

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:
Réception des soumissions - TPSGC / Bid
Receiving - PWGSC
1550, Avenue d'Estimauville
1550, D'Estimauville Avenue
Québec
Québec
G1J 0C7

REQUEST FOR PROPOSAL
DEMANDE DE PROPOSITION

**Proposal To: Public Works and Government
Services Canada**

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

**Proposition aux: Travaux Publics et Services
Gouvernementaux Canada**

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici sur toute feuille ci-annexée, au(x) prix indiqué(s).

Comments - Commentaires

Title - Sujet Engine Oil	
Solicitation No. - N° de l'invitation F3065-13N058/A	Date 2013-06-10
Client Reference No. - N° de référence du client F3065-13-N058	
GETS Reference No. - N° de référence de SEAG PW-\$QCN-015-15447	
File No. - N° de dossier QCN-3-36063 (015)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2013-06-20	Time Zone Fuseau horaire Heure Avancée de l'Est HAE
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Legendre, Sylvie	Buyer Id - Id de l'acheteur qcn015
Telephone No. - N° de téléphone (418) 649-2860 ()	FAX No. - N° de FAX (418) 648-2209
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: PÊCHES ET OCÉANS CANADA NGCC 101 BOUL CHAMPLAIN, rez-de-chaussée QUEBEC Québec G1K7Y7 Canada	

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address

**Raison sociale et adresse du
fournisseur/de l'entrepreneur**

Issuing Office - Bureau de distribution

TPSGC/PWGSC
601-1550, Avenue d'Estimauville
Québec
Québec
G1J 0C7

Delivery Required - Livraison exigée Voir doc.	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

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PART 1 - GENERAL INFORMATION

1. Security Requirement

There is no security requirement associated with this bid solicitation.

2. Requirement

This bid solicitation is being issued to satisfy the requirement of Fisheries and Oceans Canada - Coast Guard for the supply and delivery of engine oil for Alco 251 V-16, as detailed at Annex A. This oil is intended for the Coast Guard ships that will leave for the Arctic this summer.

3. Debriefings

Bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within 15 working days of receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

PART 2 - BIDDER INSTRUCTIONS

1. Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the *Standard Acquisition Clauses and Conditions Manual*

(<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The 2003 (2013-04-25) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

1.1 Equivalent Products

1. Products that are equivalent in form, fit, function and quality to the item(s) specified in the bid solicitation will be considered where the Bidder:
 - A. designates the brand name, model and/or part number of the substitute product;
 - B. states that the substitute product is fully interchangeable with the item specified;
 - C. provides complete specifications and descriptive literature for each substitute product;
 - D. provides compliance statements that include technical specifics showing the substitute product meets all mandatory performance criteria that are specified in the bid solicitation; and
 - E. clearly identifies those areas in the specifications and descriptive literature that support the substitute product's compliance with any mandatory performance criteria.
2. Products offered as equivalent in form, fit, function and quality will not be considered if:

-
- A. the bid fails to provide all the information requested to allow the Contracting Authority to fully evaluate the equivalency of each substitute product; or
 - B. the substitute product fails to meet or exceed the mandatory performance criteria specified in the bid solicitation for that item.
3. In conducting its evaluation of the bids, Canada may, but will have no obligation to, request bidders offering a substitute product to demonstrate, at the sole cost of bidders, that the substitute product is equivalent to the item specified in the bid solicitation.

2. Submission of Bids

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit by the date, time and place indicated on page 1 of the bid solicitation.

3. Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than two (2) calendar days before the bid closing date. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as "proprietary" will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the questions or may request that the Bidder do so, so that the proprietary nature of the question is eliminated, and the enquiry can be answered with copies to all bidders. Enquiries not submitted in a form that can be distributed to all bidders may not be answered by Canada.

4. Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Québec.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the bidders.

PART 3 - BID PREPARATION INSTRUCTIONS

1. Bid Preparation Instructions

Canada requests that bidders provide their bid in separately bound sections as follows:

Section I: Technical Bid (2 hard copies)

Section II: Financial Bid (1 hard copy)

Section III: Certifications (1 hard copy)

Prices must appear in the financial bid only. No prices must be indicated in any other section of the bid.

Canada requests that bidders follow the format instructions described below in the preparation of their bid:

- (a) use 8.5 x 11 inch (216 mm x 279 mm) paper;
- (b) use a numbering system that corresponds to the bid solicitation.

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process [Policy on Green Procurement](http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html) (<http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html>). To assist Canada in reaching its objectives, bidders should:

- 1) use 8.5 x 11 inch (216 mm x 279 mm) paper containing fibre certified as originating from a sustainably-managed forest and containing minimum 30% recycled content; and
- 2) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

Section I: Technical Bid

In their technical bid, bidders should explain and demonstrate how they propose to meet the requirements and how they will carry out the Work.

If a Bidder proposes equivalent products, the Bidder must provide the documents detailed at section 1.1 of Part 2 - Bidder Instructions.

Section II: Financial Bid

Bidders must submit their financial bid in accordance with the Basis of Payment. The total amount of Applicable Taxes must be shown separately.

1.1 Exchange Rate Fluctuation

C3011T (2010-01-11), Exchange Rate Fluctuation

Section III: Certifications

Bidders must submit the certifications required under Part 5.

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

1. Evaluation Procedures

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.

1.1 Technical Evaluation

1.1.1 Mandatory Technical Criteria

A) If a Bidder proposes equivalent products, the equivalent products must be compliant in accordance to section 1.1 of Part 2 - Bidder Instructions.

B) If a Bidder proposes equivalent products, the equivalent products must be compliant to the manufacturer's requirements (provided at Annex C) AND must be compatible with the existing product Petro Canada Raluble 940 CF (grade 40).

1.2 Financial Evaluation

SACC Manual Clause A0220T (2013-04-25), Evaluation of Price

2. Basis of Selection

- 2.1** *SACC Manual Clause A0069T (2007-05-25), Basis of Selection*

PART 5 - CERTIFICATIONS

Bidders must provide the required certifications and related documentation to be awarded a contract. Canada will declare a bid non-responsive if the required certifications and related documentation are not completed and submitted as requested.

Compliance with the certifications bidders provide to Canada is subject to verification by Canada during the bid evaluation period (before award of a contract) and after award of a contract. The Contracting Authority will have the right to ask for additional information to verify bidders' compliance with the certifications before award of a contract. The bid will be declared non-responsive if any certification made by the Bidder is untrue, whether made knowingly or unknowingly. Failure to comply with the certifications, to provide the related documentation or to comply with the request of the Contracting Authority for additional information will also render the bid non-responsive.

1. Mandatory Certifications Required Precedent to Contract Award

1.1 Code of Conduct and Certifications - Related documentation

By submitting a bid, the Bidder certifies that the Bidder and its affiliates are in compliance with the provisions as stated in Section 01 Code of Conduct and Certifications - Bid of Standard Instructions 2003. The related documentation therein required will assist Canada in confirming that the certifications are true.

2. Additional Certifications Precedent to Contract Award

The certifications listed below should be completed and submitted with the bid, but may be submitted afterwards. If any of these required certifications is not completed and submitted as requested, the Contracting Authority will so inform the Bidder and provide the Bidder with a time frame within which to meet the requirement. Failure to comply with the request of the Contracting Authority and meet the requirement within that time period will render the bid non-responsive.

2.1 Federal Contractors Program - Certification

2.1.1 Federal Contractors Program - over \$25,000 and below \$200,000

Suppliers who are subject to the Federal Contractors Program (FCP) and have been declared ineligible contractors by Human Resources and Skills Development Canada (HRSDC) are no longer eligible to receive federal government contracts over the threshold for solicitation of bids as set out in the Government Contracts Regulations. Suppliers may be declared ineligible contractors either as a result of a finding of non-compliance by HRSDC, or following their voluntary withdrawal from the FCP for a reason other than the reduction of their workforce to less than 100 employees. Any bids from ineligible contractors, including a bid from a joint venture that has a member who is an ineligible contractor, will be declared non-responsive.

The Bidder, or, if the Bidder is a joint venture the member of the joint venture, certifies its status with the FCP, as follows:

The Bidder or the member of the joint venture

- (a) () is not subject to the FCP, having a workforce of less than 100 full-time or part-time permanent employees, and/or temporary employees having worked 12 weeks or more in Canada;

- (b) is not subject to the FCP, being a regulated employer under the Employment Equity Act, S.C. 1995, c. 44;
- (c) is subject to the requirements of the FCP, having a workforce of 100 or more full-time or part-time permanent employees, and/or temporary employees having worked 12 weeks or more in Canada, but has not previously obtained a certificate number from HRSDC, having not bid on requirements of \$200,000 or more;
- (d) has not been declared an ineligible contractor by HRSDC, and has a valid certificate number as follows: _____.

Further information on the FCP is available on the HRSDC Web site.

PART 6 - RESULTING CONTRACT CLAUSES

1. Security Requirement

There is no security requirement applicable to this Contract.

2. Requirement

Fisheries and Oceans Canada - Coast Guard has a requirement for the supply and delivery engine oil for Alco 251 V-16, as detailed at Annex A. This oil is intended for the Coast Guard ships that will leave for the Arctic this summer.

3. Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the *Standard Acquisition Clauses and Conditions Manual*

(<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

3.1 General Conditions

2010A (2013-04-25), General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

4. Delivery

The oil must be delivered at the latest on July 2, 2013.

The Chief engineer will contact the oil supplier directly to specify the location of the ship in the port of Quebec

Delivery must take place between the hours of 07:00 and 19:00.

5. Authorities

5.1 Contracting Authority

The Contracting Authority for the Contract is:

Name: _____

Title: _____

Public Works and Government Services Canada

Acquisitions Branch

Directorate: _____

Address: _____

Telephone: _____

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Buyer ID - Id de l'acheteur

qcn015

Client Ref. No. - N° de réf. du client

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File No. - N° du dossier

QCN-3-36063

CCC No./N° CCC - FMS No/ N° VME

Facsimile: _____

E-mail address: _____

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

5.2 Technical Authority

The Technical Authority for the Contract is:

Name: _____

Title: _____

Organization: _____

Address: _____

Telephone : _____

Facsimile: _____

E-mail address: _____

The Technical Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Technical Authority, however the Technical Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

5.3 Contractor's Representative

Name: _____

Title: _____

Address: _____

Telephone : _____

Facsimile: _____

E-mail address: _____

6. Payment

6.1 Basis of Payment

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid firm prices as specified in Annex B. Customs duties are included and Goods and Services Tax or Harmonized Sales Tax is extra, if applicable.

Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work, unless they have been approved, in writing, by the Contracting Authority before their incorporation into the Work.

6.2 Limitation of Price

SACC *Manual* clause C6000C (2011-05-16) Limitation of Price

6.3 Single payment

SACC Manual Clause H1000C (2008-05-12), Single Payment

6.4 SACC Manual Clauses

C2000C (2007-11-30), Taxes - Foreign-based Contractor

6.5 Shipping Instructions - Delivery at Destination

Goods must be consigned to the destination specified in the Contract and delivered:

- (a) Free on Board (Destination) common carrier (Québec, Québec) for shipments from the United States government; or
- (b) Delivered Duty Paid (DDP) (Québec, Québec) Incoterms 2000 for shipments from a commercial contractor.

7. Invoicing Instructions

1. The Contractor must submit invoices in accordance with the section entitled "Invoice Submission" of the general conditions. Invoices cannot be submitted until all work identified in the invoice is completed.

Invoices must be by ship and must contain:

Price / liter
Quantity
Oil Type
Delivery

8. Certifications

8.1 Compliance

Compliance with the certifications and related documentation provided by the Contractor in its bid is a condition of the Contract and subject to verification by Canada during the term of the Contract. If the Contractor does not comply with any certification, provide the related documentation or if it is determined that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, pursuant to the default provision of the Contract, to terminate the Contract for default.

9. Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in _____. (*will be inserted at Contract award*).

10. Priority of Documents

If there is a discrepancy between the wording of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

- (a) the Articles of Agreement;
- (b) the general conditions 2010A (2013-04-25), General Conditions - Goods (Medium Complexity);
- (d) Annex A, Requirement;
- (e) Annex B, Basis of Payment;
- (f) Manufacturer's Requirements;
- (g) the Contractor's bid dated _____

11. SACC Manual Clauses

D0018C (2007-11-30), Delivery and Unloading
D3015C (2007-11-30), Dangerous Goods/Hazardous Products
G1005C (2008-05-12), Insurance

ANNEX "A" - REQUIREMENT**Engine oil order for Alco 251 V-16 engines****Description:**

Petro Canada Raluble 940 CF (grade 40) or equivalent such as Esso diol 9 RD 20W40. Other products could be considered equivalent as long as they meet the manufacturer's requirements (Annex C) AND that they are compatible with the existing product Petro Canada Raluble 940 CF (grade 40).

Quantity:

Pierre Radisson	8000 litres
Amundsen	12300 litres

The Contractor shall provide a sample of oil to the chief engineer.

The contractor must be able to provide valid test certificates for the hoses used during the transfer.

ANNEX "B" - BASIS OF PAYMENT

Item	Description	Qty	Firm Price per liter	Extended Price
1	<p><u>Pierre Radisson</u> Engine oil for Alco 251 V-16 Proposed Product : _____ The oil must be delivered at the latest on July 2, 2013 Proposed delivery date : _____ Delivery costs and pumping aboard are included in the price per liter.</p>	8000 litres	\$	\$
2	<p><u>Amundsen</u> Engine oil for Alco 251 V-16 Proposed Product : _____ The oil must be delivered at the latest on July 2, 2013. Proposed delivery date : _____ Delivery costs and pumping aboard are included in the price per liter.</p>	12300 litres	\$	\$
	TOTAL (applicable taxes extra)			\$

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qcn015

CCC No./N° CCC - FMS No/ N° VME

Client Ref. No. - N° de réf. du client

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ANNEX "C" - MANUFACTURER'S REQUIREMENTS

ENGINE DESCRIPTION AND DATA



FAIRBANKS MORSE ALCO ENGINES

(New Page)

A1311-1
Aug. 1995

LUBE OIL SPECIFICATIONS FM/ALCO Turbocharged Diesel Engines

SERVICE CLASSIFICATIONS

Lubricating oils meet the **API CD** service classification requirements are required for use in FM/ALCO engines.

Lubricating oils listed as Generation 3 or Generation 4 by the Locomotive Maintenance Officers Association (LMOA) meet these requirements.

Lubricating oils meeting the requirements of **MIL-L-2104C** are acceptable.

The lubricating oil must be in the **SAE 40** viscosity classification.

A lubricating oil should be selected such that its initial Total Base Number (TBN) is within the proper range for the sulfur content of the fuel, as shown below:

Fuel Sulfur, Wt. %	TBN Level (ASTM-D2896) of New Oil
Less than 0.5	7-12
0.5 - 1.0	9-16
1.0 - 1.8	16-22

OIL CONTROL GUIDELINES

The Control of the oil quality by the operator is as important to satisfactory operation as is the quality of the new oil. It is essential that oil samples be obtained and analyzed regularly to determine the condition of the oil.

Lube oil samples should be taken every 300 hours of operation, or at the middle and end of the month, whichever is first.

The oil properties to be determined are the following:

1. Pentane and toluene insolubles
2. Viscosity
3. Water Content
4. Total Base Number (TBN)
5. Particulate matter
6. Wear products analysis

Pentane insolubles designates the total contaminants in the used lube oil sample including soot, wear products, insoluble additives, and oxidized oil. It is recommended the pentane insolubles not exceed 3%. If exceeded, filters and oil should be changed. Pentane insolubles of 5% are acceptable with 4th generation oils.

The amount of oxidized oil (toluene solubles) in the used lube oil sample is obtained by subtracting the toluene insolubles from the pentane insolubles. This resulting value should not exceed 1%. If exceeded, filters and oil should be changed.

The insolubles content should be determined in accordance the **ASTM-D893, Procedure B**. If other test methods are used, correlation of the results with reference to **ASTM-D893** should be obtained.

Lubricating oil viscosity should be maintained between 70 and 100 SSU (13.0 and 20.4 CS) at 210° F.

Water content should be no more than 0.2%

The total base number of the lubricating oil in the crankcase must be maintained above the minimum value as shown below:

Fuel Sulfur, Wt. %	Minimum TBN Level (ASTM-D2896) of Used Oil
Less than 0.5	1.0
0.5 - 1.0	3.0
Greater than 1.0	three times the fuel sulfur content

The minimum TBN level must be maintained either through the addition of make-up oil or by draining the oil and adding new oil.

SEE MI-12009 AND 12050 FOR COMPLETE SPECIFICATIONS.

LUBE OIL SPECIFICATIONS – Cont.
FM/ALCO Turbocharged Diesel Engines

ENGINES USING ANTIFREEZE

Lubricating oils and glycol are **NOT** compatible.

The lubricating oil should be checked for glycol content monthly by using a test method recommended by the lubricant supplier whenever water is suspected in the lubricating oil. If any glycol is detected in the oil, the oil must be drained, the source of the glycol found and corrected. Lubricating oil system must be flushed, new oil filters fitted, and a new charge of oil installed.

LUBE OIL CENTRIFUGERS

Fairbanks Morse does **NOT** recommend the use of lube oil centrifugers. Although centrifugers remove carbon, water and heavy insoluble sludge, they do not remove material more harmful to the engine such as oxidation or polymerisation products. A centrifuger used with water washing results in removal of additives and must not be used.

LUBE OIL CONSUMPTION

Generally the lube oil consumption is 0.8% of the full load fuel consumption.



LUBRICATING OIL

INTRODUCTION

Development of high output diesel and the difficulty in obtaining distillate fuels with sulphur levels below 1%, adds increasing importance to the role of lubricating oils for properly protecting the dynamic components of the engine.

The oil industry, in keeping pace with these developments has developed or can develop lubricants which satisfactorily meet today's requirements.

The recommendations included in this Maintenance Instruction are offered as a guide to our customers, in selection and maintenance of engine lubricating oil.

OIL SPECIFICATION AND EVALUATION PROCEDURE

Unless the lubricant has earlier been successfully used on FM/ALCO manufactured engines, selection and evaluation of a suitable heavy duty lubricant should be carried out as suggested hereunder, before a lubricant is considered suitable.

Oil Supplier

A reliable oil supplier capable of making product recommendations, commensurate with FM/ALCO specifications and specific environmental influences, as well as having ability to furnish lubricants on a consistent quality level, should be consulted.

Oil Specification

Only an SAE 40 additive type lubricant conforming at least to API "CD" with adequate Alkalinity, (properties of a typical oil are listed below) and having been qualified through satisfactory field evaluation tests, as suggested in this M.I., should be used on FM/ALCO engines.

Property	Limits New Oil
Viscosity:	
SUS at 98.9°C (210°F)	72 - 85
CSt at 98.9°C (210°F)	13.5 - 16.8
SUS at 37.8°C (100°F)	700 - 1100
CSt at 37.8°C (100°F)	151 - 237.5
Viscosity Index	60 - 100
Flash Point °C	216

Viscosity:

- Pour Point °C 4.5 max.
- Total Base No. 7 - 10 if sulphur content of fuel is 0.5% to .7%)
10 - 13 (if sulphur content of fuel is 0.7% to 1%)

- NOTE -

FM/ALCO should be consulted for lubricating oil requirements if the sulphur content of fuel oil is above 1%.

Field Evaluation

Oils meeting the above specification are considered suitable for a field test. The field test should be conducted on a minimum of two FM/ALCO engines. The test duration should not be less than one year. The test engines should be subjected to normal service and maintenance schedule.

Data, in respect of physical and dimensional checks of the key components as listed below, should be collected before and on completion of the field test.

1. Cylinder Liner Diameter (Inside) - Fully Cleaned
 - a. Location of top ring travel
 - b. 6" from location (1)
 - c. At bottom liner seat location

Diameters to be measured at two right angle axes along longitudinal and transverse directions.

2. Piston Dimensions
 - a. Diameter (location crown top) - 2 axes - along axis of piston pin and at right angle
 - b. Diameter (location crown bottom) 2 axes along axes of piston pin and at right angle
 - c. Diameter (location below pin) - 2 axes - along axis of piston pin and at right angle
 - d. Diameter piston pin hole - 2 locations
 - e. Ring groove depth - all five grooves
 - f. Piston pin diameter - 3 locations



The FM/ALCO 251 Engine

3. Piston Rings
 - a. Ring gaps - Use a new liner for measuring gap all five rings
 - b. Ring depth - all five rings
4. Sizes for:
 - a. Valve guides - Use standard mandrills
 - b. Valve lever shaft diameters
 - c. Fuel pump lever bushing
 - d. Fuel pump roller pin
5. Crankpin Diameters (All pins)
6. Visually observe and record conditions of:
 - a. Small end bushings)
 - b. Big end bearings) Take
 - c. Main bearings) Photographs
 - d. Camshaft lobes and rollers)
 - e. Valves and seats)
 - f. Turbocharger bearings)
7. Engine performance data for:
 - a. Engine load
 - b. Exhaust temperatures
 - c. Lubricating oil pressures in the manifold
 - d. Air manifold pressures
 - e. Turbine inlet temperatures

The wear rate and physical condition data supplied by the customer/oil supplier will be evaluated by FM/ALCO.

After successful completion of the field test program, the oil will be considered satisfactory for use.

Oil formulation established and proven by the above program should not be changed. Any change in the additives or revision of the formulation in any way must be evaluated by the above method the oil is considered suitable for use.

- NOTE -

The above evaluation program is a complete responsibility both financially and otherwise, of the oil supplier, and/or the user. FM/ALCO will assist in carrying out analysis of test data and act only in an advisory capacity.

Mixing of Lubricants

FM/ALCO's recommendations against mixing of oil types cannot be over-emphasized. However, if this becomes mandatory, following suggestions are made to assist in reducing the risks associated with this practice.

- The number of lubricating oils to be mixed must be restricted to three for a given area of operation.
- The lubricants considered for mixing should have same additive concentrate.
- After the lubricants have been selected, an equally proportioned mixture must be subjected to field evaluation test listed above, and results analyzed by FM/ALCO before adopting this practice for the fleet operation.

MAINTENANCE/LUBRICANT CONTROL

Key to proper evaluation and control of used lubricants, for satisfactory engine performance lies in:

- Knowing the oil type, the engine and the service severity
- Developing histories to a series of tests
- Correlating analytical results with engine condition
- Watching for abrupt changes for normal use oil condition

See Table for recommended test, frequency, ASTM test method, limits and action for lubricating oil used on FM/ALCO engines.



The FM/ALCO 251 Engine

RECOMMENDED TESTING AND LIMITS FOR USED OIL			
TEST	RECOMMENDED FREQUENCY	ASTM TEST DESIGNATION	USED OIL LIMITS
Appearance & odor	Trip	No Numerical Limits - Interpreted by observer	
Crackle	Trip	No Numerical Limits - Interpreted by observer	
Blotter Spot Test	Trip	No Numerical Limits - Interpreted by observer	
Viscosity Increase at 100°C	Monthly	D 88 or D 445	+ 20%
Viscosity Increase at 40°C	Trip	D 88 or D 445	+ 30%
Viscosity Index	Monthly	D 567	
Pentane Insolubles	Monthly	D 893	3% max. (coagulated)
Benzene Insolubles	Monthly	D 893	Report
Fuel Dilution Vol. %	Trip	D 322	5% max
Sulphated Ash Content	Monthly	D 874	6% of new value
Total Base No.	Monthly	D 2896	3 - for oils with TBN of 7 to 10 when new
Total Base No.	Monthly	D 2896	6 - for oils with TBN of 10 to 13 when new
PH	Monthly	D 664	5

TRACE ELEMENTS PPM MAXIMUM				
TEST	RECOMMENDED FREQUENCY	ASTM TEST DESIGNATION	USED OIL LIMITS	if results higher than limit inspect
Aluminium	Monthly	Spectrographic	5 PPM	Piston
Chromium	Monthly	Spectrographic	10 PPM	Liner & water leaks
Copper	Monthly	Spectrographic	20 PPM	Bushings
Iron	Monthly	Spectrographic	50 PPM	Rings and other ferrous parts
Lead	Monthly	Spectrographic	10 PPM	Main con. rod & turbo, lead bearing
Silicon	Monthly	Spectrographic	5 PPM	Air filters
Sodium	Monthly	Spectrographic	30 PPM	Water leaks (water treatment contains sodium)

Note: If any trace elements show a sudden or unexplained increase, this is sufficient reason to inspect engine components for unusual wear.



The FM/ALCO 251 Engine

**LIST OF LUBRICATING OILS KNOWN TO HAVE PERFORMED
SATISFACTORILY ON 251 ENGINES**

The inclusion of a product in this list does not imply approval or endorsement by FM/ALCO. It is published for the information of operators of 251 engines to assist them in obtaining satisfactory engine performance.

SUPPLIER	BRAND NAME	TBN
BP Canada Ltd.	BP Energol 1C-RG40	6
BP Oil Company (USA)	BP Dieselube RR240	6
BP Trading Co. Ltd. (International)	BP Energol 1C-R1140	6
	BP Energol 1C-RT40	7
Gulf Oil Canada Ltd.	Ralube 950	
Gulf Oil (USA)	Gulf Oil 493	
Exxon (Imperial Oil Ltd., Canada)	Galena RD 40	6.4
Exxon Corporation	Dion RDX	
*Mobil	MobilGard 412	15
Pemex (Mexico)	Dieselmex	
Shell Canada Ltd.	Tornus Oil 40	
Shell Oil Company and Affiliates	Caprinus T Oil 40	7
	Caprinus R Oil 40	10
	Tornus Oil 40	7
	Caprinus Oil 40	10
	Janus Oil 40	11
	Rotella T Oil 40	9
	Rotella TX Oil 40	9.5
Texaco Canada	DEO 1570	6.5



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Texaco Inc. (USA and overseas)	2208 Taro 4-80	
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* - Added or changed since last issue.