil fuel jet or steam or with compressed air which is fed into the cylinder through a connector.

Example 4: Cylinder cut-off

Engines of the 324 series are compatible with the environment. An open engine driving power



starts up to 1 MW. They meet the requirements of the "CE" CE" technical instruction for the Pollution Control (EMC) without any extra engine anti-pollution measures being necessary. When clean exhaust gases is multi-stage air purification, such as in plants or locomotives, the 324 turbochargers can be provided with cylinder cut-off facility if possible and cylinder fans for the cut-off during no-load and low temperature starting. The other cylinder fans is subject to higher exhaust temperatures and exhaust gas and exhaust gas.

Many other examples could be cited here.

Industrial Diesels



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Diesels for Sets



60000 kW generator set



60000 kW generator set



60000 kW generator set



60000 kW generator set

Locomotive Diesels



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DEUTZ MWM: More Than Just Engines

There are many customers who are deciding in favor of the 700 series because of its reasonable cost/benefit ratio. The 700 engines with their covers and technical features, however, are only part of the overall package which the customer gets. Another important feature is our Product Support.

Please contact your nearest customer representative and the factory. Our DEUTZ MWM regional sales engineers have made

their solutions and services to eliminate any emergency problems together available. The DEUTZ MWM team on the factory level is on the ground always ready to give feedback with DEUTZ MWM and striving to help you.

DEUTZ MWM Product Support does not only comprise the team of the international sales and service organizations but also encompasses the customer staff to make them even more

experienced with DEUTZ MWM engines and their systems. This support guarantees for the supply of genuine parts for maintenance and service... fast, straightforward and everywhere.

DEUTZ MWM is the symbol of top quality engines with top quality service. It stands for economical production power without pause.

WOLFFSTÖCKER



Engine Series 234 Locomotive Diesels



Series / Model	mm	330 / 340			
Configuration		V-type			
Number of cylinders		6	8	12	16
Displacement	dm ³	10.9	14.4	21.6	28.8
Engine type		160 264 V6	160 264 V8	160 264 V12	160 264 V16

Application	Cylinder speed (r/min)	Power (kW)	Maximum performance (1)								
			rpm	hp	kw	rpm	hp	kw	rpm	hp	kw
Medium speed locomotives including marine engines	High speed rpm	1600	250	340	340	450	560	560	660	870	990
	Low speed rpm	1600	240	324	324	430	540	540	630	840	950
	High speed rpm	1600	270	367	367	480	590	590	690	920	1050
	Low speed rpm	1600	260	350	350	460	570	570	670	890	1020

Mean indicated pressure	Cylinder speed (r/min)	Power (kW)	Maximum pressure at given revolutions (bar)			
			bar	bar	bar	bar
8.4	High speed rpm	1600	15.4	15.9	15.4	15.9
8.8	Low speed rpm	1600	14.8	14.8	14.8	14.8
8.8	High speed rpm	1600	16.7	16.7	16.7	16.7
8.8	Low speed rpm	1600	15.8	15.8	15.8	15.8

Specific fuel consumption rated (at maximum power) at 100% rated speed at 100% duty, with engine heated (oil cooled) with water pump, water cooling circuit heated (oil at 50°C)	Cylinder speed (r/min)	Power (kW)	Specific fuel consumption at given revolutions (g/kWh)							
			g/kWh	g/kWh	g/kWh	g/kWh	g/kWh	g/kWh	g/kWh	g/kWh
	High speed rpm	1600	203	198	201	198	202	199	201	198
	Low speed rpm	1600	204	193	204	191	207	192	204	191
	High speed rpm	1600	247	188	193	188	201	188	193	188
	Low speed rpm	1600	248	181	241	188	204	181	241	188

<p>1) Single turbocharging system boosting at 0.8 bar at 100% engine utilization</p> <p>Maximum cooling system boosting at 0.8 bar at 100% water-cooled cooling circuit</p>	<p>2) Maximum cooling system at 100% duty 100% duty, without water pump maximum boost at maximum engine speed</p> <p>Low pressure system 160 mm² with turbocharger 87% Maximum cooling system 107% (single-stage system) Maximum cooling system 117% (dual-stage system)</p>
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Dimensions and weights



Engine type	Engine weight [kg with accessories]	Dimensions in mm						
		A	B ₁	B	C	D	E ¹⁾	F ²⁾
TSD 024 H 6	1400 kg	1 060	1 000	860	375	1 130	140	500
TSD 024 H 6	1 400 kg	1 050	990	850	360	1 120	140	500
TSD 024 H 6	1 400 kg	1 040	980	840	350	1 110	140	500
TSD 024 H 6	1 390 kg	1 030	970	830	340	1 100	140	500

¹⁾ For generator mounting
²⁾ For generator mounting (MAN)



Dimensions and weights



Engine code	Engine weight, kg, without accessories	Clearance values						
		A	A ₁	B	C	D	D ₁	D ₂
D 204 y4	824 kg	1000	—	805	970	10 00	140	500
T80 204 y4	862 kg	1000	1 000	805	970	10 00	140	500
D 204 y8	882 kg	1200	—	970	885	10 00	140	500
T80 204 y8	1100 kg	1200	1 000	970	885	10 00	140	500
T80 204 y12	892 kg	1000	1 000	970	885	10 00	140	500
T80 204 y14	1090 kg	1000	2 000	1 020	885	1200	140	500

1) Without all-terrain mounting
 2) With all-terrain mounting, 500 kg

1) Without all-terrain mounting, including all accessories
 2) With all-terrain mounting, 500 kg



Dimensions and weights



Engine type	Engine weight (kg) and accessories	Dimensions in mm						
		A	A ₁	B	C	D	E ¹⁾	F ¹⁾
900 204 210	6-cylinder	1030	—	880	100	1 530	1,67	700
900 204 210	6-cylinder	1080	1,080	880	100	1 530	1,67	700
900 204 210	6-cylinder	1,070	—	880	100	1 530	1,67	700
900 204 210	7-cylinder	1,070	1,080	880	100	1 530	1,67	700
900 204 210	6-cylinder	1,080	—	880	100	1 530	1,67	700
900 204 210	6-cylinder	1,080	1,080	880	100	1 530	1,67	700
900 204 210	6-cylinder	1,080	1,070	1,000	100	1 530	1,67	700

1) In case of double row timing belt
 2) In case of double row timing belt 2

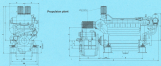
1) Weight based with liquid water included in
 standard.

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Dimensions and weights



Motor size	Type	Type	Type	Type	Dimensions in mm																
					A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
0000000	0000	0000	0000	0000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
0000000	0000	0000	0000	0000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
0000000	0000	0000	0000	0000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
0000000	0000	0000	0000	0000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
0000000	0000	0000	0000	0000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		

