

- 9.1 Engine Specifications and Settings**
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Technical Specifications

9.1 Engine Specifications and Settings

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Model

Numbers of cylinders	
Cylinder arrangement	
Bore	[mm]
Stroke	[mm]
Total displacement	[cm³]
Compression ratio	[ε]
Working cycle	
Combustion system	
Direction of rotation	
Weight incl. integrated cooling system as per DIN 70020-A (without starter, with alternator)	ca.[kg]
Engine power	[kW (PS)]
Speed	[1/min]
Lubrication	
SAE oil	
Max. oil temperature in oil sump	[°C]
Min. oil pressure in warm condition, oil temperature 110 °C at: 900/min (low idling speed)	[bar]
1800 /min	[bar]
max. 3300 /min, *max. 3000 /min	[bar]
Oil change quantity (oil sump) ca.	[ltr.]
Oil change quantity with filter (Standard 0.5 ltr.) ca.	[ltr.]
Valve clearance with cold engine	[mm]
(Engine cooling time at least 30 Min.: Oil temperature below 80°C)	[mm]
Start of delivery	[°crank angle b TDC]
Injector opening pressure: vehicle/genset engine	[bar]
Firing order of the engine	
V-Belt tension: Pretension / Retension (after the engine has been running under load for 15 mins):	[N]

F2L 1011F	F3L 1011F	F4L 1011F	F4L 1011FL*
2	3	4	4
vertical in line			
91			
105	105	105	112
1366	2049	2732	2912
18,5			
4-stroke diesel engine			
naturally aspirated engine with direct injection			
counter clockwise			
167	208	249	250
1)			
1)			
pressure lubrication			
20 W 20			
130			
1,4 ³⁾			
2,2 ³⁾			
3 ³⁾			
6 ²⁾	5,5 ²⁾	10 ²⁾	10 ²⁾
6,5 ²⁾	6 ²⁾	10,5 ²⁾	10,5 ²⁾
inlet 0.3			
exhaust 0.5			
1)			
210 / 250 ⁺ 8			
1 - 2	1 - 2 - 3	1 - 3 - 4 - 2	1 - 3 - 4 - 2
450 / 350 ±20			

¹⁾ Engine power, speed, start of delivery are stamped on engine rating plate, see also 2.1.

²⁾ Ca. value can vary depending on model. **The upper oil dipstick marking should always be taken as authoritative.**

³⁾ Values for engines without engine oil heating.

Technical Specifications

9.1 Engine Specifications and Settings

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Model

Number of cylinders	
Cylinder arrangement	
Bore	[mm]
Stroke	[mm]
Total displacement	[cm³]
Compression ratio	[ε]
Working cycle / Combustion system	
Direction of rotation	
Weight without cooling system	[kg]
Weight without starter, with alternator as per DIN 70020-A ca.	[kg]
Engine power	[kW (PS)]
Speed	[1/min]
Lubrication	
SAE oil	
Max. oil temperature in the oil sump	[°C]
at: 900/min (low idling speed)	[bar]
1800 /min	[bar]
max. 3000 /min	[bar]
Oil change quantity (oil sump without cooling system) ca.	[litr.]
Oil change quantity with filter (Standard 0.5 ltr.) ca.	[litr.]
Valve clearance with cold engine	
(Engine cooling time at least 30 mins.: oil temperature below 80°C)	[mm]
Injector opening pressure: vehicle/genset engine	[bar]
Start of delivery	[°crank angle b TDC]
Firing order of the engine	
V-Belt tension: Pretension / Retension (after the engine has been running under load for 15 mins):[N]	

BF3L 1011F/L	BF4L 1011F/FT
3	4
vertical in line	
91	
105/112	105
2184	2732
17	
4-stroke diesel with turbocharging and direct injection	
counter clockwise	
Refer to head-office	
233	256
1)	1)
1)	1)
pressure lubrication	
20 W 20	
130	
1,4 ³⁾	
2,2 ³⁾	
3 ³⁾	
7,5	10 ²⁾
8	10,5 ²⁾
inlet 0,3 + ^{0,1} / exhaust 0,5 + ^{0,1}	
210 / 250 + ⁸	
1)	
1 - 2 - 3	1-3-4-2
450 / 350 ±20	

¹⁾ Engine power, speed, start of delivery are stamped on engine rating plate, see also 2.1.

²⁾ Ca. value can vary depending on oil sump and or cooler design (external cooling system). **The upper oil dipstick marking should always be taken as authoritative.**

³⁾ Values for engines without engine oil heating.

Technical Specifications

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Model

Number of cylinders
Cylinder arrangement
Bore
Stroke
Total displacement
Compression ratio
Working cycle
Combustion system
Direction of rotation
Weight without cooling system
(without starter, with generator) ca.
Engine power
Speed
Lubrication
SAE oil
Maximum oil temperature in the oil sump
Minimum oil pressure in warm condition, oil temperature 110 °C,
at: 900/min (low idling speed)
1800 /min
max. 3000 /min

Engine with Thermostat

Oil change quantity without external cooler (see 3.1.1.2)/ without filter approx.
Oil change quantity without external cooler (see 3.1.1.2) + filter replacement
(Standard 0.5 litre) approx.

Genset engine without Thermostat:

Oil change quantity including cooler (see 3.1.1.3)/ without filter approx.
Oil change quantity including cooler (see 3.1.1.3) + filter replacement
(Standard 0.5 litre) approx.

Valve clearance at cold engine

(Engine cooling time at least 30 mins.: oil temperature below 80°C)

Start delivery

Injector opening pressure: vehicle/genset engine

Firing order of the engine

V-Belt tension: Pretension / Retension(after the engine has been running under load for 15 mins):[N]

	F3M 1011F	F4M 1011F
	3	4
	vertical in line	
[mm]	91	
[mm]	112	112
[cm ³]	2184	2912
[e]	18,5	
	4-stroke diesel engine	
	naturally aspirated engine with direct injection	
	counter clockwise	
	Rückfrage Stammhaus	
[kg]	200	242
[kW (PS)]	1)	
[1/min]	1)	
	Druckumlaufschmierung	
	20 W 20	
[°C]	130	
[bar]	1,4 3)	
[bar]	2,2 3)	
[bar]	3 3)	
[ltr.]	5,5 2)	10 2)
[ltr.]	6 2)	10,5 2)
[ltr.]	8,5 2)	13 2)
[ltr.]	9 2)	13,5 2)
[mm]	inlet 0,3 + 0,1 / exhaust 0,5 + 0,1	
[°crank angle b TDC]	1)	
[bar]	210 / 250 ⁺⁸	
	1 - 2 - 3	1 - 3 - 4 - 2
	450 / 350 ±20	

¹⁾ Engine power, speed, start of delivery are stamped on engine rating plate, see also 2.1.

²⁾ Ca. value can vary depending on oil sump and or cooler design (external cooling system).The upper oil dipstick marking should always be taken as authoritative.

³⁾ Values for engines without engine oil heating.

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Technical Specifications

9.1 Engine Specifications and Settings

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Model

Number of cylinders

Cylinder arrangement

Bore

Stroke

Total displacement

Compression ratio

Working cycle

Combustion system

Direction of rotation

Weight without cooling system
(without starter, with generator) ca.

Engine power

Speed

Lubrication

SAE oil

Maximum oil temperature in the oil sump

Minimum oil pressure in warm condition, oil temperature 110 °C,
at: 900/min (low idling speed)

1800 /min

max. 2800 /min

Engine with Thermostat

Oil change quantity including cooler (see 3.1.1.2)/ without filter approx.

Oil change quantity without external cooler (see 3.1.1.2) + filter replacement
(Standard 0.5 litre) approx.

Genset engine without Thermostat:

Oil change quantity including cooler (see 3.1.1.3)/ without filter approx.

Oil change quantity including cooler (see 3.1.1.3) + filter replacement
(Standard 0.5 litre) approx.

Valve clearance at cold engine
(Engine cooling time at least 30 mins.: oil temperature below 80°C)

Start delivery

Injector opening pressure: vehicle/genset engine

Firing order of the engine

V-Belt tension: Pretension / Retension (after the engine has been running under load for 15 mins):-[N]

BF3M 1011 F	BF4M 1011 F
3	4
vertical, in line	
91	
112	
2184	2912
17	
4-stroke diesel	
turbocharging and direct injection	
counter clockwise	
Refer to head-office	
226	249
1)	
1)	
pressure lubrication	
20 W 20	
130	
1,4 ³⁾	
2,2 ³⁾	
3 ³⁾	
7,5	10 ²⁾
8	10,5 ²⁾
11	13,5 ²⁾
11,5	14 ²⁾
inlet 0,3 ^{+0,1} / exhaust 0,5 ^{+0,1}	
1)	
210 / 250 ⁺⁸	
1-2-3	1-3-4-2
400 / 300 ±20	

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²⁾ Ca. value can vary depending on oil sump and or cooler design (external cooling system). **The upper oil dipstick marking should always be taken as authoritative.**

³⁾ Values for engines without engine oil heating.

Technical Specifications

9.2 Torque Wrench Settings

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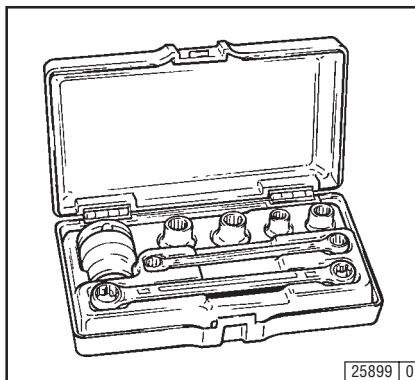
Location	Preload [Nm]			Torquing Load [Nm]				Total [Nm]	Remarks
	1st Stage	2nd Stage	3rd Stage	1st Stage	2nd Stage	3rd Stage	4th Stage		
Rocker cover								8,5	
Rocker arm set screw								21	
Air intake manifold								21	
Exhaust manifold								40	
Oil drain plug								55	
Injector mounting								21	TORX
Injector line mounting								22	
Oil pan (cast iron)								31	
Oil pan (sheet metal)								21	

9.3 Tools

Technical Specifications

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TORX

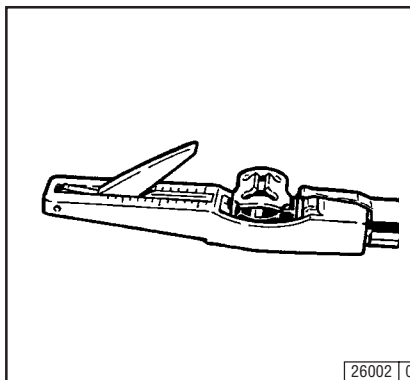


A TORX wrench set (order number 8189) is used with engines in the 1011 series. This system was chosen because of the many advantages it offers:

- Outstanding accessibility to bolts.
- High load transfer when loosening and tightening.
- Almost impossible for socket to slide off or break.

TORX tools can be ordered from:
COMPANY WILBÄR
Postfach 14 05 80
D-42826 Remscheid

V-belt Tension Gauge



The V-belt tension gauge can be obtained under order number 91 107 from:

COMPANY WILBÄR
Postfach 14 05 80
D-42826 Remscheid