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May 17<sup>th</sup>, 2016

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ASTM D02.B0.03 L-42 Surveillance Panel  
Members and Guests:

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

**May 11<sup>th</sup>, 2016 Surveillance Panel Meeting (Automation Alley – Troy, MI)**

Please direct any corrections or comments to my attention.

Very Respectfully,

Eric Donovan, Chairman  
L-42 Surveillance Panel

## L-42 Surveillance Panel Meeting Minutes

Automation Alley – Troy, MI

May 11, 2016

**Attendees:** voting members in **bold**, \* indicates called in via teleconference

D. Bell (Afton)	B. Dwornick (US Army)	A. Trader (Intertek)
B. Bubonic (LZ)	A. Goyal (BASF)	<b>M. Umerley (LZ)</b>
<b>A. Comfort (US Army)</b>	J. Milner (Tianhe Chemical)	W. Venhoff (LZ)
<b>J. Dharte (AAM)</b>	<b>T. Muransky (Meritor)</b>	<b>R. Warden (SwRI)</b>
<b>E. Donovan (Afton/C)</b>	<b>S. Parke (TMC)</b>	
*K. Duho (Valvoline)	<b>D. Smith (Intertek)</b>	

### Call to Order

#### Review of Agenda

The meeting agenda is attached.

#### Review of Membership

Bruce McGlone has retired from Meritor. Motion made by D. Smith to have Troy Muransky replace Bruce as a voting member, second by M. Umerley. Unanimous approval, no abstentions.

#### Approval of Meeting Minutes

Meeting minutes for approval:

- "20160210\_SP" → February 10, 2016 – Warrendale, PA

Motion by J. Dharte, second by D. Smith to approve meeting minutes as presented. Unanimous approval, no abstentions.

#### L-42 Replacement Spring Steel

During the Feb 2016 meeting, M. Umerley brought up an issue that new steel for manufacturing new springs could not be located. After research, SAE 1074 steel was found and ordered from Admiral Steel and was heat treated to the correct temper after machining.

#### L-42 Hardware – Thinking Ahead

During the Feb 2016 meeting, R. Warden voiced concerns about current hardware costs from the recent Dana batch. The panel discussed potential options for future hardware. E. Donovan spoke with Gary Schmalbach from Dana to discuss the possible next batch with Dana and reducing the cost so both sides are happy. Dana still wants the business and concerns/fears that were present prior to the last batch are

no longer since completion of the most recent batch. E. Donovan will continue the discussion with G. Schmalbach and attempt to reduce the cost per axle for the next batch. This will keep industry costs down since we would not have to develop a completely new axle which is desired by all on the panel at this time.

**L-42-1 Development Update**

Afton has continued to further develop L-42-1 testing using an all-electric motor test rig with current Dana hardware mounted without springs. A Siemens engineer visited Afton to assist in development and further drive tuning. This service was provided free of charge as a way for Siemens to show their support and further their own knowledge. Adjustments were made to input torque control which showed very positive results in the system response matching the setpoints. The next steps are to continue fine tuning of the test rig and begin initial testing with reference oils and new Dana hardware.

**New/Open Issues**

No new or open issues at this time.

**Adjournment**

Motion by D. Smith, second by R. Warden. All in favor, meeting adjourned.

Respectfully submitted,

A handwritten signature in black ink, appearing to be 'E. Donovan', with a long horizontal line extending to the right.

Eric Donovan

L-42 Surveillance Panel Chairman



## L-42 Surveillance Panel Meeting

Automation Alley

Troy, MI

May 11, 2016





10:30am-11:30am

Passion for Solutions™

# Agenda

- 📌 Call to Order
- 📌 Agenda
- 📌 Membership Review & Update
- 📌 Approval of Meeting Minutes
- 📌 Update on replacement spring steel
- 📌 Hardware – Thinking Ahead
- 📌 L-42-1 Development
- 📌 New/Open Issues
- 📌 Adjournment

## L-42 SP Voting Members

-  Rob Banas - ExxonMobil
-  Allen Comfort – US Army
-  John Dharte – AAM
-  Eric Donovan – Afton Chemical (Chair)
-  Bruce McGlone – Meritor
-  Scott Parke – TMC
-  Dale Smith – Intertek
-  Matt Umerley– Lubrizol
-  Rebecca Warden – SwRI

# Approval of Meeting Minutes

## **SP Meeting Minutes**

- ▲ “20160210\_SP” → Feb 10, 2016 – Warrendale, PA

## L-42 Replacement Spring Steel

- ▲ 5/16” thick SAE 1074 steel, spring temper RC 42-46
- ▲ During Feb 2016 SP meeting, M. Umerley brought up that steel to make replacement springs could not be located
- ▲ Current springs were made many years ago, SwRI in charge of the order
- ▲ Admiral Steel carries 0.312” thick SAE 1074/1075 steel
  - ▲ Would need to be tempered to RC 42-46 after cutting to size



## L-42 Hardware – Thinking Ahead

 **Currently we have plenty of hardware**

 **Next hardware run – Dana vs new hardware**

- ▲ High cost for current hardware vs development cost for new axle

 **If we can negotiate a lower price or keep current price, stay with Dana?**

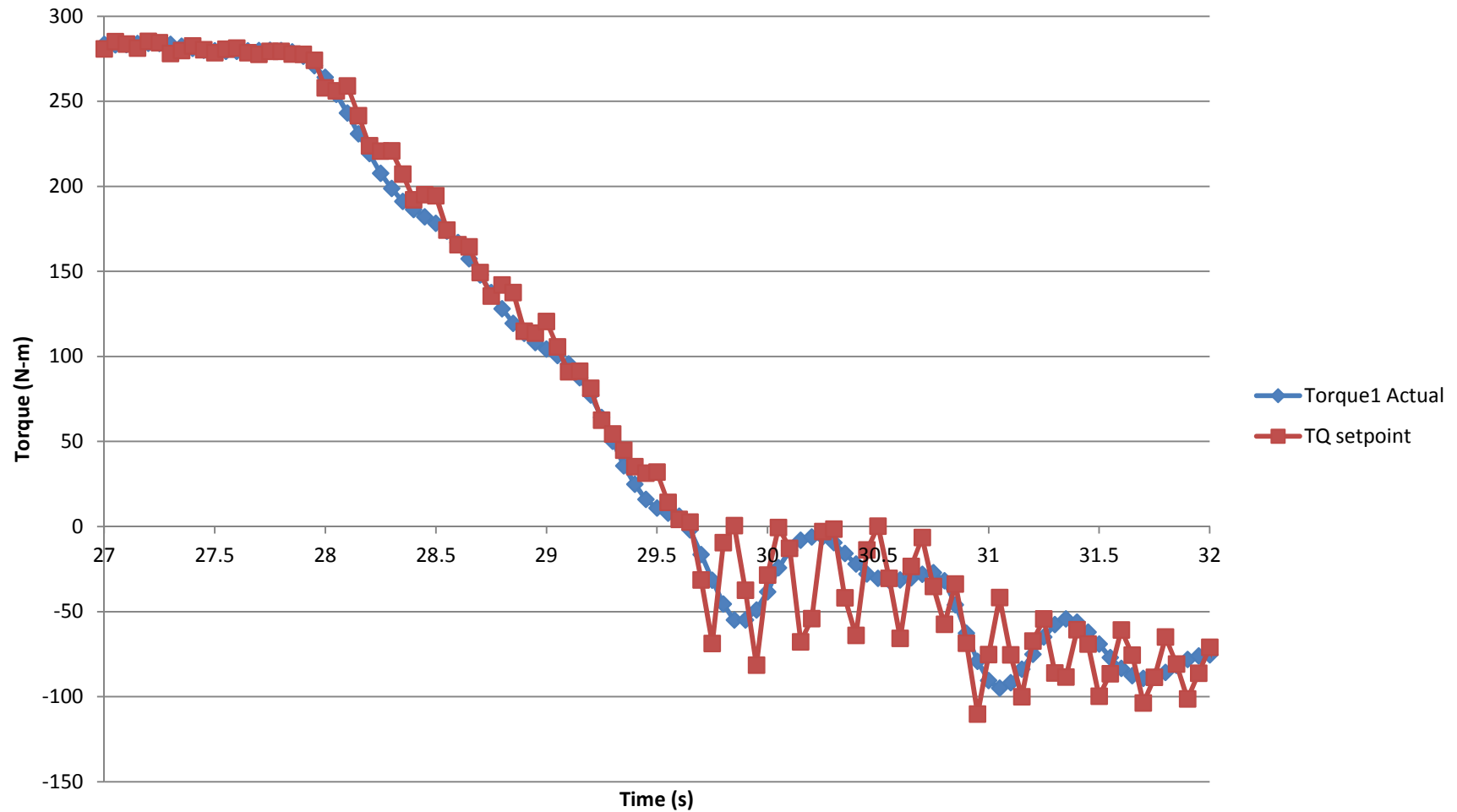
- ▲ Dana is still interested in working with us
- ▲ Is there a price point we want to stay under before deciding to develop new hardware?

## L-42-1 Development

- 📈 Electric T-rig (input and outputs)
- 📈 Dana 44 mounted without springs
- 📈 Data from L-42 run was used to create 100 Hz setpoints for initial L-42-1 testing
- 📈 Goal is to have the rig follow L-42 setpoints first then use mathematical model for setpoints

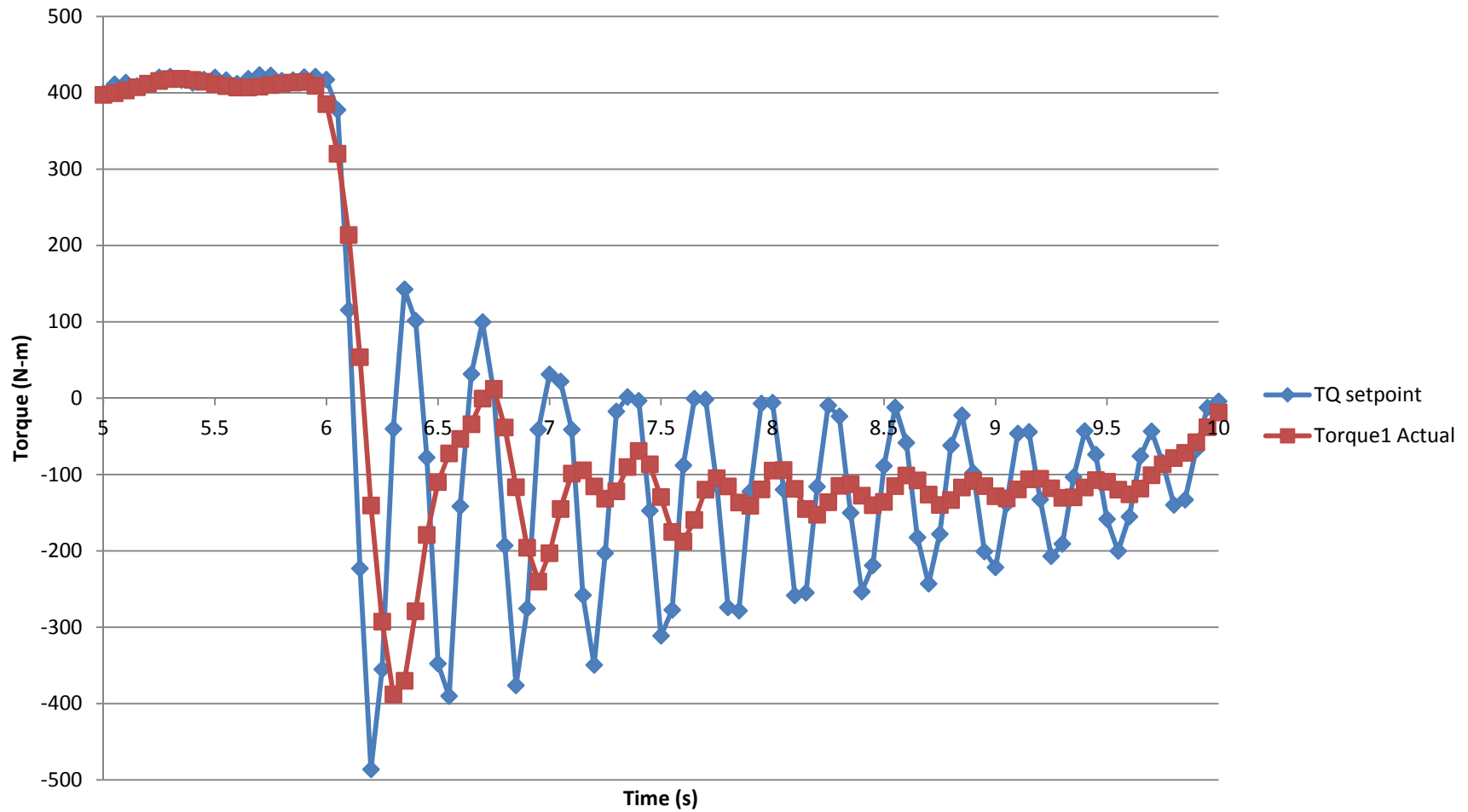
# L-42-1 Development – Dec 2015

## L42-1 Shock 1 - Input Torque Comparison



# L-42-1 Development – Dec 2015

## L42-1 Shock 2 - Input Torque Comparison

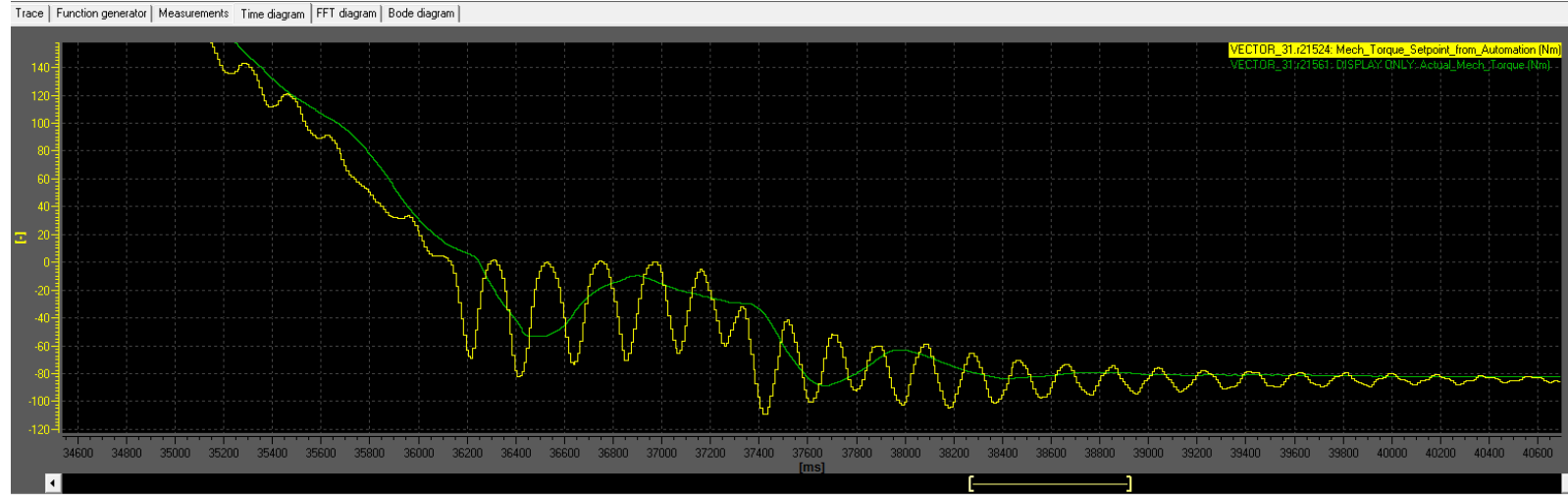


## L-42-1 Development – April 2016

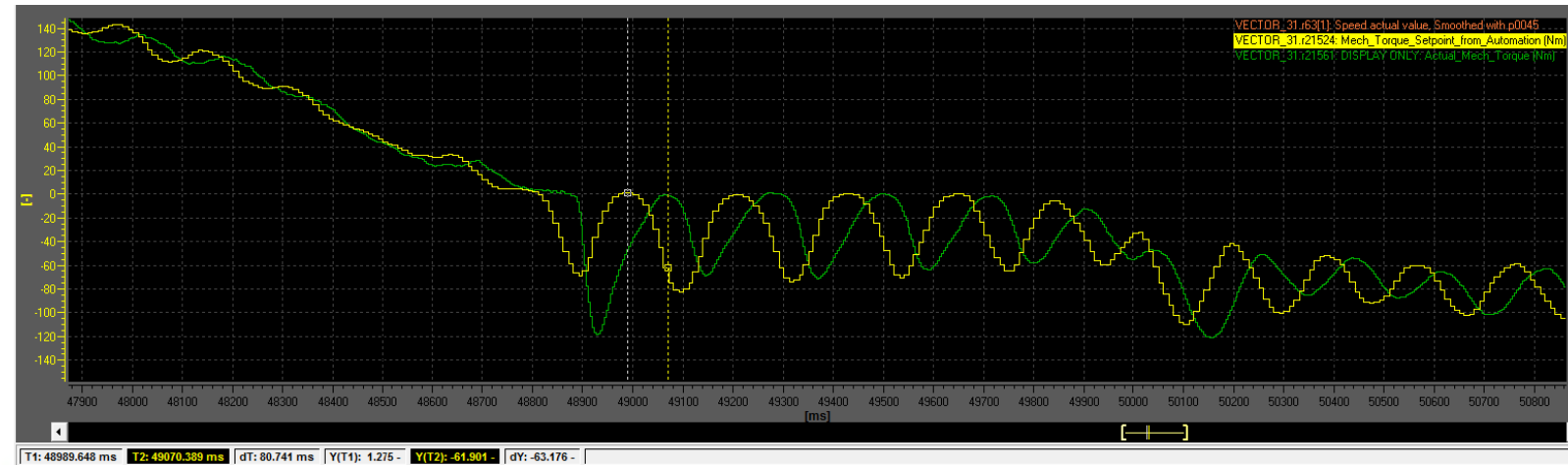
- ▶ Afton worked with a Siemens Applications Engineer to tune the rig for a dynamic test
- ▶ Input torque control parameters were adjusted
- ▶ Very positive results after two days with minor tuning still remaining

# L-42-1 Development – April 2016

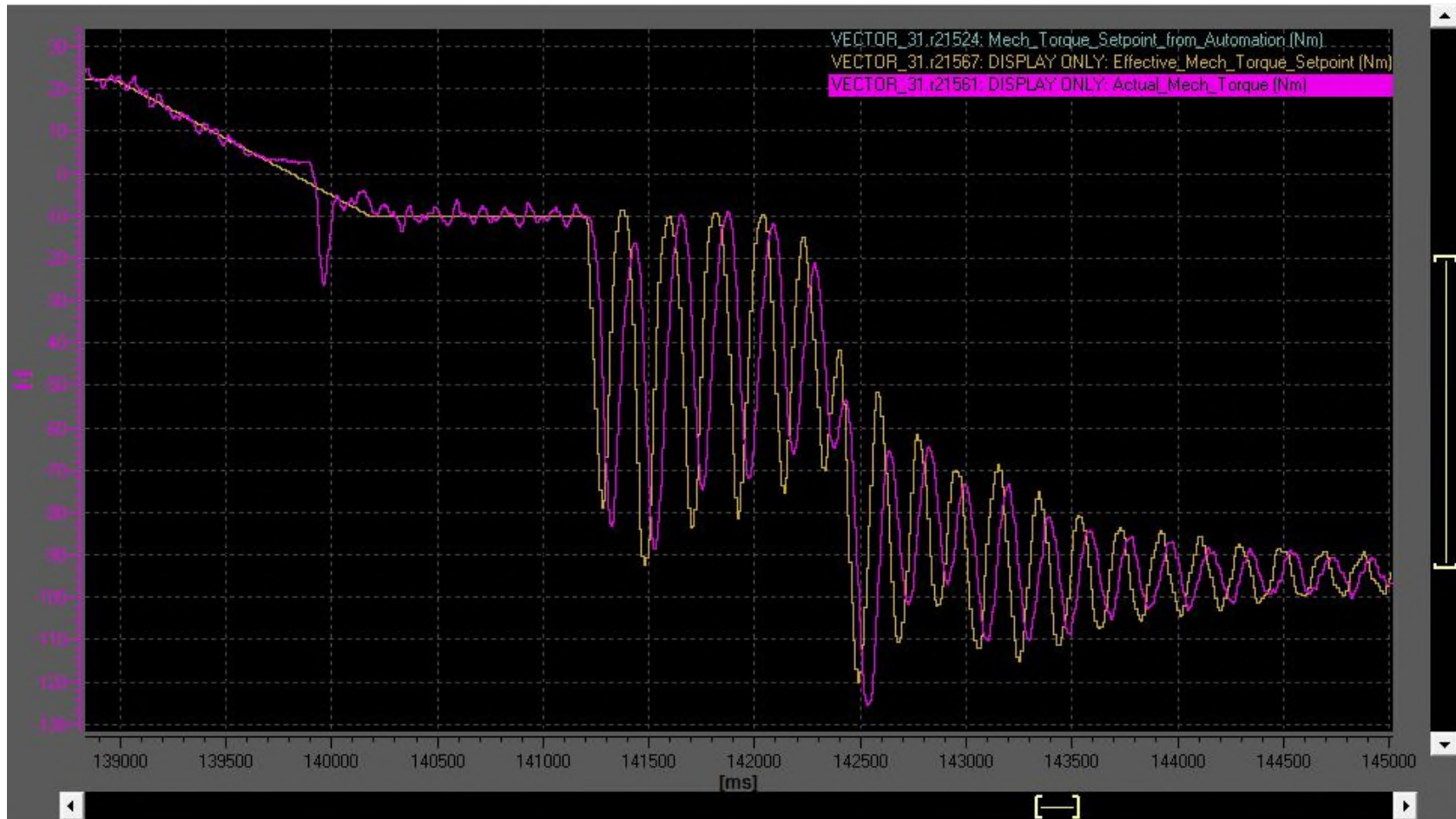
## Before



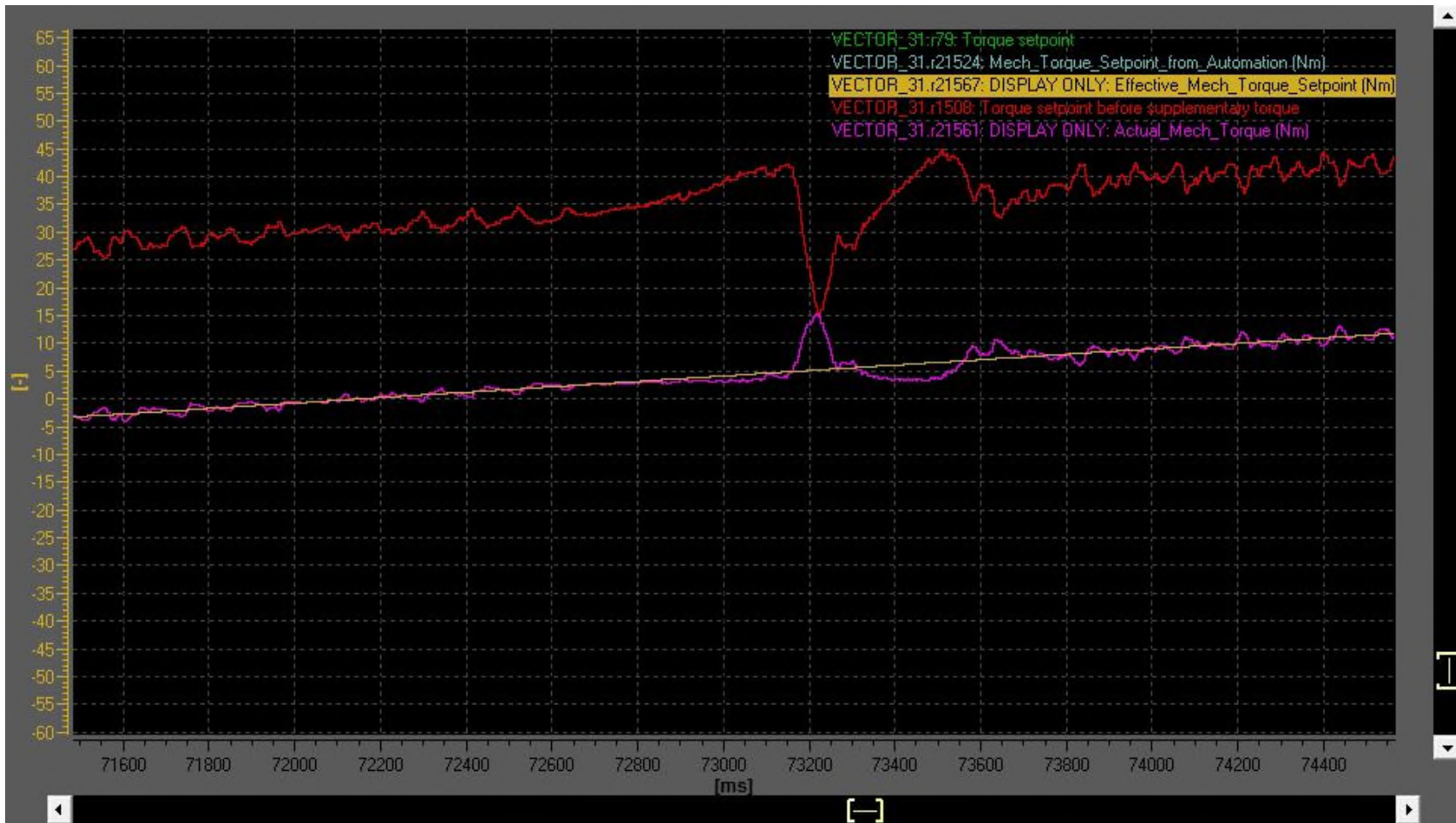
## After



# L-42-1 Development – April 2016



# L-42-1 Development – April 2016





# New/Open Issues

Thanks!



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**L-42 Surveillance Panel Membership/Attendance  
Automation Alley - Tory, MI  
May 11, 2016**


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**L-42 Surveillance Panel Membership/Attendance  
Automation Alley - Tory, MI  
May 11, 2016**

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**L-42 Surveillance Panel Membership/Attendance  
Automation Alley - Tory, MI  
May 11, 2016**

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**L-42 Surveillance Panel Membership/Attendance**  
**Automation Alley - Tory, MI**  
**May 11, 2016**

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**L-42 Surveillance Panel Membership/Attendance  
Automation Alley - Tory, MI  
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