Memorandum of Agreement
For Funding of the ASTM Sequence VID Test Matrix Program

PURPOSE

This Memorandum of Agreement (MOA) is to define the responsibilities of parties interested in the completion of the ASTM Sequence VID Test Matrix Program and to promote completion of the program in a cost-effective and timely manner.

The ASTM Sequence VID Test Matrix (hereinafter the “Test Matrix” or “Matrix”) will provide data on the Sequence VID test that is intended for use in the establishment of a new International Lubricant Standardization and Approval Committee (ILSAC) passenger car engine oil performance specification. Successful completion of the Test Matrix will be an important step towards establishing a new International Lubricant Standardization and Approval Committee (ILSAC) performance specification for gasoline engine oils and might enable the eventual development of a new API gasoline engine oil service category.

The parties to this agreement (hereinafter the “Parties”) are four (4) trade associations, two (2) laboratories, and ASTM International (hereinafter “ASTM”). The trade associations (hereinafter the “Trade Associations”) are the American Petroleum Institute (API), the American Chemistry Council (ACC), the Alliance of Automobile Manufacturers (Alliance), and the Japan Automobile Manufacturers Association (JAMA). The test laboratories are Intertek Automotive Research (IAR) and Southwest Research Institute (SwRI) and are referred to hereinafter as the “Matrix Labs,” “Contract Labs,” or “Test Laboratories.”

SCOPE

This agreement addresses only funding of the testing specified in the ASTM Sequence VID Test Matrix. The Test Matrix will be designed by the ASTM Passenger Car Engine Oil Classification Panel (hereinafter the “PCEOCP”).

The number of test stands, laboratories and test oils have been chosen by industry statisticians to provide data for test acceptability. This agreement covers all operationally valid engine tests, all results of which will be used in establishing the precision of the Sequence VID. Test results will also be used to establish base oil interchange (BOI) and viscosity grade read-across (VGRA) guidelines for the VID test. This agreement does not include contingency funding for rerunning operationally invalid tests.

Sequence VID Test Matrix Decision Criteria

The Sequence VID Matrix Design Task Force (MDTF) will recommend a Test Matrix design based on the matrix’s ability to provide statistically significant data on the precision of the new proposed VID test. The PCEOCP will review and decide whether to
accept the recommended Test Matrix design. If the PCEOCP accepts the MDTF recommendation, the PCEOCP will then determine if the Sequence VID Test Matrix readiness criteria listed below have been met. If the PCEOCP does not accept the MDTF recommendation, the PCEOCP will return the recommended Test Matrix design to the MDTF for changes, and the process will repeat until the PCEOCP accepts the MDTF recommendation.

The PCEOCP must formally declare by vote the Sequence VID test suitable for matrix testing in terms of test procedure, materials supply, and the ability to discriminate between oils before testing commences. The VID must demonstrate discrimination between oils of different performance levels using a P value less than or equal to 0.05. It is expected that testing will begin for the Sequence VID as soon as it is declared suitable for matrix testing.

**Sequence VID Test Matrix Readiness Criteria**

After approving the Test Matrix, the PCEOCP must determine that each of the following conditions are met before matrix testing begins. Each item must be addressed specifically in a panel conference call or meeting or by ballot:

- Each oil used to demonstrate discrimination has a minimum of two valid test results in the most current test procedure. The ASTM Sequence VI Surveillance Panel must be satisfied with these test results.

- Each Matrix Lab has run at least two operationally valid tests (shakedown runs are eligible) using the Test Matrix procedure. Shakedown runs are full-length, operationally valid runs on oils such as potential candidate or research oils. The ASTM Sequence VI Surveillance Panel will decide if these test results are satisfactory in terms of precision, Lubricant Test Monitoring System (LTMS) impact, and relative agreement among labs.

- The lab inspection team has made a visit to each Matrix Lab and filed a report regarding the Matrix Lab’s conformance to specifications that include, at a minimum, completed lab inspection checklists.

- Matrix Lab readiness, as summarized by the lab inspection team reports, is deemed satisfactory by the ASTM Sequence VI Surveillance Panel.

- The current batch supply of critical test parts used in the Test Matrix is sufficient to use in post-matrix testing beyond one reference cycle.

- The PCEOCP has identified a Project Supervisor for the test program as described under Test Management.

- The MOA has been signed by all participating parties.
Reporting of Test Program Delays

Each Matrix Lab must promptly report any technical impediments and delays in testing that arise, as defined by the Test Matrix design, so that the MDTF can, if appropriate, recommend a revision to the Test Matrix design for review and decision by the PCEOCP.

TEST MANAGEMENT

ASTM and the appropriate ASTM committees agree to act as the fund and test administrators for the Sequence VID Matrix (hereinafter, “Project Managers”). The responsibilities of the Project Managers are as follows:

- ASTM will act as the fund-collection and dispersing body for the Sequence VID Matrix. Testing will not begin until all funds have been collected. API, ACC, the Alliance, and JAMA will be invoiced as described below in Agreement Concerning Funding and Resources, section (a), second paragraph, according to the contribution level of each association. In the event that a matrix is terminated early, test labs can invoice for up to two tests per stand provided the Project Supervisor has acknowledged in writing successful completion of that number of valid tests according to the established guidelines.

- ASTM will make payment on lab invoices on a per test basis upon completion of the following:
  - Sequence VID Matrix funds have been received at ASTM from the Trade Associations.
  - ASTM Test Monitoring Center (hereinafter the "ASTM TMC") provides contract labs with a one-page confirmation of acceptance of test results.
  - Contract labs provide invoices for each test with the one-page confirmation from ASTM TMC attached.
  - Contract labs send invoices to ASTM International, Accounts Payable-VID Matrix, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

- PCEOCP will be responsible for administration of the Sequence VID Matrix testing in a manner consistent with the terms of this agreement. The ILSAC/Oil Committee will provide oversight and guidance to the PCEOCP on all issues pertaining to funding, timing or revisions to the initial Matrix design. The ILSAC/Oil Committee will get appropriate direction from API, ACC, and ILSAC. Any and all revisions to the Matrix after the commencement of the testing shall be proposed and approved by the ILSAC/Oil Committee.

—The Director-Administrator of the ASTM Test Monitoring Center will serve as the Project Supervisor. The Chair of the PCEOCP, in consultation with the ILSAC/Oil Committee, is responsible for identifying a Project Supervisor who will be responsible for the technical oversight and direction of the project (“Project Supervisor”). The Project Supervisor is responsible for providing technical oversight and direction of the project.
and will also be responsible for providing written status reports on the program to the Chair of the PCEOCP with copies to the Trade Associations and the Test Laboratories. In the event that the Director of the ASTM Test Monitoring Center is unable to accept or complete the duties of the Project Supervisor, the Chair of the PCEOCP, in consultation with the ILSAC/Oil Committee, is responsible for nominating a candidate for Project Supervisor for consideration by the PCEOCP.

**AGREEMENT CONCERNING FUNDING AND RESOURCES**

The Trade Associations and Test Laboratories agree to provide funds and resources to support the engine Test Matrix as prescribed below.

**a) Trade Associations**

The Trade Associations agree to provide the funds for the Test Matrix. Each Trade Association will be responsible for prompt disbursement of funds to ASTM upon receipt of invoice with a targeted processing period of ten (10) business days. The Test Laboratories agree to provide a total of 12 calibration runs at no cost [see chart and (b) below]. These runs should be credited proportionately between the precision and BOI/VGRA segments as shown in the table below. However, to complete the Test Matrix in a timely manner and provide a more complete data base, API and ACC have volunteered to make a one-time only funding accommodation that allows the 12 calibration runs to be credited only to the precision matrix segment. ASTM will invoice the Trade Associations for the amounts indicated in the table below:

<table>
<thead>
<tr>
<th>VID Matrix Tests</th>
<th>Precision</th>
<th>BOI/VGRA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td># Lab-Financed Tests</td>
<td>8</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td># Association-Financed Tests</td>
<td>20</td>
<td>12</td>
<td>32</td>
</tr>
<tr>
<td>Total # Matrix Tests</td>
<td>28</td>
<td>16</td>
<td>44</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>One-Time Funding Accommodation</th>
<th>Precision</th>
<th>BOI/VGRA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td># Lab-Financed Tests</td>
<td>12</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td># Association-Financed Tests</td>
<td>16</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td>Total # Matrix Tests</td>
<td>28</td>
<td>16</td>
<td>44</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Association Funding Commitments</th>
<th>Precision</th>
<th>BOI/VGRA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>API</td>
<td>$114,528.00</td>
<td>$171,792.00</td>
<td>$286,320.00</td>
</tr>
<tr>
<td>ACC</td>
<td>114,528.00</td>
<td>171,792.00</td>
<td>286,320.00</td>
</tr>
<tr>
<td>Alliance</td>
<td>76,734.00</td>
<td>0</td>
<td>76,734.00</td>
</tr>
<tr>
<td>JAMA</td>
<td>37,794.00</td>
<td>0</td>
<td>37,794.00</td>
</tr>
<tr>
<td>Totals</td>
<td>$343,584.00</td>
<td>$343,584.00</td>
<td>$687,168.00</td>
</tr>
</tbody>
</table>

The total cost of the 16 association funded precision tests is divided between API, ACC, the Alliance, and JAMA [one third each for API and ACC and one third split between the Alliance and JAMA (two thirds Alliance and one third JAMA)]. API and ACC split evenly the cost of the 16 BOI/VGRA tests.
The Trade Associations and ASTM are not responsible for any claims, liabilities, or damages and are not responsible for any claims arising out of any and all aspects of the testing performed pursuant to this agreement.

In the unlikely event that the Matrix is terminated or modified, testing stopped, and/or the category development canceled, any unspent cash contributions will be returned to the Trade Associations in the same ratio as the cash contributions were collected for each test. In its role as the fund collection and dispersement body, ASTM has no independent financial liability or requirement to continue the Matrix if funds are not received from the Trade Associations.

(b) Test Laboratories
The Test Laboratories agree to run three lab-financed Sequence VID tests on each Matrix test stand to ensure proper test calibration. The Matrix requires two stands at each Test Laboratory. These test stands will be considered calibrated upon the successful completion of the Sequence VID Test Matrix and in compliance with calibration criteria as determined by the Sequence VI Surveillance Panel. The calibration period will begin concurrently with the effective date of ACC registration of the VID.

To maintain confidentiality of pricing information, the full and final prices paid to a Matrix Lab are shown only on that Matrix Lab’s copy of this MOA and the master copy kept by API.

- **Intertek Automotive Research** will provide to ASTM, at no charge, the pertinent data and results of 6 tests for the Sequence VID matrix. Intertek also commits to conduct 16 tests for the Sequence VID matrix at the fixed full and final price of ________.

- **Southwest Research Institute** will provide to ASTM, at no charge, the pertinent data and results of 6 tests for the Sequence VID matrix. Southwest Research Institute also commits to conduct 16 tests for the Sequence VID matrix at the fixed full and final price of ________.

All tests submitted by the Test Laboratories must be operationally valid. Operational validity of engine tests will be determined by the testing laboratory using guidance from the ASTM TMC and input from the Project Supervisor using guidelines established by the ASTM Sequence VI Surveillance Panel prior to the start of the matrix. Matrix tests that are determined to be operationally invalid will be re-run at the test laboratory’s expense. The Test Laboratories are not responsible for performing any testing beyond what is stated above.

**TEST SCHEDULE**
Sequence VID testing will begin when the test has been formally affirmed "ready for Matrix testing" by the PCEOCP and all other conditions set forth in Scope have been met. Testing shall be conducted in accordance with the approved Test Matrix (see Attachment).

The targeted completion date for the Sequence VID Test Matrix is three (3) months after its commencement date. The stands included in the Test Matrix should be used exclusively for matrix testing until the assigned tests in those stands have been completed. The commencement date is the date that the first Matrix test begins. Extension of the timing past this targeted completion date must be approved by the ILSAC/Oil Committee.

COMPLETION OF TESTING & TEST REPORTS

The Test Laboratories will immediately communicate Matrix test results to the Project Supervisor, the ASTM-TMC, the Trade Association staff person designated by each association, and the PCEOCP Chair. All reports shall become the property of the Parties to this agreement. Each Party shall have the right to use the report in any manner it deems appropriate including to create its own copyrightable derivative work, subject to this agreement. The Parties represent and warrant that they will not permit use of the reports and the data contained therein by any non-party, including, but not limited to members of Trade Association Parties, without a written copyright licensing agreement which prohibits use of the reports and data for goals inconsistent with the development, administration, or application of an ILSAC performance specification, including, but not limited to, the development or administration of any oil specification which is intended for use or actually used to the exclusion of any proposed or existing ILSAC specification. Upon the completion or termination of each test, ASTM will return any unspent cash contributions for any reason to API, ACC, the Alliance, and JAMA based on their originally contributed percentages. Unless otherwise recommended by the ILSAC/Oil Committee in writing, surplus funds from one test cannot be used to support additional testing.

MISCELLANEOUS TERMS

- The Parties express agree to reasonably exercise their best efforts their continued commitment and intention to support equitably the development of future passenger car engine oil categories.

- The Trade Associations express their continued support for the API Engine Oil Licensing and Certification System for as long as the system remains fully functional.

- Supplemental data from additional labs and stands deemed ready by ASTM will be included in development of the precision statement unless identified and confirmed as a statistical outlier by the industry statistician team, assuming the last test of the data submission has started by the end of matrix step 2.
• The Test Laboratories are neither responsible for any use made by any other party of the data and test results provided by the Test Laboratories nor liable for the consequences of any such use.

• This document sets forth the entire agreement of the Parties on the subject hereof and supersedes all previous or contemporaneous oral or written representations or agreements relating to the rights and duties provided herein, and may not be modified or amended except by written agreement of the Parties.

• The waiver by any Party of or the failure by any Party to claim a breach of any provision of this agreement shall not be, or be held to be, a waiver of any subsequent breach or affect in any way the further effectiveness of any such provision.

• This agreement will be executed in multiple counterparts, and each counterpart will constitute an original instrument, but all such separate counterparts will constitute only one and the same instrument. Each Party will sign a separate copy of the same document. Each copy will be considered as an original document, and all signed copies together will be the same document.

• This agreement, and all rights, duties and responsibilities herein, will not become effective until all Parties have executed this agreement.

• The Parties express their continued support for the development of laboratory stand calibration based on acceptable test results from matrix runs.

American Petroleum Institute

By: ________________________________
    Brenda S. Hargett
    Vice President & CFO

By: ________________________________
    Michele E. Rinn
    Corporate Secretary

American Chemistry Council
(On behalf of ACC PAPTG)

By: ________________________________

Date: ______________________________

ASTM International

Alliance of Automobile Manufacturers
By: _________________________  By: _________________________

Date: _________________________  Date: _________________________

**Japan Automobile Manufacturers Association**

By: _________________________

Date: _________________________

**Intertek Automotive Research**  **Southwest Research Institute**

By: _________________________  By: _________________________

Date: _________________________  Date: _________________________
### Attachment 1: Sequence VID Matrix Summary

<table>
<thead>
<tr>
<th>Test</th>
<th>Sequence VID</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDTF Design</td>
<td></td>
</tr>
<tr>
<td>Number of Stands</td>
<td></td>
</tr>
<tr>
<td>Number of Labs</td>
<td></td>
</tr>
<tr>
<td>Number of Oils</td>
<td></td>
</tr>
<tr>
<td>Oil Codes</td>
<td></td>
</tr>
<tr>
<td>Total Number of Tests</td>
<td></td>
</tr>
<tr>
<td>Calibration Tests</td>
<td></td>
</tr>
<tr>
<td>Sponsored Tests</td>
<td></td>
</tr>
<tr>
<td>Number of Tests / Stand</td>
<td></td>
</tr>
<tr>
<td>Number of Tests / Oil</td>
<td></td>
</tr>
</tbody>
</table>