

**Report of Meeting
ASTM PM-2 Task Force
Automotive Gear Lubricants and Fluids
PRI Headquarters
Warrendale, PA
February 2, 2005**

CALL TO ORDER

Mr. Akucewich, Chairman, called the meeting to order at 9:20 am.

AGENDA

Task force reviewed the agenda. No changes were made. The agenda is shown as Attachment 1. The attendance list is shown as Attachment 2.

MEMBERSHIP

Attachment 3 shows the task force membership.

TASK FORCE SCOPE

The task force scope was reviewed. The scope is shown as Attachment 4.

SAE LETTER

Attachment 5 contains two letters from the SAE. The first is a letter to ASTM requesting the development of a new category for commercial vehicle synchromesh manual transmissions. The second is a letter from SAE outlining the gear performance requirements of the new category.

PROPOSED TESTS

The draft list of proposed tests are outlined in Attachment 6. One problem exists with the list. The task force has yet to identify a test for pitting protection. Although testing for this property is desirable, a developed useable test in the near future is not probable. The CEC has stopped work on a pitting test. Other organizations are developing a pitting test, but the tests are not developed to the point of use by ASTM. The task force will monitor developments in this area. If a viable test becomes available, it will be added to the specification.

However, the SAE has identified pitting resistance as a key gear performance requirement. Proceeding without a pitting test would require agreement from the SAE. The task force agreed to draft a letter to be sent to the SAE requesting clarification on the

proposed gear performance requirements. Specifically, can the pitting requirement be dropped in the new category and still be acceptable. If a pitting test is required, the SAE needs to understand that the specification will be significantly delayed. Section B0.03 would have to develop a pitting test.

OPEN ISSUES

Attachment 7 shows a few additional issues discussed during this meeting.

Timing of Specification

It is up to the task force. The chairman is willing to meet as frequently as necessary. This will depend upon how fast and dedicated the members are to getting the job done.

Wear Test (general)

Development of a test for this requirement will take some effort from the task force to determine a test procedure and limits. This topic was not discussed in much detail due to time constraints.

Pitting Test

The lack of availability of an acceptable pitting test was discussed above.

Reference Oils

The group discussed the need for a category reference oil and not use a bunch of industry oils for each test procedure. The development of this specification will require two category reference oils. Required reference oils include a clear pass oil and one which is a borderline. This issue will be discussed in more detail in the future.

NEXT STEPS

The chairman will draft a letter to the SAE requesting that they revalidate of the need for this new category and see if the task force can have some latitude with the pitting (i.e. drop the requirement).

ADJOURNMENT

The meeting was adjourned about 10:45 am.



Edward S. Akucewich,
PM-2 Task Force Chairman

Agenda

- Call To Order
- Membership
- Task Force Scope
- SAE Letter
- Proposed Tests
- Open Issues
- Next Steps
- Adjourn

PRI Headquarters, Warrendale, PA

February 2, 2005

Attachment	<u>1</u>
Page	<u>1/1</u>
Reference	<u> </u>

**PM-2 Task Force Meeting
2-Feb-05
Attendance Record**

NAME	ADDRESS	TELEPHONE
Chris Schakenberg	Lubrizol	-2927
ION BARTLETT	Lubrizol	-2388
Jenny Gropp	Lubrizol	440-347-1223
FRANK FARBER	TMC	412-365-1030 frank@astmtmc.com.edu
Brian Koehler	SNRI	210-522-3588 Bkoehler@snri.org
THELMA MAROUKY	EATON	248 226-6985 thelmaemarouky@eaton.com
Don Lind	TMC	412-365-1031 dml@astmtmc.com.edu
Dale Smith	PARC	412-826-5051 dsmith@priscac.com
Cory Koglin	Afton Chemical	804-788-5305 Cory.koglin@aftonchemical.com
Don Bell	Afton chemical	8047886332 don.bell@aftonchemical.com
Bill Sullivan	Exxon Mobil Chemical	732-321-8354 William.t.sullivan@exxonmobil.com
Chris Cantuier	Lubrizol	440 347 2973

e-mail
csce@lubrizol.com

email
dbs@lubrizol.com

jhg@
Lubrizol.com

412-365-1030
frank@astmtmc.com.edu

210-522-3588
Bkoehler@snri.org

248 226-6985
thelmaemarouky@eaton.com

412-365-1031
dml@astmtmc.com.edu

412-826-5051
dsmith@priscac.com

804-788-5305
Cory.koglin@aftonchemical.com

8047886332
don.bell@aftonchemical.com

732-321-8354
William.t.sullivan@exxonmobil.com

440 347 2973

Attachment	<u>2</u>
Page	<u>1/1</u>
Reference	_____

PM-2 Task Force Membership

- Committed Members
 - Lubrizol
 - Afton Chemical
 - SwRI
 - TMC?
 - ExxonMobil
 - PARC

PRI Headquarters, Warrendale, PA

February 2, 2005

Attachment	<u>3</u>
Page	<u>1/1</u>
Reference	<u> </u>

Proposed Specification

Synchronized Manual Transmissions for Commercial Vehicles

Scope

To create a specification using standardized tests and methods that will define a minimum acceptable level of performance for lubricants to be used in synchronized commercial vehicle manual transmissions.

PRI Headquarters, Warrendale, PA

February 2, 2005

Attachment	<u>4</u>
Page	<u>1/1</u>
Reference	<u> </u>

Committee Correspondence

Name of Committee: Fuels and Lubricants
Division

Date: 12 June, 1998

Reply to:

J. A. Spearot
Fuels and Lubricants Dept.
GM Research & Development Center
30500 Mound Rd. - Box 9055
Mail Code: 480-106-160
Warren, MI 48090-9055
Phone: 810-986-1880
FAX: 810-986-2094

Mr. John Lauck
Chairman, API Lubricants Committee

Mr. Frank Duffey
Chairman, ASTM Subcommittee B

Gentlemen:

Subject: New Gear Category for Commercial Vehicle Synchronesh Manual Transmissions
and Transaxles

SAE has been evaluating the need to develop a new service category for Commercial Vehicle Synchronesh Manual Transmission and Transaxles. SAE Technical Committee Three and SAE Division have completed their evaluation and have voted affirmative that the need exists. One note on the approach that the Task Force took was to address the needs on a global basis. This is reflected in the input of its members and the proposed tests included in the final recommendation as it contains both ASTM and CEC performance tests.

The performance requirements and proposed tests are as follows:

<u>Requirement</u>	<u>Proposed Test</u>
High Torque Low speed Axle	--
Corrosion Protection (wet/dry)	--
High Speed Shock Load	--
Anti Foaming Performance	ASTM D892
Storage and Compatibility	FTM 3440
Synchronesh Durability	--
Shift Quality	--
Coefficient of Friction	--
Oil Elastomer Compatibility	--

Attachment	5
Page	1 of 4
Reference	

Committee Correspondence

Shear Stability

Tapered Roller Bearing

Thermal/Oxidative Stability

CEC L-4-T-93

CRC L-60 and/or CEC Oxidation Test
(CEC L-48-A-95)

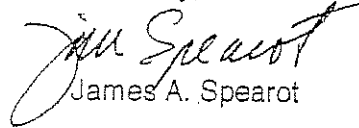
Pitting Resistance

--

Accordingly, the SAE Fuels & Lubricants Division requests that the ASTM D02.B and the API Lubricants Committee take appropriate action to create this new category and to determine that appropriate tests and limits are established.

If there are any questions regarding the specifics of the recommendation, please let me know.

Sincerely,


James A. Spearot

cc:

J. Williams - API
R. Klein - Oronite
R. Cain - Lubrizol

Attachment	<u>85</u>
Page	<u>2 of 4</u>
Reference	<u> </u>

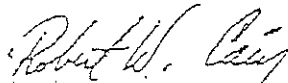
• Performance Requirements and Proposed Tests: (continued)

Gear Performance Requirement	Proposed Test
Synchronesh Durability > Shift Quality > Coefficient of Friction	--
Oil Elastomer Compatibility	--
Shear Stability	Taper Roller Bearing (CEC L-45-T-93)
Thermal / Oxidative Stability	CRC L-60-1 and/or CEC Oxidation Test (CEC L-48-A-95)
Pitting Resistance	--

- ASTM is encouraged to evaluate test methods developed by CEC and other standard groups for their applicability to this category.
- This new category provides performance that is not currently provided by API GL-4, API MT-1 or the proposed specification PM-1.
- This new "worldwide" category has international support from a wide variety of OEMs and is targeted at medium/heavy duty commercial vehicle synchronized manual transmissions and also transaxle applications.
- Axle only performance of API GL-4 could be addressed by API GL-5, or its successor performance categories.
- Upon successful completion of this new category, API GL-4 could be obsolete.

Very truly yours,

THE LUBRIZOL CORPORATION



Robert W. Cain, Chairman
SAE Task Force Commercial Vehicle Synchronesh Manual
Transmissions and Transaxles

RWCA:ernb

cc: Dr. James A. Spearot
Mr. Richard M. Klein
SAE Task Force Members

Attachment	<u>5</u>
Page	<u>4 of 4</u>
Reference	<u> </u>

Proposed Tests

<u>Property</u>	<u>Proposed Method</u>	<u>Description</u>	<u>Proposed Requirement</u>
Viscometrics	ASTM D445	Kinematic viscosity	Per SAE viscosity grade as defined by SAE J306
Viscometrics	ASTM D2983	Apparent (dynamic) viscosity	Per SAE viscosity grade as defined by SAE J306
Shear stability	CEC L-45-A-99	20 h laboratory bearing shear test	Stay in grade as per SAE J306

PRI Headquarters, Warrendale, PA

February 2, 2005

Attachment	<u>6</u>
Page	<u>1/4</u>
Reference	_____

Proposed Tests

<u>Property</u>	<u>Proposed Method</u>	<u>Description</u>	<u>Proposed Requirement</u>
Corrosion (Fe)	ASTM D7038	7-day moisture corrosion test w/axle components	SAE J2360 limits
Corrosion (non-Fe)	ASTM D130	Standard Cu strip test run at 3h/121°C condition	MT-1 limits
Oxidation & Stability	ASTM D5704	L-60-1 bench test using 120 mL oil, Cu cat., and air	MT-1 limits
Oxidation	CEC L-48-A-95	Glassware bench oxidation test	TBD

PRI Headquarters, Warrendale, PA

February 2, 2005

Attachment	<u>6</u>
Page	<u>2/4</u>
Reference	_____

Proposed Tests

<u>Property</u>	<u>Proposed Method</u>	<u>Description</u>	<u>Proposed Requirement</u>
Elastomer compatibility	ASTM D5662	Seal immersion test using FL, PA, NI type elastomers	MT-1 limits, FL and PA Only
Foaming tendency	ASTM D892	Lab glassware test for tendency and stability at RT and 93°C	MT-1 limits
Storage and compatibility	FTM 3440	Compatibility w/other oils meeting same specification	MT-1 limits

PRI Headquarters, Warrendale, PA

February 2, 2005

Attachment	<u>6</u>
Page	<u>3/4</u>
References	_____

Proposed Tests

<u>Property</u>	<u>Proposed Method</u>	<u>Description</u>	<u>Proposed Requirement</u>
Wear (general)	CRC L-20 or ASTM D4998 or Modified L-37	High torque, low speed hypoid axle test – 30 h at 93 – 121°C or FZG Wear Test	No xs wear + no ridging, rippling, scuffing damage
Scuffing	CEC L-084-02	FZG ½ tooth width step load test (A10/16.6R/120)	TBD
Pitting	Work Stopped by CEC	FZG pitting test (C/8.3/90-LS TBD)	TBD
Synchromesh	CEC L-066-01	FZG SSP180 durability test w/friction material TBD	TBD

PRI Headquarters, Warrendale, PA

February 2, 2005

Attachment	<u>6</u>
Page	<u>4/4</u>
Reference	_____

Open Issues

- ❑ Timing of Specification
 - Up to Us
- ❑ Abrasive Wear Test
 - L-20 or ASTM D4998 (FZG based) or Modified L-37
- ❑ What about Pitting?
- ❑ Reference Oils
 - Two category oils needed

PRI Headquarters, Warrendale, PA

February 2, 2005

Attachment	<u>7</u>
Page	<u>1/1</u>
Reference	<u> </u>