



# Technical Circular

0199 - 99 - 3002/8 EN



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Date: 16.04.2008  
Author: Werner Asselborn, VS-DI  
Phone: +49 (0) 221 822-3687  
Fax: +49 (0) 221 822-2452

**DEUTZ AG**  
Ottostraße 1  
51149 Köln

[www.deutz.com](http://www.deutz.com)

## Lubricating oil

The 8th replacement is made on account of

- Change to table T1, DEUTZ lubricating oils



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This technical circular applies for all air and liquid-cooled DEUTZ compact engines. For previous engines which are no longer in the production program, please contact your DEUTZ Service responsible.

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### Note:

The part numbers indicated in this document are not subject to updating.  
Binding for the identification of spare parts is exclusively the spare parts documentation.

### Lubricating oil in general

Modern diesel engines make very high demands on the lubricating oil used. The continuously increasing specific engine performances over the last few years lead to an increased thermal load on the oil and in addition the oil is more heavily contaminated due to reduced oil consumption and longer oil change intervals. For this reason it is necessary to observe the requirements and recommendations in this technical circular in order not to reduce the life of the engine.

Lubricating oils always consist of a basic oil and an additive package. The most important tasks of a lubricating oil (e.g. wear protection, corrosion protection, neutralisation of acids from combustion products, prevention of coke and soot deposits on engine components) are taken over by the additives. The properties of the basic oil are also decisive for the quality of the product, e.g. with regard to the thermal load.

Mixtures of engine oils should be avoided because the worst properties of the mixture always dominate. In principle, all engine oils are mixable so that a complete lubricating oil change from one oil type to another is no problem as far as mixability is concerned.

#### DEUTZ lubricating oil recommendation

We recommend the following DEUTZ lubricating oils of the appropriate quality classes for use in DEUTZ engines (see section Lubricating oil quality).

The lubricating oils are specially adapted to the engine requirements and have been proven in hard engine operation.

DEUTZ quality class	DEUTZ lubricating oil designation	Container size	DEUTZ part number
DQC II-05	DEUTZ OIL TLS-15W40D	5 l canister **	0101 6331
		20 l canister	0101 6332
		209 l barrel	0101 6333
		Tankers *	0101 6334
DQC III-05	DEUTZ OIL TLX-10W40FE	5 l canister **	0101 6335
		10 l canister	0101 6336
		209 l barrel	0101 6337
		Tankers *	0101 6338
DQC IV-05	DEUTZ OIL DQC4-5W30-UHP****	20 l canister	0101 7849
		209 l barrel ***	0101 7850

T 1 DEUTZ lubricating oils

\* loose delivery in the tanker, state order quantity

\*\* only available in container size 4 x 5 l

\*\*\* on request

\*\*\*\* for delivery until 05/2008 only with manufacturer label



### Lubricating oil quality

The lubricating oil quality has a considerable influence on the life, efficiency and thus the economy of the engine. The performance capacity and therefore the quality of the lubricating oil is determined in standardised laboratory and test bench tests.

Lubricating oils which are intended mainly for the European market are tested and classified according to ACEA regulations (ACEA = Association des Constructeurs European d'Automobiles). The testing includes laboratory tests for determining physical-chemical properties of the oils and extensive engine tests on European engines which represent the advanced state-of-the-art.

Accordingly, lubricating oils for the US market are tested according to API (American Petroleum Institute).

These specifications are used world-wide. The use of the ACEA classification is to be preferred to the API classification in the European trade area. With DHD-1 a new lubricating oil specification has been created by ACEA and the American and Japanese engine manufacturer associations EMA and JAMA which includes the requirements ACEA E5-02, API CH-4 and JAMA DX(H).

For use in DEUTZ engines the lubricating oils are divided into DEUTZ lubricating oil quality classes (DQC). Lubricating oils which are released according to higher DQC classes may also be used in the respective lower DQC classes.

- **DQC I-02** minimum quality for standard engines, partly with reduced oil change intervals
- **DQC II-05** standard quality for standard engines
- **DQC III-05** high performance diesel engine oils, application for engines with closed crankcase breather and for engines with increased performance
- **DQC IV-05** ultra-high performance engine oils for engines with maximum power and closed crankcase breather

DEUTZ has introduced a new release procedure for the lubricating oil quality according to DQC. This should make the choice of lubricating oils for DEUTZ engines easier for the customer and ensure a quality level that is tailor made for the requirements of DEUTZ engines.

The list of released lubricating oils and information about the release procedure in accordance with factory standard H 0685-3 can be found on the Internet under [www.deutz.com](http://www.deutz.com) - Service Operating Media and Diagnosis - Deutz Quality Class.

Please bear in mind that, for engines which require a lubricating oil quality of DQC III or DQC IV according to the specifications in this technical circular, only lubricating oils which are on the Internet release list may be used, the release lists contained in earlier editions of TR 0199-99-3002 no longer apply.

Release lists do exist for DQC I and DQC II for which application is recommended but not an absolute obligation. Alternatively oils in accordance with ACEA, API or DHD as in the table below can be used for DQC I and DQC II:

DEUTZ lubricating oil quality class	DQC I-02	DQC II-05	DQC III-05	DQC IV-05
DEUTZ release list	DQC I-02	DQC II-05	DQC III-05	DQC IV-05
or ACEA specification	E2-96	E7-04 or E3-96 or E5-02 or E4-07 or E6-04	–	–
or API specification	CF or CF-4	CG-4 or CH-4 or CI-4 or CI-4 Plus or CJ-4	–	–
or world-wide specification	–	DHD-1	–	–

T 2 Definition of permissible lubricating oils for DEUTZ engines

The exact assignment of the permissible oil qualities to the engines is specified in the tables T 3 to T 6 of the section "Lubricating oil change intervals".

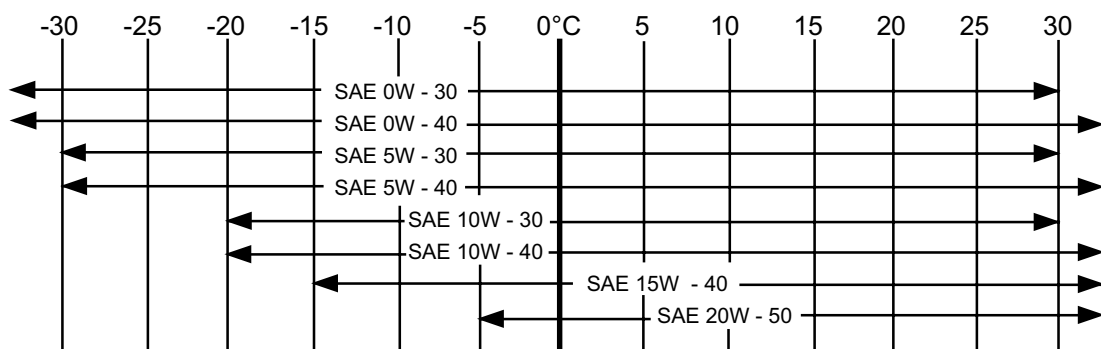
Please contact your responsible DEUTZ Service in regions where none of these qualities is available.

### Lubricating oil viscosity

The ambient temperature at the installation site or in the area of application of the engine is decisive for selecting the right viscosity class. Too high a viscosity can lead to starting difficulties, too low a viscosity can endanger the lubricating effect and result in high lubricating oil consumption. At ambient temperatures below  $-40^{\circ}\text{C}$  the lubricating oil must be pre-heated (e.g. by placing the vehicle or machine in a hall).

The viscosity is classified according to SAE. Oils suitable for multiple ranges must always be used. Oils for single ranges can be used in closed, heated rooms at temperatures  $> 5^{\circ}\text{C}$ . The specified lubricating oil qualities must also be observed for single range oils of course.

Depending on the ambient temperature we recommend the following common viscosity classes:



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A 1 Viscosity classes according to ambient temperature



## Lubricating oil change intervals

The lubricating oil change intervals are dependent on the lubricating oil quality, the sulphur content in the fuel and the operating conditions. The first lubricating oil change after first commissioning or restarting after a major repair (general overhaul) takes place after 50 operating hours in 226/413/513/912/913/1008/2008/2009 engines, see operation manual.

In built-in engines the necessary lubricating oil change interval is specified in operating hours (oh) in vehicle engines usually as mileage. It is possible to adapt the change intervals to the maintenance intervals of the machine (building machine, tractor and similar) prescribed by our installation customers.

The lubricating oil change intervals specified in the tables T 3 to T 6 may not be exceeded however.

A lengthening of the prescribed lubricating oil change times up to 100% is **only** possible when it is ensured by using the DEUTZ oil diagnosis system that the lubricating oil quality is still sufficient, see TR 0199-99-1119.

### Lubricating oil change intervals for built-in and marine engines

		Lubricating oil quality							
		DQC I-02		DQC II-05		DQC III-05		DQC IV-05	
Engine series	Engine version	Lubricating oil change intervals in oh							
		Oil load							
		normal	high	normal	high	normal	high	normal	high
<b>B/FM 1008</b>	All engines	125	125	125	125	125	125	125	125
<b>BFM/L1011</b>	Aspirated engines	1000	500	1000	500	1000	500	1000	500
<b>BFM/L 2011</b>	Turbocharged engines	250	125	500	250	500	250	500	250
<b>TD/D 226</b>	Aspirated engines	500	250	500	250	500	250	500	250
<b>BFL 413/513</b>	Turbocharged engines	250	125	500	250	500	250	500	250
<b>B/FL 912</b>	Aspirated engines	500	250	500	250	500	250	500	250
<b>B/FL 913/914</b>	Turbocharged engines	250	125	500	250	500	250	500	250
	BF6L913/914C with 176kW at 2500 rpm	–	–	–	–	500	250	500	250
<b>BFM 1012</b>	All engines except:	250		500		500		500	
	engines in harvesting machinery, district heating power stations, electricity generators**	–		–		500		500	
<b>BFM 1013</b>	All engines except:	250		500		500		500	
	engines from nonroad stage II	–		500		500		500	
	engines in harvesting machinery, district heating power stations, electricity generators**	–		–		500		500	
	BF4M1013FC	–		–		500		500	
	BF6M1013FC (P ≤ 200 kW), crankcase breather open	–		500		500		500	
	BF6M1013FC (P ≤ 200 kW), crankcase breather closed	–		–		500		500	
	BF6M1013FC (P > 200 kW), crankcase breather open	–		250		250		250	
	BF6M1013FC (P > 200 kW), crankcase breather closed	–		–		250		250	
<b>BFM 1013</b>	BF6M1013FC Genset 200 kVA crankcase breather open	–		500		500		500	
	BF6M1013FC Genset 200 kVA crankcase breather closed	–		–		–		500	



		Lubricating oil quality									
		DQC I-02		DQC II-05		DQC III-05		DQC IV-05			
Engine series	Engine version	Lubricating oil change intervals in oh									
		Oil load									
		normal	high	normal	high	normal	high	normal	high		
<b>BFM 2012</b>	All engines except:	250		500		500		500			
	BF4M2012C > 95 kW	–		–		500		500			
	BF6M2012C >143 kW, from nonroad stage II with cylinder bore 101 mm or 98 mm with MV system	–		–		500		500			
	BF6M2012C >135 kW, from nonroad stage II with cylinder bore 98 mm with mech. injection system	–		–		500		500			
	Other engines from nonroad stage II	–		500		500		500			
	engines in harvesting machinery, district heating power stations, electricity generators**	–		–		500		500			
<b>BFM 2013</b>	All engines except:	250		500		500		500			
	engines from nonroad stage II	–		500		500		500			
	BF4M2013C, P > 90 kW	–		–		500		500			
	BF6M2013C, P > 120 kW	–		–		500		500			
	engines in harvesting machinery, district heating power stations, electricity generators**	–		–		500		500			
<b>BFM 1015</b>	All engines except:	250	125	500	250	500	250	500	250		
	1015C from nonroad stage II	–	–	500	250	500	250	500	250		
	1015CP	–	–	–	–	500	250	500	250		
	BF6M1015MC ≤ 300 kW	–	–	500	250	500	250	500	250		
	BF8M1015MC ≤ 400 kW	–	–	500	250	500	250	500	250		
	BF6M1015MC > 300 kW	–	–	–	–	500	250	500	250		
	BF8M1015MC > 400 kW	–	–	–	–	500	250	500	250		
<b>BFM 2015</b>	All engines	–		–		500		500			
<b>D 2008</b>		250	125	500	250	500	250	500	250		
<b>TD/D 2009</b>		500	250	500		500		500			
<b>D 2011</b>		500	250	1000	500	1000	500	1000	500		

		Lubricating oil quality							
		DQC I-02		DQC II-05		DQC III-05		DQC IV-05	
Engine series	Engine version	Lubricating oil change intervals in oh							
		Oil load							
		normal	high	normal	high	normal	high	normal	high
<b>TD/w 2011</b>		250	125	500	250	500	250	500	250
<b>TD/i 2011</b>		250	125	500	250	500	250	500	250
<b>TCD/w 2011</b>		250	125	500	250	500	250	500	250
<b>TCD 2012 2V</b>	Crankcase breather open	–		500		500		500	
	Crankcase breather closed	–		–		500		500	
<b>TCD 2012 4V</b>	Crankcase breather open	–		500		500		500	
	All engines except	–		500		500		500	
	L04 P > 88 kW	–		–		500		500	
	L06 P > 132 kW	–		–		500		500	
	Crankcase breather closed	–		–		500		500	
<b>TCD 2013 2V</b>	Crankcase breather open	–		500		500		500	
	Crankcase breather closed	–		–		500		500	
<b>TCD 2013 4V</b>	Crankcase breather open	–		–		500		500	
	Crankcase breather closed	–		–		500		500	
<b>TCD 2015</b>	Crankcase breather closed	–		–		500		500	

T 3 Lubricating oil change intervals for built-in and marine engines

\*\* Electricity generators are to be understood here as those with mains/parallel operation.

Emergency generators are dealt with in TR 0199-99-1126.



## Remarks for built-in and marine engines

- Normal oil load for engines with low to medium workload (up to 70 %):

Examples for built-in engines: rollers, industrial trucks, railway vehicles, emergency pumps

Examples for marine engines: ferries, harbour boats, light fishing boats, river craft, auxiliary drives

- High oil load in engines with high workload (> 70%) or with other factors which make things difficult, e.g. high dust load or high dynamic operation):

Examples for built-in engines: tractors, harvesting machinery, mining equipment, wheel loaders, hydraulic excavators, graders, waste compressors, district heating power stations, mains/parallel operation, engine with 2-stage combustion

Examples for marine engines: speed boats, catamarans, yachts, gliders, generator drives

- The assignment of the workload to the applications is an example, the assignment may be different in the concrete case.
- If the prescribed lubricating oil change intervals are not reached within a year, the lubricating oil change must be made at least once a year.
- The following conditions apply for the lubricating oil change intervals:
  - Continuous ambient temperatures  $\geq -10\text{ °C}$  ( $\geq +14\text{ °F}$ )
  - Sulphur content in fuel  $\leq 0.5$  weight %
- The lubricating oil change interval must be halved at
  - continuous ambient temperatures  $< -10\text{ °C}$  ( $< +14\text{ °F}$ ) or oil temperature  $< 60\text{ °C}$  **or**
  - sulphur content in the fuel  $> 0.5$  to 1 weight % **or**
  - operation with bio-diesel fuel.**or**
  - operation with pure plant oil (rape seed oil), e.g. DEUTZ Natural Fuel Engines® TCD 2012 L06 2V, TCD 2012 L06 4V

### Lubricating oil change intervals for vehicle engines

building site machinery/city traffic/city buses (average speed approx. 15 mph)

		Lubricating oil quality				
		DQC I-02	DQC II-05	DQC III-05	DQC IV-05	
Engine series	Engine version	Lubricating oil change intervals in km				
<b>TD/D 226/</b>	Aspirated engines	15000	15000	20000	20000	
	<b>B/FL 413/513/912/913/914</b>	Turbocharged engines	10000	15000	20000	20000
<b>BFM 1012/1013/2012/2013</b>	Euro I	10000	15000	20000	20000	
	Euro II and Euro III, except:	–	15000	20000	20000	
BF4M1013FC	Euro II ≤ 14 l oil content (first filling)	–	–	10000	10000	
	Euro II > 14 l oil content (first filling)	–	–	20000	20000	
	Euro III	–	–	20000	20000	
BF6M1013FC, open crankcase breather	Euro II ≤ 19 l oil content (first filling)	–	10000	10000	10000	
	Euro II > 19 l oil content (first filling)	–	20000	20000	20000	
	Euro III	–	20000	20000	20000	
BF6M1013FC, closed crankcase breather	Euro II ≤ 19 l oil content (first filling)	–	–	10000	10000	
	Euro II > 19 l oil content (first filling)	–	–	20000	20000	
	Euro III	–	–	20000	20000	
BF4M2012C	> 95 kW from Euro II	–	–	20000	20000	
BF6M2012C	> 143 kW from Euro II with cylinder bore 101 mm or 98 mm with MV system	–	–	20000	20000	
	> 135 kW from Euro II with cylinder bore 98 mm with mechanical injection system	–	–	20000	20000	
BF4M2013C	> 90 kW	–	–	20000	20000	
BF6M2013C	> 120 kW	–	–	20000	20000	
<b>BFM 1015</b>	Euro I, except:	–	15000	20000	20000	
	BFM 1015CP	Euro II	–	–	20000	20000
<b>TCD 2013 4V</b>		–	–	20000	20000	
City traffic	TCD2013L04 4V	–	25000	45000	45000	
	TCD2013L06 4V	–	30000	50000	50000	
City buses	TCD2013L06 4V	Coach	–	30000	50000	50000
		InterCity	–	20000	30000	30000
		CityBus	–	15000	20000	20000
<b>TCD 2015</b>		–	–	20000	20000	

T 4 Lubricating oil change intervals for vehicle engines (average speed approx. 15 mph)



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Local transport (average speed approx. 25 mph)

		Lubricating oil quality				
		DQC I-02	DQC II-05	DQC III-05	DQC IV-05	
Engine series	Engine version	Lubricating oil change intervals in km				
<b>TD/D 226/ B/FL 413/513/912/913/914</b>	Aspirated engines	20000	20000	30000	30000	
	Turbocharged engines	15000	20000	30000	30000	
<b>BFM 1012/1013/2012/2013</b>	Euro I	15000	20000	30000	30000	
	Euro II and Euro III, except:	–	20000	30000	30000	
	BF4M1013FC	Euro II ≤ 14 l oil content (first filling)	–	–	15000	15000
		Euro II > 14 l oil content (first filling)	–	–	30000	30000
		Euro III	–	–	30000	30000
	BF6M1013FC, open crankcase breather	Euro II ≤ 19 l oil content (first filling)	–	15000	15000	15000
		Euro II > 19 l oil content (first filling)	–	30000	30000	30000
		Euro III	–	30000	30000	30000
	BF6M1013FC, closed crankcase breather	Euro II ≤ 19 l oil content (first filling)	–	–	15000	15000
		Euro II > 19 l oil content (first filling)	–	–	30000	30000
Euro III		–	–	30000	30000	
BF4M2012C	> 95 kW from Euro II	–	–	30000	30000	
BF6M2012C	> 143 kW from Euro II with cylinder bore 101 mm or 98 mm with MV system	–	–	30000	30000	
	> 135 kW from Euro II with cylinder bore 98 mm with mechanical injection system	–	–	30000	30000	
BF4M2013C	> 90 kW	–	–	30000	30000	
BF6M2013C	> 120 kW	–	–	30000	30000	
<b>BFM 1015</b>	Euro I, except:	–	20000	30000	30000	
	BFM 1015CP	Euro II	–	–	30000	30000
<b>TCD 2013 4V</b>	Euro I, except:	–	20000	30000	30000	
	TCD2013L044V	–	40000	60000	60000	
	TCD2013L064V	–	50000	75000	75000	
<b>TCD 2015</b>		–	–	30000	30000	

T 5 Lubricating oil change intervals for vehicle engines (average speed approx. 25 mph)

Long distance transport (average speed approx. 38 mph)

		Lubricating oil quality				
		DQC I-02	DQC II-05	DQC III-05	DQC IV-05	
Engine series	Engine version	Lubricating oil change intervals in km				
<b>TD/D 226/ B/FL 413/513/912/913/914</b>	Aspirated engines	30000	30000	40000	40000	
	Turbocharged engines	20000	30000	40000	40000	
<b>BFM 1012/1013/2012/2013</b>	Euro I	20000	30000	40000	40000	
	Euro II and Euro III, except:	–	30000	40000	40000	
	<b>BF4M1013FC</b>	Euro II ≤ 14 l oil content (first filling)	–	–	20000	20000
		Euro II > 14 l oil content (first filling)	–	–	40000	40000
		Euro III	–	–	40000	40000
<b>BF6M1013FC, open crankcase breather</b>	Euro II ≤ 19 l oil content (first filling)	–	20000	20000	20000	
	Euro II > 19 l oil content (first filling)	–	40000	40000	40000	
	Euro III	–	40000	40000	40000	
<b>BF6M1013FC, closed crankcase breather</b>	Euro II ≤ 19 l oil content (first filling)	–	–	20000	20000	
	Euro II > 19 l oil content (first filling)	–	–	40000	40000	
	Euro III	–	–	40000	40000	
<b>BF4M2012C</b>	> 95 kW from Euro II	–	–	40000	40000	
<b>BF6M2012C</b>	> 143 kW from Euro II with cylinder bore 101 mm or 98 mm with MV system	–	–	40000	40000	
	> 135 kW from Euro II with cylinder bore 98 mm with mechanical injection system	–	–	40000	40000	
<b>BF4M2013C</b>	> 90 kW	–	–	40000	40000	
<b>BF6M2013C</b>	> 120 kW	–	–	40000	40000	
<b>BFM 1015</b>	Euro I, except:	–	30000	40000	40000	
	<b>BFM 1015CP</b>	Euro II	–	–	60000	60000
<b>TCD 2013 4V</b>	Euro I, except:	–	20000	30000	30000	
	<b>TCD2013L044V</b>	–	60000	80000	80000	
	<b>TCD2013L064V</b>	–	75000	100000	100000	
<b>TCD 2015</b>		–	–	60000	60000	

T 6 Lubricating oil change intervals for vehicle engines (average speed approx. 38 mph)



### Remarks on vehicle engines

- If lubricating oil changes are carried out according to operating hour intervals in vehicles, the lubricating oil change intervals in table T1-2 for "normal oil load" apply.
- If the prescribed mileage is not reached within a year, the lubricating oil change must be made at least once a year.
- The following conditions apply for the lubricating oil change intervals:
  - Continuous ambient temperatures  $\geq -10\text{ °C}$  ( $\geq +14\text{ °F}$ )
  - Sulphur content in fuel  $\leq 0.5$  weight %
- The lubricating oil change interval must be halved at
  - continuous ambient temperatures  $< -10\text{ °C}$  ( $< +14\text{ °F}$ ) or oil temperature  $< 60\text{ °C}$   
**or**
  - sulphur content in the fuel  $> 0.5$  to 1 weight %  
**or**
  - Operation with bio-diesel fuel

### Lubricating oil filter maintenance

The filter cartridges must be changed with every oil change and the filter cleaned.

For the 226/413/513/912/913/1008/2008/2009 engine series the first filter cartridge change or the first filter cleaning must be made after 50 oh after first commissioning or restarting after major repairs (general overhaul).

All intervals also apply for sub-flow filters delivered by DEUTZ (e.g. centrifugal filters in the fan).

An additional lubricating oil conditioning by sub-flow filters is not necessary. Lengthening the lubricating oil change intervals when using sub-flow filters is not permitted.

### Explanations of the properties of DQC III-05 and DQC IV-05 - Oils

For following engines or types of application

- BFM 1013FC/BFM 1015CP/TCD 2015
- all engines in district heating power stations
- all engines in electricity generators with mains/parallel operation
- Engines in harvesting machinery
- Engines BFM 2012C with increased power  
(for an exact definition see tables T 3 and T 4)

the **DEUTZ ÖI TLX-10W40FE** must be used. Alternatively oils according to the DEUTZ lubricating oil quality class DQC III-05 or DQC IV-05 can be used.

The DQC III-05 oils have a high quality. In addition these oils are partly synthetic or even fully synthetic and therefore achieve the thermal resistance necessary for the application and in engines with a closed crankcase breather a low tendency for deposits in the turbo-charger and the charge air lines (according to the specifications of the lubricating oil manufacturers for the MTU lab test MTV 5040).

### For engines

- **BF6M1013FC Genset 200 kVA with closed crankcase breather only oils according to DEUTZ lubricating oil quality class DQC IV-05 must be used.**

DQC IV-05 only allows fully synthetic oils of the finest quality (ACEA E4) and therefore guarantees the necessary turbocharger cleanliness with very high turbocharged engines with closed crankcase breather.

## Further remarks on the use of lubricating oils in fast running DEUTZ engines

### Low-ash engine oils for engines with exhaust gas post-treatment (SCR/DPF)

Sulphate and oxide ashes of metal-organic additives, phosphorous from wear-protection additives as well as sulphur and sulphur compounds have a negative influence on the catalyst activity in post-treatment systems (e.g. SCR) and shorten the life of diesel particle filters significantly. Therefore the mineral oil industry has developed low-ash engine oils (low SAPS oils - low Sulphated Ash, Phosphorus, Sulphur) which are classified according to API CJ-4, ACEA E6-04 as well as the future ACEA E9. DEUTZ recommends the use of low-ash engine oils in engines with exhaust gas post-treatment systems, whereby all the requirements of this technical circular must be observed in the choice of oil.

The low-ash oils have a lower TBN (base number) than normal engine oils due to the lower percentage of ash-forming additives and therefore a low potential for buffering acidic components. Therefore these oils may not be used when the sulphur content in the fuel is above 500 mg/kg.

For low-ash engine oils released according to the DQC system an appropriate reference is made in the oil release list.

### Biologically degradable lubricating oils

Biologically degradable lubricating oils may be used in DEUTZ engines if they meet the requirements of this technical circular.

For biologically degradable oils released according to the DQC system an appropriate reference is made in the oil release list.

### Synthetic lubricating oils

Synthetic lubricating oils are used increasingly and offer advantages. As already mentioned in the section "Explanations of the properties of DQC III-05 and DQC IV-05 - oils", synthetic oils have a better temperature and oxidation stability as well as a relatively low cold viscosity which makes them suitable for using in Arctic temperatures (< -25°C), see table T 2.

Since some processes which are relevant for determining the oil change times are largely independent on the oil quality (e.g. the infiltration of soot and other contamination), the oil change time may not be increased in relation to the specifications in the subsection on lubricating oil change intervals or the tables T 3 to T 6 even when using synthetic oils.



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## Tractor universal oils

To simplify the storage in agricultural enterprises, universal oils have been developed for agriculture which can be used in the engine, gear, hydraulic system and in oil-cooled, so-called wet brakes. These oils which are known as STOU = "Super Tractor Oils Universal" may only be used in the engine when the specifications in this technical circular are observed and at the same time the relevant specifications for all oil-lubricated tractor components must be satisfied. Although almost all the currently necessary specifications and requirements can be met with STOU oils, compromises are obviously necessary and the possible optimum performances of special oils optimised for individual tractor components cannot be fully reached. The demands on a high performance engine oil especially are difficult to reconcile with other demands. Therefore DEUTZ recommends the use of appropriate engine oils according to DQC.

For STOU engine oils released according to the DQC system an appropriate reference is made in the oil release list.

## Additives to the lubricating oil

The lubricating oils described in this technical circular contain additives for all tasks in the engine which are carefully adapted to each other and finally tested extensively as a finished product. The effect of other additives is not usually tested with the same care so that unforeseeable effects cannot be ruled out. The use of additives in DEUTZ engines is therefore prohibited.

## Service Information

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