

<b>Topic:</b>	<b>DIESEL FUEL QUALIFICATION</b>
<b>Point of Contact:</b>	Terry Ullman Phone: (210) 522-2654 Fax: (210) 522-3950
<b>Test Objective:</b>	The objective of this test is to qualify one fuel by comparing resulting emissions against another accepted fuel.
<b>Apparatus:</b>	The apparatus used is principally a DDC Series 60 HD Diesel engine. Other post-1990 engines can be substituted.
<b>Test Procedure:</b>	Repetitive EPA hot start transient emission tests are performed.
<b>Fuel Requirement:</b>	The fuel requirement for this test is 250 gallons of each test fuel.
<b>Duration:</b>	The duration of this test is from 7 to 10 days, with 20 hot-start transient tests on each fuel.
<b>Test Results:</b>	Test results include quantification of HC, CO, NO <sub>x</sub> , particulate, SOF, and SO <sub>4</sub> .  A PASS/FAIL determination is made with regard to NO <sub>x</sub> , particulate, and SOF as compared to reference fuel.
<b>Note:</b>	This procedure is recognized by CARB.

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<b>Topic:</b>	<b>EXHAUST VALVE SEAT RESSION</b>
<b>Point of Contact:</b>	Al Brunett Phone: (210) 522-2892 Fax: (210) 684-7530
<b>Test Objective:</b>	The objective of this test is to determine the effects of gasoline additives and/or lead (Pb) content in reducing or eliminating exhaust valve seat recession in an engine designed to run on regular leaded gasoline.
<b>Apparatus:</b>	For this test, a 134 CID Ford industrial engine on a dynamometer test stand is used.
<b>Test Procedure:</b>	Normally, 8-hour segments of 2,100 rpm at wide open throttle are required for this test procedure.
<b>Fuel Requirement:</b>	The fuel requirement for this test varies with test time; however, approximately 4 gallons of fuel per hour are required.
<b>Duration:</b>	Test duration is 40 hours for 0.075 in. recession (unleaded, nonadditized fuel).
<b>Test Results:</b>	At end of test, exhaust valve seat recession is noted.
<b>Note:</b>	

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<b>Topic:</b>	<b>HIGH FREQUENCY RECIPROCATING RIG (HFRR)</b>
<b>Point of Contact:</b>	Robert Legg Phone: (210) 522-2071 Fax: (210) 522-4544
<b>Test Objective:</b>	The objective of this test is to define the wear resistance of diesel fuels.
<b>Apparatus:</b>	The apparatus used for this test is a high-frequency reciprocation rig (HFRR).
<b>Test Procedure:</b>	A 75-minute test is performed during which a ball slides on a flat specimen with a reciprocating motion. The diameter of the scar on the ball at conclusion of the test is noted as a measure of wear resistance.
<b>Fuel Requirement:</b>	The fuel requirement for this test is 10 ml diesel fuel.
<b>Duration:</b>	Test duration of this test is 2 hours.
<b>Test Results:</b>	The wear scar diameter is recorded in millimeters.
<b>Note:</b>	This test procedure has been standardized as ASTM D 6079.

<b>Topic:</b>	<b>OCTANE REQUIREMENT TEST</b>
<b>Point of Contact:</b>	Bill Buscher Phone: (210) 522-6802 Fax: (210) 681-7523
<b>Test Objective:</b>	The objective of this test is to determine the response of a given engine to various fuels/additives in terms of the change in engine octane requirement over time.
<b>Apparatus:</b>	For this test, a test stand consisting of engine, automatic transmission, dynamometer, and inertia flywheels is used. Current configuration simulating 1993 Oldsmobile Achieva with automatic transmission is used.
<b>Test Procedure:</b>	The test procedure is as follows: 1. Simulate commuter-type driving 2. Cycle among idle, 35 mph, and 65 mph 3. Electronically determining octane requirement every 24 hours under conditions simulating severe acceleration in a vehicle Various procedures to fit the octane requirement increase, octane requirement reduction, or octane requirement increase control objective may be used.
<b>Fuel Requirement:</b>	Approximately 1.5 gallons of fuel per test hour will be required.
<b>Duration:</b>	Typically, a test duration of 250 hours is necessary to achieve octane requirement equilibrium.
<b>Test Results:</b>	Test results are as follows: PRIMARY: Engine octane requirement trend over time. SECONDARY: Intake valve and combustion chamber deposit ratings, weights, and combustion chamber deposit thickness
<b>Note:</b>	The Stand configuration for this test is outlined in SAE Paper No. 950744.

<b>Topic:</b>	<b>SEQUENCE VI (MODIFIED) Fuel Economy Test</b>
<b>Point of Contact:</b>	Bill Buscher Phone: (210) 522-6802 Fax: (210) 681-7523
<b>Test Objective:</b>	The purpose of this test is to evaluate fuel economy associated with fuels/additives.
<b>Apparatus:</b>	A 1982 Buick 3.8-L V-6 engine with two-barrel carburetor is used for this test.
<b>Test Procedure:</b>	For this procedure, a modified ASTM Sequence VI (Fuel Efficient Engine Oil) test procedure is used. This procedure compares fuel consumption of test fuel/additive to that of a baseline fuel at 150°F and 275°F oil temperature.
<b>Fuel Requirement:</b>	The fuel requirement for this test is 100 gallons.
<b>Duration:</b>	The duration of this test is 64 hours.
<b>Test Results:</b>	Percent fuel economy improvement is noted at the end of this test.
<b>Note:</b>	This test is a modified version of the ASTM Fuel Efficient Engine Oil Test, Sequence VI.

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<b>Topic:</b>	<b>TRUCK FUEL ECONOMY IMPROVEMENTS</b>
<b>Point of Contact:</b>	Larry Eckhardt Phone: (210) 522-2980 Fax: (210) 681-5344
<b>Test Objective:</b>	The objective of this test is to evaluate fuel economy benefits associated with various fuel additives, oil additive component, or devices
<b>Vehicle:</b>	Class-8 trucks and busses are used for this test.
<b>Test Procedure:</b>	Test procedures used include: ● SAE and TMC Joint Test Procedure (J1321 Fuel Consumption Test Procedure - Type II)
<b>Fuel Requirement:</b>	The amount of diesel fuel required for this test depends on the test plan used.
<b>Duration:</b>	The duration of the test is 6 to 8 weeks.
<b>Test Results:</b>	Fuel consumption is recorded (procedure accuracy $\pm 1$ percent).
<b>Note:</b>	

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<b>Topic:</b>	<b>U.S. ARMY SCUFFING LOAD TEST AS A MEASURE OF LUBRICITY</b>
<b>Point of Contact:</b>	Robert Legg Phone: (210) 522-2071 Fax: (210) 522-4544
<b>Test Objective:</b>	The objective of this test is to define the lubricity of diesel fuels under highly loaded conditions.
<b>Apparatus:</b>	A modified ball-on-cylinder lubricity evaluator (BOCLE) is used for this test.
<b>Test Procedure:</b>	The test procedure is as follows: <ul style="list-style-type: none"><li>● Laboratory scale wear test using ball-on-cylinder geometry.</li><li>● Minimum applied load required for the on set of severe adhesive wear is taken as a measure of lubricating quality.</li></ul>
<b>Fuel Requirement:</b>	For this test, 50 ml of diesel fuel is required.
<b>Duration:</b>	Duration of this test is 2 hours.
<b>Test Results:</b>	Test results recorded are load in grams to produce scuffing.
<b>Note:</b>	This procedure has been standardized as ASTM D 6078.

<b>Topic:</b>	<b>VEHICLE DRIVEABILITY TESTING</b>
<b>Point of Contact:</b>	Kevin Brunner Phone: (210) 522-3579 Fax: (210) 681-5344
<b>Test Objective:</b>	The objective of this test is to evaluate effects of fuel or fuel additive on vehicle operation as related to deposit formation or fuel volatility/driveability index.
<b>Vehicle:</b>	Various vehicles may be used for this procedure.
<b>Test Procedure:</b>	This test procedure may include: <ol style="list-style-type: none"><li>1. CRC cold start and warm-up driveability procedure</li><li>2. BMW driveability procedure</li><li>3. SAE procedure</li></ol>
<b>Fuel Requirement:</b>	The fuel requirement is dependent upon test objective and procedure (10 gallons per evaluation).
<b>Duration:</b>	Duration of this test is dependent upon test objective and procedure (24 hours per evaluation).
<b>Test Results:</b>	Total of weighted demerits is recorded at the end of the test.

<b>Topic:</b>	<b>VEHICLE OCTANE REQUIREMENT DETERMINATIONS AND OCTANE REQUIREMENT INCREASE (ORI) EVALUATIONS</b>
<b>Point of Contact:</b>	Kevin Brunner Phone: (210) 522-3579 Fax: (210) 681-5344
<b>Test Objective:</b>	The objective of this test is to determine the lowest octane level fuel at which a vehicle can be operated without audible knock being detected by a trained rater. For ORI, the test objective is to determine the amount of increase in octane requirement of a vehicle as it accumulates miles.
<b>Vehicle:</b>	Various vehicles may be used for this test procedure.
<b>Test Procedure:</b>	<ul style="list-style-type: none"> <li>● For individual vehicle octane requirement determinations, CRC designation E-15 procedure is used.</li> <li>● For ORI evaluations, multiple determinations are conducted at various test mileage points with ORI being the difference in start and end determinations.</li> </ul>
<b>Fuel Requirement:</b>	CRC-specified octane reference fuel is used for this test procedure.
<b>Duration:</b>	During determinations, approximately 35 miles are accumulated. For ORI evaluations, the final determination is conducted after octane requirement has stabilized, which requires approximately 20,000 miles.
<b>Test Results:</b>	Test results reported include: <ul style="list-style-type: none"> <li>● Vehicle octane requirement</li> <li>● Vehicle ORI</li> </ul>
<b>Note:</b>	ORI evaluations are usually incorporated into a fleet program that also includes intake valve deposit (IVD) and combustion chamber deposit (CCD) evaluations.