

Sequence III Surveillance Panel

January 20, 2016

11:00 – 12:30 EST

Agenda

1.0) Attendance

The attendance is shown in **Attachment 1**.

2.0) Chairman Comments

George Szappanos substituted as chair for this meeting.

3.0) Approval of minutes

3.1) Minutes from 01/13/2016 Conference Call

One correction, to Toyota's presentation, was posted to the minutes, which were approved without objection.

4.0) Action Item Review

4.1) Fuel Injector Cleaning Procedure. Schweitzer

The procedure is shown in **Attachment 2**. Addison Schweitzer moved (Altman seconded) that the panel approve this (slides 6 and 7 spell out the details) as the cleaning procedure for the IIIF and IIIG methods, effective 1/20/16. The motion carried without objection. The TMC will issue appropriate information letters.

5.0) Old Business

5.1) Analysis of IIIF & IIIG run 7-10 data.

The stats group will meet January 27, 2016.

6.0) New Business

6.1) George Szappanos IIH group activity update:

Lab D mild result

- In depth study of Operational data complete
- Source of variability either not measured or measured inaccurately
- Group continues to search for source of variability

Stand differences

- Labs continuing to review photos of PM stands
- Blowby gas evacuation system differences discovered; will standardize

Operational differences

- ECM "de-rate" or "limp home mode" investigation. Chrysler help needed
- Labs to capture data from CANbus; in process
- Need Chrysler's help to capture proprietary parameters from ECU
- It was mentioned that oil pressure differences were noted during the matrix. Possible causes are being investigated

Engine build differences

- Minor differences noted between labs with cylinder bore and finish measurements
- Labs to bore/hone block, measure surface finish and then send to Jeff Betz for measurement
- Surface finish data suggests adjustment to some finish specs may be in order
- SwRI has agreed to lead a build workshop in the near future

Engine swapping between labs

- Afton and SwRI swapping built engines to run on stands configured as they were during PM testing. The engines are expected to ship sometime the week of January 25th

6.2) Test stand/lab referencing (SP decision)
This will be deferred to a later meeting.

7.0) Next Meeting

7.1) Wednesday, January 27, 2016 11:00 EST

8.0) Meeting Adjourned

The meeting concluded at 12:00 pm.

Name/Address	Phone/Fax/Email		Signature
Ed Altman	804-788-5279	Voting Member	Present <input checked="" type="checkbox"/> X <input type="checkbox"/>
Jeff Betz	jeff.betz@fcagroup.com	Voting Member	Present <input type="checkbox"/>
Jason Bowden	440-354-7007	Voting Member	Present <input checked="" type="checkbox"/> X <input type="checkbox"/>
Timothy L. Caudill	606-329-1960 x5708	Voting Member	Present <input type="checkbox"/>
Richard Grundza	412-365-1031	Voting Member	Present <input type="checkbox"/>
Jeff Hsu, PE	j.hsu@shell.com	Voting Member	Present <input type="checkbox"/>
Tracey King	947-517-4107	Voting Member	Present <input type="checkbox"/>
Teri Kowalski	734-995-4032	Voting Member	Present <input type="checkbox"/>
Patrick Lang	210-522-2820	Voting Member	Present <input type="checkbox"/>
Addison Schweitzer	210-706-1586	Voting Member	Present <input checked="" type="checkbox"/> X <input type="checkbox"/>
Bruce Matthews	248-830-9197	Voting Member	Present <input type="checkbox"/>
David Tsui	973-305-2337	Voting Member	Present <input type="checkbox"/>
Cliff Salvesen		Voting Member	Present <input checked="" type="checkbox"/> X <input type="checkbox"/>
Andrew Ritchie	908-474-2097	Voting Member	Present <input checked="" type="checkbox"/> X <input type="checkbox"/>
Ron Romano	313-845-4068	Voting Member	Present <input checked="" type="checkbox"/> X <input type="checkbox"/>
Greg Shank	301-790-5817	Voting Member	Present <input type="checkbox"/>
Kaustav Sinha, Ph.D.	713-432-6642	Voting Member	Present <input checked="" type="checkbox"/> X <input type="checkbox"/>
Thomas Smith	859-357-2766	Voting Member	Present <input type="checkbox"/>
Scott Stap	scott.stap@tgidirect.com	Voting Member	Present <input type="checkbox"/>
Mark Sutherland	210-867-8357	Voting Member	Present <input type="checkbox"/>
George Szappanos	440-347-2352	Voting Member	Present <input checked="" type="checkbox"/> X <input type="checkbox"/>
Haiying Tang	248-512-0593	Voting Member	Present <input checked="" type="checkbox"/> X <input type="checkbox"/>

ASTM Sequence III Surveillance Panel (22 Voting members)

date:

Name/Address	Phone/Fax/Email		Signature
Ricardo Affinito	affinito@chevron.com	Non-Voting Member	Present_____
Art Andrews	856-224-3013	Non-Voting Member	Present_____
Dan Lanctot	TEI	Non-Voting Member	Present_____X_____
Doyle Boese	908-474-3176	Non-Voting Member	Present_____X_____
Adam Bowden	440-354-7007	Non-Voting Member	Present_____
Dwight H. Bowden	440-354-7007	Non-Voting Member	Present_____
Matt Bowden	440-354-7007	Non-Voting Member	Present_____X_____
Jerome A. Brys	440 347-2631	Non-Voting Member	Present_____
Bill Buscher III	210-240-8990	Non-Voting Member	Present_____
Bob Campbell	804-788-5340	Non-Voting Member	Present_____
Chris Castanien	Chris.Castanien@gmail.com	Non-Voting Member	Present_____X_____
Martin Chadwick	210-706-1543	Non-Voting Member	Present_____
Jeff Clark	412-365-1032	Non-Voting Member	Present_____X_____
Sid Clark	586-873-1255	Non-Voting Member	Present_____X_____
Todd Dvorak	804-788- 6367	Non-Voting Member	Present_____X_____
Frank Farber	412-365-1030	Non-Voting Member	Present_____
Joe Franklin	210-523-4671	Non-Voting Member	Present_____
David L. Glaenzer	804-788-5214	Non-Voting Member	Present_____
Karin E. Haumann	281-544-6986	Non-Voting Member	Present_____X_____
Walter Lerche	313-667-1918	Non-Voting Member	Present_____
Josephine G. Martinez	510-242-5563	Non-Voting Member	Present_____X_____
Mike McMillan	mmcmillan123@comcast.net	Non-Voting Member	Present_____X_____
Bob Olree	248-689-3078	Non-Voting Member	Present_____
Kevin O'Malley	kevin.omalley@lubrizol.com	Non-Voting Member	Present_____
Christian Porter	804-788-5837	Non-Voting Member	Present_____
Phil Rabbat	914-785-2217	Non-Voting Member	Present_____
Allison Rajakumar	440-347-4679	Non-Voting Member	Present_____
Scott Rajala	srajala@ilacorp.com	Non-Voting Member	Present_____

ASTM Sequence III Surveillance Panel (22 Voting members)

date:

Name/Address	Phone/Fax/Email	Non-Voting Member	Signature
Jim Rutherford	510-242-3410	Non-Voting Member	Present_____
Amol Savant	606-320-1960 x5604	Non-Voting Member	Present_____
Philip R. Scinto	440-347-2161	Non-Voting Member	Present_____
Don Smolenski	248-255-7892	Non-Voting Member	Present_____
Jim Linden		Non-Voting Member	Present_____
Tom Wingfield	wingftm@cpchem.com	Non-Voting Member	Present_____
Charlie Leverett		Non-Voting Member	Present_____
Terry Bates	ASTM Facilitator	Non-Voting Member	Present_____
Chris Taylor	VP Fuels	Non-Voting Member	Present_____X_____
Amol Savant			Present_____X_____
Ankit Chaudhry			Present_____X_____
Robert Stockwell			Present_____X_____
Gordon Farnsworth			Present_____X_____
Kostan, Travis G.			Present_____X_____
Dave Passmore			Present_____X_____

ATTACHMENT 2

Sequence III F/G Fuel Injector Cleaning Procedure

»» Part Number: 17120601

Overview

- ▶ Seq. III fuel injector (GM#17120601) has become unavailable and the current inventory needs to be utilized through the end of the life of the Seq. III F/G.
- ▶ A cleaning procedure was suggested to prolong the usage of the current inventory of fuel injectors.
- ▶ Cleaning Experiment:
 - Four faulty Seq. III fuel injectors (GM# 17120601) were used for the experiment.
 - 3 injectors displayed dripping/leaking
 - 1 injector displayed an unusual flow pattern
 - These injectors would have been discarded per the current procedure.
 - Flow tested three times prior to ultrasonic cleaning.
 - Ultrasonic cleaned for 20 minutes using Stoddard Solvent.
 - Flow tested three times following ultrasonic cleaning.
- ▶ Results



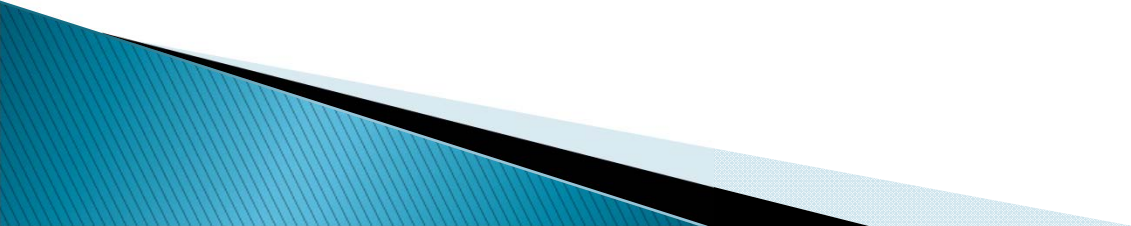
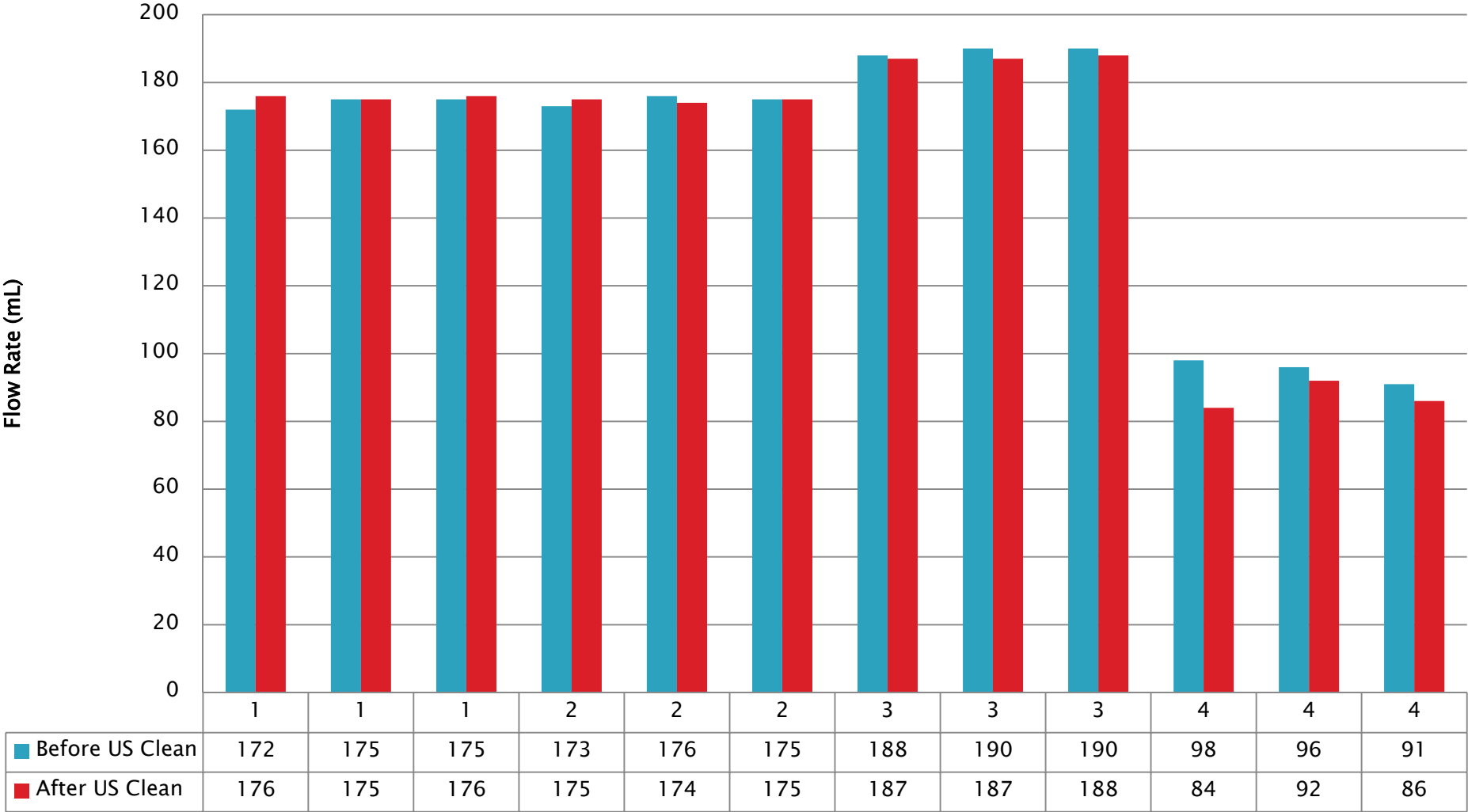
Flow Data Before US Cleaning

FUEL INJECTOR FLOW DATA (BEFORE US CLEANING)					
INJECTOR NUMBER	FLOW RATE (ml)	FLOW PATTERN	INJECTOR LEAKAGE	PASS/FAIL	COMMENTS
1	172	Acceptable	Dripping/Leaking	FAIL	
	175	Acceptable	Dripping/Leaking	FAIL	
	175	Acceptable	Dripping/Leaking	FAIL	
2	173	Acceptable	Dripping/Leaking	FAIL	
	176	Acceptable	Dripping/Leaking	FAIL	
	175	Acceptable	Dripping/Leaking	FAIL	
3	188	Acceptable	Dripping/Leaking	FAIL	
	190	Acceptable	Dripping/Leaking	FAIL	
	190	Acceptable	Dripping/Leaking	FAIL	
4	98	Not Acceptable	None	FAIL	
	96	Not Acceptable	None	FAIL	
	91	Not Acceptable	None	FAIL	

Flow Data After US Cleaning

FUEL INJECTOR FLOW DATA (AFTER US CLEANING)					
INJECTOR NUMBER	FLOW RATE (ml)	FLOW PATTERN	INJECTOR LEAKAGE	PASS/FAIL	COMMENTS
1	176	Acceptable	None	PASS	
	175	Acceptable	None	PASS	
	176	Acceptable	None	PASS	
2	175	Acceptable	None	PASS	
	174	Acceptable	None	PASS	
	175	Acceptable	None	PASS	
3	187	Acceptable	None	PASS	
	187	Acceptable	None	PASS	
	188	Acceptable	None	PASS	
4	84	Not Acceptable	None	FAIL	
	92	Not Acceptable	None	FAIL	
	86	Not Acceptable	None	FAIL	

Fuel Injector Flow Data



Proposed Seq. III Fuel Injector Cleaning Procedure

- ▶ For any fuel injector (GM# 17120601) that fails the injector flow testing specifications outlined in section 6.14.1 of the Seq. III F/G test procedures the following cleaning procedure may be administered:
 - Step 1: Flow test fuel injector(s) in question and record reasons for injector failing current specifications.
 - Step 2: Ultrasonic clean the fuel injector(s) in Stoddard solvent for 20 minutes.
 - Ultrasonic Cleaner (3000 mL) from Lab Safety Supply Model #32V118 has been found suitable.
 - Step 3: Flow test fuel injector(s) after ultrasonic cleaning to ensure they pass the flow pattern, drip, and leak test per section 6.14.1 of the Seq. III F/G test procedure prior to use.

Motion to Seq. III SP

- ▶ MOTION:

- IAR recommends the Sequence III Surveillance Panel to approve the ultrasonic cleaning method for Seq. III fuel injector (GM# 17120601) and that the proposed fuel injector cleaning procedure be added to the IIF/G test procedures under section 6.14.1 with the effective date of 1/20/2016.

