

ASTM D-7038 (L-33-1) MOISTURE CORROSION TEST  
SURVEILLANCE PANEL MEETING

February 13, 2019

PRI Headquarters

Warrendale, PA

## Agenda

I. Call to Order

II. Approval of Minutes

November 7, 2018 Automation Alley

Motion:

Second:

Vote:

III. Business

a. Membership review Voting Members

<b>Name</b>	<b>Company</b>
Banas, Rob	ExxonMobil
Beck, Dylan	TMC
Comfort, Allen	US Army TACOM
Donovan, Eric	Afton Chem
Drilja, Kristijan	Lubrizol
Dharte, John??	AAM
Goyal, Arjun	BASF
Smith, Dale	Intertek
Stevens, Mary	SWRI
Ved, Chintan	Ford Motors
Zreik, Khaled	General Motors

b. New Hardware Update

i. Presentation New Hardware:

ii. Next steps?

IV. Additional Discussion / Business?

V. Summary of Action Items

VI. Adjourn

Thank you,  
Dale B. Smith  
ASTM D-7038 Chairman

ASTM D-7038 (L-33-1) MOISTURE CORROSION TEST  
SURVEILLANCE PANEL MEETING

February 13, 2019

PRI Headquarters

Warrendale, PA

**Minutes**

I. Call to Order

II. Approval of Minutes

November 7, 2018 Automation Alley

Motion: Mary Stevens

Second: Eric Donovan

Vote: Unanimous

III. Business

a. Membership review Voting Members

<b>Name</b>	<b>Company</b>
Banas, Rob	ExxonMobil
Beck, Dylan	TMC
Comfort, Allen	US Army TACOM
Donovan, Eric	Afton Chem
Drlja, Kristijan	Lubrizol
<b>Dharte, John??</b>	<b>AAM Retired</b>
Muransky, Troy	AAM
Goyal, Arjun	BASF
Smith, Dale	Intertek
Stevens, Mary	SWRI
Ved, Chintan	Ford Motors
Zreik, Khaled	General Motors

b. New Hardware Update

i. Presentation New Hardware:

Presentation Attached:

ii. Next steps?

The committee agreed to move forward acquiring a small batch lot of 8 T1XX axles for preliminary testing prior to making a large industry order to assure the performance of the T1XX is the same as the previous K2XX batch. The labs are to run one pass and one fail each for comparison. The chairman is to coordinate with AAM to move the request forward.

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c. Rating review 7 possibility:

Dylan Beck from the TMC presented data from the most recent rater workshop on adding a 7 rating to the L-33-1 ratings. The data looks appropriate for the purpose. There was some confusion as to the need for this exercise and much discussion resulted. The confusion is where the 7 rating would fit and how it would be used. The 7 rating would fit numerically between the 8 and 5 currently defined as L-33-1 ratings. It is intended to be a method of dividing the 8 rating and defining a new severity level below the 8 but better than 5. The current K2XX axles are more severe than the previous obsolete Dana model 30 that required correction of +.6 merit to bring the severity back to historic levels of severity. The cause of this is likely the rated parts being much larger and additional capacities of oil and water. This additional severity naturally adds more 8 to the final ratings of candidates and is a point of controversy with the number of 8s allowed for a J-2360 approval. The 7 rating is intended to establish a new place in the 8 ratings showing separation between a mild and severe 8. The intent is to better define the severity level of this axle. Should the exercises show a good separation in the reference results the new rating category will offer a better tool to divide test results for candidate and reference in the future? The Rating definition and results are attached:

The committee agreed to continue with the rater review of the 7 rating at the next rating workshop.

IV. Additional Discussion / Business?

No new business

V. Summary of Action Items

Contact AAM on the small batch order 8 of T1XX axle for screening tests.

VI. Adjourn:

Motion: Mary Stevens

Second: Wes Venhoff

Motion: Unanimous

Thank you,  
Dale B. Smith  
ASTM D-7038 Chairman



# INTERTEK AR T1XX TRANSITION OVERVIEW

## L-33-1 AAM T1XX Axle Review

We have a replacement axle for the K2XX for L-33-1



# AAM CONTACTS CHANGED

New People

**William Worman:**

No longer the lead on the T1XX axle.

**John Moses:**

Product Engineer in charge of T1XX LD rear axles.

**Sherry Meadows:**

Prototype Sales Leader contact for our T1XX axle batch.

# T1XX VS K2XX DIFFERENT

There are some changes!

What is different between the K2XX and T1XX 8.6" 3<sup>rd</sup> members!

- Pinion flange changed from 4-footed cast iron with mild steel deflector to round piloted cast iron with stainless steel deflector for T1XX.
- Pinion flange is external but will require a shaft modification flange face to fit the driveshaft.
- Carrier casting for T1XX gained some extra mounting bosses on top.
- Expected not impact our oven space or test.
- The pinion seal became fully rubber coated on the exterior for T1XX.
- Pinion seal is an external part not required in test results.
- Some enhancements made for meeting the new 15-year corrosion requirement for T1XX (for years 10-15 the axle has to be able to operate safely even if it is not pretty or serviceable at that point).
- This comment required additional investigation as we are running a corrosion test?

## T1XX VS K2XX DIFFERENT

John Moses Comments

What is different between the K2XX and T1XX 8.6" 3<sup>rd</sup> members!

- We had a phone conversation about all that is involved in the corrosion protection?
- All of the changes are external on the axle including SS steel dust deflector on the yoke as well as the pinion seal and yoke. They are confident the interior is the same.

## T1XX VS K2XX SAME

Similar in all aspects for our needs.

What is same between the K2XX and T1XX 8.6" 3<sup>rd</sup> members!

- The basic axle materials have not changed,
- This is good news as our rated parts should not be impacted!!!!





AAM Global Prototype Sales ATDC  
 1840 Holbrook Avenue  
 Detroit, MI 48212-3442  
[PrototypeSalesCoordinator@aam.com](mailto:PrototypeSalesCoordinator@aam.com)

January 28, 2019

To: Intertek Attn: Dale Smith

Re: **Request for Quote -01252019 Intertek T1 3<sup>rd</sup> Member Testing GUIDANCE QUOTE**  
 AAM is pleased to quote the pricing and timing for the following unit(s) through our Global Prototype Department.

Part Number/Description	Quantity	Pc Price	Timing
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P40211874A Rev. A CARRIER ASM. DIFF 8.6 3.42 OPEN w/Housing Cover (Steel) Rust preventative and VCI bags included.	700	\$1100.00	TBD (ARO)
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*This is a guidance quote until a Tech Review can be performed, following the review a firm quote will be provided.*

Lead time applies to each purchase order issued. Delivery of each new order is subject to the full quoted lead time from the date the order is received. Lead-time is contingent upon the receipt of a purchase order. The delay in the issuance of the purchase order will drive a day for day slip in the delivery of the material requested.

Please issue your purchase order to:  
**AAM Duns 966126646 BSBQ**  
**ATDC 1840 Holbrook Avenue**  
**Detroit, MI 48212-3442**

Please send your purchase order to:  
 Attn.: Prototype Sales [PrototypeSalesCoordinator@aam.com](mailto:PrototypeSalesCoordinator@aam.com)

**Include on your order:**

1. Ship to address
2. COLLECT shipping instructions
3. Billing Address
4. Correct Part Number and Revision Level
5. Correct Piece Price

The purchase order must be mailed or faxed with all the information before delivery can be made.

This quotation is valid for 30 days. Lead-time is based upon receipt of customer authorization. The customer shall indemnify and hold AAM harmless from all losses arising from foreign currency exchange rate fluctuations with respect to transactions that are directed buy by the customer with suppliers in currencies other than U.S. dollars. All quotations provided are in US dollars unless specified otherwise.

AAM will make every effort to meet or beat the commit date(s) above and we appreciate this opportunity to quote. If you have any questions, please feel free to contact me.

Thank you,  
 Sherry Meadows  
 Prototype Sales Leader  
[PrototypeSalesCoordinator@aam.com](mailto:PrototypeSalesCoordinator@aam.com)

# GENERAL QUOTE

This quote is a guidance quote pending engineering review by the prototype department.

As we make decisions on exact quantities of axles.

We can separate the labs out on final quote

# K2XX BUILD SHEET

We Have the build sheets from the K2XX axles and I expect to use a similar request for the T1XX.

Any show stoppers for the labs?

L33 Axle - American Axle P40128429A 8.6" 3.42 Ratio Open Differential

Operation	Qty	Component Part/Item	Component Name	AAM Note	ASTM Note
10-Assemble	1	00517900-D	WASHER, PINION FLANGE	WASHER, PINION FLANGE	
10-Assemble	1	09783762-F	NUT, REAR AXLE DRIVE PINION	ALT: 09783762- PPR/RevA	
10-Assemble	1	26060975-E	PINION SEAL SLEEVE	SLEEVE, PINION SEAL	
10-Assemble	1	26064029-D	Pinion Seal	SEAL, PINION	
10-Assemble	1	40010355-D	GSVPTU Spacer, Collapsible	SPACER, PINION BEARING	
10-Assemble	1	40018901-E	GASKET DIFF COVER PAN	GASKET, DIFF COVER PAN	Do we need this?
10-Assemble	1	40048052-B	BEARINGS	BEARING, TAPERED CONE	See below
10-Assemble	1	40048053-B	Bearings	BEARING, TAPERED RACE	See below
10-Assemble	2	40048055-B	TAPERED ROLLER BEARINGS	BEARING, TAPERED CONE	See below
10-Assemble	2	40048056-B	BEARINGS	BEARING, TAPERED RACE	See below
10-Assemble	1	40048058-B	BEARING	BEARING, TAPERED RACE	See below
10-Assemble	1	40048060-B	BEARING	BEARING, TAPERED CONE	See below
10-Assemble	10	40061033-A	BOLT-RING GEAR 8.6 ENHANCED	BOLT, 7/16 X 20	Specify no Thread lock
10-Assemble	10	40089728-B	BOLT, COVERPAN	BOLT, COVERPAN	Specify no Thread lock

# K2XX BUILD SHEET PG#2

We Have the build sheets from the K2XX axles and I expect to use a similar request for the T1XX.

Any show stoppers for the labs?

10-Assemble	1	40090474-A	FLANGE DEFLECTOR ASM AND	FLANGE ASM, DEFLECTOR AND	
10-Assemble	1	40097381-B	CARRIER, DIFF (MACH)	CARRIER, DIFF (MACH)	One run of manufacture
10-Assemble	1	P40128432A-A	GEARSET, RING AND PINION	GEARSET, RING AND PINION	Non lubricated; One run of manufacture from same heat of steel
10-Assemble	1	40039162-C	COVER ASM DIFF CARRIER		Without Magnet?
10-Assemble	1	40042937-G	FILL/DRAIN PLUG		Without Magnet?
15-Rework Assembly	1	40048044LUB-D	Diff ASM STD		
15-Rework Assembly	2	40048055LUB-B	Bearing		See below
15-Rework Assembly	2	40048056LUB-B	Bearing		See below
			Diff ASM bolt		Specify no Thread lock
Bearing Details					
Head					
2	1	40048051	BEARING ASM, TAPERED	Koyo	
3	1	40048052	BEARING, TAPERED CONE	Koyo	
3	1	40048053	BEARING, TAPERED RACE	Koyo	
Tail					
2	1	40048057	BEARING ASM, TAPERED	Koyo	
3	1	40048058	BEARING, TAPERED RACE	Koyo	
3	1	40048060	BEARING, TAPERED CONE	Koyo	
Diff					
2	2	40048054	BEARING ASM, TAPERED	Koyo	
3	2	40048055	BEARING, TAPERED CONE	Koyo	
3	2	40048056	BEARING TAPERED RACE	Koyo	



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Set#	AREA	10	10	22	22	30	30	36	36	37	37	38	38	42	42	42	42	MIN	MIN	MAX	MAX	AVG	AVG	Std Dev	Std Dev	CMIR	Results	Oil
1C	1	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8.00	8.00	0.00	0.00	124974	8	123-2
1C	2	8	7	8	7	8	7	8	7	8	7	8	7	8	5	5	8	8	5	8	7	7.57	6.71	1.13	0.76	SR	8	
1C	3	8	7	8	7	8	7	8	7	8	8	8	7	8	8	8	8	8	8	8	8	8.00	7.14	0.00	0.38		8	
1C	4	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8.00	8.00	0.00	0.00		8	
1C	5	8	8	9	9	9	9	8	8	8	8	8	8	9	8	8	9	8	8	9	8.43	8.43	0.53	0.53		8		
1C	6	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8.00	8.00	0.00	0.00		8		
1C	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8.00	8.00	0.00	0.00		8		
1C	8	8	8	10	10	9	9	10	10	8	8	8	8	8	8	10	10	8	8	8	8.71	8.71	0.95	0.95		8		
1C	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8.00	8.00	0.00	0.00		8		
1C	10	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8.00	8.00	0.00	0.00		8		
Total Rust		8.0	7.7	8.2	8.0	8.2	7.9	8.2	7.9	8.0	7.8	8.0	7.7	7.5	7.4	7.5	7.4	7.50	7.41	8.25	7.96	8.01	7.76	0.25	0.18		8.0	
2C	1	9	9	10	10	9	9	9	9	9	9	9	9	9	9	9	9	9	9	10	9.14	9.14	0.38	0.38	122904	10	123-2	
2C	2	8	7	8	7	8	7	8	7	8	8	8	7	8	8	8	8	8	8	8	8.00	7.29	0.00	0.49	LZ	9		
2C	3	8	7	8	7	8	7	8	7	8	7	8	7	8	8	8	7	8	7	8	8.00	7.00	0.00	0.00		8		
2C	4	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8.00	7.86	0.00	0.38		8		
2C	5	8	8	8	8	9	9	9	9	8	8	8	8	8	8	9	9	8	8	9	8.29	8.29	0.49	0.49		8		
2C	6	8	8	8	8	10	10	9	9	8	8	8	8	8	8	10	10	8	8	8	8.43	8.43	0.79	0.79		8		
2C	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8.00	8.00	0.00	0.00		8		
2C	8	9	9	8	8	9	9	8	8	9	9	9	9	9	8	9	9	8	8	9	8.71	8.71	0.49	0.49		10		
2C	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8.00	8.00	0.00	0.00		10		
2C	10	9	9	8	8	9	9	9	9	9	9	9	9	9	9	9	9	8	8	9	8.86	8.86	0.38	0.38		8		
Total Rust		8.3	8.0	8.2	7.9	8.5	8.0	8.3	8.1	8.3	8.2	8.3	8.0	8.3	8.2	8.3	8.2	8.17	7.89	8.50	8.17	8.30	0.10	0.10		8.7		

Set#	AREA	10	10	22	22	30	30	36	36	37	37	38	38	42	42	MIN	MIN	MAX	MAX	AVG	AVG	Std.Dev	Std.Dev	CMIR	Results	Oil
3	1	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10.00	10.00	0.00	0.00	123088	10	155-1
3	2	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8.00	8.00	0.00	0.00	SR	8	
3	3	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8.29	8.14	0.49	0.38		8	
3	4	9	9	8	8	8	8	9	9	8	8	9	9	8	8	8	8	9	9	8.57	8.43	0.53	0.53		9	
3	5	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10.00	10.00	0.00	0.00		10	
3	6	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10.00	10.00	0.00	0.00		10	
3	7	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	9	10	10	9.71	9.71	0.49	0.49		10	
3	8	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9.86	10.00	0.38	0.00		10	
3	9	10	10	10	10	10	10	9	9	10	10	10	10	10	10	10	10	10	10	9.86	9.86	0.38	0.38		10	
3	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10.00	10.00	0.00	0.00		10	
Total Rust		9.3	9.3	9.1	9.1	9.1	9.1	9.2	9.2	9.4	9.1	9.1	9.1	9.1	9.1	9.09	9.09	9.35	9.26	9.17	9.15	0.10	0.07		9.3	
4	1	8	8	8	8	8	8	8	8	8	8	8	8	7	7	8	7	8	8	8.00	7.86	0.00	0.38			
4	2	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8.00	7.86	0.00	0.38			
4	3	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9.00	9.00	0.00	0.00			
4	4	8	8	8	8	8	7	8	8	8	8	8	8	8	7	8	8	8	8	8.00	7.71	0.00	0.49			
4	5	9	9	8	8	8	8	9	9	9	9	9	9	9	9	8	8	9	9	8.71	8.71	0.49	0.49			
4	6	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9.00	9.00	0.00	0.00			
4	7	9	9	9	9	9	9	8	8	9	9	9	9	9	9	8	8	9	9	8.86	8.86	0.38	0.38			
4	8	10	10	10	10	9	9	9	9	10	10	10	10	10	10	9	9	10	10	9.71	9.71	0.49	0.49			
4	9	10	10	10	10	9	9	8	8	9	9	9	9	8	8	8	8	10	10	9.29	9.29	0.76	0.76			
4	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10.00	10.00	0.00	0.00			
Total Rust		8.80	8.80	8.7	8.7	8.6	8.4	8.5	8.5	8.7	8.7	8.7	8.7	8.8	8.4	8.52	8.35	8.80	8.80	8.69	8.61	0.11	0.18			
5	1	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9.00	9.00	0.00	0.00	124975	8	123-2
5	2	8	8	8	8	8	8	8	8	7	7	8	8	8	8	8	7	8	8	8.00	7.86	0.00	0.38	SR	8	
5	3	8	8	8	8	8	8	8	7	8	8	8	8	8	8	8	8	8	8	8.00	7.57	0.00	0.53		8	
5	4	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8.00	8.00	0.00	0.00		8	
5	5	8	8	8	8	8	8	9	9	9	9	8	8	8	8	8	8	9	9	8.43	8.43	0.53	0.53		8	
5	6	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8.00	8.00	0.00	0.00		8	
5	7	9	9	10	10	9	9	9	9	10	10	9	9	10	10	9	9	10	10	9.43	9.43	0.53	0.53		8	
5	8	9	9	10	10	8	8	8	8	10	10	9	9	9	9	8	8	10	10	9.00	9.00	0.82	0.82		9	
5	9	9	9	8	8	8	8	8	8	8	8	9	9	8	8	8	8	9	9	8.29	8.29	0.49	0.49		8	
5	10	9	9	8	8	8	8	9	9	9	9	9	9	8	8	8	8	9	9	8.57	8.57	0.53	0.53		8	
Total Rust		8.39	8.29	8.4	8.4	8.1	8.1	8.3	8.2	8.5	8.2	8.4	8.4	8.4	8.4	8.14	8.14	8.53	8.39	8.35	8.28	0.12	0.09		8.1	

10 = absence of corrosion (same as before)

9 = up to 6 spots, each spot is smaller than 1 mm in diameter (same as before)

8 = 7 or more spots, each spot is smaller than 4 sq mm with the affected area not more than 1% of the rated area (the template for a trace/light spall can be used to determine 4 sq mm).

7 = Any single spot 4 sq mm or greater in area but not more than 1% of the rated area.

5 = over 1% and up to 5% of the rated area (same as before)






0 = greater than 5% (same as before)

#### Existing Scale:

Rust Levels: 10, 9, 8, 5, or 0 using these definitions:





None	=	10	
Trace	=	9	not more than six spots, each 1 mm diameter or less
Light	=	8	seven (7) or more spots less than 1 mm in diameter or, one (1) or more spots greater than 1 mm in diameter with a combined area of all the spots no greater than 1% of the total rated component surface.
Moderate	=	5	in excess of above and up to 5% of considered surface
Severe	=	0	covering more than 5% of considered surface

ASTM D 7038 L-33-1 SURVEILLANCE PANEL PARTICIPANTS LIST  
February 13, 2019




Initials	Name	Voting V/INV	Company Name Company Address	Phone / Fax / E-Mail
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	Comfort, Allen	V	US Army <del>FACOM</del> <i>CCDC</i> Mail Stop 110 6501 E. 11 Mile Road Warren, MI 48397-5000 AMSTA-TR-D / 210	Phone: 586-282-4225 Fax: 586-282-4244 E-mail: allen.s.comfort.civ@mail.mil



ASTM D 7038 L-33-1 SURVEILLANCE PANEL PARTICIPANTS LIST  
February 13, 2019

Initials	Name	Voting V/NV	Company Name Company Address	Phone / Fax / E-Mail
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