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Date: 970422

Ref no: Im704221

To: AgipPetroli  
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Attn: Mr Salvatore Gaist, R&D Automotive Lubricants

Telefax No: 009-39-6-59886736

From: Jan Odeberg

No of pages including cover sheet: 3

Subject: Field test with AGIP GEUM C (SAE 40) in Reggio Emilia

Dear Mr Salvatore Gaist

First, please let me apologise for the delayed answer.  
Now also the components from the field test (cylinder head and piston rings) have reached Trollhättan and been analysed.

The field-test was successful, and the lubricating oil is now accepted for use in Wärtsilä Diesel W25SG and W28SG engines running on natural gas.  
See also document no 91-948-002-00

Best regards



Jan Odeberg  
Wärtsilä Diesel Technology

PS. I will also send You a letter containing our document no. 91-948-002-00 "Lubricating oils for W25SG and W28SG (on natural gas)" and doc. no. 91-948-005-00 "Used lubricating oil condemning limits..."

**91-948-002-02**

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Avdelning/Dept

Datum/Date

Ref.

TL

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Jan Odeberg

Direct calling No

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Fördelning/To

För kännedom/For information

TG, TL

KA, SK

Ärende/Subject

## Lubricating oils for W25SG and W28SG (on natural gas)

Wärtsilä Diesel AB has to be contacted for consultation before selection of lubrication oil for natural gas engine application.

Main WDS demands:

Total base number: 5 > TBN > 7

Sulphated ash content < 0.6 %

Viscosity: SAE 40 or multigrade

Viscosity index: VI > 90

The following lubricating oils are approved by Wärtsilä Diesel AB (see data & specification 91 939 144 00E - Lubricating System) for natural gas application:

<b>Mobil</b>	<b>Pegasus 480</b>
<b>Mobil</b>	<b>Pegasus 1</b>
<b>Elf</b>	<b>XT 3722</b>
<b>Castrol</b>	<b>NG 404</b>
<b>Texaco</b>	<b>Geotex LA 40</b>
<b>Exxon</b>	<b>Essolube PC 40</b>
<b>Shell</b>	<b>Mysella Oil LA (SAE 40)</b>
<b>Cepsa</b>	<b>Troncoil gas (SAE 40)</b>
<b>Agip</b>	<b>Geum C (SAE 40)</b>

The following lubricating oils are only approved for field tests. Engine laboratory at Wärtsilä Diesel AB has to be contacted before a field test is initiated (see also Document 91-948-001-00 Conditions for field testing of lubricating oils):

<b>Statoil</b>	<b>PowerWay GN40</b>
<b>Exxon</b>	<b>Estor SHPC 40</b>
<b>Exxon</b>	<b>Estor super 40</b>
<b>Exxon</b>	<b>Estor super 15W-40</b>
<b>BP</b>	<b>Energol IC-DG 40</b>
<b>BP</b>	<b>Energol IC-DG 40 S</b>
<b>Elf</b>	<b>Nateria WD 40</b>
<b>Chevron</b>	<b>HDAX Low Ash (SAE 40)</b>
<b>Chevron</b>	<b>HDAX Low Ash (SAE 15W-40)</b>
<b>Pennzoil</b>	<b>GEO LA (SAE 40)</b>
<b>Q8</b>	<b>Mahler MA (SAE 40)</b>
<b>Castrol</b>	<b>HPL 40</b>
<b>FINA</b>	<b>gas engine oil 405</b>
<b>Repsol</b>	<b>Motor Gas SAE 40</b>
<b>TOTAL</b>	<b>LMG 405</b>



## USED LUBRICATING OIL CONDEMNING LIMITS FOR WÄRTSILÄ DIESEL AB ENGINES TYPE W25SG AND W28SG, AT NATURAL GAS APPLICATION

**Table 1**
**Used lubricating oil condemning limits for W25SG and W28SG running on natural gas**
**General information:**

Oil supplier (brand)

Lubrication oil type name

**Analytical data:**

Test and analysis methods used are to be stated	Unit	Preferred test method	Condemning Limits
Viscosity at 40C	cSt	D445	50 % increase
Viscosity at 100C	cSt	D445	25 % increase
Water content	%	D95/D1744	0.2 %
TBN	mg KOH/g	D2896	50 % decrease
TAN	mg KOH/g	D664	2.5 increase
Initial PH	mg KOH/g	D664	4.0 minimum
Nitration	Abs/cm	IR	20
Oxidation	Abs/cm	IR	20
Insolubles, coagulated pentane	w %	D893	1.0 %
- Wear metals			tendency
Fe			
Cu			
Pb			
Al			
Cr			
Sn			
and Si			
- Glycol		D2982	0 %