



PRODUCT UPDATE ACTION NOTICE

PU 07-06

Date: August 1, 2007

Subject: Field Rework Instructions for Failed Danfoss® ETS 250 Valves on YCAV/YCIV Chillers

From: Mike Greiman, Product Technical Support Manager, Commercial Chillers

To: Johnson Controls® Branches

Problem: YCAV/YCIV chillers refrigerant control valve (Drain and Feed valve - Figure 1) piston unscrews from the drive motor, typically causing low suction pressure faults. Affected systems normally run only for a short period of time before shutting down on a fault. Low flash tank refrigerant levels are also common when the Feed valve fails due to the loose piston.

Scope: Failures appear to occur on approximately 5% of the chillers manufactured between August 2006 and March 2007, based on supplier failure rates on all valve applications. **Only valves on a failed refrigerant system (circuit) need to be reworked and torque checked.**

Note: Each refrigerant system contains both a Drain valve and Feed valve. Perform the rework and torque check on the failed valve **and** the other valve in the problem system. The check on the operational valve in the problem system is strongly recommended because the refrigerant is removed from the low side of the system already.

A copy of this procedure and the required parts (gasket and special Allen key tool) have been sent to each Service Branch Manager.



Figure 1: Example Valve

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Affects: This problem affects all Danfoss ETS 250 Drain and Feed valves (Figure 1) used on all YCIV and most YCAV chillers manufactured between August 2006 and March 2007. See Table 1 for the specific valve model numbers.

Table 1: Models Affected by This Product Action Notice

Part Number	
York	Danfoss
025-41538-000	034G2004
025-41565-000	034G2006

Solution: Verify that the valve is not opening/controlling correctly and that it matches a valve type listed in the *Affects* section. Then perform the following steps:

- Verify the date code on the stepper motor assembly. The date code is a four-digit code stamped on the side of the valve body. The first two digits are the week of the year and the last two digits are the year. Valves made after the twelfth week of 2007 (stamped with date code 1207 or later) do not need to be reworked because the factory reworked them prior to shipment. See Figure 2.



Figure 2: Date Code

- Check if the valve has a punch mark on the side of the valve body opposite the date stamp. This punch mark indicates that the valve was reworked by the factory. If the valve has been reworked, you do not need to take further action. See Figure 3.



Figure 3: Reworked Valve with a Punch Mark

Action: Repair the valve in the field using the procedure outlined in *Repairing the Valve*.

Note the following:

- Allow sufficient time for the procedure. We estimate the valve repair to take approximately 8 hours.
- Take out a warranty number, apply all costs to the warranty claim via Service Ticket using standard procedures, and make sure the SD warranty comment description reads as follows:

ETS loose piston assembly valve repair - PU-0706.

This description allows us to track the failure rate and costs.

- Be sure to use environmentally safe procedures when removing any refrigerant that cannot be pumped into the condenser and isolated.



CAUTION: Risk of Environmental Damage.

Provide proper containment for any potential release of refrigerant, solvent, or oil. Such hazardous materials can be harmful to the environment if they are released.

Deadline: Rework the valves upon failure.

Note: If the unit is under warranty, you can apply all costs to the warranty. Warranty length is **not** extended as part of this update.

Repairing the Valve

Required Tools and Parts

The following tools and parts are required to repair the valve:

- 41 mm hex socket and torque spanner set to **165 N·m (122 lb·ft)** (valve top removal)
- 27 mm open-end spanner and torque spanner set to **50 N·m (37 lb·ft)** (stepper motor removal)
- 8 mm Allen key and torque spanner set to **25 N·m (18.5 lb·ft)** (valve piston removal)
- 16 mm Allen key with an 11 mm center hole (valve piston tightening). See Figure 4.

Note: This tool is supplied by Danfoss and has been sent to your Service Branch Manager in a special mailing for you to use.



Figure 4: Danfoss 16 mm Allen Key Inserted into a Steel Nut

- Open-end wrench adjustable up to 44 mm or 48 mm
- New metal gasket for the stepper motor - 034G2099 (20 pack). Each valve requires one gasket.

Note: This part has been sent to your Service Branch Manager in a special mailing for you to use.

- Center punch

Dismantling the Valve

To dismantle the valve:

1. Locate and remove the stepper motor plug (black water-tight plug connecting the chiller wiring harness to the control panel). **Do not** attempt to remove the wire cable from the top of the valve stepper motor.
2. Remove the stepper motor using the open-end spanner (27 mm) or wrench. During removal, be sure to backwrench the valve body (hold the valve body steady with another wrench [41 mm]) to prevent damage to the installed valve. See Figure 5.



Figure 5: Stepper Motor

3. Discard the metal gasket on the valve top or stepper motor (Figure 6).

Note: You will replace the gasket later in *Reassembling the Valve* (Figure 11).



Figure 6: Old Gasket in Assembly

4. Remove the valve top using the 41 mm hex socket wrench. Be sure to backwrench the valve body with another wrench to prevent damage to the installed valve. See Figure 7.



Figure 7: Valve and 41 mm Hex Socket

5. Separate the piston from valve top (Figure 8).



Figure 8: Valve Top and Piston (with Steel Nut)

6. Go to *Checking the Valve Piston Torque*.

Checking the Valve Piston Torque

To check the valve piston torque:

1. Place the special 16 mm Allen key tool with an 11 mm center hole on the steel nut of the piston (Figure 4).
2. Using the 8 mm Allen key torque spanner in the brass end of the piston and the special tool inserted into the piston, tighten to **25 N·m (18.5 lb·ft)**. This is accomplished easily on a tabletop vice or on the floor using a crescent wrench (Figure 9).



Figure 9: Torque to 25 N·m (18.5 lb-ft)

3. Go to *Reassembling the Valve*.

Reassembling the Valve

To reassemble the valve:

1. Place the piston in the valve top. Be sure the piston can move smoothly to the top and bottom of the valve.
2. Assemble the piston and valve top on the valve body (Figure 10).

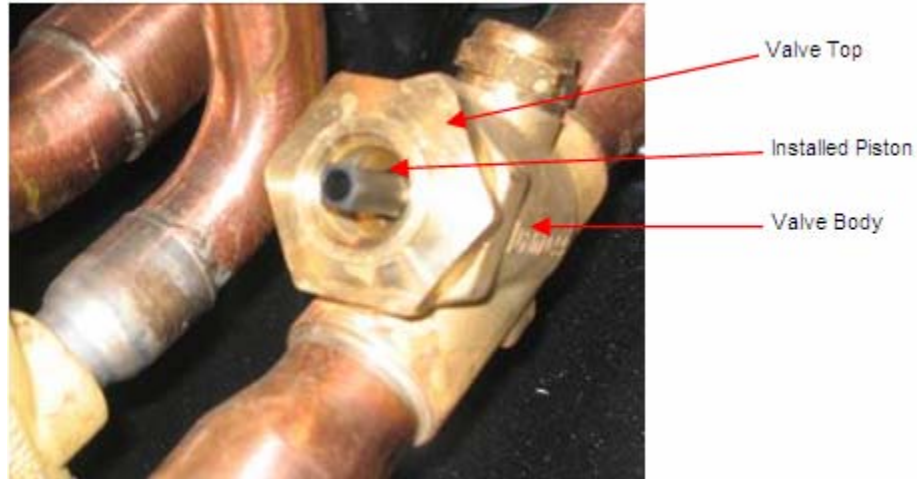


Figure 10: Assembled Piston and Valve Top/Body

3. Tighten the valve top to a torque of **165 N·m (122 lb·ft)** (Figure 7). **Do not overtighten or you may strip the threads and damage the valve.**
4. Check again that the piston can move smoothly from the closed position to the open position. Use the stepper motor screw inserted into the piston, if needed.
5. Install one new metal gasket on the stepper motor (Figure 11). Remember to remove the old gasket (Figure 6).



Figure 11: New Gasket

6. Set the piston to its fully closed position, and screw the motor into the piston spindle.
7. Tighten the stepper motor to a torque of **50 N·m (37 lb·ft)**. Be sure to backwrench the valve body with another wrench to prevent damage to the valve body (Figure 5). **Do not overtighten or you may strip the threads and damage the valve.**

8. Carefully make one center punch mark on the side of the valve opposite the date stamp to identify that the valve is reworked. Verify the punch is easily visible for future reference (Figure 3).
9. Reconnect the stepper motor cable plug.
10. Go to *Detecting Leaks and Returning the System to Operation*.

Detecting Leaks and Returning the System to Operation

To detect leaks and return the system to operation:

1. Ensure the portion of the refrigerant system being worked on is evacuated to 500 microns and is able to hold a vacuum for at least 10 minutes without an increase in pressure.
2. Install the refrigerant removed from the system.
3. Open the service valves.
4. Use a refrigerant leak detector to verify that the valve top and motor connections are tight.
5. Remove and reapply control power to ensure the valves return to the closed position.

The system is now ready to run.