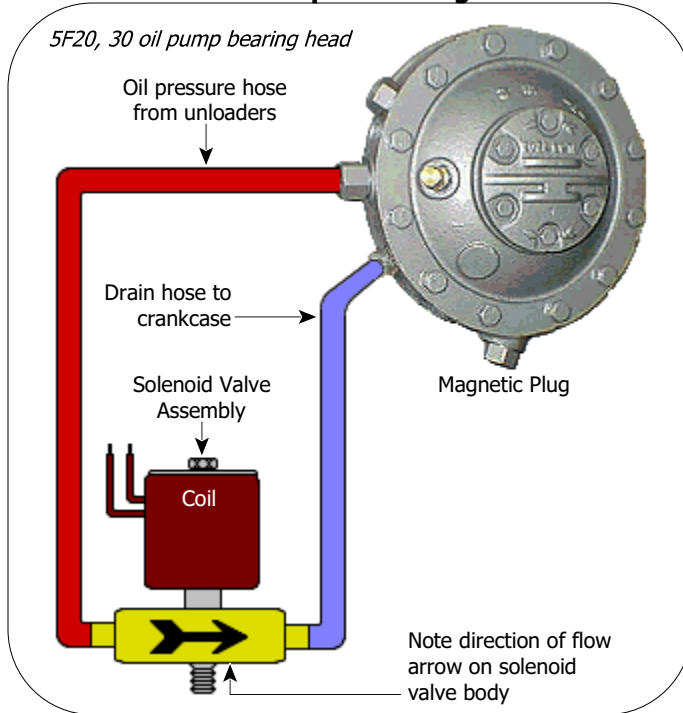
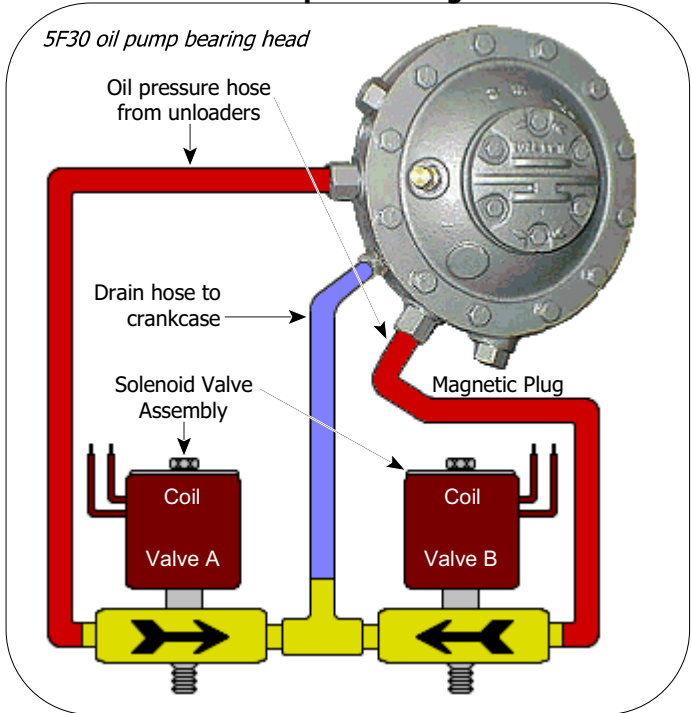


Carrier/Carlyle 5F20 - 30 Compressors Solenoid Unloading

One Step Unloading



Two Step Unloading



One step unloading can be applied to both the 5F20 and 5F30 compressors. For stationary cast iron body compressors one cylinder can unload on the 5F20 and two cylinders can unload on the 5F30. For transportation aluminum body compressors all of the cylinders are either loaded or unloaded. Either a suction pressure control or air temperature control can be used to actuate the solenoid valve. There is an orifice in the port on the bearing head between the oil pump and unloader power element(s). Passages for bearing lubrication are located between the oil pump and the orifice. When open the solenoid valve allows oil pressure to drain from the unloader power element(s) to the crankcase. Since the orifice will only allow a small volume of oil to flow through it oil pressure remains high enough on the pump side to adequately lubricate the bearings.

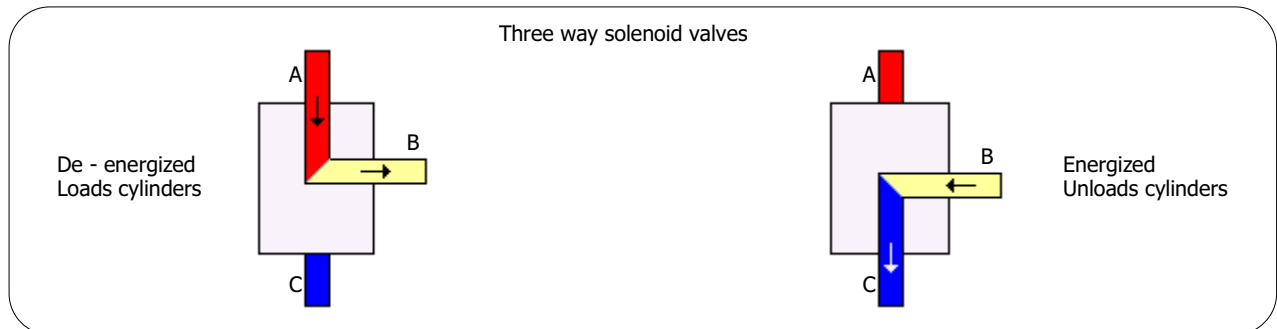
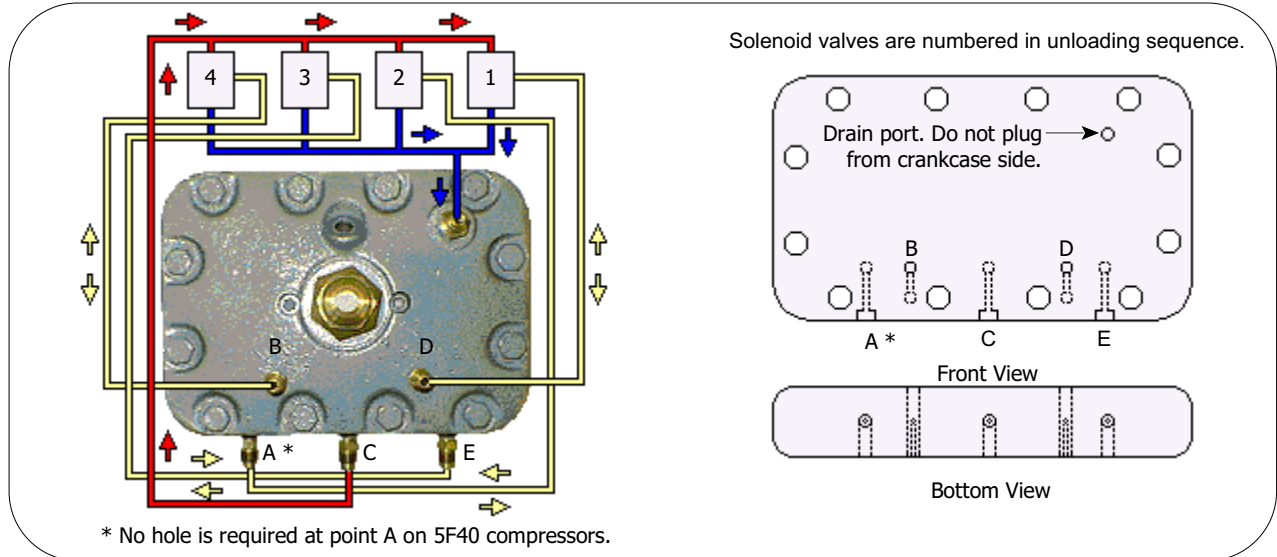
The control that actuates the solenoid valve is usually adjusted to maintain a relatively constant minimum suction pressure on stationary compressors. On transportation compressors the control either completely loads all cylinders or completely unloads all cylinders. On some transportation applications the compressor crankshaft is driven by an engine at all times. By completely unloading all cylinders the compressor is effectively deactivated when cooling is no longer required while the engine continues to run.

Two step solenoid unloading is applied only to the aluminum body transportation 5F30 compressor. All three cylinders can be unloaded. These compressors use normally open solenoid valves and they must be energized to load the cylinders. Either a suction pressure control or air temperature control can be used to actuate the solenoid valves. There is an orifice in each of the ports on the bearing head between the oil pump and unloader power elements. Passages for bearing lubrication are located between the oil pump and the orifices. When open the solenoid valves allow oil pressure to drain from the unloader power elements to the crankcase. Since the orifices will only allow a small volume of oil to flow through them oil pressure remains high enough on the pump side to adequately lubricate the bearings.

Solenoid valve A controls the left hand and center cylinders facing the oil pump end of the compressor. Solenoid valve B controls the right hand cylinder facing the oil pump end of the compressor.

On some transportation applications the compressor crankshaft is driven by an engine at all times. By completely unloading all cylinders the compressor is effectively deactivated when cooling is no longer required while the engine continues to run.

**Carrier/Carlyle
5F40,60 Compressors
Conversion from Standard to Electric Unloading**



1. Remove capacity control handhole cover. Remove hydraulic relay and all tubing. As shown in drawing at upper right drill three holes in bottom side of cover and two on front. Tap holes with 1/8 NPT tap. No hole is required at point A on 5F40 compressors. Plug the five lower cover holes that connected cover to relay. Plugs are 1/8 NPT. Do not plug the hole near the top of the cover where the control oil pressure was formerly taken. This port becomes the drain port.

2. Install cover with new cover gasket.

3. Mount solenoid valves on a sturdy bracket attached to the compressor.

4. Connect external oil lines as shown in the picture on upper left of this page. The following three way valves have been used in the field and are listed as a guide:

Alco Controls No. 702RA001
Alco Controls No. S608-1
Sporlan Type 180

Lines shown in picture attached to top of solenoid valves supply oil pressure to three way valves. Lines attached to right side of valves either supply oil pressure to or drain oil pressure from unloaders. Lines attached to bottom of valves drain oil pressure from valves to compressor sump. Port for drain to sump is 1/4 NPT.