



COMMITTEE D02 on PETROLEUM PRODUCTS, LIQUID FUELS, AND LUBRICANTS

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SEQUENCE IX SURVELLANCE PANEL

Date: 20 Nov 24

ATTENDANCE

SWRI	Christine Eickstead, Khaled Rais, Pat Lang, Mike Lochte
INTERTEK	Jason Soto, Al Lopez, Bill Buscher
LUBRIZOL	George Szappanos, Tony Catanese
AFTON	Jason Lekavich, Bob Campbell, Amanda Stone, Layne T(?), Ben Maddock
INFINEUM	Todd Dvorak, Paul MaKaruch, Andy Ritchie
TMC	Rich Grundza
ORONITE	Robert Stockwell, Ricardo Affinito
EXXONMOBIL	Paul Rubas
SHELL	Jeff Hsu
IMTS	Dave Passmore, Sid Clark
HALTERMAN SOLUTIONS	Ed Hennessy
GM	Tim Cushing
FORD	Mike Deegan
OHT	Jason Bowden
TEI	Derek Grosch, Dan Lanctot
TOYOTA	Venkat Deshpande

ATTACHMENTS:

- A: Meeting Agenda
- B: Downtime Presentation, Christine

MEETING:

- Attendance. See table above.
- Motion to approve minutes from last SP meeting (September 25, 2024), Khaled. Rich seconds. Approval unanimous.

Action items from last set of minutes:

None from last meeting. Previous meeting: Task Force for calculations - had one call, will have another call soon

- Haltermann – EEE, in process of rebuilding right now, should have new product by first week of December. They will communicate ahead of time.
- TMC update, Rich

224-2 includes 3 donated tests as well as op valid ref tests

Mean not far off at all, sigma is slightly higher

All previous data generated on BB pistons, if only consider BB tests, sigma not that much higher than before.

Mach2019 pistons – limited data but slightly more severe and higher sigma

IMTS pistons – don't look as severe as the MACH2019 but still somewhat higher than expected, sigma less even though that is not unexpected with smaller data set

Probably should update sigma, don't think we are making that much error with current targets. Rich is not making a motion to update sigma, will leave up to group. Updating sigma might make the magnitude of the SAs a bit smaller. Understanding that the SAs update pretty quickly with this test

221-1 – currently out of 221, been using retains. Only one 221-1 run complete.

Rich – caution, we burn through these ROs faster than any other test. Pay attention to quantities.

Projecting 224-2 to be done in 4 years at current rate (Rich would half this estimate)

Busher – if look at trends, IXAGED picking up the most quickly. Low activity on wear tests, gives labs more freedom to convert stands to IXAGED stands.

221-1 – how many do we need? Christine

Rich – we got 3 on 224-2, need 3? Busher – can introduce on reference tests like other test types? Rich – risky, 224-1 was dead on, but that was a smaller size blend. Rich doesn't see getting more than 2 donated tests on 221-1.

Rais – so Rich recommends updating sigma, but hasn't been run by stats group. Deegan agrees.

Rich – to send data to stats group for review

Deegan - Labs A and B have successfully calibrated on ITMS pistons?

Rich – done

➔ **Hardware discussion:**

Lubrizol – update on BC pistons:

George – attempted running BCs with intention of calibrating. As expected, were severe out of the box.

Got to a point where 220 was below threshold, but subsequent tests were all over the place. Abandoned engine.

IMTS piston engine – also severe, but did calibrate. 211 was severe (20s), then 224 was ~7. So still severe, but still calibrated.

So two labs have been able to calibrate with IMTS pistons.

Rich – they are different (forged) so may take three refs to bring in, just a different animal.

Rais - availability – no more IMTS pistons made?

IMTS – Sid – we are going to have to do a buy, will have to talk to the users of the test.

Afton – what is the lead time? Sid – 6-8 wks

Deegan – still two sets at IMTS? Sid will confirm.

Rais – minimum order quantity? Sid – have not discussed yet. Sid to get back to group.

Rich – we don't know what the life of the IMTS pistons will be. We saw with the dealer pistons – only 1 or 2 cycles out of them.

Andy – so the size of the order could vary by 1-4X, based on how long these things last.

Busher – so if the first order is conservative, labs will be able to do subsequent orders? Sid – yes, this won't be a one-time buy-out.

Sid – lower the quantity, the higher the cost. Each order will be considered a batch.

Rais – will need a spec in the procedure on the bore - clearance spec. Sid worked that out with SwRI the first time around.

Rich – will work to get a letter ballot for IL, annex to define IMTS pistons clearances.

Deegan – want to get other two sets into the system to try and get more data. Rich – sure they will work their way in...

Pat – we have a calibrated IMTS stand right now. Will see how long they last. We have one more set, and will be commissioning another engine with these when we need to.

Afton – also interested in running IMTS

Lubrizol – have no other choice

Busher – so have commitments to have a couple more sets brought in in near future.

Busher – does this mean the machined pistons will be phased out? Pat – no, but more variability with machined pistons

Rich – not dramatic difference in sigmas (also small sample size).

Christine – need to keep machined pistons as an option until we are sure IMTS pistons can last though life of test. Everyone agrees.

Pat – we are calibrating both side by side for now. Need to keep both as an option for now.

➔ Downtime, Christine

- See Appendix B
- Vote: to approve scenario in below slide:

Remedy:

▪ If Case 1:

- Modify procedure para. 4.2 from:
4.2 The test procedure is conducted in four iterations. Each iteration is 175,000 engine cycles in length.
to:
4.2 The test procedure is conducted in four cycles. Each cycle consists of Steps 1 through 6 of Table 9. Step 4 of Table 9 is referred to as one iteration.
- Modify procedure para. 11.3 from:
11.3 Test Cycle – For one complete test, carry out the test cycle shown in Table 9 until four valid iterations have been recorded four times (see 11.3.4). Each cycle is referred to as one iteration, the four cycles being denoted as iterations A, B, C, and D.
to:
11.3 Test Cycle – For one complete test, carry out the test cycle shown in Table 9 until four valid cycles have been recorded (see 11.3.4). Each cycle consists of Steps 1 through 6 of Table 9, and are denoted as cycles A, B, C, and D. Step 4 of Table 9 is referred to as one iteration.

Approve: 5

Waive: 4

Disapprove: 0

Deegan? Approve

More discussion. Everyone agrees with Christine 😊

➔ Rais – one more issue: AVL settings

Grounded input checked? Rais – should not be checked for these sensors

Rich - Action – have each lab verify what the setting is. Then can put picture in procedure to specify.

➔ Other items – George

Seems do not have an oil filter specified in IX and X procedures. Should clean that up.

Action – labs verify what filter used. 400 on aged, 910 on IX and X, then will add specification to procedure

➔ Next mtg – sometime in January

➔ Motion to adjourn. So moved.