**IAR Ford LSPI Test Procedure**

**Oil Flush Procedure:**

* Charge engine with 5 liters of new oil and new oil filter
* Start engine and operate at Idle for 2 minutes.
* 30sec ramp to 2000RPM and 70 Nm.
  + Test temperatures
  + Maintain conditions for 15 minutes
* 30 sec ramp down to idle.
  + Maintain for 2 minutes and shut down.
* Drain engine oil for 15 minutes.
* Repeat for Flush 2.

**Test 1 Procedure:**

* **Flush 1**
* **Flush 2**
* Charge engine with 3600 grams of test oil and new oil filter.
* **Warm up:** Idle for 2 minutes, Test condition temperatures.
* **Stage 1:** 30 sec ramp to 1750RPM and 100 Nm, test condition temperatures, for 15 minutes.

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| **Test Condition Temperatures** | | |
| **Controlled Parameter** | **Set Point** | **Units** |
| Coolant Out Temperature | 95 | degC |
| Oil Gallery Temperature | 95 | degC |
| Air Charge Temperature | 43 | degC |
| Inlet Air Temperature | 28 | degC |

* **Stage 2 (Seasoning):** 60 sec ramp to 1750RPM and 269 Nm, test condition temperatures, for 60 minutes.
* **Stage 3 (Cool Down):** 60 sec load ramp down to 1750RPM and 50 Nm. 15 minute temperature cool down. Ramp down to idle for 2 minutes and shut down.

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| **Cool Down Specifications** | | | |
| **Controlled Parameter** | **Set Point** | **Units** | **Ramp times (min)** |
| Engine Speed | 1750 | RPM | N/A |
| Engine Load | 50 | Nm | 1 |
| Coolant Out Temp | 45 | degC | 15 |
| Oil Gallery | 45 | degC | 15 |
| Intake Air Temp | 28 | degC | N/A |
| Air Charge | 30 | degC | N/A |

* Shut down for a minimum of 10 minutes. Take oil dip and inspect engine and stand.
* **Warm up:** Idle for 2 minutes, Test condition temperatures.
* **Stage 4:** 30 sec ramp to 1750RPM and 100 Nm, test condition temperatures, for 15 minutes.
* **Stage 5:** 60 sec ramp to 1750RPM 269Nm, test condition temperatures, Hold until the following conditions are true:
  + Coolant Out Temp: 95degC
  + Oil Gallery Temp: 95degC
  + Intake Air Temp: 28 degC
  + Air Charge: 43 degC
  + Let stabilize for 5 minutes after the above criteria is met. All the above temperatures should be met within a maximum of XX minutes.
* **Stage 6:** Test Conditions, begin recording AVL data for 175,000 combustion cycles.

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| **Test Conditions** | | |
| **Controlled Parameter** | **Set Point** | **Units** |
| Speed | 1750 | RPM |
| Load | 269 | Nm |
| Coolant Out Temperature | 95 | degC |
| Oil Gallery Temperature | 95 | degC |
| Air Charge Temperature | 43 | degC |
| Inlet Air Temperature | 28 | degC |

* **Stage 7 (Cool Down):** 60 sec load ramp down to 1750RPM and 50 Nm. 15 minute temperature cool down. Ramp down to idle for 2 minutes and shut down.
* Shut down for a minimum of 10 minutes. Take oil dip and inspect engine and stand

**Test 2-4 Procedure**: (Repeat this procedure for test 2,3, and 4)

* **Warm up:** Idle for 2 minutes, Test condition temperatures.
* **Stage 1:** 30 sec ramp to 1750RPM and 100 Nm, test temperatures, for 15 minutes
* **Stage 2:** 60 sec ramp to 1750RPM 269Nm, test temperatures, Hold until the following conditions are true:
  + Coolant Out Temp: 95degC
  + Oil Gallery Temp: 95degC
  + Intake Air Temp: 28 degC
  + Air Charge: 43 degC
  + Let stabilize for 5 minutes after the above criteria is met. All the above temperatures should be met within a maximum of XX minutes.
* **Stage 3:** Test Conditions, begin recording AVL data for 175,000 combustion cycles.
* **Stage 4 (Cool Down):** 60 sec load ramp down to 1750RPM and 50 Nm. 15 minute temperature cool down. Ramp down to idle for 2 minutes and shut down.
* Shut down for a minimum of 10 minutes. Take oil dip and inspect engine and stand
* Repeat for Tests 3 and 4.