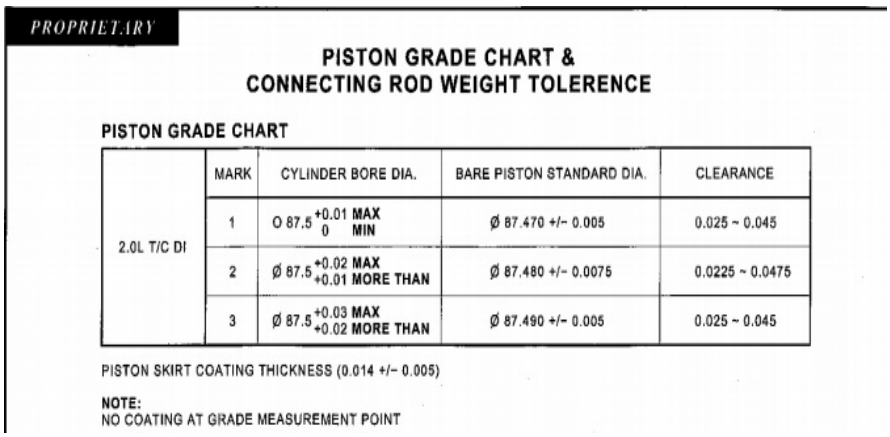
Sequence X Procedure Review Teleconference
30th May and 13th June 2018

Written By: Al Lopez
05/30/18

1. Discussion on piston measurement continued.
   1.1 IAR measured pistons in a controlled environment to see if the temperature was affecting the measurement. Below are the measurements.
   1.2 The group concluded that this was a non effect since the block is also measured at the same temperature.

Micrometer Type	Measurement Location	Room Temperature	Diameter Measurement
Mitutoyo Blade (422-333-30)	**Metrology**	**70°F**	**87.443**
Mitutoyo Blade (422-333-30)	**Build Area**	**73°F**	**87.449**
Mitutoyo Round Face (293-347-30)	Metrology	70°F	87.477
Mitutoyo Round Face (293-347-30)	Build Area	73°F	87.482

2. Study of the published piston diameters, clearance limits and table of graded pistons was discussed. There is confusion as to what limits to use considering the measurements seen with and without the coating. Felt considered the maximum piston grade diameter limits and the maximum limits of the clearance.



PROPRIETARY

PISTON GRADE CHART &
CONNECTING ROD WEIGHT TOLERENCE

PISTON GRADE CHART

	MARK	CYLINDER BORE DIA.	BARE PISTON STANDARD DIA.	CLEARANCE
2.0L T/C DI	1	O 87.5 +0.01 MAX 0 MIN	Ø 87.470 +/- 0.005	0.025 ~ 0.045
	2	Ø 87.5 +0.02 MAX +0.01 MORE THAN	Ø 87.480 +/- 0.0075	0.0225 ~ 0.0475
	3	Ø 87.5 +0.03 MAX +0.02 MORE THAN	Ø 87.490 +/- 0.005	0.025 ~ 0.045

PISTON SKIRT COATING THICKNESS (0.014 +/- 0.005)

NOTE:
NO COATING AT GRADE MEASUREMENT POINT

3. Ron to seek input from piston engineers. Labs to keep building engines and gathering data of clearance with and without the coating interfering.

4. Blowby procedure to include J-tech. Demetrius and Christian to write up wording to include in the procedure.
5. IAR is rejecting pistons if the ultrasonic cleaner removes the coating. Jason to check on cleaning method and make recommendations to remove risk of damaging pistons.
6. Premeasured pistons to be shipped to KS – all labs. Ron to provide address.

06/13/18

1. Demetrius presented his write up of the Blowby procedure using a J-tech. Attached below. This wording will be added to the Sequence X procedure in addition to the procedure using the cart and manometer method. The intent is to allow the use of either method now with the understanding that all labs will eventualy switch to the J-Tech method.
2. Christian agreed to forward 15 minutes of BB data from his stand that was acquired in parallel to a cart. The length of time of data acquisition was deemed to long at 15 minutes. The Sequence IIH acquires data for only 30 seconds after a one minute stabilization. Data will be studied and a length of time determined.
3. Demetrius agreed to make a diagram of the J-tech set-up.
4. Terry Bates forwarded a draft of the Sequence X procedure. This edition has been posted on the TMC website. The following open items need to be added
    a. Final J-tech blowby method
    b. Piston measuring technique and tooling
    c. Revised piston cleaning method. The current method is not removing all of the deposits from the ring pack area. Jason has volunteered to experiment with the cleaning and try a solvent on the ring area plus the ultrasonic to complete the cleaning.

Lubrizol draft blowby flow rate measurement procedure using JTEC

9.3.1.2 *Blowby flow rate measurement using JTEC- procedure*
Note: This procedure assumes that the JTEC is hard plumbed into the blowby system.
(1) Position the 3-way valve to divert the blowby gas from the engine PCV valve to the JTEC. This can be done manually or automatically.
(2) Allow one minute for flow to stabilize before recording blowby flowrate.
(3) Measure and record blowby flowrate for a period to allow for an accurate average flowrate to be obtained. This can be up to the full fifteen-minute measurement period.
(4) After completing the measurements, position the 3-way valve to divert the blowby gas back to the engine PCV valve.
(5) Calculate the average blowby flow rate and correct the value to standard conditions (38 °C, 100.3 kPa).