

**Memorandum of Agreement
For Funding of the ASTM PC-10 Test Matrix Program**

PURPOSE

The purpose of this Memorandum of Agreement is to define the responsibilities of parties interested in the completion of the ASTM PC-10 Test Matrix Program and to ensure the program is completed in a cost-effective and timely manner.

The ASTM PC-10 Test Matrix (hereinafter the "Test Matrix" or "Matrix") will provide data on engine tests that are being considered for use in the establishment of a new diesel engine oil category. This category is based on the performance levels needed for model year 2007 and earlier vehicles. Successful completion of the Test Matrix should enable the development of a new service category.

The parties covered by this agreement include three (3) trade associations, ? (?) laboratories, and ASTM International. The trade associations (hereinafter the "Trade Associations") are the American Petroleum Institute (API), the American Chemistry Council (ACC), and the Engine Manufacturers Association (EMA). The test laboratories are PerkinElmer Automotive Research (PE), Southwest Research Institute (SwRI), and ? and are referred to hereinafter as the "Matrix Labs" or "Test Laboratories."

SCOPE

This agreement addresses only provisions for funding the testing specified in the ASTM PC-10 Test Matrix. The ASTM PC-10 Test Matrix will be designed by the ASTM Heavy Duty Engine Oil Classification Panel (hereinafter the "ASTM HDEOCP"). The Test Matrix will include the following tests and number of test runs:

PC-10 Tests	Number of Test Runs
Caterpillar C13	26
Cummins ISB	14
Mack T-12	14

The number of test stands, laboratories and test oils have been chosen by industry statisticians to deliver optimum results. This agreement covers all operationally valid engine tests, all results of which will be used in establishing the precision of the PC-10 engine tests. Caterpillar C13 results will also be used to establish base oil interchange (BOI) guidelines for the C13 test. There is no provision for contingency funding for rerunning invalid tests.

PC-10 Test Matrix Decision Criteria

The PC-10 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 PC-10 tests. The ASTM HDEOCP will review and decide whether to accept the recommended test matrix design based on the considerations provided

below. If it accepts the MDTF recommendation, the test program may proceed. If it does not, the HDEOCP will return the recommended test matrix design to the MDTF for changes, and the process will repeat until the HDEOCP accepts the MDTF recommendation.

The ASTM HDEOCP must formally declare the Caterpillar C13, Cummins ISB, and Mack T-12 tests suitable for matrix testing in terms of test procedure, materials supply, and the ability to discriminate between oils before testing commences.

More specific factors that the ASTM HDEOCP is expected to consider include the following:

- The test results generated in the engine test type have demonstrated discrimination in the most current test procedure to the satisfaction of the appropriate ASTM Surveillance and Classification Panels. Each oil used to demonstrate discrimination should have a minimum of two valid test results in the most current test procedure.
- Each Matrix Lab has run at least two operationally valid tests (shakedown runs are eligible) using the Test Matrix procedure. The appropriate ASTM Surveillance Panel will decide if these test results are satisfactory in terms of precision and relative agreement among labs.

Test Program Readiness Criteria

Before testing may begin and in addition to approving the test matrix design, the HDEOCP must determine that the following conditions are met:

- 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 appropriate ASTM Surveillance and Classification Panels.
- 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 HDEOCP has identified a project manager for the test program using the procedure shown below under **Test Management**.
- The MOA has been signed by all participating parties.
- The API Base Oil Interchange (BOI)/Viscosity Grade Read Across (VGRA) Task Force and API Lubricants Committee have approved the application of the BOI

and VGRA guidelines for the Cummins M11EGR and Mack T-10 tests to the Cummins ISB and Mack T-12 tests.

AGREEMENT CONCERNING FUNDING AND RESOURCES

The Trade Associations and Test Laboratories agree to provide funds and resources to ASTM to support the engine test matrix for the proposed diesel engine oil category as prescribed by the ASTM HDEOCP:

a) Trade Associations

The Trade Associations agree to provide the following funds to ASTM for the PC-10 matrix-testing program:

- The API will provide up to \$1,000,000 to ASTM for the PC-10 matrix-testing program.
- The American Chemistry Council will provide up to \$1,000,000 to ASTM for the PC-10 matrix-testing program.
- The Engine Manufacturers Association will provide up to \$350,000 to ASTM for the PC-10 matrix-testing program. Note that EMA also agreed to provide more than \$650,000 in in-kind funding as detailed in the attached spreadsheet (see Attachment 1).

The Trade Associations will be individually responsible for prompt disbursement of funds to ASTM upon receipt of invoice with a targeted processing period of ten (10) business days. ASTM will invoice the Trade Associations for their share of the cost of each test in the test matrix as each is started or when ASTM and a Trade Association(s) mutually agree to an earlier invoicing date. “Started” is defined as when the ASTM HDEOCP has adopted each test and said that it is ready for use in the matrix.

The Trade Associations 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, testing stopped, and/or the category development canceled, any unspent monies would be returned to the Trade Associations in the same ratio as the funds were collected for each test.

(b) Test Laboratories

The Test Laboratories agree to provide the following resources to ASTM for use in the PC-10 Test Matrix.

	Caterpillar C13		Cummins ISB		Mack T-12	
Lab	Lab Financed Runs	ACC/API/EMA Financed Runs	Lab Financed Runs	ACC/API/EMA Financed Runs	Lab Financed Runs	ACC/API/EMA Financed Runs

PerkinElmer						
SwRI						

To maintain confidentiality of pricing information, the full and final prices paid to a lab are shown only on that lab's copy and the master copy kept by API.

- **PerkinElmer** will provide to ASTM, at no charge, the pertinent data and results of ? (?) Caterpillar C13, ? (?) Cummins ISB, and ? (?) Mack T-12 tests for the PC-10 matrix. PerkinElmer also commits to conduct ? (?) Caterpillar C13, ? (?) Cummins ISB, and ? (?) Mack T-12 tests for the PC-10 matrix at the full and final price of _____.
- **Southwest Research Institute** will provide to ASTM, at no charge, the pertinent data and results of ? (?) Caterpillar C13, ? (?) Cummins ISB, and ? (?) Mack T-12 tests for the PC-10 matrix. Southwest Research also commits to conduct ? (?) Caterpillar C13, ? (?) Cummins ISB, and ? (?) Mack T-12 tests for the PC-10 matrix at the 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 Test Monitoring Center (hereinafter the "ASTM TMC") and input from the Project Manager using guidelines established by appropriate ASTM Surveillance Panels prior to the start of each matrix. Matrix tests that are determined to be operationally invalid will be re-run at the cost of the test laboratory. The Test Laboratories are not responsible for performing any testing beyond what is stated above.

TEST MANAGEMENT

ASTM and the appropriate ASTM committees agree to act as the fund and test administrators for the PC-10 matrix. The responsibilities of ASTM and the ASTM committees are as follows:

- ASTM will act as the fund-dispersing agency for the PC-10 matrix. API, ACC, and EMA will be invoiced as described above in **Agreement Concerning Funding and Resources, section (a), second paragraph**, according to the contribution level of each association. ASTM will disburse funds to the Test Laboratories on a per test basis.
- ASTM HDEOCP will be responsible for the management of the PC-10 matrix testing. The PC-10 New Category Development Team (hereinafter the "PC-10 NCDT") and API/EMA Diesel Engine Oil Advisory Panel (hereinafter the "DEOAP") will provide oversight and guidance to the ASTM HDEOCP on all issues pertaining to funding, timing or revisions to the initial matrix design. The PC-10 NCDT and DEOAP will get appropriate direction from API, ACC, and EMA. If the PC-10 NCDT and DEOAP

revise the matrix after commencement of the testing, the PC-10 NCDT Chair and DEOAP Co-Chairs will immediately communicate with and obtain concurrence to the changes by all parties in this agreement.

- The Chair of the ASTM HDEOCP in consultation with the PC-10 NCDT Chair and DEOAP Co-Chairs is responsible for identifying a project manager who will be responsible for the technical oversight and direction of the project. The project manager will also be responsible for reporting the status of the program to the Chair of the ASTM HDEOCP with copies to Trade Association staff, the Test Laboratories, the PC-10 NCDT, and the DEOAP.

TEST SCHEDULE

The testing covered by this agreement begins when each of the three tests—Caterpillar C13, Cummins ISB, and Mack T-12—have been formally affirmed "ready for matrix testing" by the ASTM HDEOCP and all other conditions shown above under **Scope** have been met.

The targeted completion date for each engine test for the ASTM PC-10 test matrix is ? months after its commencement date. The commencement date is the date that the first test begins. Extension of the timing past this targeted completion date must be approved by the PC-10 NCDT and DEOAP.

COMPLETION OF TESTING & TEST REPORTS

The Test Laboratories will immediately communicate Matrix test results to the ASTM TMC, the Trade Association staff person designated by each association and the ASTM HDEOCP 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. ASTM will return any funds unspent for any reason to API, ACC, and EMA based on their originally contributed percentages.

MISCELLANEOUS TERMS

- The parties express their continued support for the development of future diesel engine oil categories.
- The Trade Associations express their continued support for the API Engine Oil Licensing and Certification System and agree to promote its use for as long as the system remains fully functional.
- The Test Laboratories shall not be 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 represents the final written understanding of all of the terms of this agreement and is a complete statement of those terms.
- This agreement will be executed in ? counterparts, and each counterpart shall constitute an original instrument, but all such separate counterparts shall constitute only one and the same instrument. Each party will sign a separate copy of the same document. Each copy shall be considered as an original document and all signed copies together shall be the same document.
- This agreement, and all rights, duties and responsibilities herein, shall 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

American Chemistry Council
(On behalf of ACC PAPTG)

By: _____

By: _____

By: _____

Date: _____

Date: _____

ASTM International

Engine Manufacturers Association

By: _____

By: _____

Date: _____

Date: _____

PerkinElmer Automotive Research

Southwest Research Institute

By: _____

By: _____

Date: _____

Date: _____