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2/28/10

Government of India
Ministry of Railways
(Railway Board)

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24.10
पहानिदे. । लपर महानिदे.
सा. निदे. । निदेदर MP

No.2001/M(L)/466/1102

New Delhi, dt 22.10.2003

EDS(MP),
RDSO,
Lucknow.

अ०अ०मा०स० लखनऊ
पादती एवं प्रवण अनुभाग
रोगो पत्र डा० सं०.....
दिनांक.....

Sub : Approval of lubricants for use on diesel locomotives.
Ref : RDSO's letter no.SD.Oil.3(Conf) dt. 13.10.2003.

Changes suggested by RDSO vide their letter quoted above in guidelines for approval of lubricants for diesel locomotives are approved.

(Shakeel Ahmed)
Exec. Director Mech.Engg.(Tr.),
Railway Board.

D/Engg
MP.2

10/10/03
20/10
A. 3/28/10

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संयोजन विभाग
पा. सं. ...
दिनांक ... 9/12/2000

S No. 75
पहल दिने । उपर महानिदे ।
कावे दिने । निदेशक (MP)

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

By FAX

No. 99/M(L)/466/1102

New Delhi, dated 6.3.2000.

✓ Director General,
R.D.S.O.,
Lucknow.

Sub : Approval of lubricants for use on diesel locos.
Ref : DG(MP)/RDSO's letters of even number dt. 30.9.99 & 24.12.99-73

71

It has been decided to approve the guidelines for approval of lubricants for use on diesel locos sent vide your letters under reference above.

(Shakeel Ahmed)
Exec. Dir. Mech. Engg. (Tr.)
Railway Board

Copy to:-

EDRS(C) - for information.

SD

~~EDRS~~
Dir. Mech.
MP
2nd 9/3
SD. Conf. 3.
23/3

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भारत सरकार GOVERNMENT OF INDIA
रेल मंत्रालय MINISTRY OF RAILWAYS
(रेलवे बोर्ड RAILWAY BOARD)

Jan. 70

No. 91/M(L)/466/1102 ^{रेल भवन, नई दिल्ली-110001, तिथि} _{Rail Bhavan, New Delhi-110001, dated} 19.12.1995


Director General,
R.D.S.O.,
Lucknow.

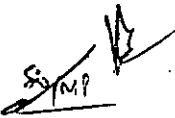
Sub: Approval of lubricants from other than major oil companies for use on diesel and electric locomotives.

68 | Ref: DG(MP)/RDSO's letter No.SD.Engine.Oil dated 8.8.1995.

After considering the various issues involved in procuring lubricants from major oil companies other than IOC, BPC etc., it has been decided that lubricating oil procurement can be made from other vendors also, subject to their having substantial standing in the field and the capability to supply oil of requisite quality and quantity to the Railways. The guidelines to be followed for approval of lubricating oils for the diesel locomotives from the new vendors, are enclosed herewith.

Encl: As above.


(S.Dhasarathy)
Exec.Dir.Mech.Engg.(Tr.),
Railway Board.


A place on file

20/12/95

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17/11

Signature
11/11
पञ्जाब विद्युत् विभाग
एन डी रोड विभाग

भारत सरकार
पञ्जाब एवं प्रथम मन्त्रालय
विद्युत् व प्रथम विभाग
दिल्ली

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

No.2004/M(L)/466/1102

New Delhi, dated 9th/₁₀ November, 2004

Exec. Dir. Stds. (Motive Power),
RDSO,
Lucknow.

Sub: Approval of lubricants for use on diesel locomotives.

- Ref: (i) Board's letter No. 2001/M(L)/466/1102 dt. 23.10.2003.
- (ii) RDSO's letter No. SD.Eng.Oil.IOC dt. 7/8-10-2004.

The guidelines for approval of lubricants for diesel locomotives were approved vide Board's letter at reference (i). These may continue to be applied with the proviso that fresh applicants will be considered after prior approval by this office. Limited approval accorded to M/s Exxon Mobil is endorsed.

Signature
14/11/04
(Sanjiv Handa)
Exec. Dir. Mech. Engg. (Traction)
Railway Board

Signature
17/11
EDSMP
✓ SD.Engg
M.P.2
18/11

SD. Eng oil: 2004
keep a copy in SD. oil conf.

M.P.2
SD. Eng. oil (conf)
19/11/04

Oil. An. Div. 24/12
No. SD.Oil.3 (Confdl.)

SN No. 73
Dated: 24.12.99

The Secretary (Traction),
Railway Board,
Rail Bhavan,
New Delhi-110001

देशी-75

Sub: Approval of lubricants for use on diesel locos.

71 | Ref: This office letter of even number dated 30.9.99.

The minimum requirements for the following six important applications of lubricants on diesel locomotives have been identified and are enclosed herewith:

- i) Engine crankcase oil.
- ii) Compressor oil.
- iii) Suspensio. bearing oil.
- iv) Axle box grease.
- v) Traction motor sealed bearings grease.
- vi) Gear case compound.

These may be incorporated as an annexure to our letter under reference. It is requested that the approval to the proposed guidelines may be issued early.

This issues with the approval of EDS(MP).

A. Kumar
24/12-99

Encl: As above

(Vivek Kumar)
Director General (MP)
for Director General (MP)

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No.SD.Oil.3 (Conf)

Dt:13-10-2003

The Secretary (Tr),
Railway Board,
Rail Bhavan,
New Delhi-110001

Sub: Approval of lubricants for use on diesel locomotives.

Ref: Board's letter No.99/M(L)/466/1102 dt.6.3.2000. |

RDSO had framed guidelines for approval of lubricants for diesel locomotives and sent to Railway Board in Sept.1999. These guidelines were approved by Railway board through the letter under reference.

With the changes that have taken place in the oil sector in our country, and the experience gained during the last three years, some amendments are being proposed to these guidelines.

(i) Extract of Para 3(a)- *'The lubricant shall be formulated from virgin base stock and proven additive system keeping the Indian fuel and operating conditions in mind. Assured supply of base stock from at least one reputed indigenous source should be available to supplier.'*

With the opening up of the economy, base oils are widely available in the international market. There is no possibility of disruption of base oil supply due to the act of war etc. because imported base oil is available from various locations like South East Asia, Europe, America and Middle East. Moreover, some of imported base oils are reputed to display excellent characteristics.

The above extract of Para 3(a) may be amended as follows:

'The lubricant shall be formulated from virgin base stock and proven additive system keeping the Indian fuel and operating conditions in mind. .''

(ii) Para 6(g) *The ownership of blending plant equipped with adequate testing facilities is essential. Mechanized loading facilities at the blending plant are essential.'*

This requirement was incorporated in the policy document to protect against small time oil companies, without adequate infrastructure. However, it is found that even global leaders like M/s Exxon Mobil do not have their own blending plant in India. They are getting their oils blended through "toil blenders", who are doing exclusive blending for them. Quality systems and facilities, however, are state of art and conform to the global high standards.

Para 6(g) may be amended as follows:

"The blending plant shall be equipped with adequate testing facilities. Mechanized loading facilities at the blending plant are essential"

It is felt that the other provisions in the guidelines like requirement of the country-wide distribution and service net work, substantial market presence in the lubricant market etc. are adequate to take care of the small time oil companies, who cannot be relied upon to maintain consistent quality of these crucial lubricants.

It is requested that the above changes may be approved. A copy of the existing guidelines with the proposed changes indicated in red ink is enclosed herewith.

DA:As above

fu
(S.K. Sinha)
Executive Director Stds (MP)
or Director General (MP)

o/c

202 (2) 2021/2

Telex : 0535-2424 RDSO-IN

Fax : 91-0522-259972

तार : 'रेलमानक' लखनऊ

Telegram : 'RAILMANAK', Lucknow

टेलीफोन/Tele : 50567 & 50017



भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक ज्ञाठन
लखनऊ-226011

Government of India-Ministry of Railways
Research Designs & Standards Organisation
LUCKNOW - 226011

Confidential

No.SD.Engine.Oil

Dated: 8.8.95

The Executive Director (Traction),
Railway Board, Railway Bhawan,
Room No.323
NEW DELHI.

Sub: Approval of lubricants from other than
Major oil companies for use on diesel
and electric locomotives.

Ref: 1.Rly.Bd's letter No.76-M(L)/466/108
dated 17.7.77

2.This office letter No.SD.Engine.Oil
dated 12.12.94 & 15.2.95. - 8 205

As a general policy, lubricants for various applications on locomotives have been recommended by RDSO from the products of the four major oil companies, viz. IOC, BPC, HPC and Balmer Lawrie.

2 Lately, a number of oil companies have been approaching RDSO for approval of their products for use on locomotives. In this context, the following points deserve consideration :

- a) Diesel and electric locomotive components are costly. All possible care is to be exercised to see that they give the best reliability and maximum life.
- b) Production of lubricants of the desired quality requires a certain level of know-how and R&D back up facilities.
- c) Multiplicity of sources for the same end-use may lead to confusion and difficulties in inventory control and wastage apart from the problems of compatibility of lubricants obtained from different sources.
- d) While it may be possible to ensure quality at the time of initial approval/testing, it would be almost impossible to do so if lubricants are obtained from a large number of sources. Continuous monitoring of products from different sources, to ensure quality, would be necessary but impossible. Any let up in quality may lead to component failures or reduced life of costly components, years after such lubricants have been used.
- e) Multiplicity of sources of lubricants would also necessitate the setting up of testing facilities of a much advanced nature than are presently available in the sheds in order to ensure quick testing of the lubricants supplied to the sheds so that use of inferior quality lubricants is checked. This would entail very high expenditure on testing facilities alone.

3 Board's instructions on the subject, conveyed vide letter No.76-M(I)/466/108 dt.17.7.77 (copy enclosed), stipulate that lubricants for diesel locomotives should be restricted to the products of the major oil companies only. RDSO has also been consistently of the view that lubricants should be procured from the four major oil companies only. In this context, DG, RDSO's D.O.letter No.SD.Oil (Confl.) dt. 22.10.80 to the then Director Stores, Railway Board may be referred to (copy enclosed).

4 The conditions of the lubricants market in the country are extremely uncertain at the moment. A large number of private companies, including some well known international names, have suddenly entered the market. Some of these new companies may ultimately stay on and create their production, R&D, marketing and service engineering facilities. However, many others may be just looking for a quick profit. At this stage it would be impossible to segregate the two types.

5 In view of the reasons cited above, it is felt that Indian Railways should continue the policy of procuring lubricants from the four major oil companies only, as hitherto. In case any special requirement necessitates deviation from the above policy, Board's permission would be taken on a case to case basis.

6 However, in case the suggestion outlined in para 5 is not feasible, it is suggested that we follow certain guidelines for approval of lubricants as outlined in the 'Draft' Guidelines enclosed.

7 Board may kindly consider and issue directives on the subject.

Encl: As above.

P. Bhattacharya
(P. BHATTACHARYA)
for Director General/MP

No.SD.Oil.3(Confdl)

Dated:30.9.99

The Secretary (Traction),
Railway Board,
Rail Bhavan,
New Delhi-110001.

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Sub: Approval of lubricants for use on diesel locomotives.

The need for caution in procuring lubricants, particularly the crankcase oil cannot be over emphasised. It is not possible for the railways to comprehensively test the quality of the supplied oil. Any deterioration in quality can lead to a cascading of failures and immobilisation of a large fleet of locomotives. With proliferation of brands, the locomotives may get topped up at different stations with different brands and it may not be possible to pin point responsibility on any supplier in the event of sudden spate of locomotive failures attributable to poor oil.

It is, therefore, necessary that the vendors approved for the supply of lubricants shall have the capability, commitment and integrity to maintain consistent quality on sustained basis.

This was realised by Railway Board and a policy guidelines for approval of lubricating oils for diesel locomotives from new vendors were issued vide letter No.91/M(L)/466/1102 dated 19.12.95.

With the recent liberalisation of economy, RDSO is being approached by a large number of new vendors regarding approvals for lubricants. The existing guidelines need to be therefore modified to effectively screen the companies lacking commitment or capability to supply diesel locomotive lubricants to the railways. Some specific areas identified are:

(1) Cost of conducting field trials:

Field trials of lubricants are a long drawn affair requiring a big investment from the Railways – both in terms of efforts and expenditure. The benefit of approval of new lubricants would be shared between the Railways and the oil companies. It is, therefore, proposed that the oil company should bear 50% of the cost of conducting the trials. In cases, where the lubricant is developed at the request of RDSO or is likely to overwhelmingly benefit the railways, EDS(MP)/RDSO should be empowered to waive the field trial charges on the oil companies.



भारत सरकार - रेल मंत्रालय
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DID (0522) 2465310



Email id: mp.directorengine@gmail.com fax: 0522- 2453916

No. SD. Eng. Oil (Gear case HHP)

Date: 17.02.2020

EDME / Traction
Rail Bhawan, Railway Board
New Delhi- 1110001
email id: edmetr@gmail.com

Fax no. 011- 23386285

Sub: Revision of "minimum requirement for approval of lubricant for use in diesel locomotives" to incorporate minimum requirement for approval of gear case oil of HHP diesel locomotives of Railway Board Guideline.

Ref: (i) Letter no. 2001/M (L)/466/1102 dt. 22.10.2003 of Railway Board.
(ii) Letter no. SD.engine.Oil.GM4000 dt. 08.01.2018.
(iii) Letter no SD.Eng.Oil (Gear case HHP) dt.13.5.2019.
(iv) Letter no SD.Eng.Oil (RB) dt.02.08.2019.

In continuation to letter under reference (ii) above, the draft para named as "para 7" titled as "*HHP gear case oil*" on Minimum Requirement for Approval of HHP gear case oil has been further reviewed to include oxidation test ASTM D-2893 & Copper strip corrosion test.

The revised proposal is enclosed herewith for approval and incorporation in "minimum requirement for approval of lubricant for use in diesel locomotives".

(V.K. Agarwal)
Exe. Director Standards/MP
RDSO /LKO

To be incorporated Para named as “Para 7” titled as “HHP gear case oil” in Minimum Requirement for Approval of Lubricant for use in diesel locomotives.

7. HHP Gear case oil

The following should be submitted:

1. Base oil used in the formulation
2. Viscosity of the base oil at 40°C & 100 °C
3. The base oil should be virgin quality with minimum 155 V.I (without V.I.Improver)
4. Oil should pass ASTM D -665 – B test for rust.
5. Company should also submit Viscosity index, Flash point, COC, Pour point, color, Foaming characteristic.
6. Oxidation test result to be submitted as per test method ASTM D-2893
7. The Gear oil sample shall be tested as per *EMD specification EMS 1044 (except color requirement) at M&C Dte./RDSO & revised specification viz. report no. MP.TP-67 (Rev. 0.00) April -2019* for application in traction motor gear case of HHP diesel locomotives or latest.
8. Miscibility test
 - I. The oil company to submit fresh oil sample and internal test report.
 - II. Fresh oil samples of approved gear case oil brands will be collected from diesel sheds free of cost, jointly by diesel shed representative and RDSO representative. The oil company seeking approval and the approved brand oil company will be given opportunity to witness oil sample collection from diesel shed.
 - III. The oil samples of approved vendors will be tested as per *EMD specification EMS 1044 at M&C Dte./RDSO & revised specification viz. report no. MP.TP- 67 (Rev. 0.00) April -2019, prior to conducting miscibility test (testing charges shall be borne by oil company seeking approval).*
 - IV. Homogeneity and Miscibility test of the offered oil should be carried out in line with *EMD specification EMS 1044 & revised specification viz. report no. MP.TP- 67 (Rev. 0.00) April -2019*, in the following ratio: (testing charges shall be borne by Oil Company seeking approval):
 - a. 75% (of offered oil) + 25% (of existing approved fleet oil on IR)
 - b. 50% (of offered oil) + 50% (of existing approved fleet oil on IR)
 - c. 25% (of offered oil) + 75% (of existing approved fleet oil on IR)
9. The company offering the product should have the following test facilities:
 1. Kinematic Viscosity at 40 deg. C and 100 deg. C - ASTM D- 445
 2. Viscosity index - ASTM D 2700
 3. Pour point – ASTM D -97
 4. Foaming Characteristics – ASTM D – 892

5. Flash point COC – ASTM – 92
6. Color (ASTM D 1500), ASTM number, maximum.
7. Copper strip corrosion test (IS: 1118) test method IS: 1448 (P-15)
8. Oxidation test ASTM D- 2893

Field Trials:

- A. After the scrutiny of lab tests at RDSO, the oil in question will be tested in field for oil performance for a minimum period of 18 months.
- B. The oil required for field trials should be supplied by the company free of cost.
- C. After the completion of trials, the oil would be evaluated on various parameters such as wear of components, lab test results and also for oil consumption.
- D. If the trial results are favorable, the gear case oil would be considered for extended field trials. This gear case oil would be supplied to one shed/ Railways and the performance and any abnormal behavior watched for 18 months, on satisfactory performance the gear case oil would be approved.

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Guidelines for Approval of Lubricating Oils for Diesel Locomotives from New Vendors.

1. SCOPE :

These guidelines cover the selection, type testing, field trials and approval of lubricating oils for diesel locomotives from new vendors for the following applications:

S.N.	Application	Currently Approved Brands
1	Engine Crankcase oil	RR606MG(IOC), HPRR813M(HPC), MAK RR513 M(BPC)
2	Compressor oil	SP150 (IOC), SP150RR(IOC),BHARAT COMPRESSOR OIL 150 (BPC)
3	Suspension Bearing oil	SP 76 (IOC), Turbinol 77 (HPC), Turbol 78 (BPC)
4	Axle Box grease	Sevogem RR3(IOC), LL3(Balmer Lawries)
5	Traction motor sealed Bbearing grease	Cyprina RA (Shell)
6	Gearcase compound	Servocoat 170 T(IOC), Bluecoat 3 (Balmer Lawries)

. Any new supplier (except IOC, HPC and BPC) of lubricant is expected to meet certain minimum requirements which are covered here. In addition, further tests as warranted by special conditions may also be prescribed.

2. CRITERION FOR CONSIDERATION

Since Indian Railways are already having two to three well known and established sources for each application, any new offer will be considered only if it professes to be technically superior. In case oil with similar characteristics only is offered, there should be a perceptible price margin to compensate the risks involved in dealing with a new brand.

3. LUBRICANT FORMULATION

a) For approval of Lubricants equivalent to the ones already in use on I.R.

The lubricant shall be formulated from virgin base stock and proven additive system keeping the Indian fuel and operating conditions in mind.

For engine oils, complete information about the types of base oils with their combination and percentages, their sources of supply, additive package used and its source of supply, shall be made available to R.D.S.O. The formulation should contain the same additive package in the same percentage as in the lubricant already in use. Changes considered necessary by RDSO, to improve performance, shall be incorporated.

Test data from a reputed source shall be arranged to establish unrestricted miscibility and compatibility of the lubricant offered with the one in use on I.R.

b) Proposals for approval of new lubricants with improved characteristics

A lubricant should be formulated from virgin base stock with reputed and proven additive package. The formulation should be already in regular use on a few major railroads in the world for high horse power locomotives.

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Certificate from the Principals about the performance of the product in the field alongwith the laboratory and bench tests should also be furnished. The improvement expected by the use of the product should also be authenticated by the Principals and reputed indigenous source should be available to the supplier.

For engine oils, Complete information about the type of base oils and additive package with their combinations , percentages and source of supply, shall be made available to RDSO.

4. TEST REQUIREMENTS

Oil companies intending to offer their product shall furnish complete information about the lubricant including test data and documents in support of their claims.

4.1 LABORATORY TESTS:

- a) Laboratory evaluation of the physico-chemical properties shall be generated on the formulation and the results advised alongwith the proposal.
- b) Engine tests, wherever applicable, shall be arranged to be carried out at a reputed institution like IIP/Dehradun and results furnished to RDSO.
- c) Charges for such testing in RDSO as required are to be paid by the company seeking approval.

4.2 . BENCH TEST/FIELD TRIALS

- a) Before commencement of field trials, a sample of the lubricant of sufficient quantity shall be made available to RDSO for testing and reference purposes.
- b) Limited field trials as per the trial scheme of RDSO will be conducted for a period of 12 to 18 months on not less than five locomotives.
- c) Lubricant required for such tests will be supplied by the oil company free of cost. In case of engine oils, IR may purchase the required quantity of oil for the field trials.
- d) Field trials involve a considerable expenditure in terms of money for fitment of new components, manpower for extensive monitoring and downtime of locomotives. 50% of the total cost of field trials should be paid by the company seeking approval. In case, the development is considered extremely beneficial for the railways, Executive Director Standards(Motive Power)/RDSO shall be empowered to waive the field trial charges.
- e) The supplier will be required to provide technical support for monitoring the condition of oil in service through periodic oil sampling and analysis.

5. APPROVAL

On successful completion of the above programme, IR would purchase a larger quantity of the lubricant and subject it to field application trials on a larger number of locomotives. The nature of monitoring in these trials would not be as extensive as the field trials, mentioned in para 4.2. On satisfactory performance in the field application trials, the lubricant will be considered for approval. The lubricant so qualified by the above procedure shall be identified not only by the brand name but also by the various physico-chemical properties. In case of any deterioration in the quality of lubricant at any time, the approval will be withdrawn.

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6. GENERAL

- a) Lubricant formulations established and proven by the above procedure shall not be changed. Any changes in the additives or base stock or revision of formulations in any manner even for product improvement must be re-evaluated before the lubricant can be considered suitable for regular use.
- b) The company seeking approval must have a country-wide distribution and service network manned by qualified technical staff to provide technical services to various diesel sheds. Outlets of the dealers would not be considered as company offices for this purpose.
- c) A new vendor must offer alternatives for at least 3 of the 6 applications mentioned in para 1.
- d) The vendor or his collaborator must possess experience in supply of lubricants for railroad applications (in India or abroad).
- e) The oil company should be able to provide bulk storage/dispensing facilities as existing in the diesel sheds as provided by present suppliers of lube oil (only in case of crankcase engine oil).
- f) The supplier should have a substantial market presence in the indigenous automotive/locomotive lubricants market.
- g) A blending plant shall be equipped with adequate testing facilities is essential. Mechanised loading facilities at the blending plant are essential.
- h) ISO-9000 accreditation for the blending plant is essential.
- i) The company must possess adequate R&D and investigative capability.
- j) While submitting their proposals, suppliers may submit information in the proforma as enclosed.

XXXXXXXXXXXX

PROFORMA

SECTION I: GENERAL INFORMATION

- 1. Name of the firm
- 2.1 Postal address
 - i) Head office
 - ii) Works/Factory
- 2.2 Telephone and fax no (with STD Code)
 - i) Head office
 - ii) Works/Factory
- 2.3 E-mail address
 - i) Head office
 - ii) Works/Factory
- 3. Description of Factory/Works
 - i) Total land area (sq.mtrs)
 - ii) Total covered area
 - iii) Different sub-units
- 4. Hours of working
- 5. Any lubricant being supplied for diesel locomotives of IR?
- 6. In the event that you have got more than one units in the same name or any other name, give names with postal address.

SECTION II: PRESENT PROPOSAL

- 1. Products offered:

Application	Brand name	Likely unit cost

- 2. Details of the base stock used (certificate of assured availability from at least one indigenous source must be attached)

SECTION III : TECHNICAL INFORMATION

A. INFRASTRUCTURE FOR PRODUCTION

1. Organisational structure – Chart to be enclosed and functions of various departments to be explained.
2. Personnel
 - i. Total number of employees
 - ii. Management employees
 - iii. Unionised category
3. Full list of Machinery & Plant giving make, model and capacity of each.
4. The following information may be given plantwise/productwise
 - i) Location
 - ii) Capacity
 - iii) Present capacity utilisation
5. The following information may be given overall for all plants.
 - i) Capacity
 - ii) Present capacity utilisation
 - iii) How the incremental supply for the railways would be met ?

B. TECHNICAL CAPABILITIES

1. Give details of R&D and investigative capabilities.
2. Any experience on additive development work for railroad oils.
3. Any base oil characterisation studies done?

C. MARKETING, DISTRIBUTION AND SERVICE NETWORK

1. Marketing and service set up
 - i) Number of offices in India (offices of dealers not to be included . Annex list with addresses and telephone /Fax nos).
 - ii) Number of executives for lubricant sales/technical services should be furnished locationwise.
2. Loading facilities in the plant and up country distribution centres /depots.
 - i) Bulk loading facilities in tank lorries.

- ii) Tank wagon siding at plant for loading of engine oils.

D. COMPANY PROFILE

- 1. Railroad lubricant experience, in India or abroad.
- 2. Market presence:
 - i. Total lubricant sales in the last 3 years.
 - ii. Sales in the last 3 years of the product offered or products of similar grade.
 - iii. Percentage of total Indian lubricant market share held (calculations to be given in the annexure)
 - iv. List of the entire product range
 - v. List of major customers with brands of lube and quantities supplied in the last 3 years.

E. QUALITY ASSURANCE

- 1. Details of quality assurance organisation with names of key personnel (attach organisation chart).
- 2. Is ISO 9000 accerdition is available for the blending plant? If yes ,please attach a copy of the certificate.
- 3. List of testing facilities and laboratory equipment for quality assurance and for complying with the specifications. Also list special purpose guages .
- 4. Give list of external sources for bought out items.
- 5. Give the detailed quality assurance plan for each product offered .
- 6. Confirm if documentation of all process parameters is rigidly maintained.

SECTION-IV:COMMERCIAL DOCUMENTS

Attach copies of following documents:

- i) Factory licence/SSI certificate or NSI certificate or industrial lincence are also by the firm.
- ii) Latest ITCC certificate.
- iii) Latest balance sheet.
- iv) Documents for allotment of power connection and copy of latest electricity bill by the firm.

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- v) Documents for ownership of the factory site and if the factory site is on rental basis, proper documents for the same.

(Signature) :

Name in capital & Designation

Place:

Date:

Stamp of the firm applying for approval

Note:

1. If the space provided against any item is insufficient, the information should be furnished on a separate sheet of paper which should be appended to this proforma.
2. Do not attach copies of any contractual agreements with parties, along with the application.

52.79

Minimum Requirements For Approval Of Lubricants For Use In Diesel Locomotives.

1. Engine Crankcase Oil

The following should be submitted:

1. Base oil used in the formulation along with the details of DI package and VII used (in case of multigrade oil) in the formulation.
2. The base oil used should be virgin quality with minimum 90 VI (without VI improver).
3. Complete physico-chemical properties of the product as per IS 13656 (1993) specification.
4. CRC L-38 and CAT IM PC/MWMB performance engine test data conforming to AM-CD/CF performance level. The data should be generated either at independent laboratory or by using certified test benches.
5. In case multigrade oil is offered, the viscosity of the oil at 100 deg.C should be in stay in grade after 30 cycles BOSCH Injecting testrig.
6. (a) Compatibility with all the engine oils in use on Indian Railways for that type of locomotives should be established by carrying out L38 single cylinder engine tests (for oil oxidation, bearing corrosion, sludge/varnish and viscosity change) in the following proportion:

50% (of offered oil) + 50% (of existing fleet oil of IR).
6. (b) Homogeneity and miscibility tests of the offered oil should also be carried out as per annexure B of IS-13656 in the following ratio:
 1. 75% (of offered oil) + 25% (of existing fleet oil on IR)
 2. 50% (of offered oil) + 50% (of existing fleet oil on IR)
 3. 25% (of offered oil) + 75% (of existing fleet oil on IR)
7. IR Spectrum of the oil offered for approval.
8. Dynamic viscosity (in case of multigrade oil).

II. After the scrutiny of the above test data and details, if the product meets the requirements, the oil will be tested on bench engine test available at ED Directorate of RDSO for measurements SFC and LOC.

1. The test oil will be supplied by the company free of cost to RDSO for tests.
2. In case the oil meets the requirement, RDSO will consider the oil worthy for field trials (WOFT).

III. The oil company offering the product for approval should have the following test facilities:

- (i) Kinematic viscosity at 40 deg.C and 100 deg.C as per ASTM D-445.
- (ii) TBN as per ASTM D-2896.
- (iii) Flash point COC as per ASTM D-92.
- (iv) BOSCH Injector test rig.
- (v) Pour point – ASTM D-97.
- (vi) CCR – ASTM D-189.
- (vii) CCS – ASTM D-2602.
- (viii) MRV – ASTM D-3829
- (ix) ICP/Direct reader spectrograph
- (x) Foaming characteristics – ASTM D-892.
- (xi) Insolubles – ASTM D-893.

IV. Field tests:

1. Eighteen months extensive field tests to be carried out in line with LMOA practices.
2. After the trials, the proposed oil will be compared in terms of lube oil consumption, fuel economy, wear, deposits etc. against the existing fleet oil.
3. If the trial results are favourable, the oil would be considered for extended field application trials. The oil would be supplied to some sheds/railways and the performance of SFC, LOC and any abnormal behaviour watched for one year/one and half years. On satisfactory performance the oil would be approved.

2. Expressor/compressor oil

1. The oil companies desirous of obtaining approval should submit the following details:

- (i) Base oil used in the formulation
- (ii) The base oil should be virgin of 90 (min) viscosity index (without VI improver).
- (iii) In case of naphthenic base, the minimum requirement of VI can be adjusted.
- (iv) Physico-chemical data for Kinematic viscosity for 40 & 100 deg.C, flash point COC, pour point, foaming characteristics, CRC value along with infrared spectrum
- (v) Oil should be free from Zinc base additives.
- (vi) Oil should meet the requirements of DIN-51506 VDL specification and the results of the tests should be submitted.
- (vii) Water separation characteristics as per ASTM D-1401 tests with 40 – 37-3 (30) and should also pass ASTM D-665B tests.

2. The oil company must have the following test facilities:

- (i) Kinematic viscosity at 40 deg.C and 100 deg.C as per ASTM D-445.
- (ii) TAN – ASTM D-664.
- (iii) Flash point COC as per ASTM D-92.
- (iv) Pneuop Oxidation tests.
- (v) Pour point – ASTM D-97.
- (vi) CCR – ASTM D-189.
- (vii) Air release value as per ASTM D-943.
- (viii) De-mulsibility as per ASTM D-1401
- (ix) Foaming characteristics – ASTM D-892.
- (x) Test equipment ASTM D-665 A & B..

79/2

3. (a) Homogeneity and miscibility tests of the offered oil should also be carried out as per annexure B of IS-13656 in the following ratio:
 1. 75% (of offered oil) + 25% (of existing fleet oil on IR)
 2. 50% (of offered oil) + 50% (of existing fleet oil on IR)
 3. 25% (of offered oil) + 75% (of existing fleet oil on IR)
- (b) Compatibility of the offered oil should also be carried out with the existing fleet oil on Indian railways for the following properties in the ratio mentioned in the para 3(a) above.
 1. Conradson carbon residue after aging by passing air through lubricating oil in the presence of FeO as Q% by mass.
 2. Distillation residue remaining after distilling 80% (V/V) of lubricating oil as specified in DIN-51356 should be tested for these properties:
 - a) Conradson carbon residue as per IS-13656.
 - b) Viscosity at 40 deg. C. cSt
4. After the scrutiny, and lab tests at RDSO, the oil in question will be tested in field for the oil performance for a minimum period of 1 year/ one and half year.
5. The oil required for field trials should be supplied by the company free of cost.
6. After the completion of trials, the oil would be evaluated on various parameters such as wear of the components, deposits on the valves and also for oil consumption.
7. If the trial results are favourable, the oil would be considered for field application trials. The oil would be supplied to some sheds/railways and the performance and any abnormal behaviour watched for one/one and half years. On satisfactory performance in these trials, the oil would be approved.

3. Suspension Bearing oil

The oil companies offering the oil for the approval should submit the following details:

1. Base oil used in the formulation.
2. The base oil should be virgin quality with 100 minimum V.I. (without V.I. improver).
3. Oil should pass ASTM D-665-B test for rust.
4. Oil should pass 1500 hrs. of oxidation test as per ASTM D-943, value should also be submitted.
5. Company should also submit the physico-chemical data for K. Viscosity at 40 deg. C and 100 deg. C, Flash point, COC, Pour point, Foaming characteristics, CCR value, and also infra red spectrum of the product.
6. The companies should have the following test facilities ;
 - (i) Kinematic Viscosity at 40 deg. C and 100 deg. C as per ASTM D-445.
 - (ii) Pour point-ASTM D-97.
 - (iii) Foaming Characteristics-ASTM D-892.
 - (iv) Flash point COC – ASTM D-92.
 - (v) CCR – ASTM D-189.
 - (vi) De-mulsibility as per ASTM D-1401.

- (vii) Test equipment ASTM D-665 B.
7. Homogeneity and miscibility tests of the offered oil should also be carried out as per annexure B of IS-13656 in the following ratio:
1. 75% (of offered oil) + 25% (of existing fleet oil on IR)
 2. 50% (of offered oil) + 50% (of existing fleet oil on IR)
 3. 25% (of offered oil) + 75% (of existing fleet oil on IR)
8. After the scrutiny of lab tests at RDSO, the oil in question will be tested in field for the oil performance for a minimum period of 1 year/ one and half year.
9. The oil required for field trials should be supplied by the company free of cost.
10. After the completion of trials, the oil would be evaluated on various parameters such as wear of the components and also for oil consumption.
11. If the trial results are favourable, the oil would be considered for field application trials. The oil would be supplied to some sheds/railways and the performance and any abnormal behaviour watched for one/one and half years. On satisfactory performance in these trials, the oil would be approved

4. Roller Bearing Grease

The following should be submitted:-

1. Details of the mineral oil used in the formulation of grease.
 - a) Flash point $^{\circ}\text{C}$ (ASTM D-92)
 - b) Viscosity SUS at 37.8°C (ASTM D-445)
 - c) Viscosity Index (VI) (ASTM D-2270)
2. Complete physico chemical properties of the grease as per specification AAR M-942 should be submitted. (Penetration @ 25°C worked for 60 strokes should be 220-250)
3. The offered grease shall be smooth well manufactured product of uniform quality, composed of high grade soap with suitable oxidation and rust inhibitors and other additives necessary for desired performance.
4. The grease shall be free from corrosive and abrasive matters.
5. The grease shall be homogenous and free from lumps.
6. EP additives are not permitted.
7. Use of VI improver is prohibited.
8. The oxidation inhibitors shall be such that the grease should satisfactorily lubricate roller bearing under operating conditions without any evidence of deterioration.
9. The grease shall be of Lithium base only.
10. Compatibility with all the greases approved for use on Indian Railways should be established by carrying out the test on the test rig specified in AAR M-942 with the grease composed of 50% of the offered grease and 50% of the existing approved greases. (Separate test for each approved grease)
11. The company offering the product should have the following test facilities.
 - a) Penetration test equipment as per (ASTM D-217)
 - b) Drop point (ASTM D-566)
 - c) Moisture % wt. (ASTM D-95)
 - d) Oxidation stability test equipment (ASTM D-942)
 - e) Corrosion rating equipment (ASTM D-1743)
 - f) AAR-Test Rig
 - g) Emcor test rating machine as per IP 220

- h) ICP/direct reader spectrograph
- i) SKF (V2F) test machines
- j) Roll Stability test (ASTM D- 1831)
- k) Wheel bearing test (ASTM D- 1263)
- 12. After the scrutiny of above test data and details, if the product meets the requirements, the grease will be tested by RDSO. The required grease should be supplied by the company free of cost.
- 13. In case the grease meets the requirements, RDSO will consider the grease worthy for field trials (WOFT).
- 14. FIELD TRIALS
 - 12 months extensive field trials would be carried out and the performance of grease would be compared against the existing approved grease in use. The grease required for field trials should be supplied by the company free of cost.
 - If the trial results are favorable the grease would be considered for extended field application trial. The grease should be applied to some sheds/Pailways and the performance and any abnormal behavior should be reported to the laboratory for further study.

5. Traction Motor Bearing Grease (Sealed Bearings)

The following should be submitted:-

- 1. Details of the mineral oil used in the formulation of grease.
 - a) Flash point °C (ASTM D-92)
 - b) Viscosity SUS at 37.8 °C (ASTM D-445)
 - c) Viscosity Index (VI) (ASTM D-2270)
- 2. Complete physico chemical properties of the grease should be submitted. (Penetration @ 25 °C worked for 60 strokes should be 220-250) and worked for 1,00,000 strokes should not differ from worked for 60 strokes by more than 25 units.
- 3. The grease shall be smooth well manufactured product of uniform quality, composed of high grade Lithium soap only with suitable oxidation and rust inhibitors and other additives necessary for the desired performance.
- 4. The grease shall be free of corrosive and abrasive matter.
- 5. The offered grease shall be homogenous and free from lumps.
- 6. Compatibility with all the greases approved for use on Indian Railways should be established by carrying out the test on the test equipment as per ASTM D-942 and ASTM D-1263 with the grease composed of 50% of the offered grease and 50% of the existing approved grease.
- 7. The Company offering the product should have the following test facilities.
 - a) Penetration test equipment as per (ASTM D-217)
 - b) Drop point (ASTM D-566)
 - c) Corrosion Copper strip @100 Deg. C (ASTM D-4048)
 - d) Freedom from deleterious particles (ASTM D-1404)
 - e) Heat stability (ASTM D-1448)
 - f) Wheel bearing test (ASTM D- 1263)
 - g) Rust pretentive test (ASTM D-1743)
 - h) Oxidation stability (ASTM D-942)
 - i) Water % by weight (ASTM D-95)
 - j) Roll Stability test (ASTM D- 1831)
- 8. After the scrutiny of above test data and details, if the product meets the requirements, the grease will be tested by RDSO. The required grease should be supplied by the company free of cost.

9. In case the grease meets the requirements, RDSO will consider the grease worthy for field trials (WOFT).

10. FIELD TRIALS

Three years extensive field trials would be carried out and the performance of grease would be compared against the existing approved grease in use. The grease required for field trials should be supplied by the company free of cost.

If the trial results are favorable the grease would be considered for extended field application trials. The grease would be supplied to some sheds/Railways and the performance and any abnormal behavior watched for three years. On satisfactory performance the grease would be approved.

6. Gear Case Compound

The following should be submitted:-

1. a) Percentage of the base oil, bitumen and additive.
b) Viscosity of the base oil at 100 °C in Cst.
2. Complete physico chemical properties of the gear case compound should be submitted including Timken O.K. load.
3. Company offering the product should have the following test facilities:
 - a) Kinematic Viscosity test equipment (ASTM D-445)
 - b) Flash point test equipment COC (ASTM D- 92)
 - c) Copper Strip Corrosion test equipment (ASTM D-130)
 - d) Timken O.K. load machine (ASTM D-2782)
 - e) Four Ball Weld load test machine (ASTM D-2266)
4. Compatibility with all the gear case compound approved for use on Indian Railways should be established by carrying out the test on the Timken O.K. load machine with 50% of the offered and 50% of the existing approved gear case compound.
5. After the scrutiny of above test data and details, if the product meets the requirements the offered gear case compound will be tested by RDSO. The required product will be supplied by the company free of cost.
6. In case the product meets the requirements. RDSO will consider the gear case compound worthy for field trials (WOFT).
7. FIELD TRIALS

18 months extensive field trials would be carried out on DSL/Elect. Locomotives and the performance of compound would be compared against the existing approved gear case compound in use. The gear case compound required for field trials should be supplied by the company free of cost.
8. If the trial results are favorable the gear case compound would be considered for extended field application trials. The gear case compound would be supplied to some sheds/Railways and the performance and any abnormal behavior watched for one and half years. On satisfactory performance the gear case compound would be approved.

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