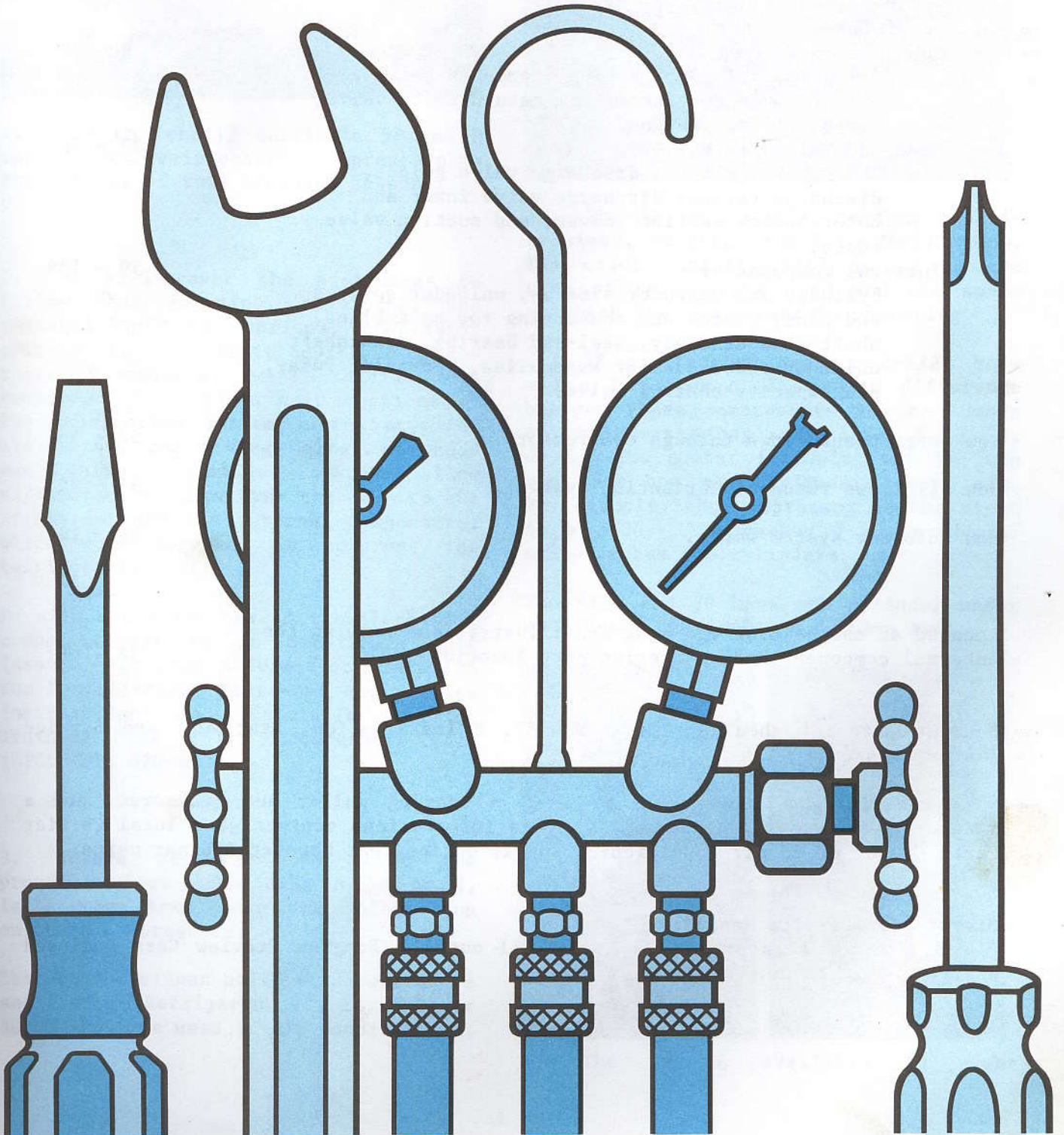


# REBUILDING 5F & H COMPRESSORS



## 5F AND H LESSON GUIDE

This training lesson is intended to give the service person the background necessary to identify each compressor component and determine the proper procedure for servicing them.

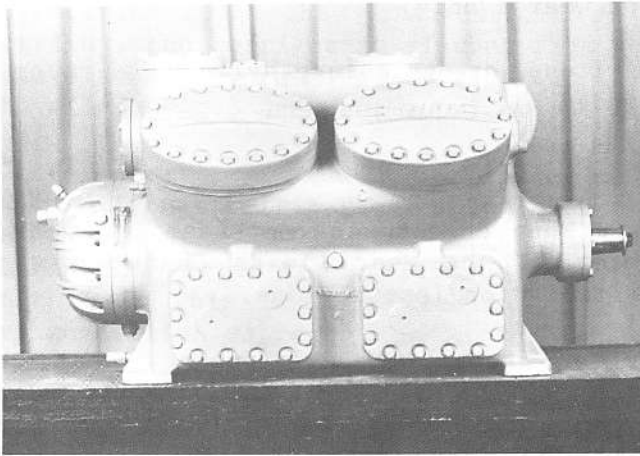
In this lesson we will cover:

<u>SUBJECT</u>	<u>SLIDES</u>
Background Information (5F and H)	1 - 8
Service Procedures - Lubrication System; oil pump, oil pump bushing, pump-end bearing, oil pressure regulator, oil return check valve, and oil filter screen.	9 - 36
Head and Valve Assemblies; heads, valveplates, discharge valve guides, discharge valves, discharge valve inner and outer seats, suction valves, and suction valve seats.	37 - 58
Internal Components; cylinder and unloader sleeves, unloader springs and pins, piston and connecting rod assemblies, shaft seal assembly, seal-end bearing, crankshaft, unloader power element assemblies, hydraulic relay, and capacity control valve.	59 - 139
How refrigerant flows through compressor.	52 - 56
How oil flows through lubrication system.	91 - 96
How unloader system works.	98 - 104
	<u>PAGE</u>
Located at the back of the book are illustrations showing the external component and connection port locations.	38 - 46

Handout material should include the 5F, H Installation, Start-up, and Service Instructions.

When rebuilding a 5F or H compressor, a bearing puller and jackscrew, and a sleeve puller are recommended. For more information, contact your local Carrier Parts Center or an air conditioning supply outlet that handles Robinar parts.

Distributor Service Managers:  
Please preview this program. Then, fill out the Program Preview Card enclosed and return it to us.



1. How to rebuild Carrier's 5F and H open-drive, reciprocating compressors is the subject of this training lesson.

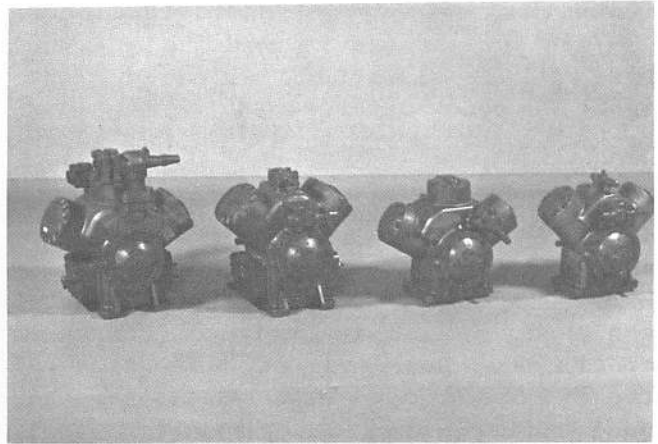
2. We will cover the procedures to follow when removing, servicing, and reinstalling the various compressor components. To make it easier to follow these procedures, we'll divide the compressor into three main sections -- the lubrication system, which supplies oil to all the moving parts; the head and valve assemblies, which allow refrigerant to flow from the low- to the high-side; and the internal components, which work together to compress the refrigerant.

We will not cover how to troubleshoot a component failure in detail in this lesson. For this information, refer to the Installation, Start-up, and Service Instructions and Carrier's Service Training book - Why Compressors Fail (GTC2-101, 020-342).

3. Before we start to cover the procedures for rebuilding a 5F or H, let's cover some background information on these compressors.

They can be either belt- or direct-drive and can use Refrigerant 12, 22, 500, or 502. They are used in air conditioning,

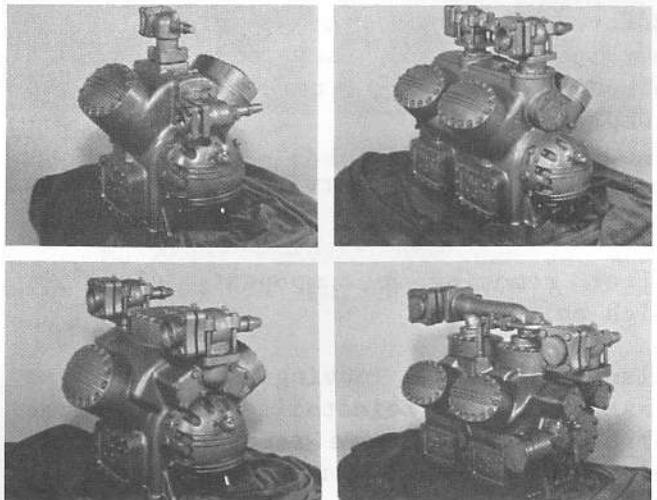
refrigeration, and process cooling applications.



4. The 5F is available in four capacity sizes, ranging from 5 to 26-1/2 tons. The exact capacity will depend on the type of refrigerant used and the speed at which the compressor is operating.

All 5F compressors have a 2-1/2" bore and a 2" stroke. The basic difference between these compressors is the number of cylinders; they will have: 2, 3, 4, or 6. The number following the 5F lets you know how many cylinders there are. For example, the compressor at the right is a 5F20. The number 2 after the 5F means it has two cylinders.

The 5F20 and 30 have one cylinder under each head; the 5F40 and 60 have two.



5. The 5H is available in eight

capacity sizes, ranging from 25 to 150 tons. These compressors will have 4, 6, 8, or 12 cylinders.

All 5H compressors have a 3-1/4" bore, with either a 2-3/4" standard stroke or a 3-7/16" extended stroke. The compressors with the extended stroke have a higher capacity rating than the standard stroke compressor with the same number of cylinders.

Like the 5F, the number after the 5H represents the number of cylinders. All 5H compressors have two cylinders under each head. To determine if the compressor has a standard or an extended stroke, check the last digit of the model number. For example, if it's a 5H40, the zero means it has the standard stroke; if it's a 5H46, the six means it's the extended stroke.

6. Now, let's cover the procedures to follow when checking out and servicing a 5F or H compressor. We'll be using a 5H80 with a standard stroke. The service procedures for the other compressors are basically the same. However, some of the component locations are different; for complete details, refer to the Installation, Start-up, and Service Instructions.

Keep the following points in mind when servicing:

Before opening the compressor for service, close the service valves, and bleed the charge remaining in the compressor.

Drain the oil, if servicing in the area of the crankcase.

After removing a component, clean it with solvent.\*

Also, label all moving components so that they are reinstalled in the same place that they were removed from. If you mix the components, they may not

have the same wear pattern and they will not wear evenly.

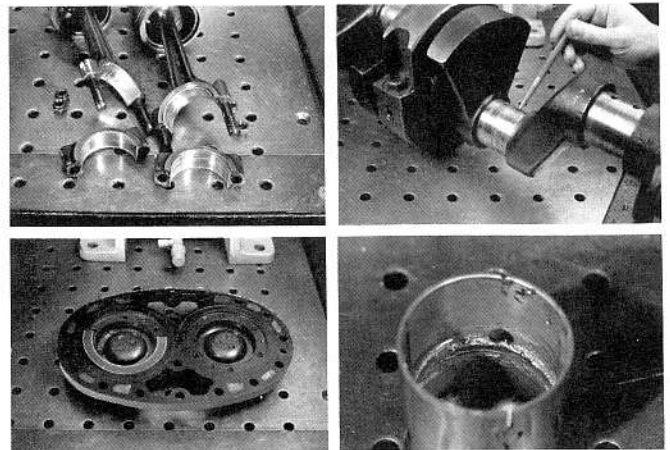
\*Agitene or trichlorethylene is recommended.

7. When checking a component for wear, refer to the Wear Limits Chart in the Installation Instructions.

Before installing a component, coat it with compressor oil and inspect all gasket surfaces. Replace all gaskets with new ones, and lightly coat them with oil. Factory-made gaskets are recommended.

Tighten all bolts to the torque values in the Installation Instructions.

And, when you're done servicing, refill the crankcase if the oil was removed.



8. The compressor we'll be using in this lesson isn't new. It was returned as a field failure. As we tear down the compressor, you'll notice some of the parts are worn or damaged.

Here we can see (starting at the top left, going clockwise) wear on the connecting rod bearings and the crankshaft journals, and damage to the seal-end bearing and a suction valve.

Most of the wear or damage was due to flooded starts. This is when the