



Test Monitoring Center

@ Carnegie Mellon University
6555 Penn Avenue, Pittsburgh, PA 15206, USA

<http://astmtmc.cmu.edu>
412-365-1000

L-37 Information Letter 14-1
Sequence Number 49
July 10, 2014

ASTM consensus has not been obtained on this information letter. An appropriate ASTM ballot will be issued in order to achieve such consensus.

TO: L-37 Surveillance Panel

SUBJECT: Requirements for using lab-assembled axle units

During a June 25, 2014 teleconference, the L-37 Surveillance Panel approved changes to the test procedure to accommodate the use of lab-assembled axle units.

Section 8 of D 6121-14 has been updated. The text of the revisions is shown in the attachment. This change is effective June 1, 2014.

Chris Prengaman
Chairman
L-37 Surveillance Panel

Frank Farber
Director
ASTM Test Monitoring Center

Attachment

cc: ftp://ftp.astmtmc.cmu.edu/docs/gear/137/procedure_and_ils/il14-1.pdf

Distribution: Email

Replace the entirety of section 8 with the following:

8. Preparation of Apparatus

8.1 Cleaning of Reusable Hardware – Clean as necessary all reusable parts including axle shafts, thermocouples, axle housing cover, and all associated drain pans and funnels used for the addition and collection of test oil.

8.2 Lab-Built Axles -

8.2.1 To be approved to build axles acceptable for testing, assemble three axles in accordance with section 8.4 using a new non-lubricated V1L528/P4T883A pinion and ring set. Run these axles in tests using a blind mix of the following TMC-assigned 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 builder is approved to build axles for testing and the test stand is calibrated for the period described in 9.2.3.

8.2.3 If only the TMC 152-2 does not meet the LTMS acceptance criteria, rerun one TMC 152-2 fluid. If the repeat run meets LTMS acceptance criteria, the builder is approved to build axles for testing and the test stand is calibrated for the period described in 9.2.3.

8.2.4 If only one of the TMC 134 tests does not meet the LTMS acceptance criteria, rerun two consecutive TMC 134's. If both repeats meet the LTMS acceptance criteria, the builder is approved to build axles for testing and the test stand is calibrated for the period described in 9.2.3.

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, repeat 8.2.1.

8.3 Serial number reporting – When rebuilding an axle assembly, follow this template for creating a serial number: LAB-CXXXX-NN

Where: LAB designates the assembly as being lab-built
-C is the one-character TMC coded lab designation
-XXXX is a unique 4-digit identifier for the housing
-NN is a 2-digit count of the number of rebuilds on the housing.

Permanently mark the serial number into the axle tube at a location near the housing vent. Revise the 2-digit rebuild count number each time the assembly is rebuilt.

8.4 Preparation of Axle:

8.4.1 Use either a newly manufactured axle assembly or, if the lab-built provisions of 8.2 have been met, a new V1L528/P4T883A gear set assembled into a reused axle housing according to the Dana Model 60 Maintenance Manual and using components from the Dana rebuild parts list given in Annex 6, Table A6.2.

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. Include drive side pattern photos of the ring gear 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 – Measure and record the breakaway and turning torques of the completely assembled test unit. Do not use any axle assembly where the breakaway or turning torque exceeds 55 lbf•in. (6.2 N•m).

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 lab-built or 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).

8.4.7 Cleaning—Wash the test unit using a cleaning solvent (see 7.2). Pay particular attention to remove all preservative oil from the pinion bearings and any contact pattern grease that may be present. Dry by blowing with clean, dry compressed air.

8.4.8 Install axle shafts in test unit.

8.4.9 Lubricate the carrier bearings, pinion bearings, differential gears, and the ring gear and pinion using 6.0 ± 0.1 pt ($2.8 \text{ L} \pm 0.05 \text{ L}$) of test lubricant.

8.4.10 Install the axle cover plate with gasket (apply sealant if needed). Do not drain the oil and recharge the test axle once the test oil has been charged to the axle.

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.

Add the following table to Annex A6:

Table A6.2

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

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

^A or equivalent part from another manufacturer.