Johnson Controls
Unitary Products
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SERVICE INFORMATION

DATE: January 14, 2009 **ST-005-09**

TO: All York Branches and Distributors
All York Service Managers
All Field Service Supervisors

SUBJECT: 40" Tall 90%+ AFUE Furnace Nuisance Limit Tripping

Recent Product Reports have raised the issue of nuisance limit tripping on our 90%+ furnaces. Below is a list of known and proven actions to identify the root cause of – **Fault Code Red 4 Flash "Open Limit Switch".**

1. Determine what Gas is being used and if the furnace properly setup for that fuel.
    a. Are the correct orifices per Rating Plate being used?
    b. Proper Gas Valve Conversion, usually just the spring in the regulator, on Modulating furnaces it is a complete valve change, Red Knob is for LP.
2. Check Manifold Pressure to insure it is within range of furnace's Rating Plate.
    a. Usually 3.5 IWC For Natural Gas and 10.0 IWC for Propane (LP).
3. Check Temperature Rise across the Heat Exchanger and Verify that it AND the Maximum Discharge Air Temperature are within range of Furnaces Rating Plate.
4. Check Blower Wheel for cleanliness and centered in scroll housing.
    a. If excessively dirty and/or show signs of being used during construction (Sheet rock Dust) pull blower assembly and check/clean the secondary coil and blower wheel.
5. Check Static Pressure, Add the Negative Pressure from blower compartment with the Discharge Pressure out of the furnace before the coil. (-0.3 + 0.3 = 0.6 Static) Residential Furnaces are rated at a maximum external static pressure of 0.5" w.c.
6. If possible, "Clock The Meter", due to high gas BTU content, furnace may be over-fired. Follow the procedures in the installation instructions.
7. Determine if it is the Main Limit on the vestibule or the Auxiliary limit on the Inducer Assembly that is tripping.
    a. If it is the Main Limit, Recheck All the Above.
    b. If it is the Auxiliary on the Inducer Assembly, Continue.

    Note: The Main Limit set point varies with model but the Auxiliary Limit set point is 160 Deg F on all models.
8. Check Vent Temperature about 6 inches outside of the cabinet.
    a. Drill hole to insert Sensor to get accurate reading, reseal with Red RTV Silicon sealant when done.
    b. Gases temperature range (can be between 100 to 150 Deg F) depending on the furnace model and the other factors listed above.
9. Check Furnace Inducer Motor Per YS-043-06
    a. Replace Inducer assembly if **Motor Date Code** is before **E06**
    b. Check that restrictor plate is correct, if required.

INDUCER REPLACEMENT KIT S1-32434558000

MODELS: PS9, FC9S, FL9S, GY9S, GM9S, GF9S, GY9F, GM9F AND MODULATING

TABLE 1: Combustion Blower Restrictor Use For Upflow Single Stage Furnaces

Upflow Furnace Models	Restrictor Description	Restrictor Part No.
(PS9/FC9S/FL9S/GY9S/GM9S/GF9S)40A12	Combustion Restrictor (Purple)	67230/S1-02815209000
(PS9/FC9S/FL9S/GY9S/GM9S/GF9S)60B12	Combustion Restrictor (Yellow)	18020/S1-02815163000
(PS9/FC9S/FL9S/GY9S/GM9S/GF9S)80B12	None Required	None Required
(PS9/FC9S/FL9S/GY9S/GM9S/GF9S)80C16, 80C20	Combustion Restrictor (Off White)	18021/S1-02815164000
(PS9/FC9S/FL9S/GY9S/GM9S/GF9S)100C16, 100C20	None Required	None Required
(PS9/FC9S/FL9S/GY9S/GM9S/GF9S)120D20	None Required	None Required
(PS9/FC9S/FL9S/GY9S/GM9S/GF9S)135D20	None Required	None Required
(GY9F/GM9F)48B12	Combustion Restrictor (Purple)	67230/S1-02815209000
(GY9F/GM9F)64C16	Combustion Restrictor (Orange)	334745/S1-02815497000
(GY9F/GM9F)80C16	Combustion Restrictor (Purple)	334746/S1-02815498000
(GY9F/GM9F)96D20	Combustion Restrictor (Brown)	18031/S1-02815172000

TABLE 2: Combustion Blower Restrictor Use For Downflow/Horizontal Single Stage Furnaces

Downflow Furnace Models	Restrictor Description	Restrictor Part No.
(PS9/FC9S/FL9S/GY9S/GM9S/GF9S)40A12	Combustion Restrictor (Light Gray)	102769/S1-02815220000
(PS9/FC9S/FL9S/GY9S/GM9S/GF9S)60B12	Combustion Restrictor (Brown)	18031/S1-02815172000
(PS9/FC9S/FL9S/GY9S/GM9S/GF9S)80B12	Combustion Restrictor (Orange)	98984/S1-02815218000
(PS9/FC9S/FL9S/GY9S/GM9S/GF9S)80C16	Combustion Restrictor (Blue)	18033/S1-02815174000
(PS9/FC9S/FL9S/GY9S/GM9S/GF9S)100C16	None	None
(PS9/FC9S/FL9S/GY9S/GM9S/GF9S)100C20	None	None
(PS9/FC9S/FL9S/GY9S/GM9S/GF9S)120D20	Combustion Restrictor (Red)	18032/S1-02815173000
(GY9F/GM9F)64C16	Combustion Restrictor (Orange)	334745/S1-02815497000
(GY9F/GM9F)80C16	Combustion Restrictor (Gray)	33474/S1-02815499000

TABLE 3: Combustion Blower Restrictor Use For Upflow Modulating Furnaces

Upflow Furnace Models	Restrictor Description	Restrictor Part No.
(PC9/FC9C/FL9C/PM9/FC9M/FL9M)60B12	Combustion Restrictor (Yellow)	18020/S1-02815163000
(PC9/FC9C/FL9C/PM9/FC9M/FL9M)80B12	None Required	None Required
(PC9/FC9C/FL9C/PM9/FC9M/FL9M)80C16	Combustion Restrictor (Off White)	18021/S1-02815164000
(PC9/FC9C/FL9C/PM9/FC9M/FL9M)100C16	None Required	None Required
(PC9/FC9C/FL9C/PM9/FC9M/FL9M)100C20	None Required	None Required
(PC9/FC9C/FL9C/PM9/FC9M/FL9M)120D20	None Required	None Required

TABLE 4: Combustion Blower Restrictor Use For Downflow/Horizontal Modulating Furnaces

Downflow Furnace Models	Restrictor Description	Restrictor Part No.
(PC9/FC9C/FL9C/PM9/FC9M/FL9M)60B12	Combustion Restrictor (Brown)	18031/S1-02815172000
(PC9/FC9C/FL9C/PM9/FC9M/FL9M)80B12	Combustion Restrictor (Orange)	98984/S1-02815218000
(PC9/FC9C/FL9C/PM9/FC9M/FL9M)80C16	Combustion Restrictor (Blue)	18033/S1-02815174000
(PC9/FC9C/FL9C/PM9/FC9M/FL9M)100C16	None	None
(PC9/FC9C/FL9C/PM9/FC9M/FL9M)100C20	None	None
(PC9/FC9C/FL9C/PM9/FC9M/FL9M)120D20	Combustion Restrictor (Red)	18032/S1-02815173000

Figure 1: Single Stage and Modulating Inducer Restrictor Ring Tables

INDUCER REPLACEMENT KIT 32434589000

FOR TWO STAGE MODELS: PT9, PV9, FC9T, FC9V FL9T, FL9V, GM9T, GM9V, XYF9S, XYF9V SERIES

COMBUSTION BLOWER RESTRICTOR USE FOR UPFLOW FURNACES		
UPFLOW FURNACE MODEL	**RESTRICTOR DESCRIPTION**	**RESTRICTOR PART NO.**
40A12	COMBUSTION RESTRICTOR (PURPLE)	67230 / 028-15209-000
60B12	COMBUSTION RESTRICTOR (YELLOW)	18020 / 028-15163-000
80B12	NONE REQUIRED	NONE REQUIRED
80C16, 80C20	COMBUSTION RESTRICTOR (OFF WHITE)	18021 / 028-15164-000
100C16	NONE REQUIRED	NONE REQUIRED
100C20	COMBUSTION RESTRICTOR (BLUE)	10833 / 028-15174-000
120D20	NONE REQUIRED	NONE REQUIRED

COMBUSTION BLOWER RESTRICTOR USE FOR DOWNFLOW FURNACES		
DOWNFLOW FURNACE MODEL	**RESTRICTOR DESCRIPTION**	**RESTRICTOR PART NO.**
60B12	COMBUSTION RESTRICTOR (YELLOW)	18020 / 028-15163-000
80B12	COMBUSTION RESTRICTOR (ORANGE)	98984 / 028-15218-000
80C16	COMBUSTION RESTRICTOR (OFF WHITE)	18021 / 028-15164-000
100C20	COMBUSTION RESTRICTOR (RED)	10823 / 028-15173-000
120D20	COMBUSTION RESTRICTOR (ORANGE)	98984 / 028-15218-000

Figure 2: Two Stage and Variable Speed Inducer Restrictor Ring Tables

10. After checking the above if flue temperature is still above 150 Deg F, then some of the Primary Heat Exchanger gases are most likely bypassing the Secondary HX and going straight to the inducer mixing with cooler gas from secondary.
    a. Remove Condensate Pan, note tightness of screws, and inspect gasket. If split between the two sections of the pan refer to ST-007-06.

Note: New Silicon Gaskets have an insert to fill the void between the two halves of the plastic pan. Without it the silicon gasket WILL split, deteriorate and leak.

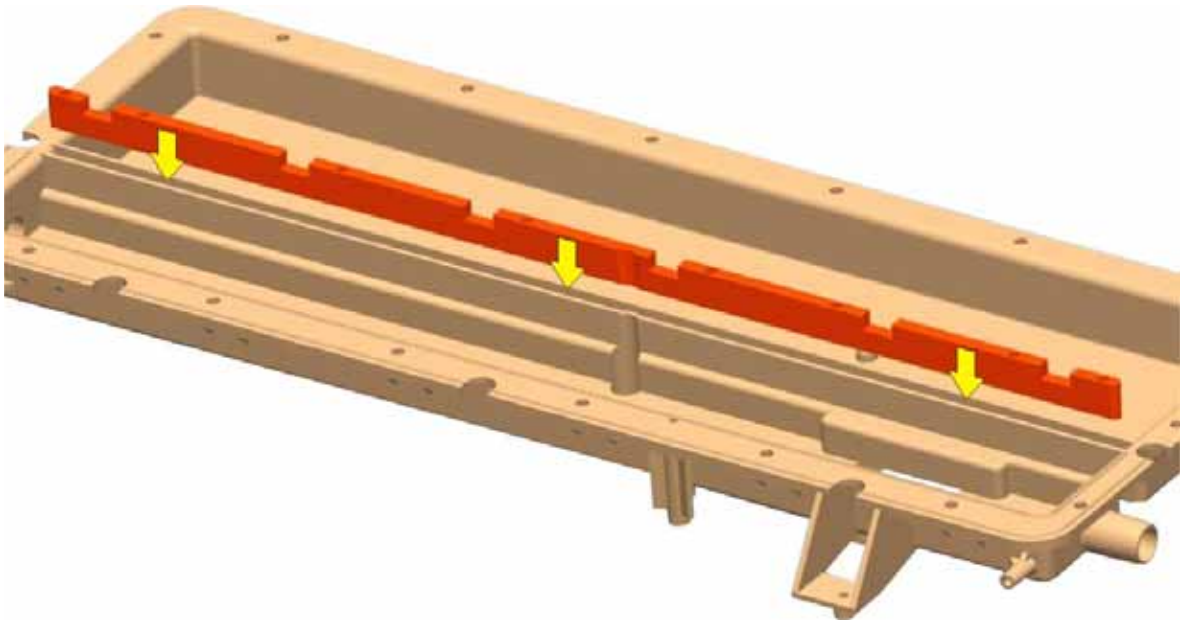


Figure 2: Condensate Pan Gasket Solid Silicon Insert, Downflow/Horizontal Version Shown.

b. Remove metal collection pan and check pan for corrosion, holes and was the gasket on good condition?

11. If no problem with gaskets is found than problem might be a case of not transferring heat through the secondary heat exchanger.
    a. Inspect opening of secondary heat exchanger for anything unusual that may cause blockage of tubes.
    b. Remove secondary from unit and inspect fins for air flow blockage, same as in step 4a above.
    c. If nothing is found that might cause gas bypassing or tube blockage then replace secondary heat exchanger.

Return of Secondary HX (if changed) and collection pan (if damaged) along with a Product Report.

If Problem Still Persists; Please File Product Report with the Attached Data Survey Sheet.

Ronald D Butcher
Field Service Supervisor

Robert Cabrera
Director of Heating Engineering

The more information provided means the more I can help you.

Limit Tripping / Excessive Flue Temperature Issue Survey Sheet

Info Taken By:	Date:
Distributor, & Job Name:	
Job Address: / City / State/Prov	

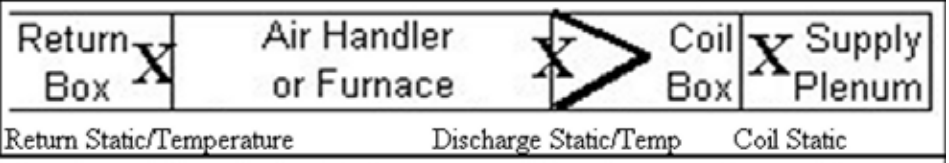
Application; New/Retrofit; Up/Down/Horizontal Left-Right. More information the better.

Furnace	Make	Model #	Serial #

From the Rating Plate	Temperature Rise Range:		Maximum Discharge Temperature:	
Natural or LP	Supply Pressure:	LP Kit #	Verify Orifice Size	

Changes Made - List adjustments to blower speed and firing rate		Start	Change 1	Change 2	Final
Heating Motor Speed					
Manifold Pressure					
Temperature	Flue 6" Out Of Cabinet				
	Return Air at Blower				
	Discharge Air Before Coil				
Static Pressures	Return Static At Blower				
	Discharge St. Before Coil				
	Coil Static After Coil				
Total System Static: Return + Discharge					

Get Readings at X



Any other information to help understand this application; Check screws around 90 condensate pan for snug tightness:

Check Blower For Proper Motor Speed And Wheel Centered