Dresser–Rand® Reciprocating Products

SERIES SPECIFICATIONS & COURSE OUTLINE

 CONTENTS
This Dresser–Rand® original equipment manufacturer training series covers the general operation and maintenance of D–R reciprocating compressors. It teaches Dresser–Rand® best practices through these highly interactive online courses.

 AUDIENCE
This series is designed for owners and operators of Dresser–Rand® reciprocating compressors.

RWB001 Recip-Compressor Major Components
This entry-level course is designed to give inexperienced participants a fundamental understanding of how a reciprocating compressor operates. Through detailed descriptions and interactivities, it familiarizes participants with the function and various styles of each component of the compressor cylinder and the frame and running gear.

RWB002 Recip-Compressor Theory
This intermediate-level course is designed to give participants an understanding of the basic theory of compression as it relates to a reciprocating compressor. After a brief understanding of how the compressor operates, participants interact with several lessons to help them understand basic gas behaviors, piston displacement, principles of compression, valve losses, rod loads and the relationship of pressure, volume and temperature. Other lessons offer participants information on how clearance volume and compression ratios affect capacity and horsepower and how multi-staging increases a compressor’s efficiency.

RWB003 Recip-Compressor Piston End-Clearance
This comprehensive maintenance-oriented course describes piston end clearance in a reciprocating compressor cylinder. It also lists the effects of improperly adjusted end clearances, addresses end clearance specifications and tolerances, and provides step-by-step procedures on how to adjust the clearance. In addition, the course covers both feeler blade and lead wire methods of gauging and measuring the frame end and outer end clearances.

Available formats:
- Interactive Online Courseware

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**RWB004 Recip-Compressor Rod Run-Out**

This course is designed to help maintenance technicians fully understand the meaning and effects of piston rod runout on the operation of reciprocating compressors. The course also teaches how to measure both vertical and horizontal runout, identify the factors that influence runout and correct an out-of-specification runout condition. The course contains guidelines to help students interpret the runout readings and provides a calculation to aid them in precisely shimming a crosshead to correct a runout that is out of tolerance.

**RWB005 Recip-Compressor Frame Lubrication**

This course is designed to provide participants with a complete understanding of the frame lubrication system on a common, process-type reciprocating compressor. The intermediate-level course explains the critical properties of lubricants and their additives, and through the use of animations and graphics, details the flow of the lubricant as it progresses from the sump to the crosshead. The course offers lessons on the importance and function of each system component and addresses operational issues related to the lubricating system.

**RWB006 Recip/Engine Crankshaft Web Deflection**

This course defines crankshaft web deflections in gas engines and reciprocating compressors. Many of the root causes of web deflections are explored and described. A representative list of maximum allowable web deflections is provided, along with recommended time intervals between crankshaft inspections. Participants are introduced to several methods used to measure web deflections and provided with an example of a typical recording chart. This course also lists the major causes of a bent crankshaft and provides methods for determining whether a crankshaft is bent.

**RWB007 Recip-Compressor Rod Packing Fundamentals**

This intermediate-level maintenance course describes the components that make up a pressure packing assembly and how they work together to form a seal around the piston rod. Detailed lessons, challenging interactivities and periodic review questions help participants understand the location and orientation of the various ring set styles within the packing case. To help give participants a complete understanding of pressure packing fundamentals, the course concludes with a lesson on packing case lubrication and cooling.

**RWB008 Recip-Compressor Rod Packing Reconditioning**

This course describes the procedures used to properly disassemble and reassemble a packing case within the compressor or on a workbench. The course instructions explain the correct procedure for safely removing a packing case. The critical inspection points for the components are identified and used to determine whether reconditioning is required. Participants are introduced to the procedures used to recondition the packing cups and the correct steps to properly reinstall the packing case in a compressor. Because of the advanced level of this course, it is recommended that participants first take the Reciprocating Compressor Rod Packing Fundamentals training course (RWB007).

**RWB009 Recip-Compressor Wedge Ring Packing**

This course is offered as a higher-level piston rod packing program and offers a description of what wedge type packing rings are, when they are required, how they seal, and what type of inert buffer gas system is needed to make them most effective. It shows participants the location of these rings and their proper orientation and installation. Because of the advanced level of this course, it is recommended that participants first take the Reciprocating Compressor Rod Packing Fundamentals training course (RWB007).

**RWB010 Recip-Compressor Divider Block Cylinder and Packing Lubrication**

This operations-focused course is designed to familiarize operators and maintenance technicians with a typical reciprocating compressor, divider valve type, cylinder and packing lubrication system. Participants are presented with information regarding the identification, purpose, operation and adjustment of the various components that make up this system. Interactivities, animations and review questions strategically placed throughout the course, and a step-by-step, interactive demonstration of the divider valve operation, help challenge learners to more thoroughly understand the many aspects of a cylinder and packing lubrication and divider valve system.

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**Available formats:**
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19 PART SERIES

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RWB011 Recip-Compressor Pump-to-Point Cylinder and Packing Lubrication
This operations-focused course is designed to familiarize operators and maintenance technicians with a typical reciprocating compressor, pump-to-point type, cylinder and packing lubrication system. Participants are presented information regarding the identification, purpose, operation and adjustment of the various components that make up this system. Interactivities, animations and review questions strategically placed throughout the course help challenge learners to more thoroughly understand the many aspects of cylinder and packing lubrication and the pump-to-point system.

RWB012 Recip-Compressor Set Screw Type Valve Cover
This detailed maintenance course offers an overview of the setscrew-type valve cover, provides step-by-step instructions on how to safely remove and install the cover, lists the consequences of improper removal and installation procedures, and addresses proper torque values and procedures for the applicable fasteners. A variety of interactivities challenge participants to recognize common valve cover components, identify areas damaged by incorrect installation procedures, and correctly list the order of major disassembly and re-assembly steps.

RWB013 Bolt Torque
This comprehensive maintenance-oriented course provides participants an opportunity to learn the characteristics of threaded fasteners, the various methods of properly tensioning them, the variables that influence the tensioning process and the procedures used to ensure accurate tensioning. The course also contains lessons on how certain variables such as lubrication, wrench extensions, damaged threads, tool calibration and self locking fasteners affect the torque applied to the fastener. Although many types of torquing tools are discussed, the proper use of the clicker type torque wrench is emphasized throughout the program.

RWB014 Recip-Compressor Crosshead and Piston Supernut
This comprehensive maintenance course shows participants where supernuts are applied in a reciprocating compressor, what advantages they have over standard hex nuts, where to find the proper torque values and jackbolt lubricant, and how to properly tighten and loosen the supernuts in both crosshead and piston nut applications. Challenging interactivities and review questions help increase learners’ retention of the complex procedures and sequential patterns that Dresser-Rand® recommends to accurately tighten these fasteners while maintaining piston rod and crosshead alignment.

EWB001 Engine-Major Components
This course illustrates and describes the major components of two- and four-cycle integral gas engines. Where there are major differences in components, they will be pointed out. Many of the components are similar to those found in any gas engine — whether it be a passenger car or a motorcycle. The major difference is often one of scale. The theory and operation of two-cycle engines is described in Engine-Two Cycle Theory (EWB002) and four-cycle engines in Engine-Four Cycle Theory (EWB003).

EWB003 Engine-Four Cycle Theory
This intermediate-level course is designed to give participants a comprehensive understanding of the theory of four-cycle gas engines. The course begins with a brief review of components specific to four-cycle engines and how they differ from those used in two-cycle gas engines. This is followed by a basic introduction to combustion theory and the natural gas laws. Once participants explore these important concepts, the course proceeds to describe the four-stroke cycle process in detail through the use of P-V and P-T diagrams and animations.
This course describes both normal and abnormal combustion processes in large-bore gas engines. The differences between pre-ignition and detonation are also clearly defined. The course explains the various causes of these destructive combustion processes and suggests methods that can be used to reduce their frequency and severity.

This maintenance-focused, intermediate-level, two- and four-cycle engine balancing course provides information to help participants understand the importance of a properly balanced engine, the consequences of an unbalanced engine, component and system conditions that can affect engine balancing, and the recommended procedure for obtaining a well-balanced engine.