

ASTM Engine Oil Gelation Test (EOGT) WK86363 Update

EOFT and EOWTT Surveillance Panel Meeting
September 16, 2025

Yong-Li McFarland, Chair



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EOFT and EOWTT Surveillance Panel Membership

21 members

Sarah Fitzgerald, Afton Chemical
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
Michael Kunselman, KJA Group

Litchi Xie, Lubrizol Additive (Zhuhai) Co., Ltd.
Victoria Fein, Lubrizol
Jason Bowden, OH Technologies Inc
Clarence McCollum, Richful (Xinxiang Richful)
Greg Miiller, Savant Group
Sean Alston, SGS North America
Becky Grinfield, SwRI
Yong-Li McFarland*, SwRI
John Loop, TMC
Jared Cavaliere, Valvoline

*Chair



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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 V9.7) uploaded on ASTM Collaboration Area
 - Oils: 11 potential reference oils offered; 17 oils received at TMC
 - Screening Tests and ILS: ILS tests ongoing
 - Timing: ILS tests to be run by August, and test available in October 2025

Agenda:

- 1. Review ILS data
- 2. Check temp before and after shearing



ILS Updates – any additional data?

- Afton: submitted ILS
- SwRI: completed ILS
- Savant: completed ILS
- Intertek: completed ILS
- Valvoline: completed ILS
- Infineum: completed ILS
- Lubrizol: completed ILS
- Richful: completed ILS



ILS Data Decision

- ILS objectives:

- 1) Determine report value: *Report the average volume at 120 s*
- 2) Establish precision (*determinability*, repeatability, and reproducibility) statement
- 3) Select reference oil(s) for test: *One of the Oil X,Y,Z reference oils to be run with each batch of candidate samples*

- Review EOGT Analysis Slides

- Options:

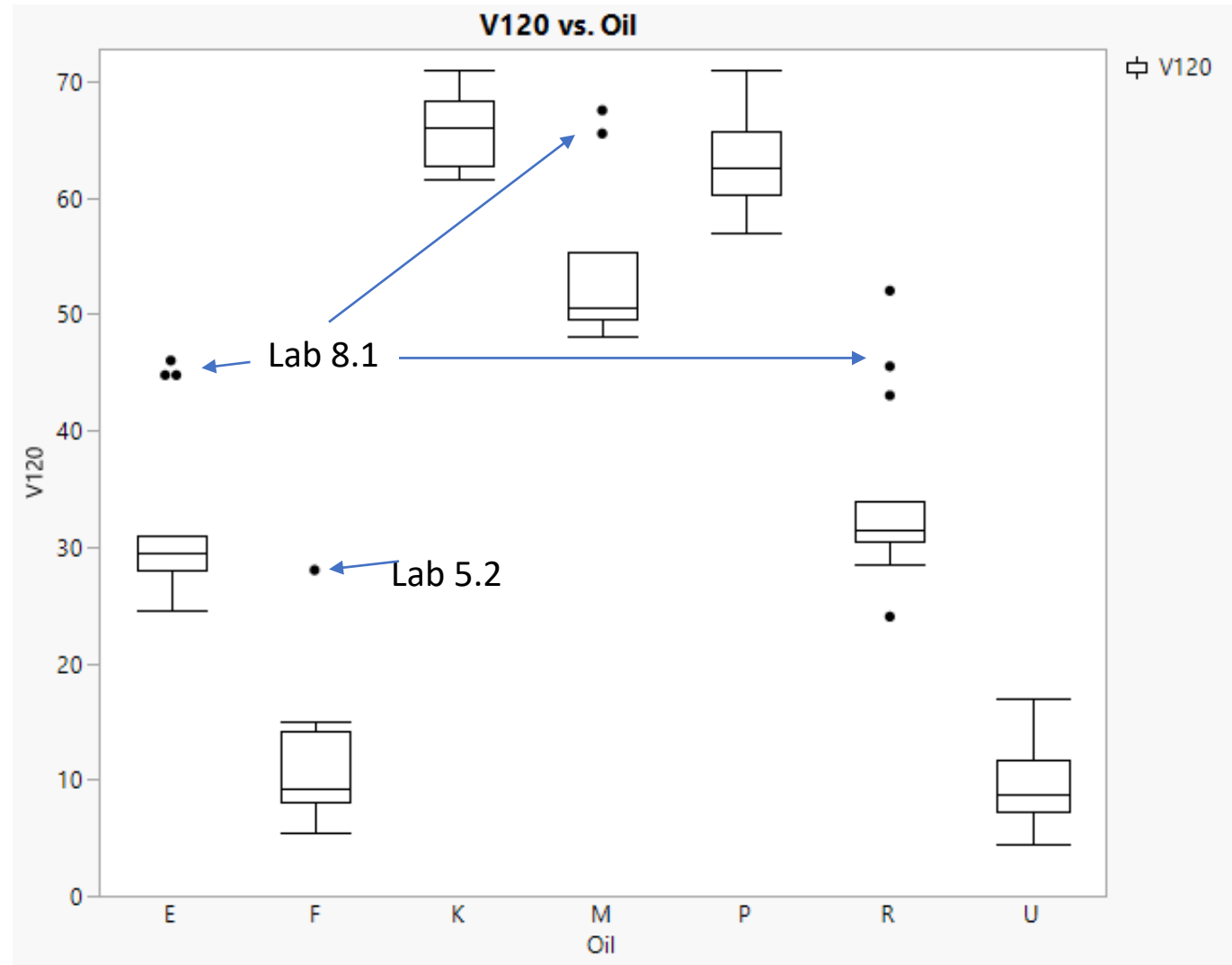
- 1) *Include all 8 labs' data in ILS data analysis*
- 2) *Include labs meeting funnel ID data (Labs, 1.1, 3.1, 5.2, 7.1, 8.1) in ILS data analysis*
- 3) *Select labs (Labs 1.1, 3.1, 5.2, 7.1) data in ILS target generation*
- 4) *Rerun ILS for all labs*



Slide from EOGT Analysis slides

Boxplots of Volume (ml) at 120 Seconds

- Valid Determinability Data



Slide from EOGT Analysis slides

Estimates

Parameter	Target	Oil F	Oil U	Oil E	Oil R	Oil K	Oil M	Oil P
Labs 1, 3, 5, 7, 8								
Volume at 120s (ml)	s_r	5.385	2.197	1.633	2.994		1.14	
Volume at 120s (ml)	s_R	7.296	3.935	7.494	7.703		7.413	
Volume at 120s (ml)	r	15.231	6.2141	4.6188	8.4683		3.2244	
Volume at 120s (ml)	R	20.636	11.13	21.196	21.787		20.967	
Parameter	Target	Oil F	Oil U	Oil E	Oil R	Oil K	Oil M	Oil P
Labs 1, 3, 5, 7								
Volume at 120s (ml)	s_r	5.385	2.001	1.785	2.411	2.990	1.061	2.652
Volume at 120s (ml)	s_R	7.801	3.978	1.785	2.665	2.990	1.208	2.652
Volume at 120s (ml)	r	15.231	5.660	5.049	6.819	8.457	3.001	7.501
Volume at 120s (ml)	R	22.065	11.251	5.049	7.538	8.457	3.417	7.501
Parameter	Target	Oil F	Oil U	Oil E	Oil R	Oil K	Oil M	Oil P
Labs 1, 3, 5 (not for Oils F and U), 7								
Volume at 120s (ml)	LS Mean	8.452	8.257	28.750	30.875	64.500	50.125	61.313
Volume at 120s (ml)	s_r	1.118	1.969	1.785	2.411	2.990	1.061	2.652
Volume at 120s (ml)	s_R	2.391	1.969	1.785	2.665	2.990	1.208	2.652
Volume at 120s (ml)	r	3.162	5.569	5.049	6.819	8.457	3.001	7.501
Volume at 120s (ml)	R	6.763	5.569	5.049	7.538	8.457	3.417	7.501

Slide from EOGT Analysis slides

Referencing/Calibration Options

1. LTMS Type System for Oils F(Slow), E (Mid), K(Fast) and/or M (Fast) with Severity Adjustments
2. Simple Go/No Go for Oils F(Slow), E (Mid), K(Fast) and/or M (Fast)
3. Options to Monitor the Difference Between Oil F and Oil K
 - i. (Oil K – Oil F Target) = $(64.5 - 8.452) \pm 2 \cdot \text{SQRT}(1.118^2 + 2.990^2)$
 - ii. (Oil K – Oil F Target) = $(64.5 - 8.452) \pm 2 \cdot \text{SQRT}(2 \cdot 2.990^2)$
 - iii. (Oil K – Oil F Target) > 8.5 (Oil K Repeatability/Reproducibility)
4. Options to Monitor the Difference Between Oil F and Oil E
 - i. (Oil E – Oil F Target) = $(28.75 - 8.452) \pm 2 \cdot \text{SQRT}(1.118^2 + 1.785^2)$
 - ii. (Oil E – Oil F Target) = $(28.75 - 8.452) \pm 2 \cdot \text{SQRT}(2 \cdot 1.785^2)$
 - iii. (Oil E – Oil F Target) > 5.05 (Oil E Repeatability/Reproducibility)

Temperature of Sheared Samples

Run #	Before Shearing Temp (°C)	After Shearing Temp (°C)	Temp Increase (°C)	
1	22.5	33.0	10.5	1 st sample, did not gel
2	22.6	33.5	10.9	
3	22.8	37.5	14.7	2 nd sample, slight gel
4	22.8	37.3	14.5	
5	22.8	39.6	16.8	3 rd sample, serious gel
6	22.8	39.8	17	

From another lab

Oil	Average Temperature Increase, °C
Oil U	7.6
Oil F	9.8
Oil P	12
Oil K	13.4
Oil M	15.9
Oil R	16.2
Oil E	18.7

From Intertek

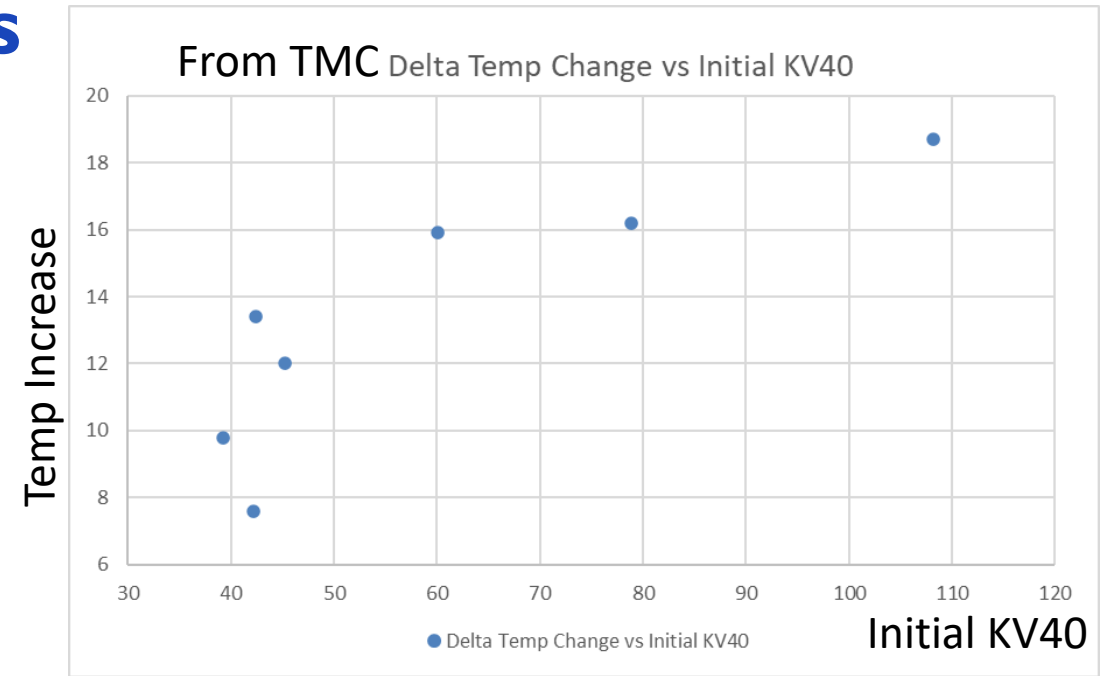


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Temperature of sheared samples

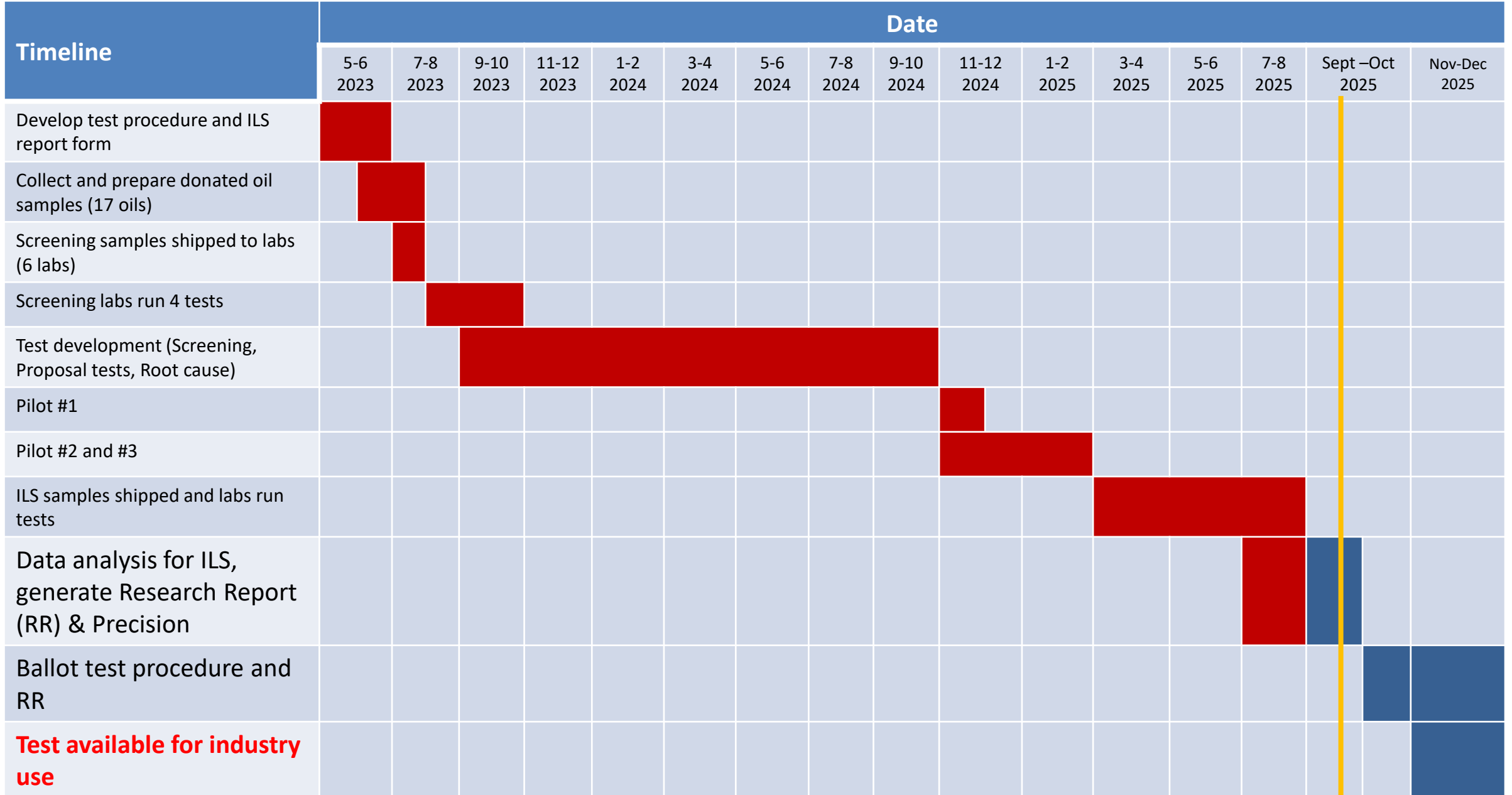
- From Intertek:

Oil	Average Temperature Increase, °C
Oil U	7.6
Oil F	9.8
Oil P	12
Oil K	13.4
Oil M	15.9
Oil R	16.2
Oil E	18.7



- The chart is color-coded according to the flow rate speeds; fast (green), mid (yellow) and slow (red).
- Notes for the temperature study:
 - The sample size is different from that used in the shearing of the EOGT ILS due to the loss of sample from transferring from the graduated cylinder where flow rates were measured during the original run.
 - Temperature measurements were done with a digital thermometer; the highest observed temperature reading was recorded for all oils.

Timeline – updated Sept 17, 2025



Action Items and Next Meeting

- Ongoing: Jared and John to work on data dictionary, all to give comments on procedure or video to Yong-Li, labs to review if data submitted accurately, let Yong-Li know of any precise funnel products and suppliers
- All: review the Data analysis slides and decide on a preferred referencing/calibration option for your organization. We will discuss at the next meeting and make a group decision.
- Ford: check internally on what is the end goal for EOGT results, to be better than Oil F results, or if so, by a certain amount, or what amount of protection/screening does this test need to provide. This question will help determine what type of result is needed in method and how robust referencing is needed.
- Any lab: optional to perform temp checks before and after final shearing step on low, mid, and high flow oils

- Next Meeting: Wed Oct 1 at 9am CDT for 1.5 hr



Thank you for your support!

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

