

# MM DATA: IS THERE EVIDENCE THAT THE TRANSMITTER TYPE HAS AN EFFECT ON AERATION?

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Performance you can rely on.



**Goal:** Analyse existing data to answer questions (be clear about what we are trying to do)

- Question #1: Is there evidence that the transmitter type has an effect on aeration? If the answer seems to be yes, why? What are the next steps to resolve?
- Question#2: ???
- ...

**How:**

1. Identify existing data:
  - LTMS file; MM Testing data
2. Combine the data (parts, aeration%) collected so far
  - Identify missing data
3. Clarify if additional data is needed

# MM testing data shared in April 2016: review nomenclature and what has changed from one test to another: model, transmitter or both?

## Industry MM Usage



Lab		Sensor Model #	Transmitter Model #	Date Installed	Flange Description
SwRI	MicroMotion used during COAT Precision Matrix	CMF025M319NU	RFT9739E4SMA	4/15/2013 is the date that the first test data was recorded.	319 is #8 VCO fitting
SwRI	Active MicroMotion used in test stand	Same	Same	Reinstalled after calibration at Emerson on 2/1/2016	319 is #8 VCO fitting
ICES	MicroMotion used during COAT Precision Matrix	CMF025M313NU	RFT9739E4SUJ	7/2014 Started; 1/2015 Ended	313 is 1/2" Weld Neck Flange
ICES	MicroMotion used during Aeration Testing	CMF025M313NU	RFT9739E4SUJ	7/30/2015 Removed after seeing a density shift during 50 hour test and could not determine cause.	313 is 1/2" Weld Neck Flange
ICES	MicroMotion used during COAT VGRA Matrix	CMF025M313N2 BAE3ZZ	5700R12ABAAZZZ w/ PUCK800	8/21/2015 Installed; 10/2015 started VGRA; 12/2015 ended VGRA	313 is 1/2" Weld Neck Flange
ICES	Active MicroMotion used for test stand	CMF025M313N2 BAE3ZZ	5700R12ABAAZZZ w/ PUCK800	Next MM Calibration expected in 8/2016	313 is 1/2" Weld Neck Flange
LZ	MicroMotion used during COAT Precision Matrix	CMF025M319NU	RFT9739E4SUJ	Installed July 2014 and utilized for both the Prove-Out and Precision Matrix	319 is #8 VCO fitting
LZ	NEW MicroMotion (Acquired Jan 2016)	CMF025M319NB AEZZZ	PUCK800	Newly Acquired (not utilized for testing)	319 is #8 VCO fitting

Any new data?

It was stated in the July 6<sup>th</sup> telecon that SwRI experienced a 1.5% shift up with the Puck800. In this experiment, was the sensor model the **SAME**?

Both changed

What is the difference between CMF025M319NU and CMF025M319NB AEZZZ?

Does Flange affect aeration?

# LTMS Data: What is currently being collected



- MM SERIAL NUMBER is being collected
  - Clarify what it means: two labs using numbers; one lab using model (refer to next slide)
  - Should extra columns be added?
- We should select additional characteristics that are currently needed
- LTMS file could house MM experimental data
  - Properly labelling all the changes that have occurred during the tests: parts, etc.
  - Following slides explain

# LTMS data: Lab G

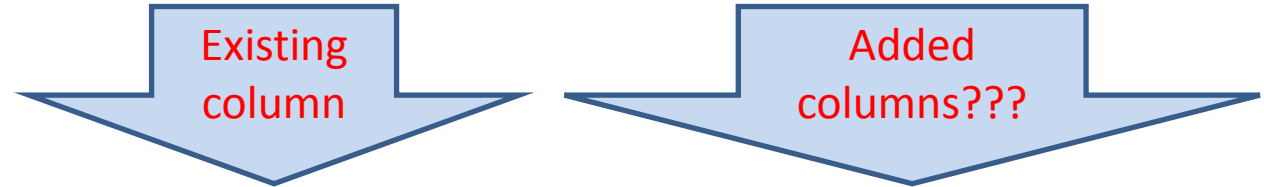


Does the table below capture the data properly?  
Should additional columns be included?  
Flange type? How many fields to describe flange?  
“Puck/Transmitter” = 5700R



TESTKEY	LTMSLAB	LTMSDATE	<b>MMSERNO</b>	transmitter model	transmitter SERNO	meter SERNO
103954-COAT	G	20141206	CMF025M;RFT9739E4SUJ	RFT9739E4SUJ		14476409
103455-COAT	G	20141208	CMF025M;RFT9739E4SUJ	RFT9739E4SUJ		14476409
103468-COAT	G	20141211	CMF025M;RFT9739E4SUJ	RFT9739E4SUJ		14476409
103462-COAT	G	20141214	CMF025M;RFT9739E4SUJ	RFT9739E4SUJ		14476409
104083-COAT	G	20141216	CMF025M;RFT9739E4SUJ	RFT9739E4SUJ		14476409
103629-COAT	G	20141219	CMF025M;RFT9739E4SUJ	RFT9739E4SUJ		14476409
106458-COAT	G	20150130	CMF025M;RFT9739E4SUJ	RFT9739E4SUJ		14476409
100263-COAT	G	20150311	CMF025M;RFT9739E4SUJ	RFT9739E4SUJ		14476409
110235-COAT	G	20150902	CMF025M;5700R	5700R	12120911	
110728-COAT	G	20150906	CMF025M;5700R	5700R	12120911	
109830-COAT	G	20150912	CMF025M;5700R	5700R	12120911	
111346-COAT	G	20151014	CMF025M;5700R	5700R	12120911	
111347-COAT	G	20151205	CMF025M;5700R	5700R	12120911	
112704-COAT	G	20160317	CMF025M;5700R	5700R	12120911	
112705-COAT	G	20160702	CMF025M;5700R	5700R	12120911	

# LTMS data: Lab B



TESTKEY	LTMSLAB	LTMSDATE	MMSERNO	transmitter model	transmitter SERNO	meter SERNO
104081-COAT	B	20141109	14268605			Same as MM SER NO
103459-COAT	B	20141113	14268605			
103625-COAT	B	20141115	14268605			
103957-COAT	B	20141120	14268605			
103465-COAT	B	20141123	14268605			
103452-COAT	B	20141128	14268605			
103453-COAT	B	20141204	14268605			
103466-COAT	B	20141208	14268605			
103958-COAT	B	20141210	14268605			
103626-COAT	B	20141213	14268605			
103460-COAT	B	20141217	14268605			
105877-COAT	B	20141220	14268605			
107387-COAT	B	20150316	14268605			
108857-COAT	B	20150513	14268605			
108858-COAT	B	20150519	14268605			
110215-COAT	B	20150724	14268605			
110230-COAT	B	20150816	14268605			
110736-COAT	B	20151015	14268605			
111033-COAT	B	20160430	14268605			

# LTMS data: Lab A



Existing  
column

Added columns???

TESTKEY	LTMSLAB	MMSERNO	transmitter model	transmitter SERNO	meter SERNO
106980-COAT	A				
107256-COAT	A				
107255-COAT	A				
109710-COAT	A	341761			
108379-COAT	A	341761			
112489-COAT	A	341761			
108380-COAT	A	341761			
111341-COAT	A	341761			
108860-COAT	A	341761			
116584-COAT	A	341761			

Same as  
MM  
SER NO

# MM Experiments: Questions for all labs



- When did the labs undergo calibration for the operational measurements as per section 8.3.1.1 relative to when the new sensors / new transmitters were used?
- What densities were recorded during warm-up with new sensor vs old sensor, with new transmitter vs old transmitter?
- How different were the temperature drops across the MM? Although within spec, 0.9 deg C difference vs a 0.1 deg C difference can help contribute to some differences.
- Has anything changed about the engine (new block, new gasketing, etc.)? Did Si levels remain passivated for all MM experiments?
- Do we expect 313 vs 319 flange to affect aeration? If so, can we run an experiment to confirm?



# Actions: To be determined by the SP



# In case additional data are needed



## Existing tests

- Additional fields for existing tests

## New tests

- Be specific about what data will be collected:
  - Reference data which oil (Oils 832, 833 or both?). Does the shift in aeration vary with oil?
  - How many tests
  - Which labs will participate
- Timeline

# APPENDIX

Performance you can rely on.



# 5700R = PUCK800



- The puck800 is the inner core of the transmitter. Basically, the processor. We went from 700 core processors to 800 core processors about 4-5 years ago. All 5700's have 800 cores but no 9739's do.

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