MINUTES
SEQUENCE VID SURVEILLANCE PANEL MEETING
September 10, 2008
San Antonio, TX

The Sequence VID Consortium met at SwRI on September 10, 2008. Participants are listed on Attachment 1.

MEETING

1. PCEOCP approval on 09.04.2008 allowed the VID test development to proceed and the initiated the formation of the Surveillance Panel.
2. This was the first meeting of the VID Panel. Doyle Boese was voting member for Infineum, and Jim Linden had proxy for Sid Clark and Tracey King.
3. Bill Buscher agreed to be Motions and Actions Recorder, and Dan Worcester Secretary.
4. The meeting was called to order at 9:00 AM.
5. Attachment 2 is the Agenda for this meeting.

NEW BUSINESS

The first item was to define the requirements for labs to run the VID test. Criteria were based on the current VIB requirements.

1. Motion – Adopt the following requirements for a lab to be able to run VID tests in the precision matrix:
   - The lab inspection team has made a visit to each Matrix Lab (dependent and independent) and filed a report regarding the Lab's conformance to specification that includes, at a minimum, completed lab inspection checklists.
   - Lab readiness, as summarized by the lab inspection team reports, is deemed satisfactory by the appropriate ASTM Surveillance and Classification Panels.
   - Each Matrix Lab has run at least two (2) operationally valid tests (shakedown runs are eligible) within a lab using the LDT & PCM Version 3.

   Dave Glaenzer / Jim Linden / Passed with one waive

Related to this, oils to be used for calibration needed to be selected.

2. Motion – Adopt the following requirements for a lab to be able to run VID tests in the precision matrix:
   - Oils to be used are: VID A, B or E (at least 2 different oils run in each lab).

   Guy Stubbs / Jim Linden / Passed unanimously

There must then be a method to define when a stand or lab is calibrated.

3. Motion – Adopt the following requirements for a lab to be able to run VID tests in the precision matrix:
   - The Sequence VI ASTM Surveillance Panel must deem these test results satisfactory in terms of precision and relative agreement among labs.

   Jim Linden / Doyle Boese / Passed with one waive

4. Action Item – The industry statisticians will review the motions above and provide a recommendation on how to deem the test results satisfactory.

Discussion took place on the number of runs at each lab. The STAT group had recommended 4-3-2 to gather a data early in the precision matrix. This was presented as an initial motion which failed. A new motion for 3-3-3 passed.

5. Motion – Use the 4/3/2 requirement for stand/engine calibration requirements for tests run in the precision matrix.

   Doyle Boese / Ron Romano / Failed with 5 For, 6 Against, 3 Waive

6. Motion – Use the 3/3/3 requirement for stand/engine calibration requirements for tests run in the precision matrix.

   George Szappanos / Dave Glaenzer / Passed with 11 For, 0 Against, 3 Waive

The next topic was stand calibration time and number of runs per engine. Again the plan was to base this on the current VIB procedure. Attachment 3 is Section 10 of D 6837, but the following are the specifics relative to this decision:

For a given test stand/engine combination, following the first calibration period of a new stand/engine combination, conduct a minimum of one operationally valid, statistically acceptable reference oil test after four full–length non-reference oil tests or 600 engine hours or 90 days, whichever occurs first.

Thereafter conduct a minimum of one operationally valid, statistically acceptable reference oil test after seven full-length non-reference oil tests or 1050 engine hours, or 90 days, whichever occurs first. The 90 elapsed days are judged from the end-of-test (EOT) day of the last operationally valid, statistically acceptable reference oil test to the start-of-test (SOT) day of a calibrated non-reference oil test.

7. Motion – Initially use the VIB stand/engine requirements for time and runs, adjusted for the differences in test length (700 instead of 600 and 1200 instead of 1050 engine hours), for VID stand/engine requirements until the precision matrix data analyses is completed.

   Dave Glaenzer / Mark Mosher / Passed unanimously

The next topic was selection of engines for the Precision Matrix. The STAT group had provided recommendations to get engines with low and high hours for Phase 1 testing.

8. Motion – Accept the statistical group recommendation for engine selection for phase 1 of the precision matrix. Applies only to the independent labs.
   - First engine is to start with less than 400 hours, the second engine is to start with between 500-2000 hours (would prefer 1000 hours).

   This does not apply to Phase 2 of the precision matrix.

   Guy Stubbs / Doyle Boese / Passed unanimously

A review of the STAT PCEOCP presentation is included.

Report to PCEOCP_9-4-08.ppt

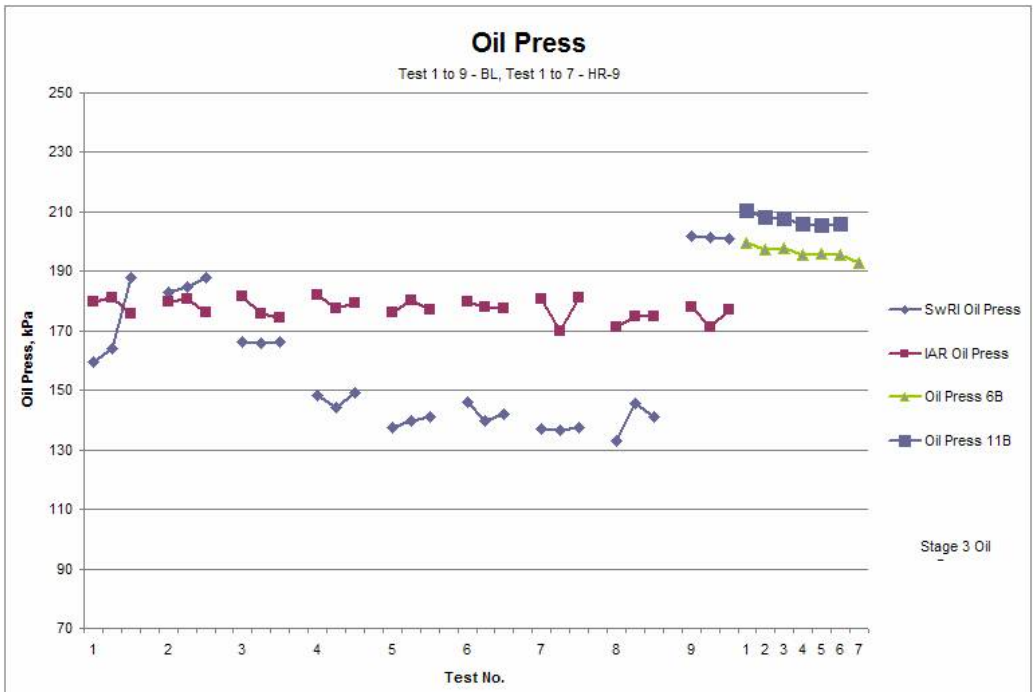
An 80-20 split was selected for BLB2 and BLA for FEI1 and 10-90 for BLB2 and BLA for FEI2. A maximum of -0.2 and +0.4 shift in un-weighted fuel consumptions between BLB1 and BLB2 will be required. Should those limits be exceeded, a third BLB run could happen. If the lab shuts the engine down for maintenance to correct the shift, the

BLB count starts over. Fuel consumption has been similar to VIB historical values. See Attachment 5 for comparisons of labs. The STAT group data indicated significant fuel consumption and FEI differences and baseline variability exists between results from IAR and SwRI. No FM carry-over was identified, but baseline fuel consumption appeared to be oil dependent.

9. Action Item – Labs to supply oil pressure, MAP and load cell temperature data for the same data set that they previously supplied fuel consumption data for. Provide data for all stages.

10. Action Item – Consider setting baseline shift limits for BLB versus BLA. Statistical group to develop a recommendation for this limit, based on Matrix V data.

    George Szappanos presented some data showing oil pressure variation.



There will be a Task Force created to compare and improve test variation between stands and labs. This should complete by 10.23.2008. Attachment 4 shows current fuel consumption variation for the VIB test for each lab.

11. Action Item – Form a task force to inspect load calibration practices and equipment at both independent labs. Create a list of all items to inspect. Findings to be presented at the 10/23/08 PCEOCP meeting.
    List to include:
    - Load arms – lengths, material used, locations, etc.
    - Load cells run under compression or tension? Should it be standardized?
    - Signal processing and system time constants.
    - Temperature spec of +/- 6C to large? [note that there is no set point – just a variance specification]
    - How is the load cell temperature being controlled? Possible to improve it or standardize on it?
    - What load cell is everyone using? The same? Can it be the same? Procedure specifies Lebow 3397 as well as listing specifications for the instrument. Are they good enough?
    - Load cell capacity (100 lb).
    - Torque arm length (should be maximized to accommodate 110 Nm, or about 10”).
    - DAQ system analog to digital converter bits (should be greater than 12 bit resolution).
    - Noise level on signal (are there intermittent or consistent ground loops).
    - Filtering on input signal (software and hardware).
    - Amount of hysteresis of dyno.
    - How stable is the supply voltage to the load cell (CRITICAL), since output is a function of excitation voltage.
    - Any others?

There will also be a Matrix Design Task Force to determine qualified labs and stands to run the Phase 1 and 2 44 test matrix.

12. Motion – TMC and statistical group will develop a method for determining outlier data in phase 2 of the precision matrix. Operationally valid data from all participating labs will be considered.

    George Szappanos / Rich Grundza / Passed unanimously

There will also be a Matrix Design Task Force to determine qualified labs and stands to run the Phase 1 and 2 44 test matrix.

Attachment 5 shows the VID report template. This must be in place to have an ACC registered test. The data dictionary to populate this report will need to be finalized and use average of averages, not six readings.

Engine builds were discussed. Labs will review the build data to see if all current measurements are required. There will also need to be a list created of acceptable engine repairs at the labs.

13. Motion – Continue with the engine build workshop process for the first two years of the VID test life. Each build workshop not to exceed 15 engines. To review the build workshop process after one year, will be added to the Surveillance Panel scope and Objectives.

    Jim Linden / Doyle Boese / Passed unanimously

14. Action Item – Labs to respond to Surveillance Panel chair on whether or not they deem all of the engine build measurements necessary. To be completed by 9/17/08.

15. Action Item – Labs to start creating a list of acceptable engine reconditioning practices. Surveillance Panel to review list at a later date.

Engine life will need to be defined and the industry order placed by 10.17.2008. The VIB estimate is 29 tests per engine. The Surveillance Panel will make this decision for reference oils.

16. Action Item – Surveillance Panel to recommend a quantity of engines to purchase for the life of the VID test to OHT. Surveillance Panel chair, TMC and OHT to initially generate a quantity estimate for the Surveillance Panel to review. To be completed prior to 10/17/08.
17. Action Item – Surveillance Panel will recommend the reference oils to be used for the VID test.

    Haltermann has requested a usage rate for fuel. This should apply for the next two years.

18. Action Items – Labs to estimate annual VID fuel usage rates for the next two years and to report to Haltermann. To be completed by 9/24/08.

    Both the VIB and VID procedures need to be updated for the correct numbers to order and use for Racor oil filters and screens. This will be done by information letter.

19. Action Item – Labs to report to TMC if they have the LFS-55 Oberg/Racor filter in service or not. To be completed by 9/17/08.

20. Motion – TMC to update VIB test procedure to indicate the correct Oberg/Racor filter on 9/18/08.

    Rich Grundza / Jason Bowden / Passed unanimously.

NEXT SP Meeting

- **The next meeting will be part of the ASTM meetings in Tampa if the Precision Matrix is in process.**
- **The Task Force meetings will be scheduled.**
- **A VID procedure meeting was scheduled for 09.11.2008.**
- **The meeting adjourned at 2:35 PM.**

ASTM SEQUENCE VIA/VIB SURVEILLANCE PANEL

Name	Address	Phone/Fax/Email	Attendance
Bowden, Dwight member	OH Technologies, Inc. P.O. Box 5039 Mentor, OH 44061-5039	Phone: 440-354-7007 Fax: 440-354-7080 dhbowden@ohtech.com	Proxy Jason
Knight, Clayton member	Test Engineering, Inc. 12718 Cimarron Path San Antonio, TX 78249-3423	Phone: 210-690-1958 Fax: 690-1959 cknight@tei-net.com	
Tracey E. King member	Diamler-Chrysler 14290 Talbot Detroit, MI 48237	Phone: 248 576-7500 tek1@Chrysler.com	Proxy Linden
Clark, Sid member	General Motors Research & Development 30500 Mound Rd./MC 480-106-160 Warren, MI 48090-9055	Phone: 810-986-1929 Fax: 810-986-2094 sidney.l.clark@gm.com	Roxy Linden
Andy Ritchie member	Infineum P.O. Box 735 1900 East Linden Ave. Linden, NJ 07036-0735	Phone: 908-474- Fax: 908-474-3637	Proxy Doyle
Ron Romano member	Ford Motor Company 21500 Oakwood Blvd POEE Bldg Rm DR 167 MD 44 Dearborn, MI 48121-2053	Phone: 313-845-4068 rromano@ford.com	Phone
Lai, Patrick member	Imperial Oil Ltd. of Canada P.O. Box 3022 453 Christina Street South Sarnia, N7T T8T8,	Phone: 519-336-5611 Fax: 519-339-5866 patrick.k.lai@esso.com	Phone
Leverett, Charlie member	~~PerkinElmer~~ Automotive Research 5404 Bandera Road ~~—~~ Intertek San Antonio, TX 78238	Phone: 210-647-9422 Fax: 210-523-4607 intertek.com charlie.leverett@~~perkinelmer.com~~	
Grunza, Rich Member	ASTM TMC 6555 Penn Ave. Pittsburgh, PA 15206-4489	Phone: 412-365-1034 Fax: 412-365-1047 Dml@tmc.astm.cmri.cmu.edu	
Miranda, Timothy Member	BP Castrol Lubricants USA 1500 Valley Road Wayne, NJ 07470	Phone: 973-305-3334 Timothy.Miranda@bp.com	
Mosher, Mark member	ExxonMobil 600 Billingsport Road Paulsboro, NJ 08066	Phone: 856-224-2132 Fax: 856-224-3628 mark_r_mosher@exxonmobil.com	
Caudill, Timothy	Ashland, Inc. 21st and Front Streets Ashland, KY 41101	Phone: 606-329-~~5708~~ 1960 Fax: 606-329-~~3009~~ 2044 x5708 Tlcaudill@ashland.com	
Stubbs, Guy member	Southwest Research Institute (SwRI) 6220 Culebra Road San Antonio, TX 78228	Phone: ~~522-5913~~ 522 5039 Fax: gstubbs@swri.edu	
Szappanos, George member	Lubrizol 29400 Lakeland Blvd. Wickliffe, OH 44092	Phone: 440-347- Fax: 440-347-4096 George.Szappanos@lubrizol.com	
Glaenzer, David member	Ethyl Research Center 500 Spring Street P.O. Box 2158 Richmond, VA 23218	Phone: 804-788-5214 Fax: 804-788-6358 Dave_Glaenzer@ethyl.com	
Ferner, Mark member	Pennzoil Quaker State 1520 Lake Front Circle P.O. Box 7569 The Woodlands, TX 77380	Phone: 281-363-8190 or 8053 Fax: 281-363-8092 or 8002 markferner@pzlqs.com	

ASTM SEQUENCE VIA/VIB SURVEILLANCE PANEL

Name	Address	Phone/Fax/Email	Attendance
Sutherland, Mark member	Chevron Oronite Company LLC 4502 Centerview Ste. 210 San Antonio, TX 78228	Phone: 731-5605 Fax: 731-5621 MSUT@chevrontexaco.com	
LINDEN, JIM	GM R&D 30500 Mound Rd M/C 480-106-460 WARREN, MI 48090	586-986-1888 586-986-2094 JAMES.L.LINDEN@GM.com	
Jason Bowden	OH TECHNOLOGIES, INC. P.O. Box 5039 Mentor, OH 44061-5039	440-354-7007 440-354-7080 Jhbowden@ohtech.com	
LARRY HAMILTOH	LUBRIZOL 29400 LAKELAND BLVD. WICKLIFFE OHIO 44092	440 347-2326 LARRY.HAMILTON@LUBRIZOL.COM	
CHRIS CASTANIEN	LUBRIZOL 29400 LAKELAND WICKLIFFE, OH 44092	440 9347 2973 Chris.Castanien@lubrizol.com	
WAYNE PETERSEN	HALTERMANN PRODUCTS PO Box 0429 Channelview, TX 77530	832-376-2213 wepetersen@jhaltermann.com	
JO MARTINEZ	Chevron Oronite 100 Chevron Way Richmond, CA 94802	510 242 5563 jogm@chevron.com	
RAY SEIZ	4241 Piedras DR E STE 111 SA TX 78228	210-732-8123 EX 12 RAY.SEIZ@INFUEUM.COM	
Doyle Boese	1900 E. Linden Ave Linden, NJ 07036	908 474-3176 Doyle.Boese@Infineum.com	
DAN WORCESTER	SWRI 528 TOMSLICK SA TX 78228	210.240.2455 DAN.WORCESTER@SWRI.ORG	
BILL BUSCHER	SwRI 6220 CULEBRA RD SA, TX 78228	210-522-6802 - Phone 210-240-8990 - cell william.buscher@swri.org	
Gordon Farnsworth Mike McMillan	> phone		

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Sequence VI Surveillance Panel Meeting
September 10, 2008
SwRI Building 209 Conference Room 103

Agenda

1.) Meeting Called to order & Chairman's comments.

2.) Review of voting members by Company.

3.) Selection of Secretary, Dan will act as the secretary and Bill will cover as the Motion/Action Item Recorder.

4.) New Business:

a.) Determine the requirements for a Lab to be able to run VID tests, below are the guidelines we used in GF-4:

Adopt the GF-4 requirements for VID Test Stands, which are included below:

- *The lab inspection team has made a visit to each Matrix Lab (dependent and independent) and filed a report regarding the Lab's conformance to specification that includes, at a minimum, completed lab inspection checklists.*
- *Lab readiness, as summarized by the lab inspection team reports, is deemed satisfactory by the appropriate ASTM Surveillance and Classification Panels.*
- *Each Matrix Lab has run at least two (2) operationally valid tests (shakedown runs are eligible) using the latest test procedure. The appropriate ASTM Surveillance and Classification Panels must deem these test results satisfactory in terms of precision and relative agreement between labs.*

b.) Develop a recommendation for Stand/engine calibration requirements for tests run in the Precision Matrix:

Statistical Group *recommended we use 4/3/2*

c.) Develop a recommendation for Stand/engine calibration requirements concerning time and runs.

Statistical Group recommended *we use the VIB until the Precision Matrix Data analyses is completed, this is shown below:*

For a given test stand/engine combination, following the first calibration period of a new stand/engine combination, conduct a minimum of one operationally valid, statistically acceptable reference oil test after four full–length non-reference oil tests or 600 engine hours or 90 days, whichever occurs first.

Thereafter conduct a minimum of one operationally valid, statistically acceptable reference oil test after seven full-length non-reference oil tests or 1050 engine hours, or 90 days, whichever occurs first. The 90 elapsed days are judged from the end-of-test (EOT) day of the last operationally valid, statistically acceptable reference oil test to the start-of-test (SOT) day of a calibrated non-reference oil test.

d.) Discuss Engine selection for the Precision Matrix (new or existing engines)

Statistical Group recommended:
First engine is less than 400 hrs, the second should have between 500-2000 would prefer 1000 hrs

e.) Review of the proposal for the Consortium Update

Key points from Statistical Analyses**:**

- Significant Fuel Consumption and FEI differences and Baseline variability exist between SwRI & IAR
- No FM carry-over identified. However, consecutive Baseline Fuel Consumption differences appear to be oil dependent
- All three BL runs are required
  - For minimum RMSE and maximum discrimination
- Baseline Weight
  - FEI1: 0-20 BLB1, **80 BLB2** & 0-20 BLA
  - FEI2: **0 BLB1**, 10-50 BLB2 & 50-90 BLA
  - **Selected BLB2 80 BLA 20 FEI-1 and BLB2 10 BLA 90 FEI-2**

Requested Tasks for the Surveillance Panel

- Guidelines for oil pressure, MAP, and/or baseline fuel consumption, should be established for test validity (BLB1, BLB2), and interpretability (BLB2, BLA) before the precision matrix is started.
- The following was recommended by the Consortium and also the PCEOCP
  - BLB1-BLB2 **Fuel Consumption** shift: -0.20% to 0.40%
  - If outside range, run BLB3 and compare with BLB2 if still out investigate the problem and restart.
  - ASTM Sequence VI Surveillance Panel to investigate test-to-test variability in baseline fuel consumption and report findings before start of precision matrix

f.) Review of the proposal for the Precision matrix from the Matrix Design Task Force.

Summary:

- Total number of tests: 44
- Total donated tests: TBD today
- Total number of precision matrix tests: 28
- Total number of BOI/VGRA tests: 16

Phase I is 8 tests/stand 4 stands 2/lab

Phase II is 3 tests/stand 4 stands 2/lab, these are to be run on the 3 reference oils run in Phase I

Some Things to Consider:

All "Qualified Labs" as defined by this Surveillance Panel may participate in the Phase II of the Precision Matrix, what method will we use to determine Outlier Data?

Should the initial Precision Statement come from the runs at the Independent Labs?

g.) ACC VID Template – review of attached template and consensus on SP response.

Other Business

a.) Engine Rebuilds, how is this to be handled in the future, work shop, by the labs, contracted builder, etc?
b.) Engine Reconditioning, what is allowed and what is required to get the stand engine calibrated following a parts change.
c.) Estimated engine life for the VID, we do not have sufficient data at this time to accurately determine the engine life but due to this engine going out of production this year we need to determine the quantity need for the life of this test (present to 2015). The order for these needs to be placed no later than October 17, 2008.
d.) Reference Oil Selection, do we believe this group should make the recommendations on these oils?
e.) Haltermann has requested we supply and estimated usage rate for this test fuel

Next Meeting

It has been suggested we meet between tests 4 & 5 of Phase I to review the data to this point. The estimated time frame for this would be ~ the first week of December, The ASTM meetings are scheduled for the week of December the 8th in Tampa, please mark your calendars as a tentative meeting date.

10. Calibration

10.1 Stand/Engine Calibration—To ensure proper response to various oil parameters, conduct a reference oil test when a new or previously used test engine is installed in a test stand. This event will be monitored by the ASTM TMC. See 11.1.2 prior to attempting calibration of a new stand. The TMC will assign reference oils for calibration tests. The reference oils used to calibrate Sequence VIB engine test stand/engine combinations have been formulated or selected to represent specific chemical types or performance levels or both. These oils are normally supplied under code numbers (blind reference oils) to ensure that the testing laboratory is not influenced by preconceived opinions in assessing test results. Number each Sequence VIB test to identify the stand number, the number of runs on that stand, the engine number, and the number of runs on the engine. For example, 56-21-3-8 defines a test on stand 56, which is the 21st test on stand 56, engine number 3, and the 8th test on engine number 3. For reruns of operationally invalid or unacceptable reference oil the stand run number shall be incremented by one and the engine run number shall be followed by the letter A for the first re-run, B for the second re-run, and so forth. For example, the next test number for an operationally invalid or unacceptable test would be 56-22-3-8A.

10.1.1 Procedure—Test stand/engine calibration is accomplished by conducting tests on ASTM TMC reference oils (see X1.2).

10.1.1.1 Conduct reference oil tests on each test stand/engine combination within a laboratory according to ASTM TMC Lubricant Test Monitoring System (LTMS) guidelines. Do not terminate a reference test due to an FEI result.

10.1.1.2 For a given test stand/engine combination, following the first calibration period of a new stand/engine combination, conduct a minimum of one operationally valid, statistically acceptable reference oil test after four full–length non-reference oil tests or 600 engine hours or 90 days, whichever occurs first.

10.1.1.3 Thereafter conduct a minimum of one operationally valid, statistically acceptable reference oil test after seven full-length non-reference oil tests or 1050 engine hours, or 90 days, whichever occurs first. The 90 elapsed days are judged from the end-of-test (EOT) day of the last operationally valid, statistically acceptable reference oil test to the start-of-test (SOT) day of a calibrated non-reference oil test.

10.1.1.4 If more than 90 days elapse between Sequence VIB tests, EOT to SOT, on a stand/engine combination, a minimum of one operationally valid, statistically acceptable (according to LTMS) test is required. If acceptable results are obtained on the reference oil the test stand/engine is calibrated.

10.1.1.5 Re-reference the engines once removed from the test stand and re-installed, even if the test number and time criteria are met by the engine. Laboratories shall inform the TMC with a written explanation when a test engine is removed from a test stand and installed into another test stand. Only appropriate Sequence VIB test engines (see X1.3) may be referenced.

10.1.1.6 The effective date of a reference test is the LTMS date and time of the reference test. Test start time is defined as the introduction of the reference oil into the engine. The LTMS date and time are defined as the date and time the test was completed (completion of the BC run following the reference oil) unless a different date and time are assigned by the TMC. The TMC may schedule more frequent reference oil tests (or approve less frequent reference oil tests) at its discretion. Under special circumstances (that is, extended downtime due to industry-wide parts or fuel outages) the TMC may extend reference periods. Note non-reference oil tests conducted during the extended time allowance in the test note section of the report.

10.1.1.7 Failure of a reference oil test to meet Shewhart or Exponentially Weighted Moving Average (EWMA) control chart limits can be indicative of a false alarm, engine, test stand, or industry-related problem. When this occurs, the laboratory, in conjunction with the TMC, shall attempt to determine the problem source. The ASTM Sequence VIA/VIB Surveillance Panel adjudicates industry problems. The TMC will decide, with input as needed from industry expertise (testing laboratories, test procedure developer, ASTM Technical Guidance Committee, Surveillance Panel, and so forth), if the reason for any unacceptable blind reference oil test is isolated to one particular engine or stand or related to other stands. If it is decided that the problem is isolated to an individual engine or stand, calibrated testing on other stands may continue throughout the laboratory. The laboratory may elect to attempt additional reference oil tests in the same engine. In the event the engine does not attain calibration, the laboratory shall remove the engine and go through the normal process of calibrating a new engine. Operationally valid, statistically unacceptable data on removed engines will be included in all appropriate databases (industry reference oil severity and precision) unless the engine failing to calibrate is a new engine (has never been calibrated and conducted non-reference oil tests).

10.1.1.8 If non-standard tests are conducted on a calibrated engine or test stand, recalibrate the stand and engine prior to running standard tests.

10.1.2 Reporting of Reference Results— Transmit the reference oil test results to the TMC (see Annex A1) using Forms 1, 4, 5, 6, and 18 shown in Annex A7 immediately after completion of test. The TMC will review the transmitted reference oil test results and use the Lubricant Test Monitoring System (LTMS) to determine test acceptability. The complete final test report package as defined in Annex A7 shall be received within 30 days of test completion by the following party:

Manager of Operations

ASTM TMC

6555 Penn Avenue

Pittsburgh, PA 15206-4489

10.1.3 Analysis of Reference/Calibration Oils:

10.1.3.1 Reference Oils Identification— Do not subject reference oils to either physical or chemical analyses for identification purposes. Identifying the oils by analyses could undermine the confidentiality required to operate an effective blind reference system. Therefore, reference oils are supplied with the explicit understanding that they will not be subjected to analyses other than those specified within this procedure unless specifically authorized by the TMC. In such instances, supply written confirmation of the circumstances involved, the data to be obtained, and the name of the person requesting the analysis to the TMC.

10.1.3.2 BC Baseline Calibration Oil and BCFHD Flush Oil —The Baseline Calibration (BC) Oil and BCFHD Flush Oil may be analyzed only to the extent required to evaluate the effectiveness of a test stand's flushing system. This analysis will be limited to molybdenum content. Do not subject the BC oil or BCFHD oil to further physical or chemical analyses other than those specified within this procedure unless specifically authorized by the TMC. In such instances, supply written confirmation of the circumstances involved, the data to be obtained, and the name of the person requesting the analysis to the TMC.

10.2 Instrument Calibration—Record all instrument calibrations for further reference. Perform a complete test stand instrument calibration every six months. The following are to be calibrated prior to a reference oil test sequence. A previously calibrated (existing) stand/engine will require that the following be calibrated prior to the next reference test: (1) fuel flowmeter; (2) engine speed; (3) AFR analysis equipment; and (4) exhaust back-pressure equipment.

10.2.1 Engine Load Measurement System— Calibration by use of deadweights is required at the start of a test and before each reference oil test. Prior to calibration, start the engine and run for a minimum of 30 min at 1500 r/min, 37 N•m. Shut the engine down, leave dynamometer cooling water on, and start performing the load cell calibration within 3 min after shutdown.

10.2.1.1 Perform the calibration at the 3 designated torques (approximately 26, 37, and 98 N•m). The stand load measurement system shall perform within ±0.3 N•m of the calibration standard.

10.2.2 Fuel Flow Measurement System—Use accurate mass scale measurements for calibrating. Perform this calibration at three fuel flow rates (approximately 1.4, 3.2, and 5.4 kg/h). Evaluate each flow rate a minimum of three times to verify repeatability.

10.2.2.1 The test stand flowmeter shall perform to within 0.25 % at 5.4 kg/h, 0.32 % at 3.2 kg/h, and 0.54 % at 1.4 kg/h of the calibration standard. For each flow rate, a minimum of three consecutive flow readings shall be within the specified tolerance. The calibration standard shall be at least 4 times more accurate than the test stand flowmeter at each specified flow rate.

10.2.3 Coolant Flow Measurement System— Calibrate the flow measuring device a minimum of once every six months.

10.2.4 Thermocouple and Temperature Measurement System —Check the calibration of the test stand temperature measurement system (thermocouple through readout) at the test stand using the existing readout system a minimum of once every six months. For the critical temperatures (see Table 3) the

individual temperature sensors shall indicate within ±0.56°C (±1°F) of the laboratory calibration standards. The calibration equipment utilized shall be appropriate for the desired ±0.56°C (±1°F) accuracy level. See 6.9 for additional thermocouple calibration requirements.

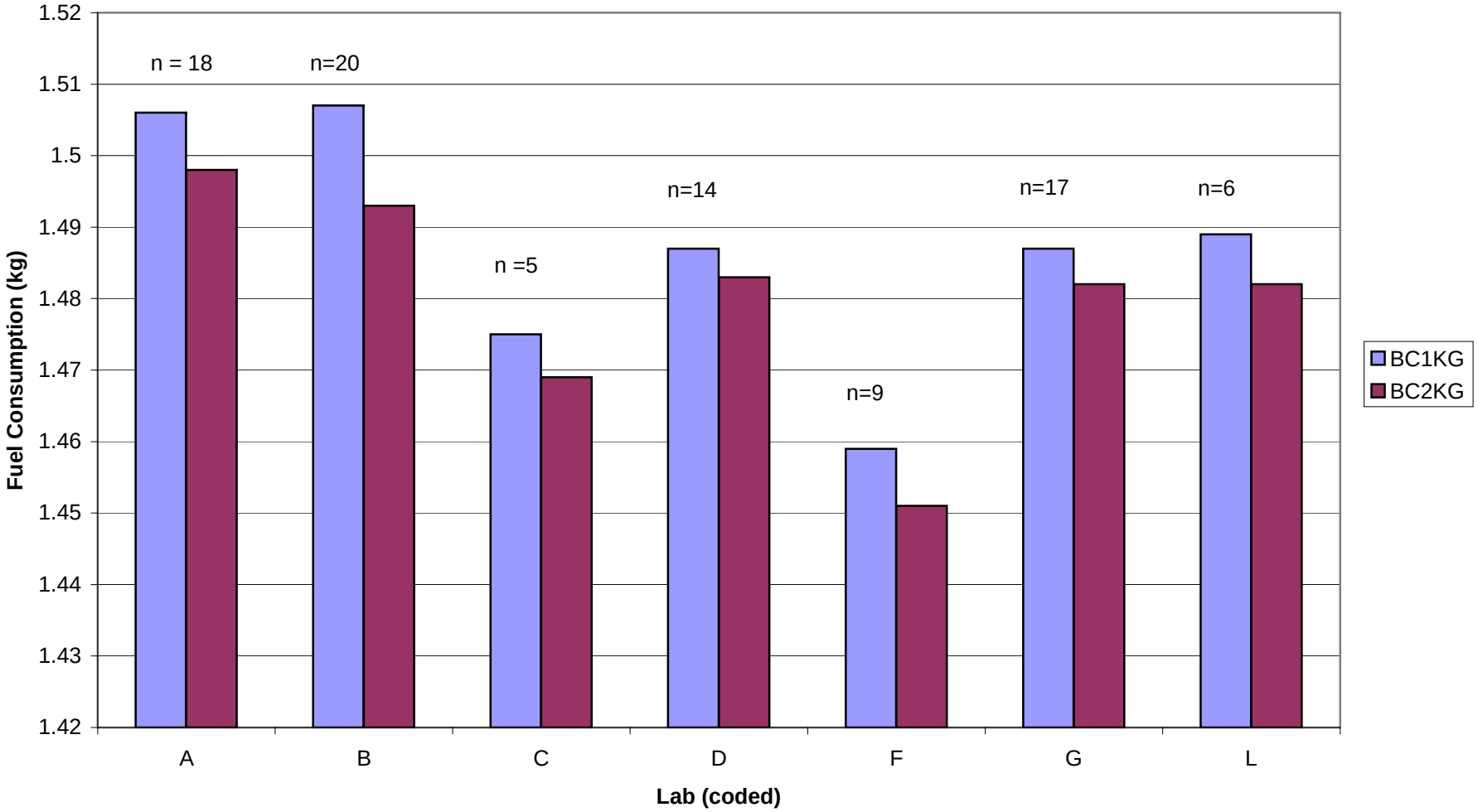
10.2.5 Humidity Measurement System—Calibrate the primary laboratory measurement system at each stand a minimum of once every six months using a hygrometer with a minimum dew point accuracy of ±0.55°C at 16°C (±1°F at 60°F). Locate the sample tap on the air supply line to the engine in the intake air cleaner.

10.2.5.1 The calibration consists of a series of paired humidity measurements comparing the laboratory system with the calibration hygrometer. The comparison period lasts from 20 min to 2 h with measurements taken at 1 to 6-min intervals, for a total of twenty paired measurements. The measurement interval shall be appropriate for the time constant of the humidity measuring instruments.

10.2.5.2 Verify that the flow rate is within the equipment manufacturer's specification, and that the sample lines are non-hygroscopic. Correct dew point hygrometer measurements to standard conditions (101.12 kPa [29.92 in. Hg]) using the appropriate equation (see 6.8.1). Compute the difference between each pair of readings and calculate the mean and standard deviation of the twenty paired readings, using Eq. A8.1 and Eq. A8.2 in Annex A8. The absolute value of the mean difference shall not exceed 1.43 g/kg (10 grains/lb), and the standard deviation shall not be greater than 0.714 g/kg (5 grains/lb). If these conditions are not met, investigate the cause, make repairs, and recalibrate. Maintain calibration records for two years.

10.2.6 Other Instrumentation—As a minimum, calibrate instrumentation for measuring parameters other than those detailed in 10.2–10.2.5 every six months. Calibrate the oil heater instrumentation prior to installation into

Sequence VIB Results
BC Before and BC After Fuel Consumption
Data Since 1/1/07



Test Method D XXXX for Measurement of the Effects of Automotive Engine Oils on the Fuel Economy of Passenger Cars and Light Trucks in the Sequence VID Spark Ignition Engine
Report Cover Sheet

Version:

Conducted For:

	V = Valid
	I = Invalid
	N = Results cannot be interpreted (refer to comment section)

	NR = Non-reference Oil Test
	RO = Reference Oil Test

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:			
Formulation/Stand Code:			
Alternate Codes			

In my opinion this test been conducted in a valid manner in accordance with Test Method D XXXX and the appropriate amendments through the Information Letter System. The remarks included in the report describe the anomalies associated with this test.

Submitted By: _____
Testing Laboratory

_____
Signature

_____
Typed Name

_____
Title

Form 2

Sequence VID

Table of Contents

1.	Report Cover Sheet (Includes Validity Statement)	Form 1
2.	Summary of Test Method	Form 3
3.	Test Result Summary	Form 4
4.	Operational Data Analysis – Baseline Before	Form 5
5.	Operational Data Analysis – Test Oil	Form 6
6.	Operational Data Analysis – Baseline After	Form 7
7.	General Parameter Listing – 16 Hour Phase I Aging	Form 8
8.	General Parameter Listing – 84 Hour Phase II Aging	Form 9
9.	General Parameter Summary – Baseline Before 1	Form 10
10.	General Parameter Summary – Baseline Before 2	Form 11
11.	General Parameter Summary – Test Oil Phase I	Form 12
12.	General Parameter Summary – Test Oil Phase II	Form 13
13.	General Parameter Summary – Baseline After	Form 14
14.	Critical Parameter Summary - Stage 1 and 2	Form 15
15.	Critical Parameter Summary - Stage 3 and 4	Form 16
16.	Critical Parameter Summary - Stage 5 and 6	Form 17
17.	Downtime Occurrences & Outliers	Form 18
18.	ACC Conformance Statement[a]	Form 19

[a] Registered tests only

Sequence VID
Form 3

Summary of Test Method

The Sequence VID is an engine dynamometer test that measures a lubricant's ability to improve the fuel economy of passenger cars and light-duty trucks. The method compares the performance of a test lubricant to the performance of a baseline lubricant over six different stages of operation.

A 2008 Cadillac SRX 3.6L High Feature (HF) V6, 4-cycle engine is used as the test apparatus. The engine incorporates Dual Overhead Camshafts, 4 Valves / Cylinder, Dual Stage Plenum Induction Manifold, 94x85.6mm Bore & Stroke, with 10.2:1 compression ratio.

The Sequence VID test incorporates a flush and run type procedure. Each test consists of two 6-stage fuel economy measurements on baseline oil (BL), one at the beginning of the test and one at the end. The test oil is evaluated in between the two baseline runs. The test oil is initially aged during 16 hours of engine operation at 2250 r/min and 120°C oil temperature. After the initial aging, a 6-stage fuel economy measurement is taken. The test oil is then aged an additional 84 hours at an engine speed of 2250 r/min and 120°C oil temperature. Following this final aging, the test oil once again goes through a 6-stage fuel economy measurement. The two fuel economy measurements taken on the baseline oil (BL) and a final value for Fuel Economy Improvement is calculated for the test oil.

Below is a summary of the operation conditions for the aging and 6-stage fuel economy portions of the test.

Fuel Economy Measurement and Aging Condition				
FE Stage	**Speed (r/min)**	**Torque (N-m)**	**Oil Temp. (°C)**	**Coolant Temp. (°C)**
1	2000	105	115	109
2	2000	105	65	65
3	1500	105	115	109
4	695	20	115	109
5	695	20	35	35
6	695	40	115	109

Aging Stage	**Speed (r/min)**	**Torque (N-m)**	**Oil Temp. (°C)**	**Coolant Temp. (°C)**
1 & 2	2250	110	120	110

Sequence VID
Form 4
Test Result Summary
Non-Reference & Reference Oil Tests

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:		Engine Serial Number:	
Formulation/Stand Code:			

Test Documentation				
	Test Oil	**BL After**	**Test Oil**	**BL After**
Start Date				
Start Time				
End Date				
End Time				
Oil Test Length, hhh:mm				
Calibration Oil Batch				
Flush Oil Batch				
Laboratory Oil Code				
SAE Viscosity Grade				
TMC Oil Code (Reference Oil Tests Only)				
New Oil Viscosity @ 40 °C, cSt				
New Oil Viscosity @ 100°C, cSt				
Aged (100 h) Oil Viscosity @ 40 °C, cSt				
Aged (100 h) Oil Viscosity @ 100°C, cSt				
Total Test Length, hhh:mm				
Total Engine Hours @ EOT				
Most Recent Fuel Batch				

Overall Results					
	BL Oil			**Test Oil**	
	Before 1	**Before 2**	**After**	**Phase I**	**Phase II**
Fuel Consumed, kg					
Shift Delta, %					
Fuel Economy Improvement, %					
FEI Industry Correction Factor, %					
FEI Severity Adjustment, % (non-reference tests only)					
FEI Final Result, %					
Total Oil Consumption, mL					

Sequence VID
Form 5
Operational Data Analysis

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:			
Formulation/Stand Code:			

Computed Averages						
Oil	Stage	BSFC kg/kW-h	BSFC C.V.%	Nominal Power kW	Weight Factor	Weighted Fuel Consumed kg
BL Before Test Oil 1	1			22.0	0.300	
	2			22.0	0.032	
	3			16.5	0.310	
	4			1.5	0.174	
	5			1.5	0.011	
	6			2.9	0.172	
Total Fuel Consumed						

Computed Averages						
Oil	Stage	BSFC kg/kW-h	BSFC C.V.%	Nominal Power kW	Weight Factor	Weighted Fuel Consumed kg
BL Before Test Oil 2	1			22.0	0.300	
	2			22.0	0.032	
	3			16.5	0.310	
	4			1.5	0.174	
	5			1.5	0.011	
	6			2.9	0.172	
Total Fuel Consumed						

Sequence VID
Form 6
Operational Date Analysis

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:			
Formulation/Stand Code:			

Computed Averages						
Oil	**Stage**	**BSFC kg/kW-h**	**BSFC C.V.%**	**Nominal Power kW**	**Weight Factor**	**Weighted Fuel Consumed kg**
Test Oil Phase I	1			**22.0**	**0.300**	
	2			**22.0**	**0.032**	
	3			**16.5**	**0.310**	
	4			**1.5**	**0.174**	
	5			**1.5**	**0.011**	
	6			**2.9**	**0.172**	
Total Fuel Consumed						

Computed Averages						
Oil	**Stage**	**BSFC kg/kW-h**	**BSFC C.V.%**	**Nominal Power kW**	**Weight Factor**	**Weighted Fuel Consumed kg**
Test Oil Phase II	1			**22.0**	**0.300**	
	2			**22.0**	**0.032**	
	3			**16.5**	**0.310**	
	4			**1.5**	**0.174**	
	5			**1.5**	**0.011**	
	6			**2.9**	**0.172**	
Total Fuel Consumed						

Sequence VID
Form 7
Operational Date Analysis

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:			
Formulation/Stand Code:			

Computed Averages						
Oil	**Stage**	**BSFC kg/kW-h**	**BSFC C.V.%**	**Nominal Power kW**	**Weight Factor**	**Weighted Fuel Consumed kg**
BL After Test Oil	1			**22.0**	**0.300**	
	2			**22.0**	**0.032**	
	3			**16.5**	**0.310**	
	4			**1.5**	**0.174**	
	5			**1.5**	**0.011**	
	6			**2.9**	**0.172**	
Total Fuel Consumed						

Sequence VID
Form 8
General Parameter Listing

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:			
Formulation/Stand Code:			

16 Hour Aging

	Spec	Average [A]	Max[A]	Min [A]
1. Speed, r/min	**2250 ±5**			
2. Torque, N-m	**110 ±0.10**			
3. Oil Gallery Temperature, °C	**120 ±2**			
4. Coolant Inlet Temperature, °C	**110 ±2**			
5. Oil Circulation Temperature, °C	**Record**			
6. Coolant Out Temperature, °C	**Record**			
7. Intake Air Temperature, °C	**29 ±2**			
8. Fuel to Flowmeter Temperature, °C	**20-32**			
9. Fuel to Fuel Rail Temperature, °C	**22 ±2**			
10. Load Cell Temperature, °C	**Record**			
11. Oil Heater Temperature, °C	**205 max**			
12. Intake Air Pressure, kPa	**0.05 ±0.02**			
13. Fuel to Flowmeter Pressure, kPa	**100 min**			
14. Fuel to Fuel Rail Pressure, kPa	**395 min**			
15. Intake Manifold Pressure, kPa abs.	**Record**			
16. Exhaust Back Pressure, kPa abs.	**105 ±0.20**			
17. Engine Oil Pressure, kPa	**Record**			
18. Coolant Flow, L/min	**80 ±4**			
19. Fuel Flow, kg/h	**Record**			
20. Intake Air Humidity, grains/kg	**11.4±0.8**			
21. Air/Fuel Ratio	**Record**			
22. Crankcase Pressure, kPa	**0.00 ±0.25**			

[A] Based on a minimum of one determination per hour

Sequence VID
Form 9
General Parameter Listing

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:			
Formulation/Stand Code:			

84 Hour Aging

	Spec	Average [A]	Max[A]	Min [A]
1. Speed, r/min	**2250 ± 5**			
2. Torque, N-m	**110 ±0.10**			
3. Oil Gallery Temperature, °C	**120±2**			
4. Coolant Inlet Temperature, °C	**110 ±2**			
5. Oil Circulation Temperature, °C	**Record**			
6. Coolant Out Temperature, °C	**Record**			
7. Intake Air Temperature, °C	**29 ±2**			
8. Fuel to Flowmeter Temperature, "C	**20-32**			
9. Fuel to Fuel Rail Temperature, °C	**22 ±2**			
10. Load Cell Temperature, °C	**Record**			
11. Oil Heater Temperature, °C	**205 max**			
12. Intake Air Pressure, kPa	**0.05 ±0.02**			
13. Fuel to Flowmeter Pressure, kPa	**100 min**			
14. Fuel to Fuel Rail Pressure, kPa	**395 min**			
15. Intake Manifold Pressure, kPa abs.	**Record**			
16. Exhaust Back Pressure, kPa abs.	**105 ± 0.20**			
17. Engine Oil Pressure, kPa	**Record**			
18. Coolant Flow, L/min	**80±4**			
19. Fuel Flow, kg/h	**Record**			
20. Intake Air Humidity, grains/kg	**11.4 ±0.8**			
21. Air/Fuel Ratio	**Record**			
22. Crankcase Pressure, kPa	**0.00 ±0.25**			

[A] Based on a minimum of one determination per hour

Sequence VID
Form 10
General Parameter Summary

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:			
Formulation/Stand Code:			

BL Before Test Oil 1

General Parameters

		Stage					
	Spec	**1**	**2**	**3**	**4**	**5**	**6**
1. Oil Circulation Temperature, °C	**Record**						
2. Coolant Out Temperature, °C	**Record**						
3. Fuel to Flowmeter Temperature, °C	**20-32**						
4. Delta Fuel to Flowmeter Temp., °C	**≤4**						
5. Test Cell Temperature, °C	**Record**						
6. Load Cell Temperature, °C	**Record**						
7. Delta Load Cell Temperature, °C [A]	**≤12**						
8. Oil Heater Temperature, °C	**205**						
9. Intake Air Pressure, kPa	**0.05 ±**						
10. Fuel to Flowmeter Pressure, kPa	**100**						
11. Fuel to Fuel Rail Pressure, kPa	**395**						
12. Intake Manifold Pressure, kPa	**Record**						
13. Engine Oil Pressure, kPa	**Record**						
14. Coolant Flow, L/min	**80 ±4**						
15. Intake Air Humidity, grains/kg	**11.4**						
16. Crankcase Pressure, kPa	**0.00**						
17. Barometric Pressure, kPa	**Record**						

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings

Sequence VID
Form 11
General Parameter Summary

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:			
Formulation/Stand Code:			

BL Before Test Oil 2

General Parameters

		Stage					
	Spec	**1**	**2**	**3**	**4**	**5**	**6**
1. Oil Circulation Temperature, °C	**Record**						
2. Coolant Out Temperature, °C	**Record**						
3. Fuel to Flowmeter Temperature, °C	**20-32**						
4. Delta Fuel to Flowmeter Temp., °C	**≤4**						
5. Test Cell Temperature, °C	**Record**						
6. Load Cell Temperature, °C	**Record**						
7. Delta Load Cell Temperature, °C [A]	**≤12**						
8. Oil Heater Temperature, °C	**205**						
9. Intake Air Pressure, kPa	**0.05 ±**						
10. Fuel to Flowmeter Pressure, kPa	**100**						
11. Fuel to Fuel Rail Pressure, kPa	**395**						
12. Intake Manifold Pressure, kPa	**Record**						
13. Engine Oil Pressure, kPa	**Record**						
14. Coolant Flow, L/min	**80 ±4**						
15. Intake Air Humidity, grains/kg	**11.4**						
16. Crankcase Pressure, kPa	**0.00**						
17. Barometric Pressure, kPa	**Record**						

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings

Sequence VID
Form 12
General Parameter Summary

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:			
Formulation/Stand Code:			

Test Oil Phase I

General Parameters

		Stage					
	Spec	**1**	**2**	**3**	**4**	**5**	**6**
1. Oil Circulation Temperature, °C	**Record**						
2. Coolant Out Temperature, °C	**Record**						
3. Fuel to Flowmeter Temperature, °C	**20-32**						
4. Delta Fuel to Flowmeter Temp., °C	**≤4**						
5. Test Cell Temperature, °C	**Record**						
6. Load Cell Temperature, °C	**Record**						
7. Delta Load Cell Temperature, °C [A]	**≤12**						
8. Oil Heater Temperature, °C	**205**						
9. Intake Air Pressure, kPa	**0.05 ±**						
10. Fuel to Flowmeter Pressure, kPa	**100**						
11. Fuel to Fuel Rail Pressure, kPa	**395**						
12. Intake Manifold Pressure, kPa	**Record**						
13. Engine Oil Pressure, kPa	**Record**						
14. Coolant Flow, L/min	**80 ±4**						
15. Intake Air Humidity, grains/kg	**11.4**						
16. Crankcase Pressure, kPa	**0.00**						
17. Barometric Pressure, kPa	**Record**						

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings

Sequence VID
Form 13
General Parameter Summary

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:			
Formulation/Stand Code:			

Test Oil Phase II

General Parameters

		Stage					
	Spec	**1**	**2**	**3**	**4**	**5**	**6**
1. Oil Circulation Temperature, °C	**Record**						
2. Coolant Out Temperature, °C	**Record**						
3. Fuel to Flowmeter Temperature, °C	**20-32**						
4. Delta Fuel to Flowmeter Temp., °C	**≤4**						
5. Test Cell Temperature, °C	**Record**						
6. Load Cell Temperature, °C	**Record**						
7. Delta Load Cell Temperature, °C [A]	**≤12**						
8. Oil Heater Temperature, °C	**205**						
9. Intake Air Pressure, kPa	**0.05 ±**						
10. Fuel to Flowmeter Pressure, kPa	**100**						
11. Fuel to Fuel Rail Pressure, kPa	**395**						
12. Intake Manifold Pressure, kPa	**Record**						
13. Engine Oil Pressure, kPa	**Record**						
14. Coolant Flow, L/min	**80 ±4**						
15. Intake Air Humidity, grains/kg	**11.4**						
16. Crankcase Pressure, kPa	**0.00**						
17. Barometric Pressure, kPa	**Record**						

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings

Sequence VID
Form 14
General Parameter Summary

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:			
Formulation/Stand Code:			

BL After Test Oil

General Parameters

		Stage					
	Spec	**1**	**2**	**3**	**4**	**5**	**6**
1. Oil Circulation Temperature, °C	**Record**						
2. Coolant Out Temperature, °C	**Record**						
3. Fuel to Flowmeter Temperature, °C	**20-32**						
4. Delta Fuel to Flowmeter Temp., °C	**≤4**						
5. Test Cell Temperature, °C	**Record**						
6. Load Cell Temperature, °C	**Record**						
7. Delta Load Cell Temperature, °C [A]	**≤12**						
8. Oil Heater Temperature, °C	**205**						
9. Intake Air Pressure, kPa	**0.05 ±**						
10. Fuel to Flowmeter Pressure, kPa	**100**						
11. Fuel to Fuel Rail Pressure, kPa	**395**						
12. Intake Manifold Pressure, kPa	**Record**						
13. Engine Oil Pressure, kPa	**Record**						
14. Coolant Flow, L/min	**80 ±4**						
15. Intake Air Humidity, grains/kg	**11.4**						
16. Crankcase Pressure, kPa	**0.00**						
17. Barometric Pressure, kPa	**Record**						

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings

Sequence VID
Form 15
Critical Parameter Summary

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:			
Formulation/Stand Code:			

Stage 1

	Spec	BL Before Test Oil 1	BL Before Test Oil 2	Test Oil Phase I	Test Oil Phase II	BL After Test Oil
Speed, r/min	**2000±5**					
Torque, N-m	**105±0.10**					
Oil Gallery Temperature, °C	**115±2**					
Coolant Inlet Temperature, °C	**109±2**					
Intake Air Temperature, °C	**29±2**					
Fuel to Fuel Rail Temperature, °C	**22±2**					
Exhaust Back Pressure, kPa abs.	**105±0.20**					
Fuel Flow, kg/h	**Record**					
Air/Fuel Ratio	**14.00–15.00**					
Delta AFR[A]	**≤ .50**					
BSFC, kg/Kw-h	**Record**					
BSFC, Standard Deviation	**Record**					
BSFC, C.V.%	**Record**					

Stage 2

	Spec	BL Before Test Oil 1	BL Before Test Oil 2	Test Oil Phase I	Test Oil Phase II	BL After Test Oil
Speed, r/min	**2000±5**					
Torque, N-m	**105±0.10**					
Oil Gallery Temperature, °C	**65±2**					
Coolant Inlet Temperature, °C	**65±2**					
Intake Air Temperature, °C	**29±2**					
Fuel to Fuel Rail Temperature, °C	**22±2**					
Exhaust Back Pressure, kPa abs.	**105±0.20**					
Fuel Flow, kg/h	**Record**					
Air/Fuel Ratio	**14.00–15.00**					
Delta AFR[A]	**≤ .50**					
BSFC, kg/Kw-h	**Record**					
BSFC, Standard Deviation	**Record**					
BSFC, C.V.%	**Record**					

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings.

Sequence VID
Form 16
Critical Parameter Summary

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:			
Formulation/Stand Code:			

Stage 3

	Spec	BL Before Test Oil 1	BL Before Test Oil 2	Test Oil Phase I	Test Oil Phase II	BL After Test Oil
Speed, r/min	**1500±5**					
Torque, N-m	**105±0.10**					
Oil Gallery Temperature, °C	**115±2**					
Coolant Inlet Temperature, °C	**109±2**					
Intake Air Temperature, °C	**29±2**					
Fuel to Fuel Rail Temperature, °C	**22±2**					
Exhaust Back Pressure, kPa abs.	**105±0.20**					
Fuel Flow, kg/h	**Record**					
Air/Fuel Ratio	**14.00–15.00**					
Delta AFR[A]	**≤ .50**					
BSFC, kg/Kw-h	**Record**					
BSFC, Standard Deviation	**Record**					
BSFC, C.V.%	**Record**					

Stage 4

	Spec	BL Before Test Oil 1	BL Before Test Oil 2	Test Oil Phase I	Test Oil Phase II	BL After Test Oil
Speed, r/min	**695±5**					
Torque, N-m	**20±0.10**					
Oil Gallery Temperature, °C	**115±2**					
Coolant Inlet Temperature, °C	**109±2**					
Intake Air Temperature, °C	**29±2**					
Fuel to Fuel Rail Temperature, °C	**22±2**					
Exhaust Back Pressure, kPa abs.	**104±0.20**					
Fuel Flow, kg/h	**Record**					
Air/Fuel Ratio	**14.00–15.00**					
Delta AFR[A]	**≤ .50**					
BSFC, kg/Kw-h	**Record**					
BSFC, Standard Deviation	**Record**					
BSFC, C.V.%	**Record**					

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings.

Sequence VID
Form 17
Critical Parameter Summary

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:			
Formulation/Stand Code:			

Stage 5

	Spec	BL Before Test Oil 1	BL Before Test Oil 2	Test Oil Phase I	Test Oil Phase II	BL After Test Oil
Speed, r/min	**695±5**					
Torque, N-m	**20±0.10**					
Oil Gallery Temperature, °C	**35±2**					
Coolant Inlet Temperature, °C	**35±2**					
Intake Air Temperature, °C	**29±2**					
Fuel to Fuel Rail Temperature, °C	**22±2**					
Exhaust Back Pressure, kPa abs.	**104±0.20**					
Fuel Flow, kg/h	**Record**					
Air/Fuel Ratio	**14.00–15.00**					
Delta AFR[A]	**≤ .50**					
BSFC, kg/Kw-h	**Record**					
BSFC, Standard Deviation	**Record**					
BSFC, C.V.%	**Record**					

Stage 6

	Spec	BL Before Test Oil 1	BL Before Test Oil 2	Test Oil Phase I	Test Oil Phase II	BL After Test Oil
Speed, r/min	**695±5**					
Torque, N-m	**40±0.10**					
Oil Gallery Temperature, °C	**115±2**					
Coolant Inlet Temperature, °C	**109±2**					
Intake Air Temperature, °C	**29±2**					
Fuel to Fuel Rail Temperature, °C	**22±2**					
Exhaust Back Pressure, kPa abs.	**104±0.20**					
Fuel Flow, kg/h	**Record**					
Air/Fuel Ratio	**14.00–15.00**					
Delta AFR[A]	**≤ .50**					
BSFC, kg/Kw-h	**Record**					
BSFC, Standard Deviation	**Record**					
BSFC, C.V.%	**Record**					

[A] Difference between the maximum stage average reading of the entire test and the individual stage average readings.

Sequence VID
Form 18
Downtime and Other Comments

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:			
Formulation/Stand Code:			

Number of Downtime Occurrences			
Test Hours	**Date**	**Downtime**	**Reasons**
Total Downtime			

Other Comments		
Number of Comment Lines		

Sequence VID
Form 18A
Downtime and Other Comments

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:			
Formulation/Stand Code:			

Number of Downtime Occurrences			
Test Hours	**Date**	**Downtime**	**Reasons**
Total Downtime			

Other Comments		
Number of Comment Lines		

Sequence VID
Form 18B
Downtime and Other Comments

Lab:	Date Completed:	Time Completed:	
Test Number			
Test Stand:	Runs On The Stand:	Engine No.	Runs on Engine:
Oil Code:			
Formulation/Stand Code:			

Number of Downtime Occurrences			
Test Hours	**Date**	**Downtime**	**Reasons**
Total Downtime			

Other Comments		
Number of Comment Lines		

Sequence VID
Form 19
American Chemistry Council Code of Practice
Test Laboratory Conformance Statement

Test Laboratory					
Test Sponsor					
Formulation / Stand Code					
Test Number					
Start Date		Start Time		Time Zone	

Declarations

No. 1 All requirements of the ACC Code of Practice for which the test laboratory is responsible were met in the conduct of this test. Yes _____ No_____ *

No. 2 The laboratory ran this test for the full duration following all procedural requirements; and all operational validity requirements of the latest version of the applicable test procedure (ASTM or other), including all updates issued by the organization responsible for the test, were met.
Yes _____ No_____*

If the response to this Declaration is "No", does the test engineer consider the deviations from operational validity requirements that occurred to be beyond the control of the laboratory? Yes _____* No_____

No 3. A deviation occurred for one of the test parameters identified by the organization responsible for the test as being a special case. Yes _____* No_____
(This currently applies only to specific deviations identified in the ASTM Information Letter System)

Check The Appropriate Conclusion

	Operational review of this test indicates that the results should be included in the Multiple Test Acceptance Criteria calculations.
	*Operational review of this test indicates that the results should not be included in the Multiple Test Acceptance Criteria calculations.

Note: *Supporting comments are required for all responses identified with an asterisk.*

Comments

_____ _____
Signature Date

_____ _____
Typed Name Title