



(11)

EP 2 398 872 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
13.11.2013 Bulletin 2013/46

(21) Application number: **10703899.4**

(22) Date of filing: **16.02.2010**

(51) Int Cl.:
C10M 101/02 ^(2006.01) **C10M 169/04** ^(2006.01)

(86) International application number:
PCT/EP2010/051915

(87) International publication number:
WO 2010/094681 (26.08.2010 Gazette 2010/34)

(54) **USE OF A LUBRICATING COMPOSITION WITH GTL BASE OIL TO REDUCE HYDROCARBON EMISSIONS**

VERWENDUNG EINER SCHMIERMITTELZUSAMMENSETZUNG MIT GTL-GRUNDÖL ZUR
VERRINGERUNG VON KOHLENWASSERSTOFFEMISSIONEN

UTILISATION D'UNE COMPOSITION LUBRIFIANTE AVEC DE L'HUILE DE BASE GTL POUR
RÉDUIRE LES ÉMISSIONS D'HYDROCARBURE

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL
PT RO SE SI SK SM TR**

(30) Priority: **18.02.2009 EP 09153072**

(43) Date of publication of application:
28.12.2011 Bulletin 2011/52

(73) Proprietor: **Shell Internationale Research
Maatschappij B.V.
2596 HR Den Haag (NL)**

(72) Inventors:
• **WEDLOCK, David John
Chester Cheshire CH2 4NU (GB)**
• **WU, Yanyun
Chester Cheshire CH2 4NU (GB)**

(74) Representative: **Matthezing, Robert Maarten
Shell International B.V.
Intellectual Property Services
P.O. Box 384
2501 CJ The Hague (NL)**

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Description

[0001] The present invention relates to the use of a lubricating composition comprising a Fischer-Tropsch derived base oil and one or more additives for particular use in the crankcase of an internal combustion engine, in particular a diesel engines such as a heavy duty diesel engine.

[0002] In recent decades, use of internal combustion engines, in particular compression ignition engines for transportation and other means of energy generation has become more and more widespread. Compression ignition engines, which will be referred to further as "diesel engines", feature among the main type of engines employed for passenger cars in Europe, and globally for heavy-duty applications, as well as for stationary power generation as a result of their high efficiency.

[0003] A diesel engine is an internal combustion engine; more specifically, it is a compression ignition engine, in which the fuel/air mixture is ignited by being compressed until it ignites due to the temperature increase due to compression, rather than by a separate source of ignition, such as a spark plug, as is the case of gasoline engines.

[0004] The growing spread of diesel engines has resulted in increased regulatory pressure with respect to engine emissions; more specifically with respect to exhaust gases and particulate matter in the exhaust gas stream.

[0005] It is desirable to reduce these emissions either as a whole or individually. Whilst some of the emissions have their origin in the fuel which is combusted in the engine, the lubricating composition which is used to lubricate the engine can also impact on the emissions, for example by direct emission of combustion products of the oil or by affecting the trap performance in a diesel particulate trap (DPT).

[0006] A variety of strategies for controlling and reducing in particular particulate matter emissions from diesel engines have been reported in recent years. These include engine management, more specifically injection and combustion processes, as disclosed for instance in US 6 651 614. Highly effective are diesel particulate traps (DPTs) as disclosed for instance EP-A-1 108 862 and EP-A-1 251 248. Such devices are used on light- and heavy-duty diesel engines to ensure particulates emission compliance with for example Euro 4 standards, further improved by additives or selected fuels, such as the use of low sulphur fuels in combination with an engine oil having a low sulphur content to reduce the number of nucleation mode particles emitted from an engine further using a catalysed particulate trap as disclosed in WO 2004/046283.

[0007] Diesel particulate traps usually operate by trapping particulate matter from the exhaust emissions of the engine. The mainly hydrocarbon derived organic particulate material will eventually cause DPT blocking and excessive pressure built-up.

[0008] This is addressed by subjecting the trap to very high temperature once the particulate trap has become saturated, by injecting for instance a certain amount of diesel fuel into the DPT to burn off the organic particulate matter. The regeneration of the diesel particulate traps increases the fuel consumption and NO_x production through the increased temperature in regeneration mode.

[0009] As disclosed in D.J. Wedlock et al., "Gas-to-Liquids Base Oils to assist in meeting OEM requirements 2010 and beyond", presented at the 2nd Asia-Pacific base oil Conference, Beijing, China, 23-25 October 2007, the use of Fischer-Tropsch derived base oils in engine oils helps in improving the operation of a re-generable diesel particulate trap in light- and heavy-duty diesel engines and also helps in reducing NO_x emissions.

[0010] WO 2007/050352 discloses a method of reducing observable smoke emitted from a two-stroke gasoline (i.e. not a diesel) engine by using a lubricant comprising a GTL base oil. Two-stroke gasoline engines have found widespread use in a wide variety of garden end recreational equipment; hydrocarbon emissions from two-stroke engines, by virtue of their basic design, tend to exceed emissions from a comparable four-cycle engine.

[0011] US 5,674,822 discloses a method for reducing hydrocarbon and carbon monoxide emissions from a gasoline or diesel engine wherein the lubricant comprises a highly polar synthetic ester.

[0012] It is an object of the present invention to provide further ways of controlling and reducing of emissions from engines, in particular diesel engines.

[0013] The above or other objects are achieved by the present invention by providing the use of a lubricating composition comprising a Fischer-Tropsch derived base oil and one or more additives in a diesel engine in order to improve the reduction of total hydrocarbon emissions. Suitably the engine is run according to the ETC test cycle (*Directive 1999/96/EC* of the European Parliament).

[0014] It has surprisingly been found according to the present invention that the use of engine oils comprising a Fischer-Tropsch derived base oil results in a reduction of total hydrocarbon emissions (in particular relative to a mineral derived Group III base oil); this effect was found to occur when a conventional diesel fuel was used, and also when a diesel fuel containing a Fischer-Tropsch derived gas oil was used.

[0015] There are no particular limitations regarding the base oil used in lubricating composition according to the present invention (provided that the base oil comprises at least a Fischer-Tropsch derived base oil), and various conventional mineral oils, synthetic oils as well as naturally derived esters such as vegetable oils may be conveniently used.

[0016] The base oil used in the present invention may - in addition to the Fischer-Tropsch derived base oil - conveniently

comprise mixtures of one or more mineral oils and/or one or more synthetic oils; thus, according to the present invention, the term "base oil" may refer to a mixture containing more than one base oil, including at least one Fischer-Tropsch derived base oil. Mineral oils include liquid petroleum oils and solvent-treated or acid-treated mineral lubricating oil of the paraffinic, naphthenic, or mixed paraffinic/naphthenic type which may be further refined by hydrofinishing processes and/or dewaxing.

[0017] Fischer-Tropsch derived base oils are known in the art. By the term "Fischer-Tropsch derived" is meant that a base oil is, or is derived from, a synthesis product of a Fischer-Tropsch process. A Fischer-Tropsch derived base oil may also be referred to as a GTL (Gas-To-Liquids) base oil. Suitable Fischer-Tropsch derived base oils that may be conveniently used as the base oil in the lubricating composition of the present invention are those as for example disclosed in EP 0 776 959, EP 0 668 342, WO 97/21788, WO 00/15736, WO 00/14188, WO 00/14187, WO 00/14183, WO 00/14179, WO 00/08115, WO 99/41332, EP 1 029 029, WO 01/18156 and WO 01/57166.

[0018] Synthetic oils include hydrocarbon oils such as olefin oligomers (including polyalphaolefin base oils; PAOs), dibasic acid esters, polyol esters, polyalkylene glycols (PAGs), alkyl naphthalenes and dewaxed waxy isomerates. Synthetic hydrocarbon base oils sold by the Shell Group under the designation "Shell XHVI" (trade mark) may be conveniently used.

[0019] Poly-alpha olefin base oils (PAOs) and their manufacture are well known in the art. Preferred poly-alpha olefin base oils that may be used in the lubricating compositions of the present invention may be derived from linear C₂ to C₃₂, preferably C₆ to C₁₆, alpha olefins. Particularly preferred feedstocks for said poly-alpha olefins are 1-octene, 1-decene, 1-dodecene and 1-tetradecene.

[0020] The base oil as used in the lubricating composition according to the present invention comprises a Fischer-Tropsch derived base oil.

[0021] There is a strong preference for using a Fischer-Tropsch derived base oil over a PAO base oil, in view of the high cost of manufacture of the PAOs. Thus, preferably, the base oil contains more than 50 wt.%, preferably more than 60 wt.%, more preferably more than 70 wt.%, even more preferably more than 80 wt.%, most preferably more than 90 wt.% Fischer-Tropsch derived base oil. In an especially preferred embodiment not more than 5 wt.%, preferably not more than 2 wt.%, of the base oil is not a Fischer-Tropsch derived base oil. It is even more preferred that 100 wt% of the base oil is based on one or more Fischer-Tropsch derived base oils.

[0022] The total amount of base oil incorporated in the lubricating composition of the present invention is preferably present in an amount in the range of from 60 to 99 wt.%, more preferably in an amount in the range of from 65 to 90 wt.% and most preferably in an amount in the range of from 70 to 85 wt.%, with respect to the total weight of the lubricating composition.

[0023] It is preferred according to the present invention that the base oil has a kinematic viscosity at 100°C of at least 4.8 cSt (according to ASTM D445). In the event the base oil contains a blend of two or more base oils, it is preferred that the total contribution of the base oil to this kinematic viscosity is at least 4.8 cSt.

[0024] In a preferred embodiment according to the present invention, the base oil has a kinematic viscosity at 100°C of at least 5.0 cSt, preferably at least 5.2 cSt. Typically, the base oil has a kinematic viscosity at 100°C below 10.0, preferably below 8.5, more preferably below 7.0 cSt, or even below 5.5.

[0025] Preferably, the lubricating composition according to the present invention meets the so-called SAE J300 Specifications (as revised in May 2004), preferably those of 5W-30 and 5W-40 crankcase engine oils. SAE stands for Society of Automotive Engineers.

[0026] It is especially preferred according to the present invention that the composition has:

- a dynamic viscosity at -30°C (according to ASTM D 5293) of below 6600 cP;
- a kinematic viscosity at 100°C (according to ASTM D 445) of at least 9.3 cSt;
- a high temperature, high shear viscosity ("HTHS"; according to ASTM D 4683) of at least 2.9 cP; and
- a Noack volatility (according to ASTM D 5800) of below 14 wt.%.

[0027] Typically, the dynamic viscosity at -30°C (according to ASTM D 5293) of the composition is between 3000 and 6600 cP, preferably between 4000 and 6450 cP (1 cP is the same as 1 mPa.s).

[0028] Typically, the dynamic viscosity at -35°C (according to ASTM D 5293) of the composition is between 4000 and 8000 cP.

[0029] Typically, the kinematic viscosity at 100°C (according to ASTM D 445) of the composition is between 5.6 and 26.1 cSt, preferably between 9.3 and 16.3, more preferably between 9.3 and 12.5.

[0030] Typically, the high temperature, high shear viscosity ("HTHS"; according to ASTM D 4683) of the composition is between 2.9 and 5.0 cP, preferably between 3.0 and 3.7 cP.

[0031] Typically, the Noack volatility (according to ASTM D 5800) of the composition is between 1 and 14 wt.%, preferably below 13.0 wt.%, more preferably below 11.0 wt.%, even more preferably below 10.5 wt.%, most preferably below 10.0 wt.%.

[0032] Also it is preferred that the composition has a mini rotary viscometer (MRV) value at -35°C (according to ASTM D 4684) of below 60,000 cP, more preferably below 50,000 cP, even more preferably below 40,000 cP, and typically above 20,000.

[0033] The lubricating composition according to the present invention further comprises one or more additives such as anti-oxidants, anti-wear additives, dispersants, detergents, overbased detergents, extreme pressure additives, friction modifiers, viscosity index improvers, pour point depressants, metal passivators, corrosion inhibitors, demulsifiers, anti-foam agents, seal compatibility agents and additive diluent base oils, etc.

[0034] As the person skilled in the art is familiar with the above and other additives, these are not further discussed here in detail. Specific examples of such additives are described in for example Kirk-Othmer Encyclopedia of Chemical Technology, third edition, volume 14, pages 477-526.

[0035] The lubricating compositions of the present invention may be conveniently prepared by admixing the one or more additives with the base oil(s).

[0036] The above-mentioned additives are typically present in an amount in the range of from 0.01 to 35.0 wt.%, based on the total weight of the lubricating composition, preferably in an amount in the range of from 0.05 to 25.0 wt.%, more preferably from 1.0 to 20.0 wt.%, based on the total weight of the lubricating composition.

[0037] Preferably, the composition contains at least 9.0 wt.%, preferably at least 10.0 wt.%, more preferably at least 11.0 wt% of an additive package comprising an anti-wear additive, a metal detergent, an ashless dispersant and an anti-oxidant.

[0038] The present invention is described below with reference to the following Examples, which are not intended to limit the scope of the present invention in any way.

Examples

Lubricating Oil Compositions

[0039] Various engine oils for use in a crankcase engine were formulated.

[0040] Table 1 indicates the properties for the base oils used. Table 2 indicates the composition and properties of the fully formulated engine oil formulations that were tested; the amounts of the components are given in wt.%, based on the total weight of the fully formulated formulations.

[0041] All tested engine oil formulations contained a combination of a base oil, an additive package and a viscosity modifier, which additive package was the same in all tested compositions.

[0042] The additive package was a so-called low SAPS (low sulphated ash, phosphorus and sulphur) formulation suitable for use with diesel particulate filter after-treatment devices. Typically, such an additive package comprises non-sulphur containing overbased detergents such as salicylates and phenates.

[0043] The additive package contained a combination of additives including anti-oxidants, a zinc-based anti-wear additives, an ashless dispersant, an overbased detergent mixture, a pour point depressant and about 10 ppm of an anti-foaming agent.

[0044] A conventional viscosity modifier concentrate was used to adjust the viscosities.

[0045] "Base oil 1" was a Fischer-Tropsch derived base oil ("GTL 5") having a kinematic viscosity at 100°C (ASTM D445) of approx. 5 cSt (mm²s⁻¹).

[0046] "Base oil 2" was a Fischer-Tropsch derived base oil ("GTL 8") having a kinematic viscosity at 100°C (ASTM D445) of approx. 8 cSt (mm²s⁻¹).

[0047] These GTL 5 and GTL 8 base oils may be conveniently manufactured by the process described in e.g. WO-A-02/070631, the teaching of which is hereby incorporated by reference.

[0048] "Base oil 3" was a commercially available Group III base oil having a kinematic viscosity at 100°C (ASTM D445) of approx. 4.34 cSt. Base oil 3 is commercially available from e.g. SK Energy (Ulsan, South Korea) (under the trade designation "Yubase 4").

[0049] "Base oil 4" was a commercially available Group III base oil having a kinematic viscosity at 100°C (ASTM D445) of approx. 6.42 cSt. Base oil 4 is commercially available from e.g. SK Energy (under the trade designation "Yubase 6").

[0050] The compositions of Example 1 and Comparative Example 1 were obtained by mixing the base oils with the additive package using conventional lubricant blending procedures.

[0051] The composition of Example 1 meets the requirements of a 5W-30 formulation, whilst the composition of Comparative Example 1 meets the requirements of a 10W-30 formulation, both according to SAE J300. This is because the mineral base oil of Comparative Example 1 (having the same base oil viscosity as the Fischer-Tropsch derived base oil of Example 1) did not allow to meet adequately the low temperature performance and Noack volatility requirements (i.e. 13 wt.% loss maximum for ACEA claims - ACEA is the European Automobile Manufacturers' Association) of 5W-30 at the same time.

[0052] The kinematic viscosities at 100°C (ASTM D 445) for the base oil blends as used in Table 2 was 5.46 cSt for

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the blend of base oil 1+2 (84.75 + 15.25 wt.%) and 5.45 cSt for the blend of base oil 3+4 (41.5 + 58.5 wt.%).

Table 1

	Base oil 1	Base oil 2	Base oil 3	Base oil 4
Kinematic viscosity at 40°C ¹ [cSt]	24.50	44.35	20.24	35.65
Kinematic viscosity at 100°C ¹ [cSt]	5.13	7.75	4.34	6.42
VI Index ²	144	145	124	133
Pour point ³ [°C]	-27	-30	-15	-12
Noack volatility ⁴ [wt. %]	9.3	1.9	14.5	7.0
Saturates ⁵ [wt. %]	99.6	99.4	99.2	99.6
¹ According to ASTM D 445 ² According to ASTM D 2270 ³ According to ASTM D 5950 ⁴ According to CEC L-40-A-93 / ASTM D 5800 ⁵ According to IP 368 (modified)				

Table 2

Component [wt. %]	Example 1 (5W-30)	Comp. Ex. 1 (10W-30)
Base oil 1	61.14	-
Base oil 2	11.00	-
Base oil 3	-	30.61
Base oil 4	-	43.16
Additive package	19.06	19.06
Viscosity Modifier	8.80	7.17
TOTAL	100	100
Dynamic viscosity at -25°C ¹ [cP]	3573	4648
Dynamic viscosity at -30°C ¹ [cP]	6317	9516
Kinematic viscosity at 100°C ² [cSt]	12.15	11.96
HTHS ³ [cP]	3.59	3.54
Noack volatility ⁴ [wt. %]	8.5	10.2
Ca content ⁵ [wt. %]	0.250	0.243
P content ⁵ [wt. %]	0.051	0.050
Zn content ⁵ [wt. %]	0.059	0.059
¹ According to ASTM D 5293. NB 1 cP (centi Poise) = 1 mPa.s ² According to ASTM D 445 ³ According to ASTM D 4683 ⁴ According to ASTM D 5800 ⁵ According to ASTM D 4951		

Total Hydrocarbon Emissions

[0053] In order to demonstrate the gaseous total hydrocarbon emission properties of the present invention, bench engine test measurements were performed on a bench dynamometer linked to a MAN D2066 Euro 4, 6 cylinder inline

common rail engine (displacement: 10.5 l; power: 324 kW; torque: 2100 Nm), whilst running the engine according to the European Transient Cycle (ETC) test cycle.

[0054] For the measurement of the total hydrocarbon emissions, a Mexa 7500 DTR automotive test system (available from e.g. HORIBA Automotive Test Systems GmbH, Darmstadt, Germany) was used as prescribed according to its manual.

[0055] Usually, according to the ETC test cycle, the total hydrocarbon emissions are measured in diluted exhaust gas and sampling takes place after exhaust after-treatment devices (such as a catalytic converter); in this case, however, undiluted raw emissions before such after-treatment devices were measured in order to give a better representation of the actual gaseous total hydrocarbon emissions (i.e. without the use of the after-treatment device).

[0056] The ETC standard test cycle has been introduced, together with the ESC (European Stationary Cycle) test, for emission certification of heavy-duty diesel engines in Europe starting in the year 2000 (see Directive 1999/96/EC of the European Parliament and of the Council dated 13 December 1999). The ETC test cycle has been developed by the FIGE Institute (Aachen, Germany), based on real road cycle measurements of heavy duty vehicles (see *FIGE Report 104 05 316, January 1994*).

[0057] Different driving conditions are represented by three phases of the ETC test cycle, including urban, rural and motorway driving. The duration of the entire test cycle is 1800s (30 minutes). The duration of each phase is 600s (10 minutes).

[0058] The ETC test cycle comprises the following parts:

- Phase one represents urban driving ("City Cycle") with a maximum speed of 50 km/hour, frequent starts, stops, and idling;
- Phase two is rural driving ("Rural Cycle") starting with a steep acceleration segment. The average speed is about 72 km/hour;
- Phase three is motorway driving ("Highway Cycle") with average speed of about 88 km/hour.

[0059] The measured total hydrocarbon emissions (in g/kWh) are indicated in Table 3 below.

[0060] Fuel 1 was a conventional low S (sulphur) mineral derived diesel, whilst Fuel 2 was a Fischer-Tropsch derived diesel.

Table 3

Lubricant	Diesel Fuel	Total Hydrocarbon Emissions							
		Phase 1 ETC (Urban) [g/kWh]	Benefit over Comp. Ex. [%]	Phase 2 ETC (Rural) [g/kWh]	Benefit over Comp. Ex. [%]	Phase 3 ETC (Motorway) [g/kWh]	Benefit over Comp. Ex. [%]	Whole ETC cycle [g/kWh]	Benefit over Comp. Ex. [%]
Example 1	Fuel 1	0.0987	2.34	0.0798	2.33	0.1137	2.42	0.0946	2.36
Comp.Ex. 1	Fuel 1	0.1011	-	0.0817	-	0.1165	-	0.0969	-
Example 1	Fuel 2	0.0898	1.76	0.0724	2.21	0.1008	2.15	0.0853	2.05
Comp.Ex. 1	Fuel 2	0.0914	-	0.0741	-	0.1030	-	0.0871	-

Discussion

[0061] As can be learned from Table 3, the total hydrocarbon emissions for Example 1 were significantly improved when compared with Comparative Example 1 for all cycles of the ETC test cycle. This is shown in terms of weight (in grams) of total hydrocarbon emissions (per kilo Watt hour of engine work). The above results were found to be statistically significant at the 95% confidence interval level.

[0062] The above effect was found both when a conventional low S (sulphur) mineral derived diesel (Fuel 1) and a Fischer-Tropsch derived diesel (Fuel 2) was used.

[0063] Please note with respect to total hydrocarbon (THC) emissions that they derive from both fuel and lubricant hydrocarbons and are detected as a gaseous phase. In contrast, particulate emissions are generally regarded as those

compounds trapped on a standard filter paper at 52°C, and which can be sub-divided into soluble and insoluble phases. There may be some non-volatile hydrocarbons that can be trapped on said filter paper but these non-volatile hydrocarbons are not counted in the THC levels as referred to in this present invention.

[0064] On the basis of analysis of total hydrocarbon emission data generated on a 3 liter V6 Jaguar passenger car diesel engine (instead of the MAN D2066 heavy-duty diesel engine as mentioned above), using the same base oils but a different low SAPS additive package (tailored for a passenger car), it was confirmed that the total hydrocarbon emissions were also reduced when using a lubricating composition comprising a Fischer-Tropsch derived base oil and one or more additives in a passenger car diesel engine.

Claims

1. Use of a lubricating composition comprising a Fischer-Tropsch derived base oil and one or more additives in a diesel engine in order to improve the reduction of total hydrocarbon emissions.
2. Use according to claim 1 wherein the engine is run according to the ETC test cycle (Directive 1999/96/EC of the European Parliament).
3. Use according to claim 1 or 2, wherein the diesel engine is a heavy-duty diesel engine.
4. Use according to any of claims 1 to 3, wherein the base oil contains more than 50 wt.% Fischer-Tropsch derived base oil.
5. Use according to any of claims 1 to 4, wherein the base oil contains more than 60 wt.% Fischer-Tropsch derived base oil.
6. Use according to any of claims 1 to 5, wherein the base oil contains more than 70 wt.% Fischer-Tropsch derived base oil.
7. Use according to any of claims 1 to 6, wherein the base oil contains more than 80 wt.% Fischer-Tropsch derived base oil.
8. Use according to any of claims 1 to 7, wherein the base oil contains more than 90 wt.% Fischer-Tropsch derived base oil.

Patentansprüche

1. Verwendung einer Schmiermittelzusammensetzung umfassend ein Fischer-Tropsch abgeleitetes Grundöl und einen oder mehrere Zusätze in einem Dieselmotor, um die Reduktion der Gesamtemissionen von Kohlenwasserstoff zu verbessern.
2. Verwendung nach Anspruch 1, wobei der Motor entsprechend dem ETC-Testzyklus (Richtlinie 1999/96/EC des Europäischen Parlaments) laufen gelassen wird.
3. Verwendung nach Anspruch 1 oder 2, wobei der Dieselmotor ein Hochleistungsdieselmotor ist.
4. Verwendung nach einem beliebigen der Ansprüche 1 bis 3, wobei das Grundöl mehr als 50 Gew.% Fischer-Tropsch abgeleitetes Grundöl enthält.
5. Verwendung nach einem beliebigen der Ansprüche 1 bis 4, wobei das Grundöl mehr als 60 Gew.% Fischer-Tropsch abgeleitetes Grundöl enthält.
6. Verwendung nach einem beliebigen der Ansprüche 1 bis 5, wobei das Grundöl mehr als 70 Gew.% Fischer-Tropsch abgeleitetes Grundöl enthält.
7. Verwendung nach einem beliebigen der Ansprüche 1 bis 6, wobei das Grundöl mehr als 80 Gew.% Fischer-Tropsch abgeleitetes Grundöl enthält.

8. Verwendung nach einem beliebigen der Ansprüche 1 bis 7, wobei das Grundöl mehr als 90 Gew.% Fischer-Tropsch abgeleitetes Grundöl enthält.

5 **Revendications**

1. Utilisation d'une composition lubrifiante comprenant une huile de base dérivée d'un procédé Fischer-Tropsch et un ou plusieurs additifs dans un moteur diesel dans le but d'améliorer la réduction des émissions totales d'hydrocarbures.
- 10 2. Utilisation selon la revendication 1, dans laquelle le moteur est mis en fonctionnement selon le cycle d'essai ETC (Directive 1999/96/EC du Parlement européen).
3. Utilisation selon la revendication 1 ou 2, dans laquelle le moteur diesel est un moteur diesel de poids lourds.
- 15 4. Utilisation selon l'une des revendications 1 à 3, dans laquelle l'huile de base contient plus de 50 % en poids d'huile de base dérivée d'un procédé Fischer-Tropsch.
5. Utilisation selon l'une des revendications 1 à 4, dans laquelle l'huile de base contient plus de 60 % en poids d'huile de base dérivée d'un procédé Fischer-Tropsch.
- 20 6. Utilisation selon l'une des revendications 1 à 5, dans laquelle l'huile de base contient plus de 70 % en poids d'huile de base dérivée d'un procédé Fischer-Tropsch.
7. Utilisation selon l'une des revendications 1 à 6, dans laquelle l'huile de base contient plus de 80 % en poids d'huile de base dérivée d'un procédé Fischer-Tropsch.
- 25 8. Utilisation selon l'une des revendications 1 à 7, dans laquelle l'huile de base contient plus de 90 % en poids d'huile de base dérivée d'un procédé Fischer-Tropsch.

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REFERENCES CITED IN THE DESCRIPTION

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