

L42 Surveillance Panel Meeting minutes
PRI Apollo Room, Warrendale, PA
February 8th, 2006

Attendees:

Cory Koglin
Don Bell
Don Bartlett
Chris Schenkenberger
Jerry Gropp
Brian Koehler
Don Lind
Frank Farber
Dale Smith
Bill Sullivan
Peter Kampe
Salvatore Rea
Don Kreinbring

Agenda

Call to Order/Membership review

Approval of Minutes

- October 27-January 27 TF teleconferences

L42-1 Update/Progress

- Review timeline at current status
- Current Matrix data
- L42-1 Engineering issues
 - Steady state filtering
 - Conditioning phase temperature limits
 - Recent TPS inconsistency
 - Check Dyno coast times
- Specification (Draft 16) and Data Dictionary Updates
 - Agreed upon Torque limits
 - Commonized Test time calculation and redefined test downtime
 - Implemented common scaling on all 15 plots
 - Facilitator reviewed spec-minor updates
- Present matrix proposed by TF
- Questions

Low Temperature L42 Data Matrix

2006 Industry Hardware Order Update

Review Rater data

Scoring/Bright Burnish

Adjournment

Motion: Approve the previous five sets of meeting minutes available on the TMC website.
Passed unanimously

L42-1 timeline/current data

The L-42-1 timeline was discussed and current matrix data. All labs use the same torque for comparative testing. There is insufficient data to determine trends on the shock series torque graphs presented for the reference oils. All labs were shown to have essentially equivalent L-42-1 trace plots of torque vs time. The acceleration ramp time was brought up for discussion and it

was concluded some labs have different set-ups for ramping up acceleration, but not expected to affect L-42 bump shock results. TMC notes that these L42-1 results are a large improvement over the older L42 test results comparing labs for torque vs time.

The current data can be found on the TMC website: <ftp://ftp.astmtmc.cmu.edu/refdata/gear/l42-1/data/>

Engineering issues:

Chairman noted that all labs should filter (3-5 Hz) on steady state test conditions to reduce torque peak variability. Labs are looking into their capabilities of applying these filters.

A steady state gear conditioning phase specification was proposed at 225 +/-5F. Conditioning phase #2 and #4 are ~ 2-3 minutes, while conditioning #3 is ~20 minutes. After conditioning #2, temperature could drop from ~222F to ~215F. Putting a temperature specification on a dynamic cycle is very challenging, so may need different validity controls for temperature. The committee has not been able identify a cooling system to sufficiently control temperatures of this highly dynamic system. For the L42, only the average temps were reported, so this specification is a more demanding requirement for L42-1.

Inconsistency in throttle control trace linked to faulty TPS sensor. Replacing the TPS sensor with a new one eliminated the variability in the acceleration/deceleration phases, thus improving the variability in the torques.

Chairman to send procedure to all labs for them to check the Dyno coast times to make sure all labs are consistent.

Specification and Data Dictionary Updates:

Task force agreed upon torque limits.

Use current torque bands for shock 1 and shock 2 torques

- Shock1= +/-15% average torque
- Shock2= +/-10% average torque

Commonized test time calculation and redefined test downtime.

Implemented common scaling on all 15 plots on report.

Facilitator reviewed spec with only minor updates required.

L42-1 Next Steps:

Prior to running matrix

- Agree/commonize upon Cond 1 & 3 (steady state) pinion torque filtering
- Lab A to calculate % deviation on temperature for Conditioning phases
 - TF to decide on path
- All labs to run coast down times on dyno's with Ram Engine setup

Recommended Testing Matrix from TF (604/637 gear batch)

- 6 runs on TMC 116
- 2 runs on TMC 112

- Hold SP meeting (Detroit?), Review Data, and follow original timeline.

Panel suggestion:

Run a reference period: 3 passing oils, 1 failing oil.

Wait 2 days (do not use any setups, only let engine warm up) to see if stand drifts.

Run again 3 passing oils, 1 failing oil.

Run and report all tests regardless of results (unless uncontrollable situation-power outage, etc).

Low Temperature L-42 Matrix:

L-42 low temp results were shown for ref oils 152 & 153.

Data can be found on TMC website: <ftp://ftp.astmtmc.cmu.edu/refdata/gear/l42/data/>

Cory to request sponsorship of labs for further L-42-1 matrix testing at standard temperature on 3 passing and 3 failing oils.

2006 industry hardware order update:

Ring gear forgings are on order with Presrite and they are attempting to locate steel.

Bruce Hall of DANA commented that dies for pinion forging from Colfor area no longer available or have been disposed of, but they don't know why. They are checking other existing forging dies to find an option. DANA cannot meet delivery date to Lugoff at this time due to these issues.

If new dies are to be made, the lead time from Colfor will be 3 months. Cost provided to Dana from Colfor to provide pinions is \$109.15

Side gears:

Original side gears made from 2.25" bar stock out of 5115

Proposed side gears to be made from 2.31" hot rolled 8822 material

Motion (by J. Gropp, 2nd by B. Koehler): Dana has 2 wks from 2/8/06 to respond on their ability to locate dies/steel for forging to avoid a prolonged period without parts. If Dana cannot find dies/forgings within two weeks (Feb 22, 2006), new dies will be made.

Motion passed unanimously.

Review L42-1 rater data from 1/7/06:

Data is available on TMC website. In general, data is acceptable according to the TMC, but set 6 pinion has high variability (more than 5% difference is an issue).

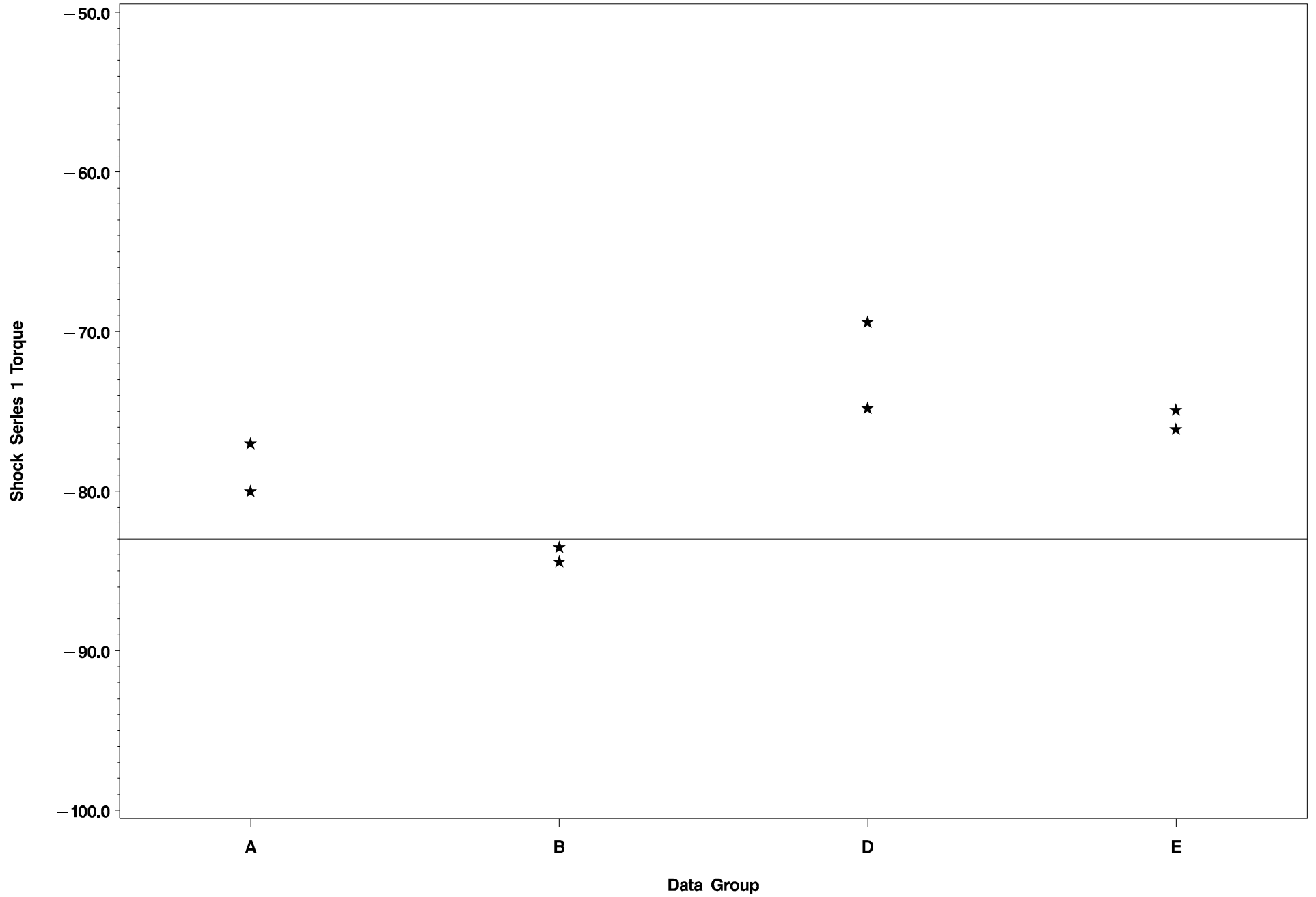
Scoring and Bright Burnish:

John D'Harte and Harold Chambers evaluations of pinions/rings with bright burnish were documented in a handout with their comments that if bright burnish was evident, then the test was non-interpretable. Burnish is typically only seen in bad discriminating oil runs and only occurs ~5% of the time as per lab feedback. Clarification is required from the LRI on what is acceptable since it is not clear what the LRI would consider burnish vs Seq II scoring and allowable limits. There is inconsistency among raters is to how to rate burnish since some are not including bright burnish as part of the scoring ratings. This whole issue still needs to be resolved and discussed further with H. Chambers and J. D'Harte on how to rate and report results. Cory will add this to the L-42-1 agenda at the next OEM meeting, possibly in Detroit at the end of March.

Adjournment: Sullivan/Lind 11:30am

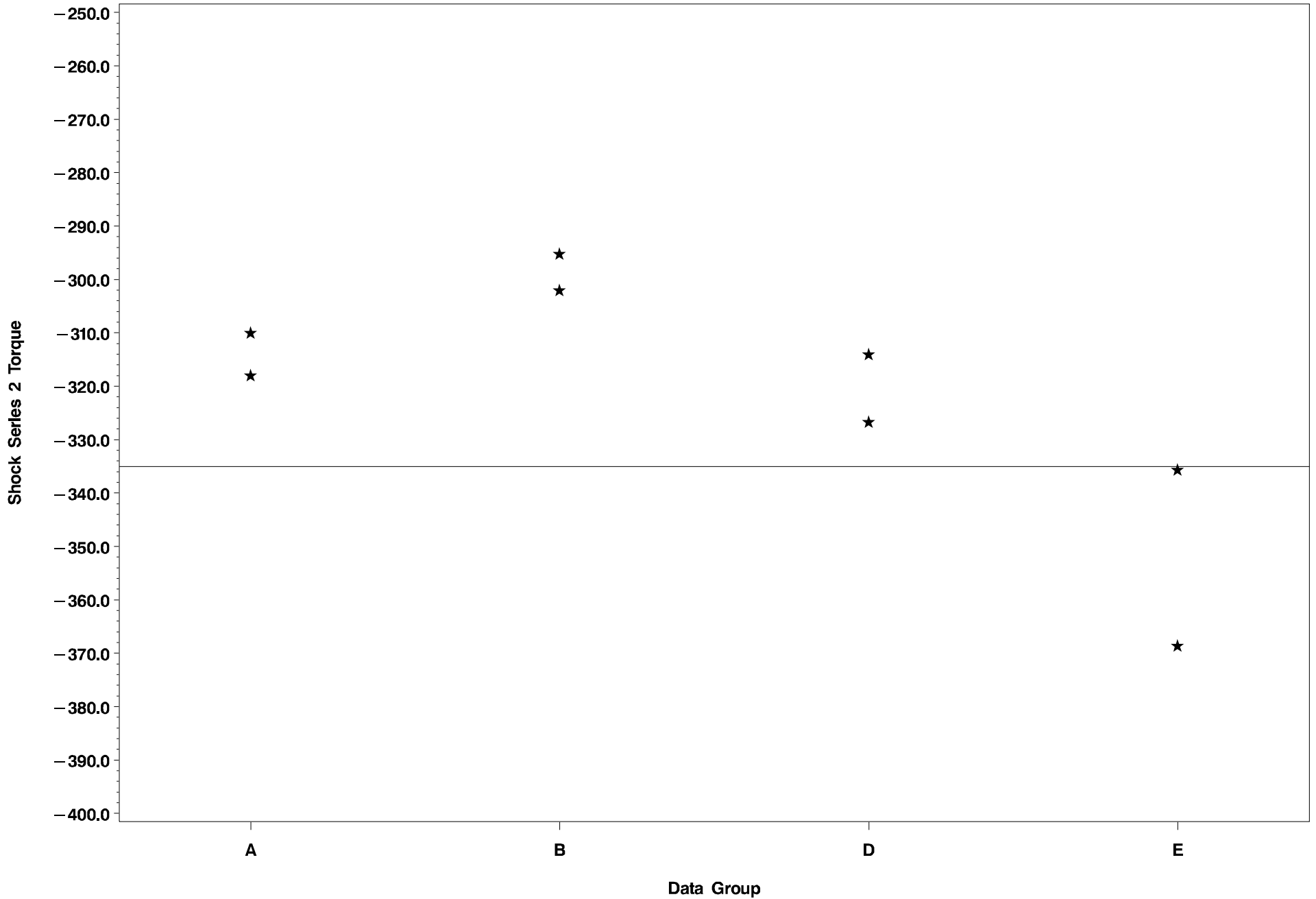
L-42-1 Shock Series 1 Torque

Matrix Lab Torque Results



L-42-1 Shock Series 2 Torque

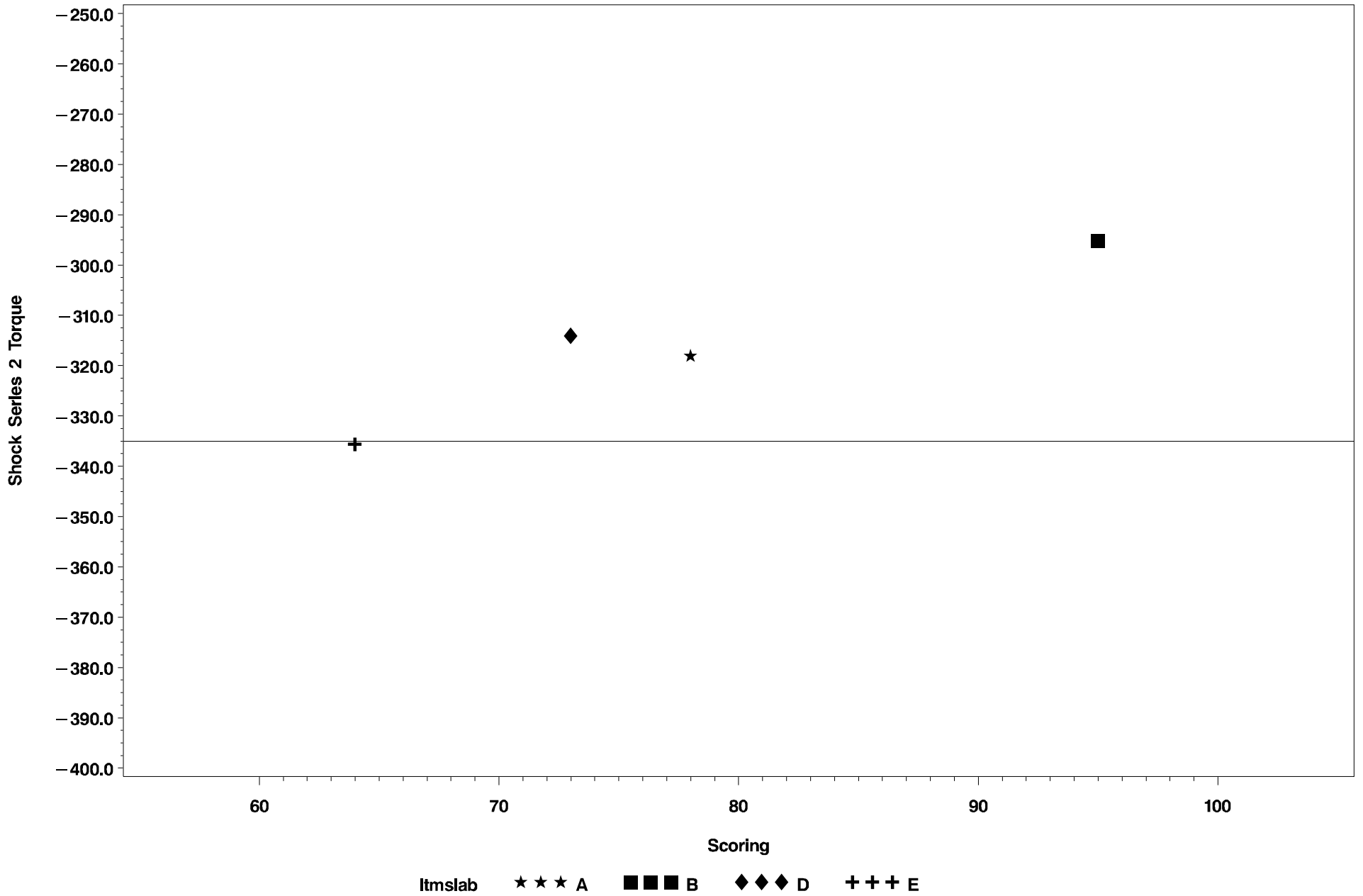
Matrix Lab Torque Results



L-42-1 Shock Series 2 Torque

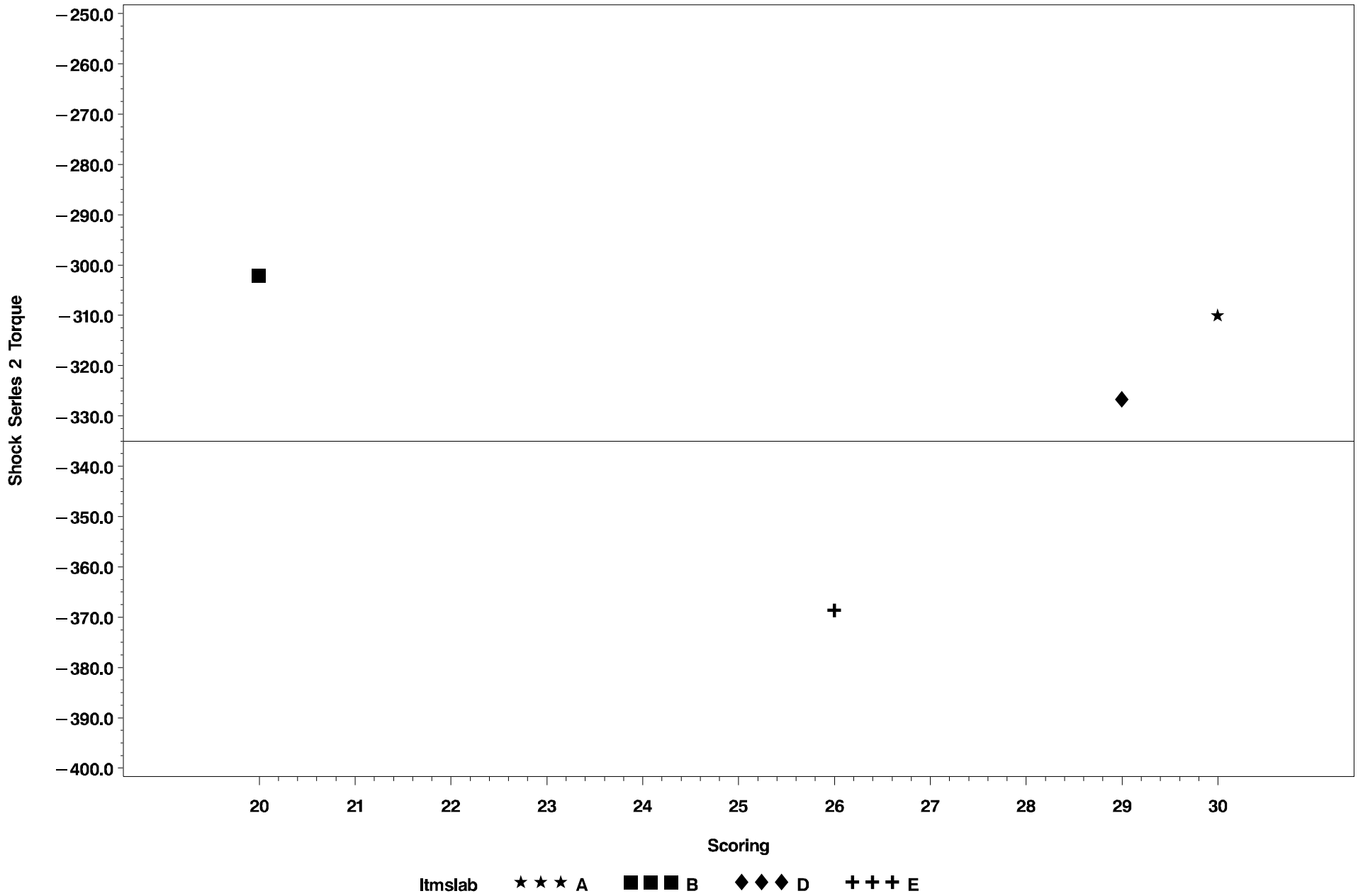
Lab Torque VS Scoring

Matrix Reference Oil 112-2 Results

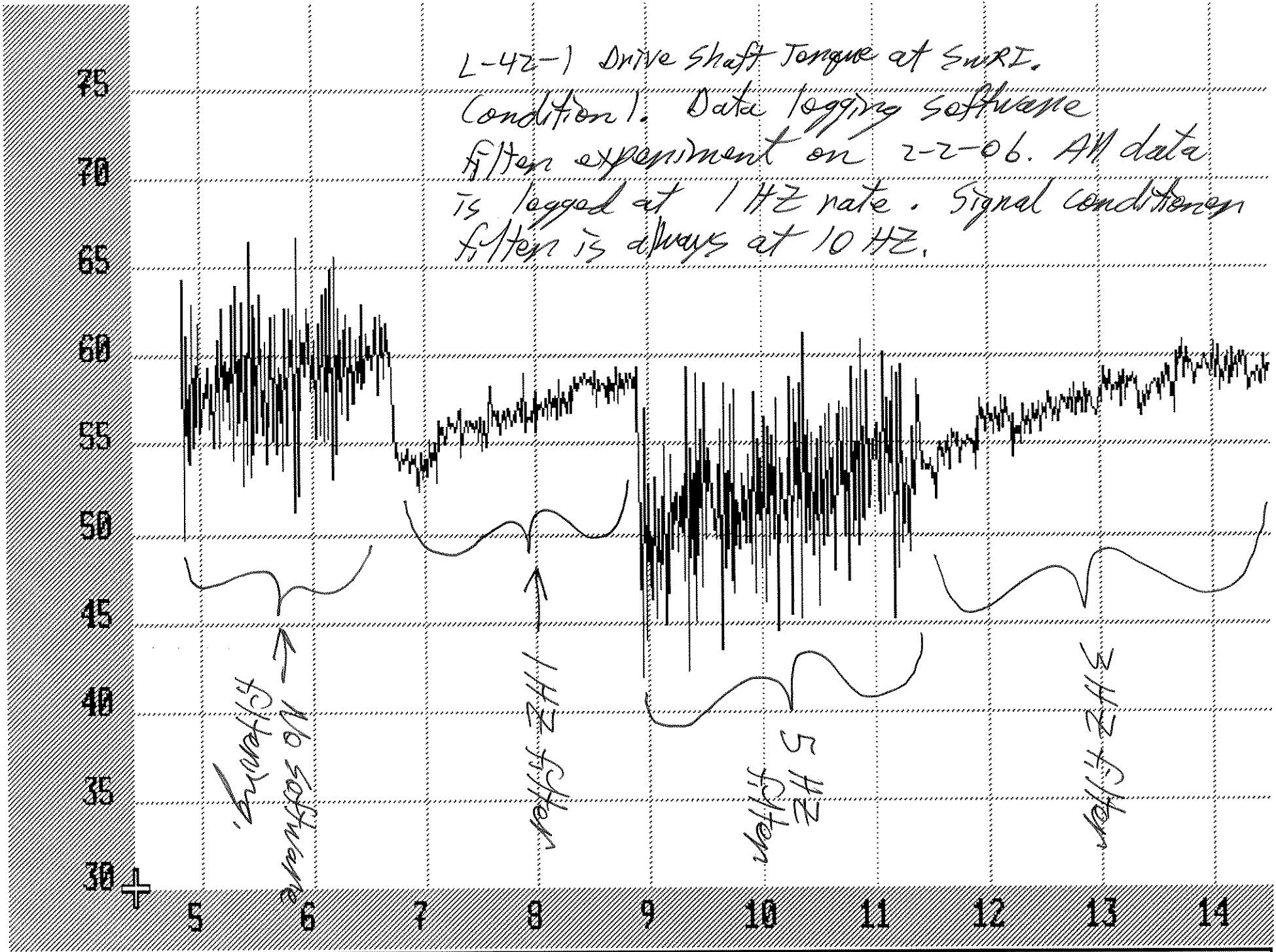


L-42-1 Shock Series 2 Torque

Lab Torque VS Scoring
Matrix Reference Oil 116 Results

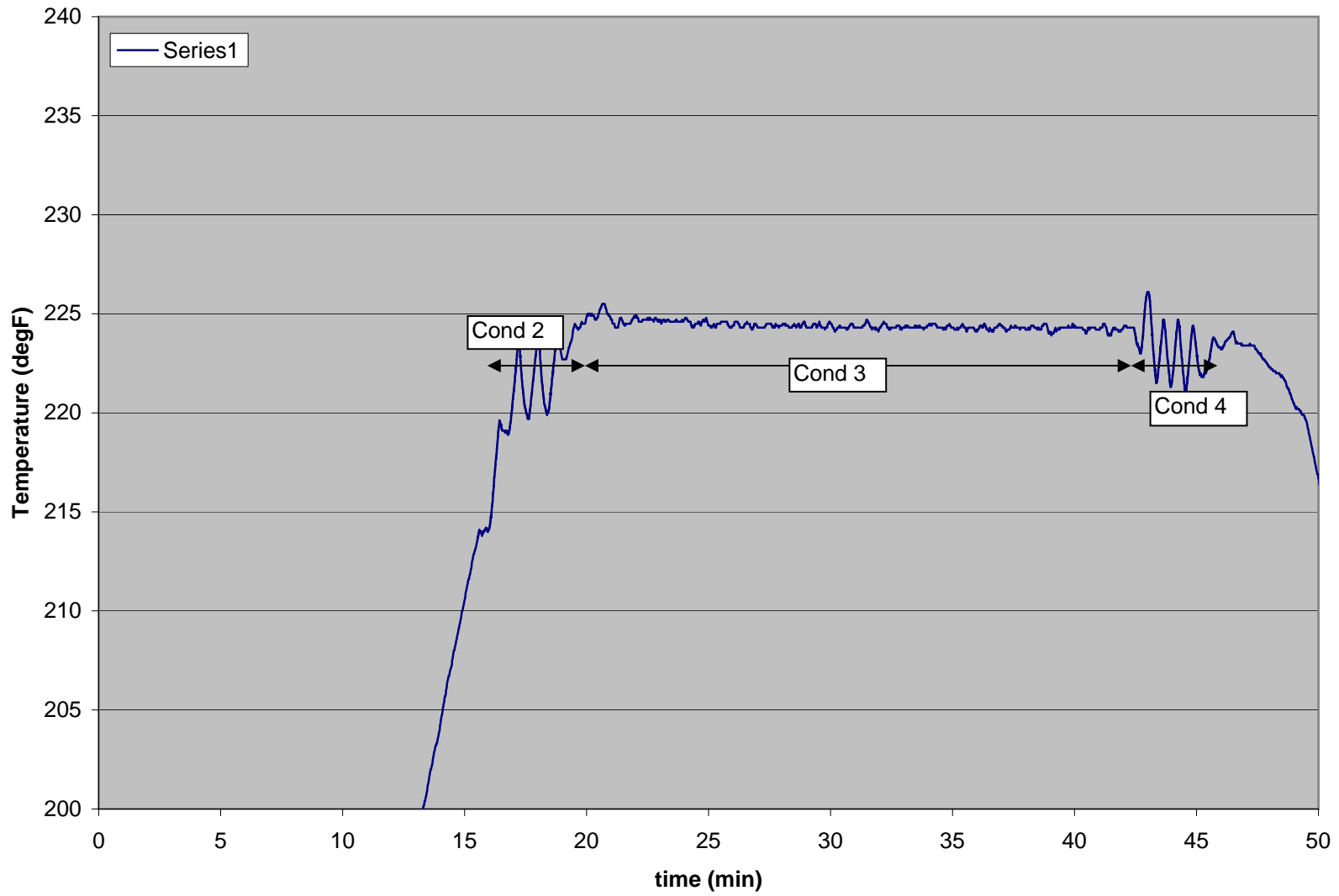


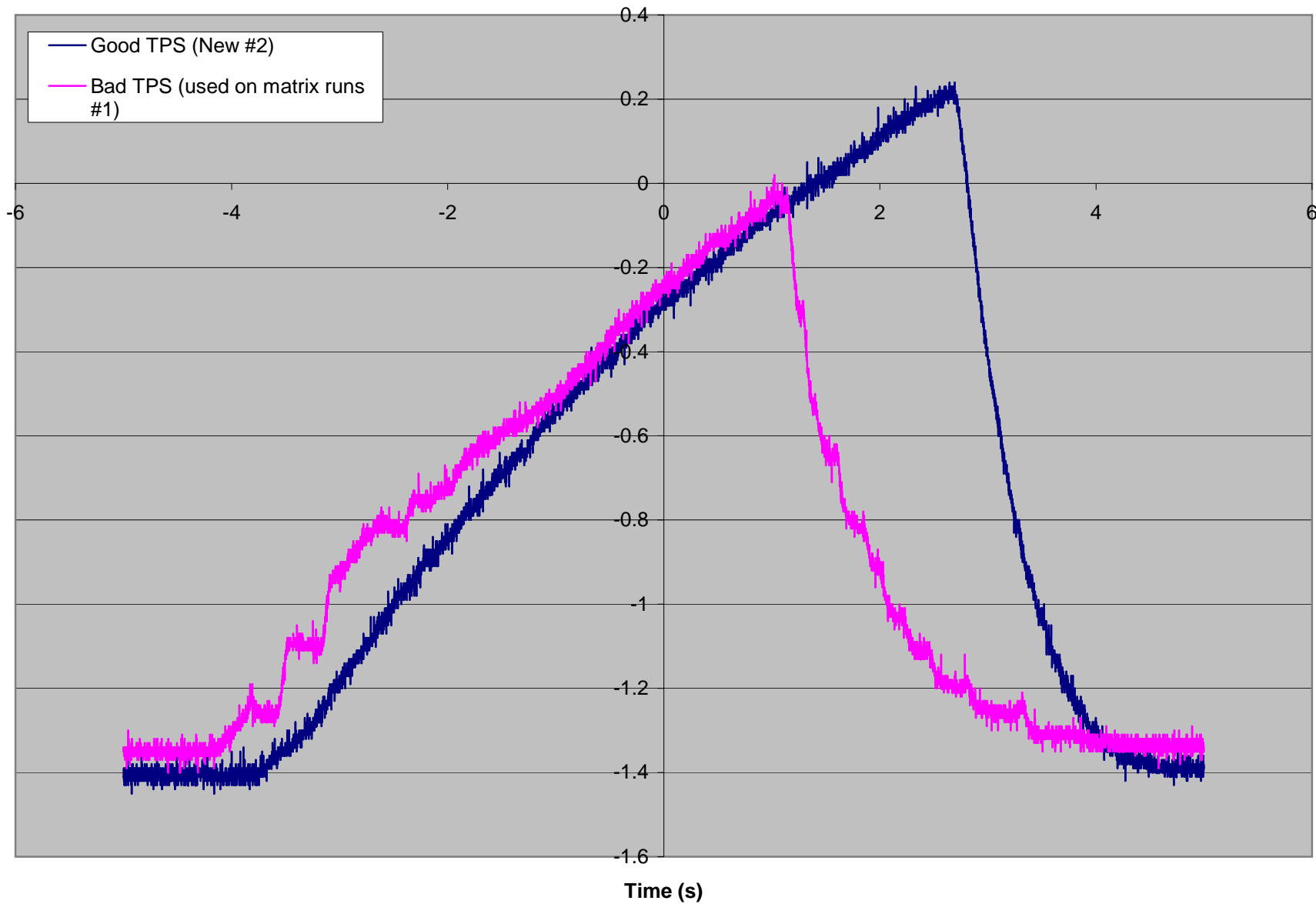
L-42-1 Drive Shaft Torque at SWRI.
 Condition 1. Data logging software
 filter experiment on 2-2-06. All data
 is logged at 1 Hz rate. Signal conditioner
 filter is always at 10 Hz.



AX300539 DrvTorg 2.93 lb-ft Time -1710372.250n

Axle temperature (TMC 112)





L-42 Low Temperature Data

Reference Oils 152 & 153

