



Address 100 Barr Harbor Drive
PO Box C700
W. Conshohocken, PA
19428-2959 | USA

Phone 610.832.9500
Fax 610.832.9666
Web www.astm.org

Committee D02 on PETROLEUM PRODUCTS AND LUBRICANTS

Chairman: KENNETH O. HENDERSON, Cannon Instrument Co., 2139 High Tech Road, State College, PA 16803, (814) 353-8000, Fax: (814) 353-8007, e-mail: kenohenderson@worldnet.att.net
First Vice-Chairman: BEN R. BONAZZA, 3457 WOODVALLEY DRIVE, LAPEER, MI 48446 (810) 664-6769
e-mail: bbonazza@charter.net
Second Vice-Chairman: JANET L. LANE, ExxonMobil Research & Engrg., 600 Billingsport Rd, Paulsboro, NJ 08066-0480
(856) 224-3302, Fax: (856) 224-3616, e-mail: janet.l.lane@exxonmobil.com
First Secretary: RALPH A. CHERRILLO, Shell Global Solutions (US) Inc., Westhollow Tech Ctr., 3333 Highway 6 South, Houston, TX 77082 (281) 544-8789, Fax: (281) 544-8150, e-mail: ralph.cherrillo@shell.com
Second Secretary: MICHAEL A. COLLIER, Petroleum Analyzer Co. LP, PO Box 206, Wilmington, IL 60481, (815) 458-0216, Fax: (815) 458-0217, e-mail: Michael.collier@paclp.com
Staff Manager: DAVID R. BRADLEY, (610) 832-9681, Fax: (610) 832-9668, e-mail: dbradley@astm.org

July 9th, 2014

Reply to:
Chris Prengaman
The Lubrizol Corporation
29400 Lakeland Blvd.
Wickliffe, OH 44092
(440) 347-4225
(440) 347-2377 (FAX)
crpr@lubrizol.com

ASTM D02.B0.03 L-37 Surveillance Panel
Members and Guests:

Attached for your review and comment are the unconfirmed minutes of the:

- **June 25th, 2014 S.P. Meeting, Teleconference**

Please direct any corrections or comments to my attention.

Sincerely,

Chris Prengaman, Chairman
L-37 Surveillance Panel

Report of Meeting
L-37 D6121 Surveillance Panel Meeting
Teleconference
June 25th, 2014 Meeting

Attendees:

Voting Members in **BOLD**

Chalkley, Jay – Afton Chemical

Parke, Scott – ASTM TMC

Marsh, Greg – American Axle Manufacturing

Guzikowski, Joe - Dana

Trader, Angela – Intertek Automotive Research

Smith, Dale – Intertek Automotive Research

Prengaman, Chris – Lubrizol

Gropp, Jerry – Lubrizol

Hamilton, Larry - Lubrizol

Warden, Rebecca – Southwest Research Institute

The meeting was called to order at 1500 EST.

1.0 Agenda Review

The agenda was reviewed

2.0 Meeting Notes

The group continued to discuss lab built axles.

Motion: *Wording Below – Regarding Lab Built Axles*

R. Warden 1st, J Chalkley 2nd

6 For, 0 Against, 1 Abstain

The following wording was proposed to the group as a motion during the meeting.

Text in blue is proposed motions/changes

(The following motion would not be brought into the procedure).

Prior to conducting the testing described in section 8.2, a lab may wish to conduct shakedown testing of lab-built axles in order to adjust the build process. Up to 52 hours of such testing may be conducted without counting toward the 650 hours of non-reference oil testing allowed on a calibrated stand. This provision may be used once per calibration period for no more than three calibration periods. Effective 6/1/14.

(the following motions would be incorporated into the procedure).

8.2 Use of Lab-Built Axles -

8.2.1 To be approved to use lab-built axles, assemble three axles in accordance with section 8.4 using a non-lubrited V1L528/P4T883A pinion and ring set. Run these axles in tests using a TMC-assigned blind mix of the following oils: one TMC 152-2 and two TMC 134's.

8.2.2 If all three of these tests are operationally valid and meet the LTMS acceptance criteria for the standard V1L528 batch hardware, the stand is calibrated for 4 months or 650 hours of non-reference oil testing (whichever occurs first) and the test lab is approved to continue testing using lab-built axles with V1L528/P4T883A pinion and ring sets.

8.2.3 If only the TMC 152-2 does not meet the LTMS acceptance criteria, the lab is to rerun one TMC 152-2 fluid. If the repeat meets the LTMS acceptance criteria, the stand is calibrated for 4 months or

650 hours of non-reference oil testing (whichever occurs first) and the test lab is approved to continue testing using lab-built axles with V1L528/P4T883A pinion and ring sets.

8.2.4 If only one of the TMC 134 tests does not meet the LTMS acceptance criteria, the lab is to rerun two consecutive TMC 134's. If both repeats meet the LTMS acceptance criteria, the stand is calibrated for 4 months or 650 hours of non-reference oil testing (whichever occurs first) and the test lab is approved to continue testing using lab-built axles with V1L528/P4T883A pinion and ring sets.

8.2.5 If two of the three tests do not meet the acceptance criteria, or the required repeats described in 8.2.3 or 8.2.4 do not meet acceptance criteria, 8.2.1 must be repeated if the test stand is to be calibrated on lab built axles and the lab approved to conduct testing using lab built axles with V1L528/P4T883A pinion and ring sets.

Examples: (run order of the first three tests is non-critical) – Not to be included in the procedure or motion.

TMC 152 – AC

TMC 134 - AC

TMC 134 – AC

*Lab is approved & referenced

Case 1 (8.2.3)

TMC 152 – OC – Repeat once – AC

TMC 134 - AC

TMC 134 – AC

*Lab is approved & referenced

Case 2 (8.2.4)

TMC 152 – AC

TMC 134 – OC – Repeat twice consecutively – AC, AC

TMC 134 – AC

*Lab is approved & referenced

Case 3,4,5 – FAILURE CASES

TMC 152 – OC

TMC 134 - OC

TMC 134 – AC

* restart matrix

TMC 152 – OC – Repeat once – OC

TMC 134 - AC

TMC 134 – AC

* restart matrix

TMC 152 – AC

TMC 134 – OC – Repeat twice consecutively – OC, AC

TMC 134 – AC

* restart matrix

The lab shall record lab built axles in the SERIALNO field as: LAB-CXXXX-XX with the first set being a housing serial number after the first letter of the TMC lab identifier with the second number identifying the number of rebuilds on that housing. Labs shall permanently mark the serial number and rebuild number into the axle tube located near the housing vent.

8.4 Preparation of Axle:

8.4.1 As an alternative to a complete, newly manufactured axle assembly, a lab may assemble a new V1L528/P4T883A gear set into a reused axle housing. Complete this assembly using a new

V1L528/P4T883A gear set, components from the Dana rebuild parts list given in appendix X and the Dana Model 60 Maintenance Manual. Include drive side pattern photos of the ring gear in the test report.

8.4.2 When using an axle assembly re-built per 8.4.1 or an assembly from an older approved hardware batch that was not marked with contact pattern information by the manufacturer, apply gear contact pattern grease on the drive and coast side of the ring gear. Turn the input of the axle assembly while applying a resisting force to the ring sufficient to require an axle input torque of approximately 30 lbf-ft (40.7 N•m). Rotate ring and pinion through the gear contact pattern grease on the drive and coast side and verify that the patterns for both sides are acceptable. Record the drive side contact pattern length and flank values in the test report.

8.4.3 If the axle assembly is a newly manufactured assembly received from Dana Corporation¹⁰, the drive side contact pattern length and flank values will be marked on the axle housing. Record these drive side contact pattern values in the test report.

8.4.4 Use only axle assemblies having a length value of L^2 or L^3 and a flank value of F^{-1} , F^0 , or F^{+1} .

8.4.5 *Breakaway and Turning Torque Measurements*—Determine and record the breakaway and turning torques of the completely assembled test unit.

8.4.6 *Backlash Measurements*—Record the backlash marked on the axle by the manufacturer. Use only axle assemblies having a manufacturer-reported backlash measurement from 0.004 to 0.012 in. (0.102 mm to 0.305 mm).

8.4.6.1 If the test axle is not marked with a manufacturer-reported backlash measurement, remove the cover plate and measure the backlash at four equally spaced locations. Record these four measurements and their average in the test report. Use only axle assemblies with an average backlash from 0.004 to 0.009 in. (0.102 mm to 0.229 mm).

8.5 Install the test unit on the stand with pinion and axle shaft centerlines horizontal. Connect dynamometers and drive shaft to the test unit.

Appendix X

Rebuild Parts List for Lab Built Axles using V1L528/P4T883A gear sets

Dana Part Number	Timken Part Number	Part
30271		Pinion Nut *
42449		Pinion Seal *
550358	HM88542	Outer Pinion Cone
550359	HM88510	Outer Pinion Cup
34801		Pre- Load Shim *
550360	HM803146	Inner Pinion Cone
550361	HM803110	Inner Pinion Cup
30291-1		Pinion Position Shim *
30291-2		Pinion Position Shim *
30291-3		Pinion Position Shim *
550363	382S	Diff. Bearing Cup
550362	387A	Diff. Bearing Cone
30276-1		Diff. Shims *
30276-2		Diff. Shims *
30276-3		Diff. Shims *
30276-4		Diff. Shims *
40638		Ring Gear Screws (120-140 Lbs/Ft.) *
34686		Cover Gasket (Replaced by 34687) *

*or equivalent part from another manufacturer.

3.0 Adjournment

Motion to adjourn .

Respectfully Submitted

Chris Prengaman