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It's the CORE that counts!

Sporlan Catch-All®

Liquid & Suction Line Filter-Driers

MARCH 2011



ENGINEERING YOUR SUCCESS.

Catch-All® Suction Line Filter-Driers

Sporlan Suction Line Filter-Driers are designed specifically for CLEAN-UP after BURNOUT using the HH TYPE CHARCOAL CORE

PROVEN BENEFITS:

- Positive protection for the compressor
- Most economical method of clean-up
- Minimum down time — system operates during clean-up
- Method is applicable to almost any size system
- Removes all contaminants — moisture, acid, sludges, dirt...
- Recommended by the leading equipment manufacturers



have a 1/4" female pipe connection (-G) in the endplate to permit the installation of an access valve to measure pressure drop. If the proper style drier is not available, then a suction line filter-drier can be used in the suction or liquid line; and a liquid line filter-drier can be used in the suction line. The pressure drop characteristics of the two types of driers are essentially the same for a given line size.

INSTALLATION

The Catch-All Filter-Drier can be installed directly in the suction line by removing a portion of the line. **After clean-up, the Catch-All Filter-Drier is generally left in the line. The cores in the replaceable model or RSF shell should be replaced with filter elements (RPE-48-BD or RPE-100) to obtain the lowest possible pressure drop.**

A hermetic motor burnout produces large amounts of acid, moisture, sludge and all types of lubricant decomposition materials. To obtain the maximum ability to remove all these various types of contaminants, the Sporlan HH style charcoal core is preferred. If the HH style core is not available, the standard cores may be used.

IMPORTANCE OF LUBRICANT AS A SCAVENGER

OEM recommendations stress the importance of lubricant in cleaning up a system after a motor burnout. The lubricant acts as a scavenger, collecting the acid, sludges, and other contaminants. Therefore, the service technician should check the **color** and **acid content** of the lubricant. It must be clean and acid free before the job is finished. The acid content can be checked with an acid test kit.

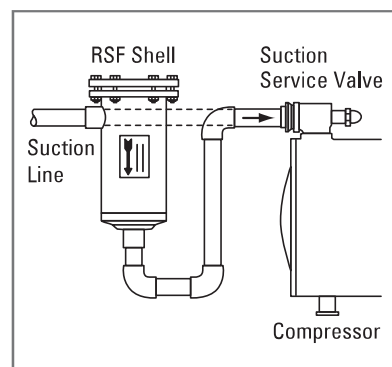
OBTAINING A LUBRICANT SAMPLE

This is frequently a difficult task. A lubricant sample can usually be obtained from the burned out compressor. To obtain repeated samples after the system is started up, install a trap in the

suction line with an access valve in the bottom of the trap. This permits collecting the small amount of lubricant required for running an acid test. Another method is to build a trap with valves, and connections for charging hoses. Then refrigerant vapor from the discharge service valve is run through this trap and put back into the suction service valve. In a short time sufficient lubricant collects in the trap for analysis. For more information request Sporlan Form 40-141.

SUCTION LINE PRESSURE DROP

Most hermetic motors rely on refrigerant vapor for cooling. Any large pressure drop in the suction line could result in reduced flow of suction gas, and thus improper cooling of the new hermetic motor. Field experience has shown that if the filter-drier is properly sized, the pressure drop across it should not exceed the values given in the table on page 31. **The pressure drop across the filter-drier should be checked during the first hour of operation to determine if the cores need to be changed.**



Any pressure loss in the suction line also reduces system capacity significantly. When an RSF shell or replaceable core type Catch-All is used, it is recommended that the cores be removed and filter elements installed when the clean-up job is complete. Obtaining a low pressure drop is particularly important for energy savings on supermarket refrigeration systems. Therefore, suction line filter-driers should be sized generously on these systems.

METHOD OF CLEAN-UP

The Suction Line Filter-Drier method of cleaning up a system after a hermetic motor burnout is favored by service technicians and recommended by manufacturers throughout our industry. This method gives the most practical and positive protection of the new compressor, since the refrigerant-lubricant mixture is filtered and purified just before it returns to the compressor. It is important that all contaminants remaining in the system be removed to prevent a repeat burnout of the new compressor.

CONSTRUCTION

The construction of the suction line filter-drier is not significantly different from the standard liquid line filter-drier. Both driers remove the important contaminants such as moisture, dirt, acid, and the products of lubricant decomposition. The suction line filter-driers utilizes the HH style charcoal core to obtain the maximum ability for lubricant clean-up and removing all types of contaminants. The sealed models have an access valve (-T) at the inlet end to permit measuring the pressure drop during the first several hours of operation. RSF shells have an access valve to measure pressure drop (see Bulletin 80-10). Also, replaceable core Catch-Alls

Catch-All

Clean-Up Procedure

1. **DIAGNOSIS** — Make certain that a motor burnout has actually occurred by running the proper electrical tests. Determine the severity of the burnout by analyzing the acid content of the lubricant from the burned out compressor. This can be done on the job with a TA-1 One Time Acid Test Kit. Note the color of the lubricant, the smell of the refrigerant, and if carbon deposits are present in the suction line.
2. **PLAN THE PROCEDURE** — Consider the following factors: If the lubricant is not acidic and none of the other indications of severe burnout are present, then the system can be classified as a “mild burnout” and cleaned up accordingly. Under these circumstances, it is easier to save the refrigerant. If a lubricant sample is desired for checking the progress of the clean-up, then a trap should be installed in the suction line (see Form 40-141). A semi-hermetic compressor can be examined and cleaned by having the head removed. A heat pump system will frequently require replacing the 4-way valve, or other special precautions. Systems with a critical charge must have the charge adjusted due to the added volume in the oversized filter-drier that is normally installed in the liquid line.
3. **MILD BURN-OUT** — If the analysis of the lubricant shows no acidity, then the system can be classified as a mild burnout, and cleaned up simply by installing an oversized Catch-All Filter-Drier in the liquid line. If the lubricant is not analyzed, and the other factors indicate some doubt, then the burnout should be considered severe and cleaned up as described below.

CAUTION — Acid burns can result from touching the sludge in the burned out compressor. Rubber gloves should be worn when handling contaminated parts.
4. **SEVERE BURNOUTS** — These systems should be cleaned using the **suction line filter-drier method**. The refrigerant in the system can be saved, and must be removed using refrigerant recovery/recycling equipment. The exact method chosen depends upon the availability of shutoff valves, the amount of charge, and the other equipment available. See the section on “Saving the Refrigerant.”
5. Remove the burned out compressor and install the new compressor.
6. Install a Catch-All Suction Line Filter-Drier or RSF shell (selected from pages 34 and 35) ahead of the new compressor. The access valve on the drier permits the pressure drop to be checked by installing gauges on the access valve and at the gauge port on the suction service valve. For systems without service valves, install a line tap valve downstream of the Catch-All Filter-Drier for the second connection.
7. Remove the liquid line drier and install an oversized Catch-All (one size larger than the normal selection size). Check the expansion valve and other controls to see if cleaning or replacement is required. Install a See•All Moisture and Liquid Indicator.
8. Evacuate the system according to the manufacturer's recommendations. Normally this will include the use of a high vacuum pump and a low vacuum micron gauge for measuring the vacuum obtained.
9. Recharge the system through the access valve on the suction line filter-drier. Then start the system according to the manufacturer's instructions.
10. The use of a Catch-All Filter-Drier installed permanently in the suction line permits the clean-up of a small system to be completed with one service call. The pressure drop across the suction line filter-drier should be measured during the first hour's operation. If the pressure drop becomes excessive, then the suction line filter-drier should be replaced. If the equipment manufacturer's recommendations are not available, the following maximum pressure drop levels are suggested. See table below.
11. In 24 hours take a lubricant sample. Observe the color and test for acidity. If the lubricant is dirty or acidic, replace the suction line and liquid line filter-driers.

In two weeks re-check the color and acidity of the lubricant to see if another change of filter-driers is necessary. It may also be desirable to change the lubricant in the compressor. Before the job is complete, it is essential that the lubricant be clean and acid-free.

SAVING THE REFRIGERANT — The refrigerant is not damaged by the burnout, and can be reused, provided the contaminants are removed. When a mild burnout has occurred on a system with service valves, the refrigerant can be saved by closing the valves and trapping the refrigerant in the system, while changing the compressor. ***The system can then be pumped down with the new compressor to save the refrigerant while installing an oversized Catch-All Filter-Drier in the liquid line.***

If a severe burnout has occurred, the above procedure might damage the new compressor. Therefore, it is preferred that the refrigerant be removed from the system for reclamation. If no service valves are available then the refrigerant **must** be removed from the system. Recovery, recycling or reclamation of the refrigerant must be performed in accordance with EPA regulations.

Sporlan recommends the use of our HH style cores for cleaning up all systems after a hermetic motor burnout. These cores contain a desiccant mix that is suitable for removing all types of system contaminants. Form 40-109 is available for selection recommendations on suction line filter-driers. Information on cleaning up centrifugal systems is given in Bulletin 240-10-3. Information on clean-up after a hermetic motor burnout is also given in Section 91 of the SAM Manual published by the Refrigeration Service Engineers Society.

Suction Line Filter-Drier Maximum Recommended Pressure Drop – psi (bar)

SYSTEM	PERMANENT INSTALLATION		TEMPORARY INSTALLATION	
	REFRIGERANT			
	22, 404A, 407C, 410A, 502, & 507	12 & 134a	22, 404A, 407C, 410A, 502, & 507	12 & 134a
Air Conditioning	3 (0.21)	2 (0.14)	8 (0.55)	6 (0.41)
Commercial	2 (0.14)	1-1/2 (0.10)	4 (0.28)	3 (0.21)
Low Temperature	1 (0.07)	1/2 (0.03)	2 (0.14)	1 (0.07)