



## Committee D-2 ON PETROLEUM PRODUCTS AND LUBRICANTS

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October 26, 1999

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### **Unconfirmed Minutes of the ASTM Mack T10 Task Force**

**Held in Richmond, Virginia  
on September 9, 1999**

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#### **1. Call to Order**

1.1 An agenda is shown as Attachment 1.

1.2 The attendance list is shown as Attachment 2.

1.3 The task force would like to thank Charlie Passut and the Ethyl Corporation for the meeting arrangements, hospitality and for the invitation to the NASCAR Truck Race on September 9th.

#### **2. Minutes from the June 21, 1999 Meeting**

2.1 The minutes from the June 21, 1999 meeting were approved with no corrections.

### 3. Scope and Objectives

3.1 Brian Lawrence presented an initial draft of the Scope and Objectives as shown as Attachment 3 and asked for comments.

3.2 For Objective 6 Don Marn and Greg Shank suggested the word "oversee" be changed to "monitor".

3.3 For Objective 7 Don Marn suggested adding the word "monitor" to the beginning of the objective.

3.4 Rod bearing weight loss will be added to the secondary test parameters (shown under Specific Activities).

3.5 Greg Shank noted that during the test development phase Mack wants to evaluate top and second ring weight loss. Don Marn suggested dropping the word "top" from primary test parameter 1.

3.6 Gary Tietze made the following motion (2nd by Mark Cooper):

**Motion:** Update the T10 Task Force Scope and Objectives with the changes noted above and accept the Scope and Objectives as a "living" document.

**Motion Passed:** *Unanimously*

### 4. Timeline Update

4.1 Jim Collum presented a revised PC-9 licensing timeline with hand written updates made at the September 8th NCDT meeting in Baltimore. The current timeline would allow oils to be available in the market by May 2002. Jim also showed an updated timeline for the T10 test. The T10 timeline is shown as Attachment 4.

### 5. Test Sponsor Update

5.1 Greg Shank presented data from a steady state EGR durability test run at Mack. This test was run at 1800 rpm, 400 bhp and approximately 15% EGR. Used oil analysis of soot, TBN, TAN and Fe are shown as Attachment 5. Liner wear data was not available at the time of the meeting. Greg also noted that used oil Cu levels were elevated. However used oil Pb was not elevated.

5.2 Greg Shank noted that Mack was still shooting for a 300 hour maximum test length for the T10 test. Mack is working with operating parameters to achieve this target. Mack is also trying to avoid using a specified shutdown (soak stage).

5.3 Three T10 engines have been delivered and the fourth engine was in transient at the time of the meeting. The final two engines of the six that have been ordered have

been delayed because of a shortage of EGR solenoid valves. Mack expects these two engines to be delivered to the labs by the end of September.

5.4 Some discussion about oil temperature and oxidation ensued. Greg Shank asked if oxidation assessment noted in the Scope and Objectives means IR numbers. Brian Lawrence indicated he wants to provide some guidance/direction to Joe Franklin and the T10 Chemical Analysis Sub Panel. Steve Kennedy noted that at this point the industry wants oxidation numbers to see if the T10 test could provide PC 9 category oxidation assessment.

## **6. Operations and Hardware Sub Panel Report**

6.1 Since virtually everyone at the T10 Task Force meeting had attended the Operations and Hardware Sub Panel meeting earlier in the day, Jim Collum did not give a report. The minutes from the Operations and Hardware Sub Panel meeting are shown on the TMC's web site.

6.2 During the Operations and Hardware Sub Panel meeting, the Lab Visitation Group looked at Ethyl's T10 installation. Two items of clarification were made:

1) The coolant return from the EGR coolers will be plumbed into the elbow going into the water pump inlet.

2) The taps immediately upstream were specified. Temperature measurement will be made using the tap closest to the venturi. Pressure measurement will be made using the tap closest to the EGR coolers.

## **7. T10 Chemical Analysis Sub Panel Report**

7.1 Joe Franklin presented the Scope and Objectives of the T10 Chemical Analysis Sub Panel as shown as Attachment 6.

7.2 Greg Shank asked 1) should we be measuring TAN using D 664 and the modified TAN method? 2) would the labs know the correct procedure for the modified TAN method?

7.3 Joe Franklin indicated that approximately 16 labs are involved in the development of the modified TAN test method. Joe indicated that he would provide the test procedure if necessary.

7.4 Don Marn commented that all test labs involved in the matrix should be involved in the chem lab round robin.

**Action Item** -All labs in the matrix need to verify that they are participating in the round robin.

7.6 Joe Franklin showed a list of potential used oil analysis methods for brainstorming within the T10 Chemical Analysis Sub Panel. Joe indicated the goal is to reduce the

number of tests and to move forward with chem lab tests that are applicable to the T10 test.

7.7 Greg Shank noted issues exist with correct measurement of oxidation and nitration by FTIR at high soot levels.

**Action Item** - The T10 Chemical Analysis Task Force will develop sample dilution and other modifications required to deal with high soot levels.

7.9 Brian Lawrence asked if anyone else had any other issues with the potential methods on the list.

7.10 Jim Collum suggested a starting point for T10 used oil analysis should include the T9 requirements plus FTIR plus the modified TAN method.

7.11 Joe Franklin noted that if T10 samples are provided (in sufficient quantity) they will be distributed for evaluation.

7.12 Charlie Passut suggested adding the Cat micro-oxidation and phosphorus NMR. Charlie also noted that ZDP depletion can be measured using IR.

## **8. CPD Report**

8.1 Gary Tietze indicated the numbering system for serializing the rod and main bearings may change. Other T10 parts which are common with the T9 test are in sufficient supply at TEI.

## **9. Discrimination Matrix Planning**

9.1 Various issues concerning discrimination matrix planning were discussed including 1) the number of reference oils to be used, 2) the number of tests per oil, etc. However no additional decisions were made concerning how discrimination would be assessed.

## **10. Next Meeting**

10.1 Greg Shank indicated he would like to have another meeting before the December 1999 meeting. The next meeting will probably be held between late October and early November.

## **11. Adjournment**

Attachment 1

# Mack T-10 Task Force Meeting

Date: Thursday, September 9, 1999  
Time: Following Mack Test Surveillance Panel  
(approx. 3:00-5:00pm)  
Location: Ethyl Corp. Research Center, Richmond, Va

## Agenda

- |                                   |                        |
|-----------------------------------|------------------------|
| 1. Membership                     | Mark Cooper            |
| 2. Minutes - June 21 meeting      | Mark Cooper            |
| 3. TF Scope & Objectives          | Brian Lawrence         |
| 4. Timeline Update                | Brent Shoffner         |
| 5. Test Sponsor Update            | Greg Shank/Ken Goshorn |
| 6. O&H Sub-Group Report           | Jim Collum             |
| 7. Analytical Sub-Group Report    | Joe Franklin           |
| 8. CPD issues                     | Gary Tietze            |
| 9. Discrimination Matrix Planning | Jeff Clark/Greg Shank  |
| 10. Any Other Business            |                        |
| 11. Next Meeting                  |                        |
| 12. Adjournment                   |                        |







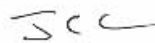



**NB:** Will presenters kindly remember to bring a copy of their material on a 3.5" floppy disk, for inclusion in the minutes (MS Word preferred, Powerpoint or Excel and acceptable). Thank you.

Secretary: Mark Cooper/Oronite 210-731-5606	Chairman: Brian Lawrence/Infineum 210-732-8123
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Attachment 2

ASTM Mack T-10 Task Force

Printed: 07-Sep-99

Name	Address	Phone/Fax/Email	Attendance
Augie Birke Mailing List	Equilon 3333 Hwy 6 South Houston TX 77082-3101	281-544-7638 281-544-6196 ahbirke@equilon.com	
Tom Boschert Mailing List	Ethyl Corporation 200 Town Center Suite 1750 Southfield MI 48075-1150	248-350-0640 248-350-0025 tom_boschert@ethyl.com	
Ron Buck Mailing List	Test Engineering, Inc. 12718 Cimarron Path San Antonio TX 78249	210-877-0221 210-690-1959 rbuck@testeng.com	
William Buscher Jr. Mailing List	Texaco Global Products P.O. Box 112 Hopewell Jet NY 12533	914-897-8069 914-897-8069 buschwa@aol.com	
Bob Campbell Mailing List	Ethyl Corporation 500 Spring Street P.O. Box 2158 Richmond VA 23218	804-788-5340 804-788-6358 bob_campbell@ethyl.com	
Gil Clark Member: 1 Vote	Specified Fuels & Chemicals 7 West Square Lade Rd., #106 Bloomfield Hill MI 48302	248-452-5659 248-333-7999	
Jeff Clark Member: 1 Vote	ASTM Test Monitoring Center 6555 Penn Ave. Pittsburgh PA 15206	412-365-1032 412-365-1047 jac@tmc.astm.cmri.cmu.edu	
Jim Collum Member: 1 Vote	EG&G Automotive Research 5404 Bandera Rd. San Antonio TX 78238	210-523-4681 210-523-4607 jim_collum@egginc.com	
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Attachment 2

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Robert Mainwaring Mailing List	Shell Global Solutions P.O. Box 1 Chester ENGLAND CH13SH	44-151-373-5235 44-131-373-5199 robert.r.mainwaring@opc.shell.com	
Glenn Mazzamaro Member: 1 Vote	Ciba Speicalty Chem. 540 White Plains Rd. Tarrytown NY 10591	914-785-4221 914-785-4249 glenn.mazzamaro@cibasc.com	
Norbert Nann Mailing List	Nann Consultants, Inc. 59 Edgehill Drive Wappingers Falls NY 12590	914-297-4333 914-297-4334	
Charlie Passut Mailing List	Ethyl Corporation 500 Spring Street Richmond VA 23218	804-788-6372 804-788-6388 charlie_passut@ethyl.com	C.P.
Dick Patrick Member: 1 Vote	CITGO P.O. Box 3758 Tulsa OK 74102	918-495-5912 918-495-5912 rpatri1@citgo.com	
Scott Richards Member: 1 Vote	Southwest Research Institute 6220 Culebra Road San Antonio TX 78238	210-522-3567 210-523-6919 srichards@swri.edu	
Dino Righi Member: 1 Vote	The Lubrizol Corporation 29400 Lakeland Blvd. Wickliffe OH 44072	440-943-1200 x 4436 dwri@lubrizol.com	D.R.

Attachment 2

Name	Address	Phone/Fax/Email	Attendance
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Mark Sutherland Mailing List	Ethyl Corporation 9910 IH 10 West Suite 800 San Antonio TX 78230	210-558-2818 210-696-4029  mark_sutherland@ethyl.com	
Gary Tietze Member: 1 Vote	Test Engineering, Inc. 12718 Cimarron Path San Antonio TX 78249	210-877-0223 210-690-3621 gtietze@testeng.com	
Richard Tucker Member: 1 Vote	Shell International P.O. Box 1380 Houston TX 77251	281-544-8354 281-544-6196 rftucker@shellus.com	
Wim Van Dam Mailing List	Oronite Additives Division Chevron Chemical Company 100 Chevron Way, 60-1214 Richmond CA 94802	510-242-1404 510-242-3172  wvda@chevron.com	
Jim Wells Mailing List	Southwest Research Institute 6220 Culebra Rd. San Antonio TX 78238	210-522-5918 210-522-6919 jwells@swri.edu	
Kenji Yatsunami Mailing List	Ethyl Japan Corporation 19F Shiroyama Hills 4-3-1 Toranomom, Minato-Ku Tokyo JAPAN 105-6019 ASIA	81-3-5401-3234 81-3-5401-3368  kenji_yatsunami@ethyl.com	



Attachment 2

ASTM Mack T-10 Task Force  
Meeting Date: Sept 9, 1999

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PHONE: <u>440-943-1200 ext 1481</u>	PHONE: _____
FAX: <u>440-943-2360</u>	FAX: _____
E-MAIL: <u>DJM@LUBRIZOL.COM</u>	E-MAIL: _____

NAME: <u>Bill Larch</u>	NAME: _____
COMPANY: <u>Lubrizol</u>	COMPANY: _____
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PHONE: <u>440-943-1200 ext 2086</u>	PHONE: _____
FAX: <u>440-943-9013</u>	FAX: _____
E-MAIL: <u>wll@lubrizol.com</u>	E-MAIL: _____

NAME: <u>MANUEL GUZMAN</u>	NAME: _____
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PHONE: <u>812-377-7761</u>	PHONE: _____
FAX: <u>812-377-7809</u>	FAX: _____
E-MAIL: <u>M.Guzman@CTC.Cummins.COM</u>	E-MAIL: _____

NAME: _____	NAME: _____
COMPANY: _____	COMPANY: _____
ADDRESS: _____	ADDRESS: _____
PHONE: _____	PHONE: _____
FAX: _____	FAX: _____
E-MAIL: _____	E-MAIL: _____

NAME: _____	NAME: _____
COMPANY: _____	COMPANY: _____
ADDRESS: _____	ADDRESS: _____
PHONE: _____	PHONE: _____
FAX: _____	FAX: _____
E-MAIL: _____	E-MAIL: _____

Attachment 3

**Mack T-10 Task Force**

**Scope & Objectives**

September 9, 1999

**Scope:**

This Task Force is responsible for development of the Mack T-10 engine test. It is accountable to the ASTM Heavy Duty Engine Oil Classification Panel and subsequently to ASTM Sub-Committee B0.02.

The Task Force will strive to achieve its objectives via close co-operation and interaction with the test sponsor, participating test laboratories and other ASTM functions (including Task Force Sub-Groups, the Test Monitoring Center and designated Critical Parts Distributor).

<b>Objectives:</b>	<b>Completed</b>
1. Evaluate preliminary test configuration and operational conditions and develop accordingly.	
2. Expedite "fit-for-purpose" test/test procedure consistent with PC-9 timeline.	
3. Identify and evaluate key performance criteria.	
4. Demonstrate discrimination with respect to key performance criteria.	
5. Optimize test procedure for maximum test precision and reliability.	
6. Monitor PC-9 Precision/BOI matrix execution.	
7. Monitor/assist statistical evaluation of matrix data.	
8. Recommend HDEOCP endorsement of T-10 test, key performance criteria and associate limits.	
9. Complete ASTM ballots for test approval/PC-9 inclusion.	
10. Complete ASTM ballots of Mack T-10 Research report.	

**Specific Activities:**

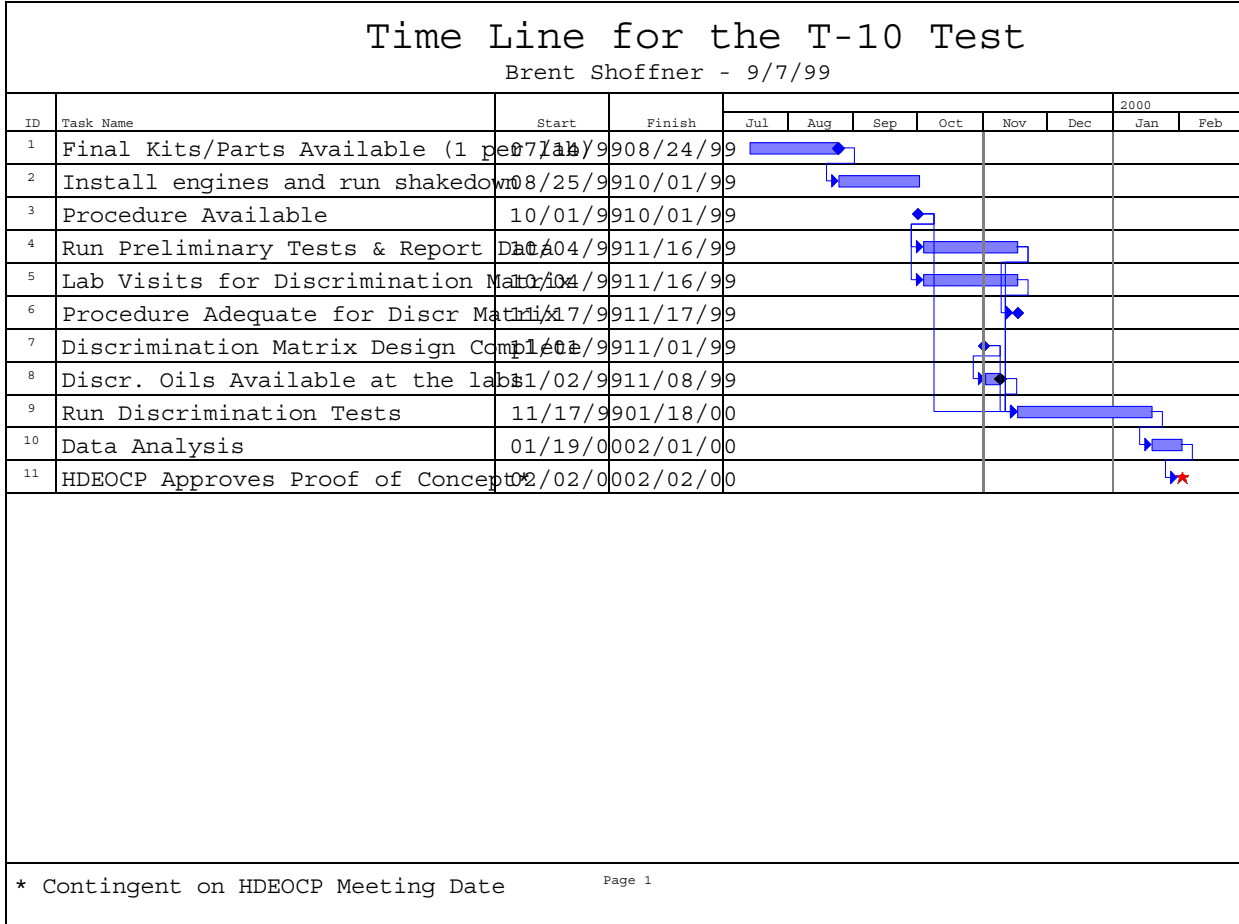
Develop primary test parameters:

1. Average Ring Weight Loss.
2. Average Cylinder Liner Wear.

Evaluate and compare range of secondary test parameters including:

1. Lead content of EOT lubricant.
2. Lubricant TBN depletion.
3. Lubricant TAN accumulation.
4. TBN/TAN interaction.
5. Oxidation/Nitration assessment via IR or alternative analytical method.
6. Bearing weight loss.

Attachment 4



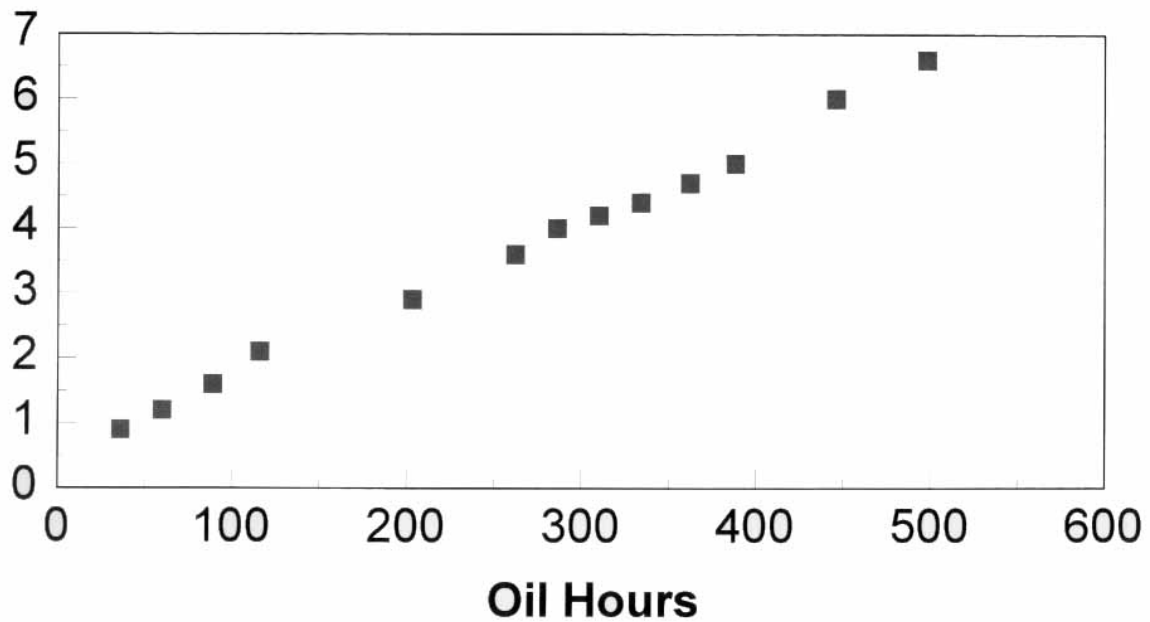
Attachment 5

# EGR TEST

8D 1768

1800 Full Load

**% SOOT TGA**



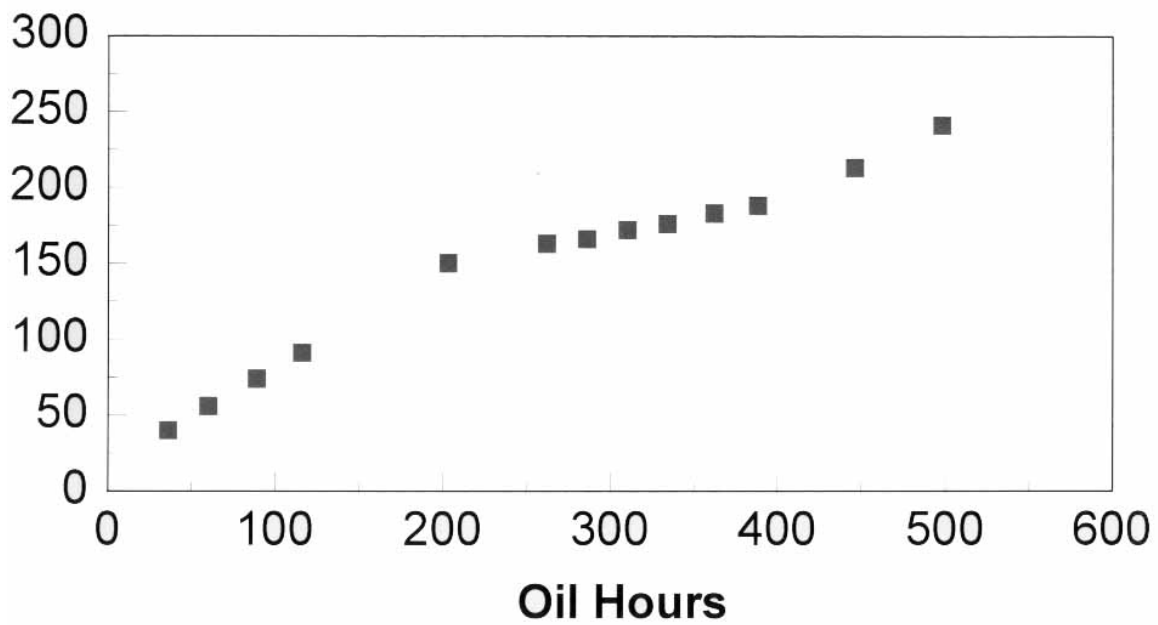
Attachment 5

# EGR TEST

15 % EGR

1800 RPM Full Load

Fe ( PPM )



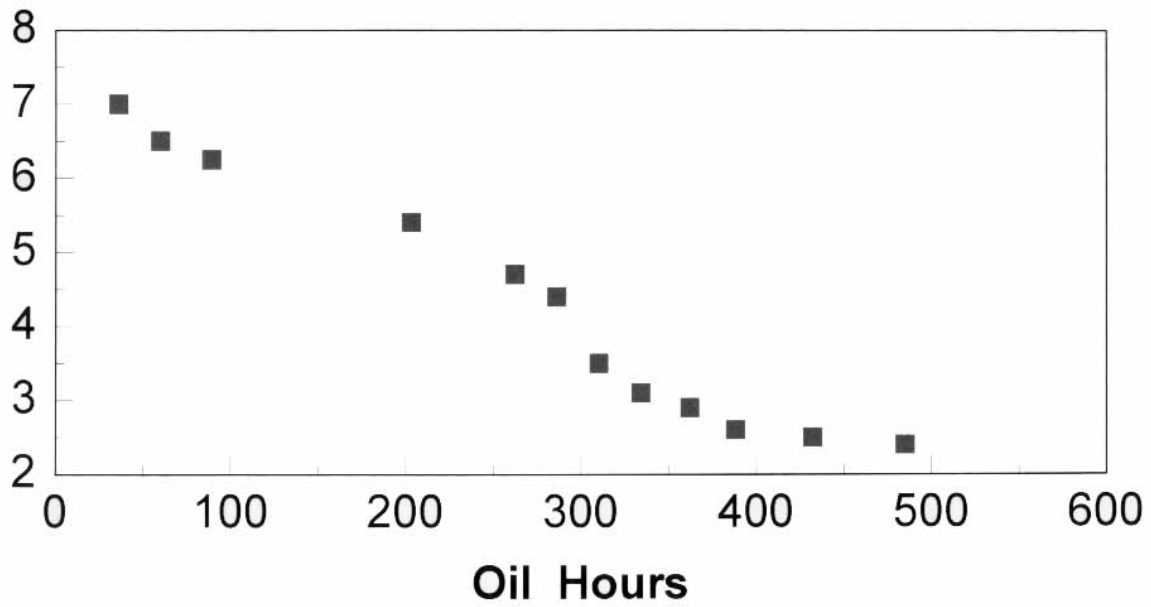
Attachment 5

# EGR TEST

15 % EGR

1800 RPM Full Load

TBN D 4739



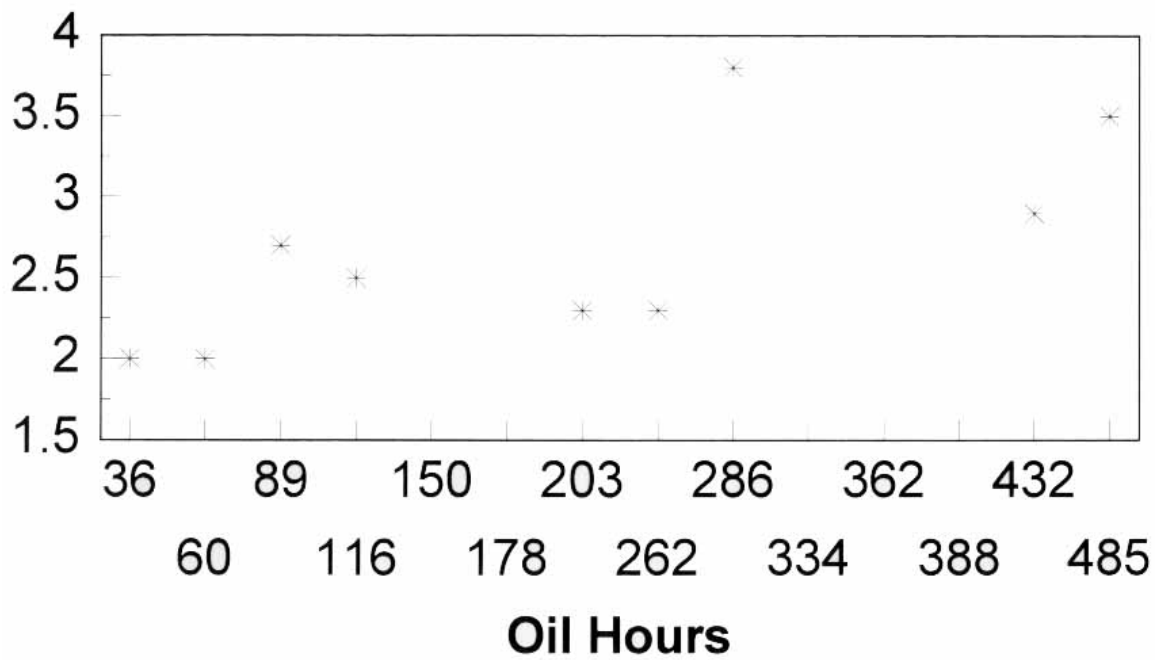
Attachment 5

# EGR Test

15 % EGR

1800 RPM Full Load

## TAN D664



Attachment 6

**T10 CHEMICAL ANALYSIS SUBGROUP  
REPORT  
09/09/1999  
Joe Franklin**

**Scope:**

**Develop and refine a list of analytical and/or bench tests to indicate used oil performance reserve. From the refined list of tests we will establish acceptable precision based on representative HDEO samples.**

**Objectives:**

**Determine the needs of the test sponsor in terms of measurement and definition of performance reserve.**

**Establish clear recommendations to the T10 Task force group before engine test precision matrix begins.**

**Action items:**

**All – Review list for technical feasibility.**

**Chair – Talk to test sponsor to review Needs.**

**Chair – Monitor T10 Development work to obtain representative samples for analysis.**