ASTM Engine Oil Gelation Test (EOGT) WK86363 Update

EOFT and EOWTT Surveillance Panel Meeting

March 6, 2025

Yong-Li McFarland, Chair

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EOFT and EOWTT Surveillance Panel Membership

21 members

Beth Schwab, Afton Chemical
Michael Kunselman, Center for Quality Assurance
Robert Stockwell, Chevron Oronite
Quanchang Li, ExxonMobil
Michael Deegan, Ford
Melissa Chu, Infineum
Angela Willis, Infineum
Joe Franklin, Intertek
Karina Gil, Intertek
Yuliza Rocha, Intertek
Michael Johnscher, ISP
Litchi Xie, Lubrizol Additive (Zhuhai) Co., Ltd.
Victoria Fein, Lubrizol
Jason Bowden, OH Technologies Inc
Greg Miiller, Savant Group
Sean Alston, SGS North America
Jared Cavaliere, SwRI
Becky Grinfield, SwRI
Yong-Li McFarland*, SwRI
John Loop, TMC
Amy Ross, Valvoline

*Chair

New EOGT WK86363, ILS# 1854

- Ford request for a new Engine Oil Gelation Test (EOGT): request to add a new test filterability test to better screen oils for field issues
- Status:
  - Method: 1 draft (Afton method V9.6) uploaded on ASTM Collaboration Area
  - Oils: 11 potential reference oils offered; 17 oils received at TMC
  - Screening Tests and ILS: Pilot II tests ongoing
  - Timing: ILS tests to be run by April, and test available in August 2025

Agenda 3-6-25:

- 1. ILS: confirm samples, report form, details, and ship out
- 2. Feedback on EOGT method V9.6 or will use for ILS
- 3. Determine EOGT SP and TMC monitoring
- 4. Concerns from industry on if EOGT is representative of field issue

Pilot Updates 3-6-25

- Afton: completed Pilot II and Pilot III
- SwRI: completed Pilot II and Pilot III
- Savant: plan to rerun Pilot II by Feb 28
- Intertek: completed Pilot II
- Valvoline: completed Pilot II
- Infineum: completed Pilot II
- Lubrizol: completed Pilot II
- Richful: waiting for samples to arrive at lab

Criteria to move forward to ILS: Root cause group to finalize method and Ford to give recommendation to move forward

- 1-30-25: With more than 4 labs able to complete Pilot II, group (including Ford) approved to move forward with ILS.

ILS Details

Labs(8)

- **Afton**
- **Infineum**
- **Intertek**
- **Lubrizol**
- Richful
- Savant
- **SwRI**
- **Valvoline**

Samples (7)

- Oil U* (**low** flow): 2 containers
- Oil F (**low** flow): 2 containers
- Oil E (**mid** flow): **not** eligible to be reference oil, 3 containers
- Oil R (**mid** flow): 3 containers
- Oil K (**high** flow): 2 containers
- Oil M (**high** flow): 2 containers
- Oil P (**high** flow): 2 containers

Details

- Each Test is 2 runs, results will be reported as average of 2 runs. A duplicate test is 4 runs. A triplicate test is 6 runs.
- Each lab will run 32 runs for ILS
- Duplicate test will need two 120 mL containers and triplicate test needs three 120 mL containers
- Use procedure EOGT 9.7
- Use industry matrix for run order
- Labs to send completed EOGT ILS Report Form to TMC by **May 1.**
- SwRI to start Research Report

3-6-25 Notes: ILS will start and samples to be shipped out by TMC. Report form and latest procedure will be sent out to all labs in ILS.

EOGT ILS Matrix

OIL	Time Block	LAB	OIL	Time Block	LAB	OIL	Time Block	LAB	OIL	Time Block	LAB	OIL	Time Block	LAB	OIL	Time Block	LAB	OIL	Time Block	LAB	OIL	Time Block	LAB
7	1	1	4	1	2	6	1	3	6	1	4	5	1	5	6	1	6	7	1	7	2	1	8
2	1	1	2	1	2	3	1	3	1	1	4	4	1	5	5	1	6	3	1	7	1	1	8
1	2	1	3	2	2	1	2	3	7	2	4	7	2	5	2	2	6	6	2	7	1	2	8
4	2	1	5	2	2	7	2	3	6	2	4	3	2	5	4	2	6	2	2	7	5	2	8
3	3	1	1	3	2	2	3	3	2	3	4	6	3	5	5	3	6	3	3	7	6	3	8
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6	4	1	4	4	2	5	4	3	1	4	4	4	4	5	3	4	6	6	4	7	3	4	8
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6	7	1	3	7	2	5	7	3	5	7	4	1	7	5	1	7	6	4	7	7	6	7	8
7	8	1	6	8	2	6	8	3	6	8	4	7	8	5	6	8	6	6	8	7	7	8	8
6	8	1	7	8	2	7	8	3	7	8	4	6	8	5	7	8	6	7	8	7	6	8	8

Oil 6 and 7 are mid flow oils

EOGT procedure and Referencing

- Procedure updates
  - Apparatus and procedure clarifications: glass container inner diameter tolerance – request in ILS Report Form; update hot plate part #
  - Determine Report Section
  - Define Low, Mid, and High Flow- determine in future

- Referencing
- Will EOGT be TMC monitored? Yes.
  - How? 1 Reference Oil run per batch of candidate samples : *Section 14: Test a TMC-coded reference oil along with each batch of non-reference oil tests. Run the reference oil with, and in the same batch as, the non-reference oils.*
  - (EOWT and EOFT: review wording of referencing "simultaneous" and consider "daily batch")
  - Yes, needs to be TMC monitored like D6795 with a quantitative result/acceptance limit on reference oil, based on ACC code of practice and/or Test Readiness recommendations, may need to be run in duplicate for reference oil. Method will include TMC inclusion and LTMS will include reference criteria for this test.

- Which SP will EOGT fit in? New one? – Will create a new SP, need chair: Jared Cavaliere, Mike Deegan

- TMC to coordinate data dictionary after ILS

ILS Oils Data

IS THIS SAMPLE FROM SINGLE (S) or MULTIPLE (M) BLEND BATCH??
Available as REFERENCE OIL (Y/N)
OK to Analyze for Molybdenum and Boron
SAE Viscosity Grade
Base Oil Group
Single Base Oil Slate
Additive Available for Reblending
Finished Oil Properties
Kinematic Viscosity @100°C, cSt (ASTM D445)
Kinematic Viscosity @ 40°C, cSt (ASTM D445)
Viscosity Index (ASTM D2270)
CCS at -35°C, cP (ASTM D5293)
CCS at -30°C, cP (ASTM D5293)
CCS at -25°C, cP at grade temp. (ASTM D5293)
CCS at -20°C, cP at grade temp. (ASTM D5293)
HTHS @ 150°C, cP (ASTM D4683)
NOACK, % loss (D5800)
MRV (Pumping) at -40°C, cP at grade temp. (ASTM D4684)
MRV (Pumping) at -35°C, cP at grade temp. (ASTM D4684)
MRV (Pumping) at -30°C, cP at grade temp. (ASTM D4684)
MRV (Pumping) at -25°C, cP at grade temp. (ASTM D4684)
Calcium, % mass (ICP)
Magnesium, % mass (ICP)
Sulfur, % mass (REPORT METHOD HERE)
Relative VM Content*
Base Oil Properties
Base Oil Blend KV @ 100°C
Base Oil Blend KV @ 40°C
Base Oil Blend Viscosity Index (VI)
Base Oil Blend Saturates (ASTM D2007)
Base Oil Blend Saturates (ASTM D7419)
Base Oil Blend Sulfur content (REPORT METHOD HERE)
Expected Performance (Good/Unknown/Poor)

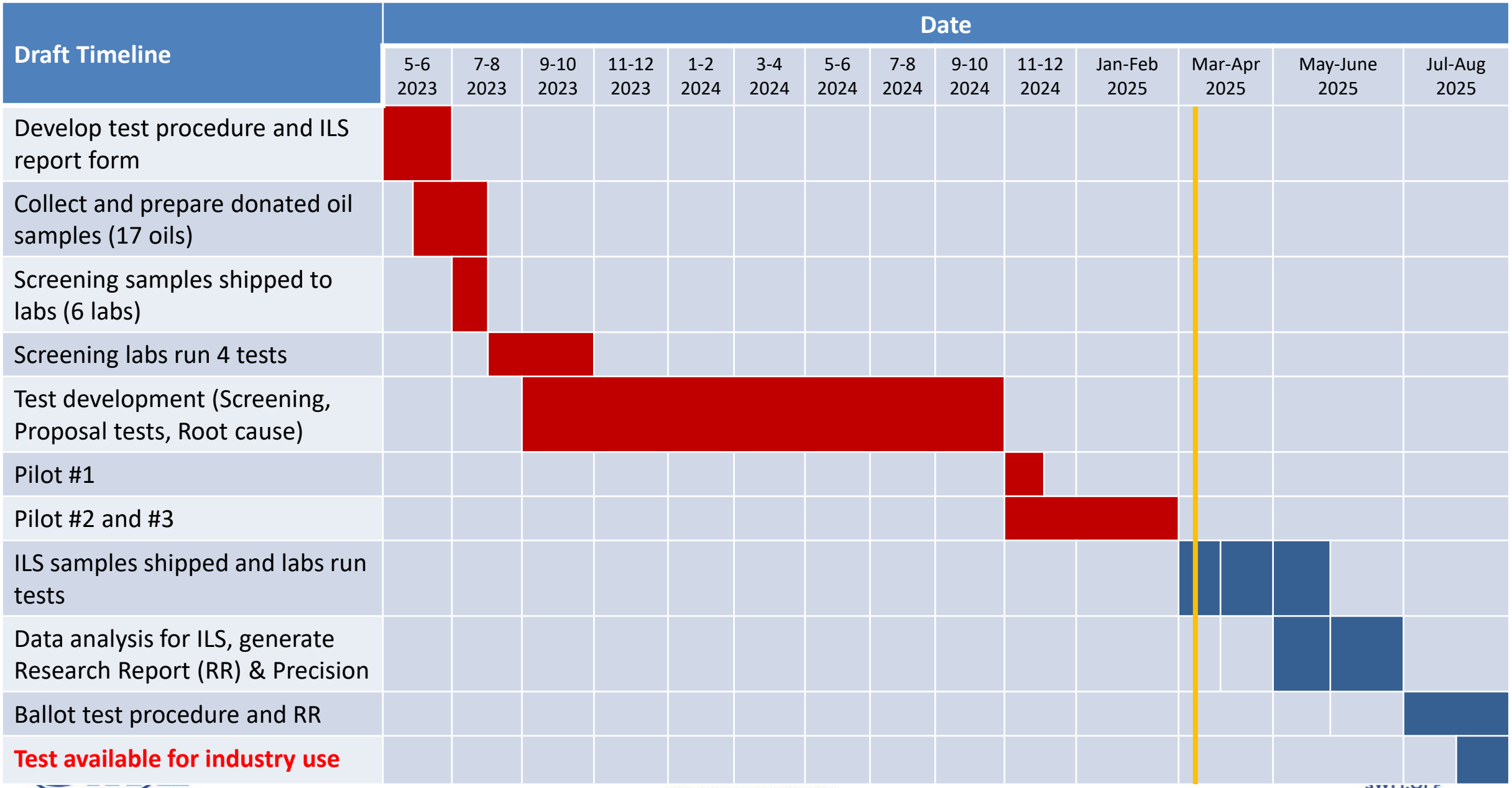
EOGT representative of field issue?

- During Feb 2025 API meetings, multiple questions regarding if the test is representative of the field issue, if gel samples were tested and similar to field samples
- Concern if EOGT test is correlated to original issue
- Gel analysis?

- What is group's response, next steps?

- Ford (Rob, Mike) to provide a response that can be shared with others.

Draft Timeline – updated Mar 5, 2025



Action Items and Next Meeting

- Richful and Savant to run Pilot II
- Oil participants to email John if donated oil P&C info and permission to share P&C's data with BOI-VGRA
- TMC to send out ILS samples to labs (except for Richful and Savant) using the test order in slide 7.
- Once samples are received, labs start ILS tests
- Yongli to send out ILS Report Form (Excel) and latest EOGT method (PDF) to group
- Ford (Mike and/or Rob) to provide a response to questions on if the EOGT is representative of the field issue

- Next Meeting: Thursday March 27 at 9AM CST for 1 hr

Thank you for your support!

Participants		
Method Development (11)	Oil Donations (9)	Testing Labs (10)
Afton ExxonMobil Ford Infineum Intertek ISP Lubrizol Oronite Savant SwRI TMC	Afton Ford Infineum Lubrizol OH Technologies (donate filters only) Oronite Subaru TMC (collection, shipping only) Toyota	Afton Infineum Intertek ISP Lubrizol Richful Savant SwRI TMC (monitoring system only) Valvoline