
From: Alfonso Lopez Intertek <al.lopez@intertek.com>
Sent: Wednesday, June 22, 2016 4:39 PM
To: Mahboob.Hosseini@chevron.com; Salvesen, Clifford R; Martin Chadwick Intertek; mbowden@OHTech.com; mhovraker@jhaltermann.com; michael.l.blumenfeld@exxonmobil.com; Mounce, Felt A; MSutherland@tei-net.com; Rich Grundza; Robert.Stockwell@chevron.com; smruti.a.dance@exxonmobil.com; tking@jhaltermann.com; tlcaudill@ashland.com; trsmith@ashland.com; wepetersen@jhaltermann.com; Bill Buscher Intertek; Smith, Jordan Cesar; Romano, Ron (R.); Jason Soto Intertek; Porter, Christian; Amol Savant - Valvoline (); J.Hsu@shell.com; Kostan, Travis G.; gordon.farnsworth@infineum.com; Jason Bowden; OMalley, Kevin; Szappanos, George; Matasic, James; doyle.boese@infineum.com; Ritchie, Andrew; Dan Lanctot; Morant, Clive C.; Teri Kowalski (TEMA TTC)
Subject: CW Task Force / Development Update
Attachments: CW LSPI Engine and Hardware Batch Change.pptx

Task Force:

A Ford Chain Wear development team meeting teleconference was held Tuesday June 21st. Earlier this month it was discovered that the engines purchased from the last solicitation were built with a different piston and ring design. Attached is a presentation describing the hardware change and background information on the engines received.

Currently the task force is looking at options to continue testing. The preferred path is to manufacture a lifetime supply of pistons and rings of the original design.

Below is a task list that the development group is working on.

CW Action Items:

- Statistical review of Precision Matrix Data scheduled for August
 - A communication from Statistical Group informed the CW panel that analysis has been delayed due to ongoing work on the Sequence VI
 - Initial analysis indicate lab differences in test results are statistically significant.
 - The development team to request an evaluation of the PM data that corrects for the lab difference seen. The goal is to use all of the data. A letter will be sent to the Stats Group describing the operational difference and the changes being evaluated to address the difference going forward.
- Data review of speed, load and cam phasor activity
 - Lab A is conducting a test with a change in speed and load control with the goal of similar control to labs G and D causing more cam phasor activity (EOT the week of June 27th).
 - Lab G evaluating control methods with the goal of tighter speed and load control and less cam phasor activity.
 - Determine if above changes cause expected directional changes in test results.
- Inventory levels of the 2014 piston batch are being evaluated to predict a timeline of CW test availability at each lab.
 - Ford to provide lead time for another piston and ring solicitation of the 2014 design.

- A lifetime buy of pistons and rings is primary option being pursued at this time.
- 2016 engine inventories are being inspected with the possibility that some were made with 2014 design pistons. 4 batches of 2016 long blocks were made.
 - Lab inventory Batch 1 engines are being torn down to measure the pistons.
 - Worldwide dealer inventories are being looked at for manufacture date and possible assembly with 2014 design pistons.
 - Goal is to continue testing with available 2014 hardware while we order more pistons and rings.

Best Regards,

Al Lopez
Principal Engineer
Intertek Automotive Research
San Antonio, Texas
Intertek Transportation Technologies
Phone: 210-647-9465
Mobile: 210-862-7935
E-mail al.lopez@intertek.com

Ford CW & LSPI Engine and Hardware Batch Change

Jason Soto

Intertek

Date:06/20/2016

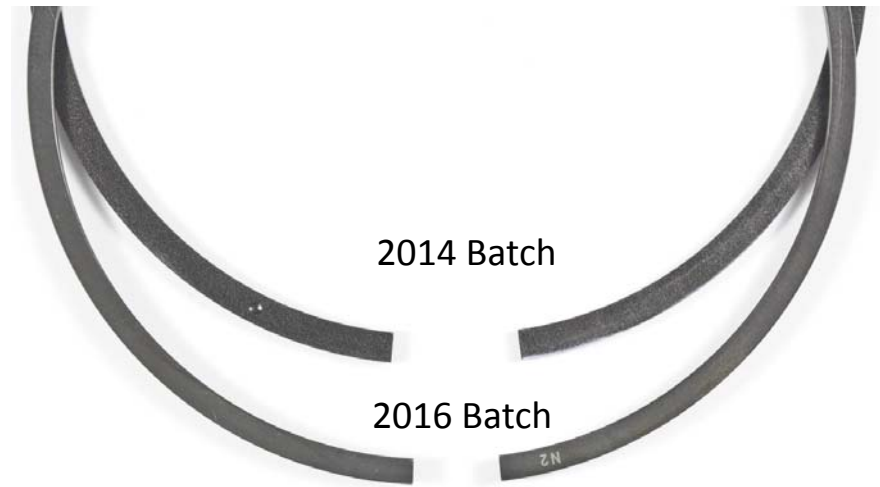
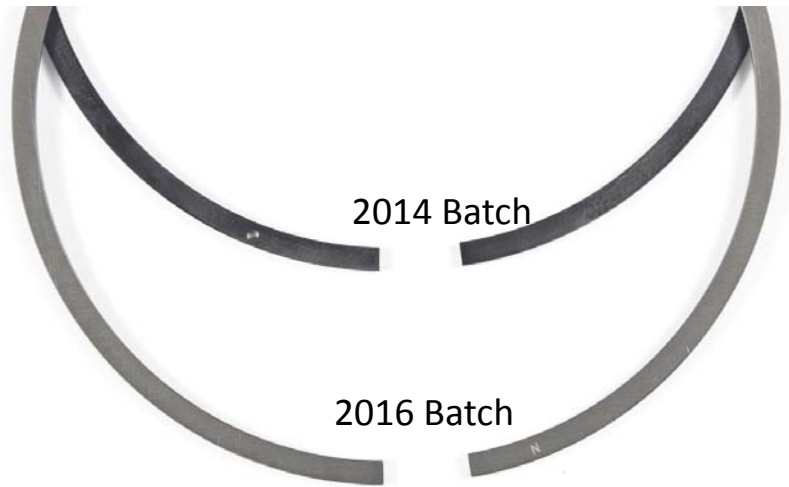
Background

- An Industry engine and critical hardware batch purchase was made for CW and LSPI testing in 2014. The precision matrix for both test types were run on this 2014 batch of engines and hardware.
- A second batch of engines was purchased and received in 2016. This new batch of engines was recently found to have different pistons and piston rings.
- Most of the 2014 batch of engines have been consumed. A decision must be made on how to proceed with the 2016 batch of engines.

Piston Rings

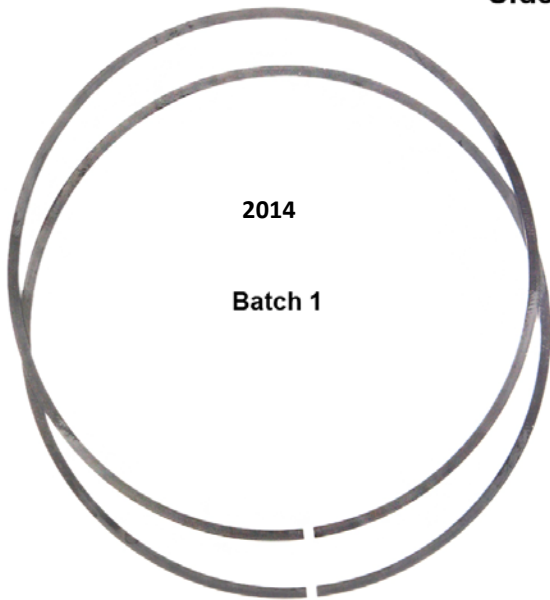
Top Rings

Bottom Rings



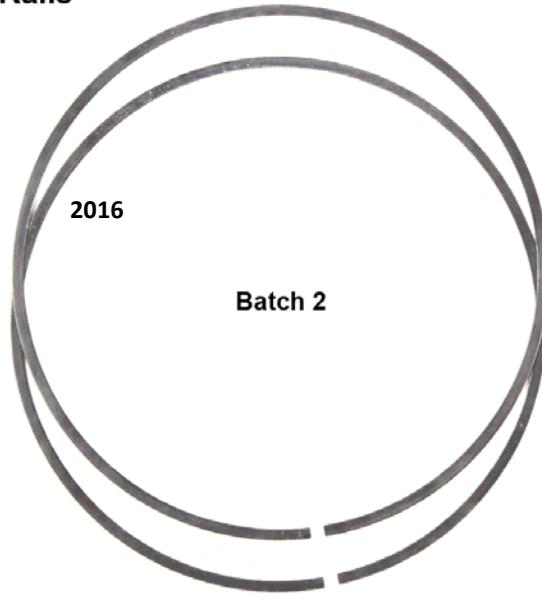
Oil Rings

Side Rails



2014

Batch 1



2016

Batch 2

Oil Control Ring

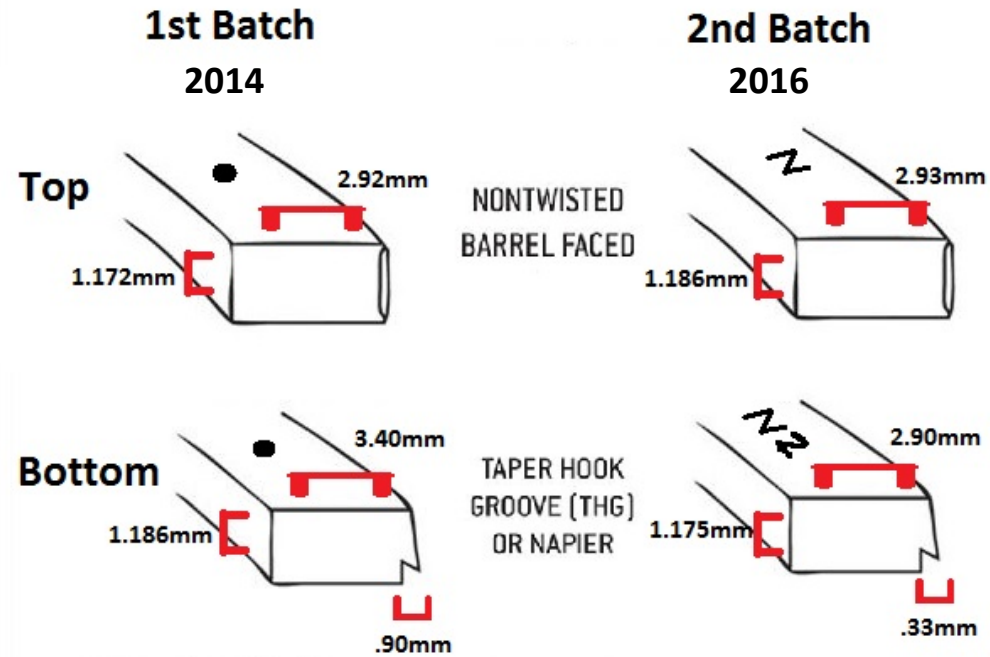


2014 Batch

2016 Batch

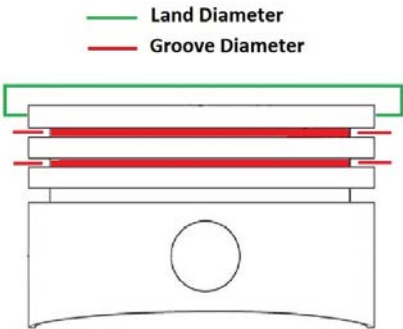
Piston Ring Dimensions

2.0 Ford Ecobost Ring Dimensions



Piston Dimensions

Ford 2.0 piston dimensions



2014 Batch

Piston Land Diameter		
Location	Longitudinal (inch)	Transverse (inch)
Top land	3.4124	3.4172
2nd land	3.3998	3.4001
3rd land	3.4131	3.4148
Skirt		3.4433

2016 Batch

Piston Land Diameter		
Location	Longitudinal (inch)	Transverse (inch)
Top land	3.4123	3.4175
2nd land	3.3976	3.3999
3rd land	3.4149	3.4173
Skirt		3.4435

Piston Groove Diameter		
Location	Longitudinal (inch)	Transverse (inch)
Top land	3.1411	3.1418
2nd land	3.0901	3.0918
3rd land	3.1558	3.1566

Piston Groove Diameter		
Location	Longitudinal (inch)	Transverse (inch)
Top land	3.1336	3.1341
2nd land	3.1339	3.1348
3rd land	3.1587	3.1594



CW/LSPI Path Forward

- Decide if the 2016 pistons and rings can be used without a change to severity.
- Make a lifetime purchase of 2014 pistons and rings. Ford has confirmed that this will be possible. The only obstacle is the lead time. Most of the 2014 hardware has been consumed.
- The development group is still gathering information. A Task Force meeting will be scheduled to report the groups findings.