

NEWS BULLETIN

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Title: CFR Training Programs
& Class Schedule for 2009

Bulletin No. 08-03
Date: November 12, 2008

CFR COURSES

Octane Operation, Octane Maintenance, Cetane Operation, Cetane Maintenance, Crankcase Overhaul and Maintenance, and FIT Operation and Maintenance courses will continue to be given in the same manner as they have in the past for the 2009 CFR Training Program.

GENERAL OVERVIEW

- All courses are conducted at the Dresser Waukesha - Product Training Center in Waukesha, Wisconsin. This facility is fully equipped with a F1/F2 CFR Combination Research/Motor Method Octane Rating Unit, a F5 CFR Cetane Method Diesel Fuel Rating Unit, and Fuel Ignition Tester (FIT) Unit. A full range of maintenance tools/equipment, and modern classrooms with complete audio/visual capabilities.
- Extensive hands-on experience by all students will be emphasized in each of the courses. Students are encouraged to actively participate in the course and ask questions to promote a better understanding of the material by all students.
- **All students are required to wear safety glasses with side shields while in the CFR training area and are encouraged to bring their own safety glasses for comfort and convenience.**
- Each student will receive supplemental training materials for use during the course and to take back to the workplace. The handouts include the following:
 1. The latest version of the ASTM manual with test methods
 2. CFR Training Course Manual
 3. CFR Operations and Maintenance Manual
 4. CFR Tool Catalog
 5. Copies of all presentations given during the course.
- **Each course starts on Monday and is scheduled for four full days. Classes start at 8:30 a.m. and end at 4:00 p.m.** The student's travel plans should be arranged accordingly.



COURSE DESCRIPTIONS

Octane Operation – This course is designed for lab personnel who need additional knowledge of the basic function and operation of the CFR Octane Rating Units and a better understanding of the ASTM Research and Motor test methods.

Prerequisite:

Basic understanding of running a CFR unit and some experience running a CFR Octane unit.

Topics covered in this course include:

- Classroom lecture and discussion covering the theory of octane testing with the CFR engine; description and function of major engine components and instrumentation; and a review of recent improvements to the CFR Octane Rating Units.
- Discussion covering engine safety, as well as personal safety, while operating or maintaining the CFR engine.
- Detailed review and discussion of the ASTM Research (D 2699) and Motor (D 2700) test methods with particular emphasis on operational aspects including basic engine and instrumentation setup; Toluene Standardization Fuel qualification requirements; and details of the equilibrium bracketing, falling level (dynamic) bracketing, and compression ratio testing procedures.
- Hands-on operation of the CFR Combination Research/Motor Octane Rating Unit by all students with sample ratings obtained using the equilibrium bracketing, falling level (dynamic) bracketing, and compression ratio testing procedures.
- Review of basic preventive maintenance and troubleshooting techniques that help to assure consistent and accurate octane ratings.

Octane Maintenance – This course is designed for CFR personnel who need further knowledge and experience concerning overhaul of the CFR Octane Rating Unit cylinder, clamping sleeve, and carburetor.

Prerequisites:

- 1) **Octane Operation** course is recommended prior to enrolling in this course.
- 2) Students must be familiar with precision measuring equipment, such as; micrometers, dial indicators, depth micrometers, and torque wrenches in order to participate in hands-on training activities.

Topics covered in this course include:

- Classroom lecture and discussion covering the theory of octane testing with the CFR engine; description and function of major engine components and instrumentation; and a review of recent improvements to the CFR Octane Rating Units.
- Discussion covering engine safety, as well as personal safety, while operating or maintaining the CFR engine.
- Hands-on cylinder and clamping sleeve overhaul including removal from the crankcase; measurement of all critical components; grinding of valves and valve seats; valve guide and seat removal and replacement; and reassembly of the cylinder and clamping sleeve on the crankcase.
- Hands-on carburetor overhaul including description and function of all critical components of the new equilibrium/falling level carburetor system.
- Review of routine crankcase inspection and maintenance requirements including changing oil and filter; operation and maintenance of the oil pressure control and crankcase breather systems; and measurement of crankshaft endplay and main bearing clearances.

Cetane Operation – This course is designed for CFR personnel who need additional knowledge of the basic function and operation of the CFR Cetane Rating Unit and coverage of the latest D613 test method.

Prerequisite:

Basic understanding of a CFR unit and some experience running a CFR Cetane unit.

Topics covered in this course include:

- Classroom lecture and discussion covering the theory of Cetane testing with the CFR Cetane Unit; description and function of major engine components and instrumentation; and a review of recent improvements made to the CFR Cetane Rating Unit.
- Discussion covering engine safety and personal safety, while operating the CFR Cetane Rating Unit.
- Detailed Review of the ASTM D613 test method with emphasis on operational aspects including basic engine and instrumentation settings and setups.
- Hands-on operation of the CFR Cetane Unit by all students with sample ratings
- Review of basic preventative maintenance and troubleshooting techniques that help to assure consistent and accurate ratings.

Cetane Maintenance – This course is designed for CFR personnel who already have a basic understanding of the D613 method and rating techniques, but need further knowledge and experience concerning the top-end overhaul.

Prerequisites:

- 1) ***Cetane Operation*** course is recommended prior to enrolling in this course.
- 2) Students must be familiar with precision measuring equipment, such as; micrometers, dial indicators, depth micrometers, and torque wrenches in order to participate in hands-on training activities.

Topics covered in this course include:

- Classroom lecture and discussion covering the description and function of major engine components/instrumentation, and review of recent improvements to the CFR Cetane Rating Units.
- Discussion covering engine safety and personal safety, while operating or maintaining the Cetane Unit.
- Hands-on cylinder, cylinder head, and hand-wheel maintenance to include the use of measuring equipment critical to the proper tolerances of all components; valve grinding and seat grinding techniques; valve guide and seat removal and replacement; and assembling of the cylinder and head to maintain the proper over-travel. This will also include discussion of the fuel-injection system and techniques on proper maintenance.
- Review of routine crankcase inspection and maintenance requirements including oil and filter changes; operation of the oil pressure control and crankcase breather systems; and a measure of crankshaft endplay and main bearing clearances.

Crankcase Overhaul and Maintenance – This course is designed for more experienced CFR personnel who need additional knowledge and understanding of the requirements for overhauling a CFR-48 crankcase.

Prerequisites:

- 1) *Octane Operation, Octane Maintenance*, and or *Cetane Operation, Cetane Maintenance* courses are recommended prior to enrolling in this course.
- 2) Students must be familiar with precision measuring equipment, such as; micrometers, dial indicators, depth micrometers, and torque wrenches in order to participate in hands-on training activities.

Topics covered in this course include:

- Classroom lecture and discussion covering description and function of major crankcase components, and the critical wear specifications and measurements used to determine when replacement is required.
- Discussion covering engine safety, as well as personal safety, while operating or maintaining the CFR engine.
- Hands-on crankcase overhaul including complete disassembly; discussion on the function and measurement of all critical components; and reassembly of the crankcase using the required fit and torque specifications.
- Review of routine preventive maintenance and inspection practices required between crankcase overhauls.

Fuel Ignition Tester (FIT) Unit Operation and Maintenance– This course is designed for FIT personnel who need additional knowledge of the basic function and operation of the FIT – (DCN) Derived Cetane Number Rating Unit and coverage of the latest D7170 test method.

Prerequisite:

Basic understanding of a Constant Volume Combustion Chamber, (CCVC) unit and some experience running a CFR Cetane unit.

Topics covered in this course include:

- Classroom lecture and discussion covering the theory of Constant Volume Combustion Chamber, (CCVC) testing with the FIT - Derived Cetane Number Unit; description and function of major unit components and instrumentation; and a review of recent improvements made to the FIT - Derived Cetane Number Rating Unit.
- Discussion covering unit safety and personal safety, while operating the FIT - Derived Cetane Number Rating Unit.
- Detailed Review of the ASTM D7170 test method with emphasis on operational aspects including basic unit and instrumentation settings and setups.
- Hands-on operation of the FIT - Derived Cetane Number Unit by all students with sample ratings
- Review of basic preventative maintenance and troubleshooting techniques that help to assure consistent and accurate ratings.

2009 CFR TRAINING SCHEDULE AND REGISTRATION

Schedule

CFR courses are held from 8:30 a.m. – 4:00 p.m. each day of the course. Each four-day course will be offered in 2009 on the dates listed below. All courses are conducted at the Dresser Waukesha - Product Training Center in Waukesha, Wisconsin.

May 4 - 7	<i>Octane Operation</i>
May 11 - 14	<i>Octane Maintenance</i>
July 13 - 16	<i>Octane Operation</i>
July 20 - 23	<i>Octane Maintenance</i>
August 10 - 13	<i>Crankcase Overhaul</i>
September 14 - 17	<i>Cetane Operation</i>
September 21 - 24	<i>Cetane Maintenance</i>
October 5 - 8	<i>Octane Operation</i>
October 12 - 15	<i>Octane Maintenance</i>
TBA	<i>FIT Operation & Maintenance</i>

Dresser Waukesha can also conduct on-site training at your facility. Please call us at (262) 549-2914 or (262) 549-2915 for more details.

Course Fee

The fee for each of our training courses is \$1,200 per student. This fee covers four days of instruction, all supplemental training materials, and lunch each day of the course. ***This fee does not cover travel and living expenses, which are the responsibilities of the student.***

Cancellation

Reservations not cancelled in writing at least 30 days prior to the starting date of the course will result in a full charge for the course fee. Substitutions are accepted.

Hotel Accommodations

Dresser Waukesha has arranged a special rate at the Comfort Suites Hotel in Pewaukee, WI, for students attending our CFR training courses. The hotel will provide free transportation to and from Mitchell International Airport in Milwaukee and daily transportation between the hotel and the Dresser Waukesha - Product Training Center. Please contact the Comfort Suites Hotel at (262) 506-2000 or 1-888-506-2005 to make your room reservation and be sure to mention Dresser Waukesha to obtain the special rate.

2009 Registration

Course registration can be completed by mail, fax, or by email using the form below. Please contact Judy Wesley at (262) 549-2915 or by email at **Judy.Wesley@waukeshaengine.dresser.com** if you have questions or require further details concerning the training courses. Class size is limited and openings are filled on a first come, first served basis. Please apply early to assure availability.

Mail registration form to: Judy Wesley, Waukesha Engine, Dresser Inc., 1101 West St. Paul Avenue, Waukesha, WI 53188 or fax to Judy Wesley at (262) 549-2960.



Registration Form

Course Title: _____

Course Dates: _____

Student's Name: _____

Company: _____

Address: _____

Telephone: () _____

Fax: () _____