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Quality and Continuous Improvement

Number: TIC2017-0001

Date: 1/10/2017

Title: Code 31 Inspection Sheet

Product Category: Gas Furnaces

Products Affected

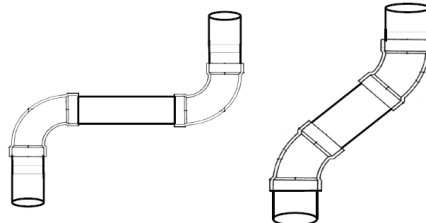
35-inch tall Condensing Gas Furnaces

Situation

When troubleshooting LPS (Collector Box) or HPS (Inducer Housing) pressure switch did not close or re-opened issues (Status Code 31), it is important to evaluate the entire installation. The information shown below can aid the service technician in inspecting the installation. References to applicable TIC's and bulletins are shown in the appropriate sections.

Vent/Combustion Air Pipes

1. Vent pipe size
 - a. Verify pipe does not exceed maximum TEL (Total Effective Length) as shown in the installation instructions
 - b. It is not necessary to change vent pipe/combustion air pipes that were sized using the original vent tables unless there is evidence of vent terminal freeze-up (TIC 2014-0002)
2. Vent pipe slope of at least $\frac{1}{4}$ " per foot (1" per four feet) along every section of vent pipe
 - a. Remember to check pipes run through an attic
3. No short horizontal offsets
 - a. Change 90 deg. ells in horizontal pipe to (2) 45 deg. ells



Avoid short horizontal offsets with 90 deg. Elbows. Short offsets can be difficult to slope and may trap condensate.

Use 45 deg. Elbows where possible, to ensure condensate drainage.

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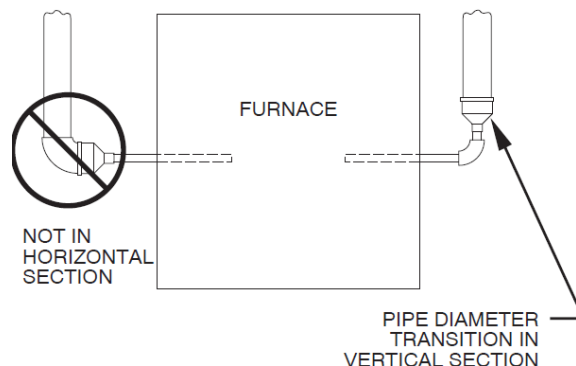
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4. No pipe diameter changes in the horizontal (sloped) section of pipe.
 - a. All pipe diameter changes must be in the vertical section of the vent or combustion air



5. Vent termination location problem areas:

- a. Inside corners
- b. Directly into strong prevailing winds
- c. Incorrect 2-pipe termination
 1. Vertical separation distance between intake and exhaust must be 12-in.
 2. Horizontal sidewall separation distance greater than 2 inches. Vents must be located together as shown or spaced 36 inches apart. When paired together as shown, the next vent termination or pair of vent terminations must be 36 inches apart

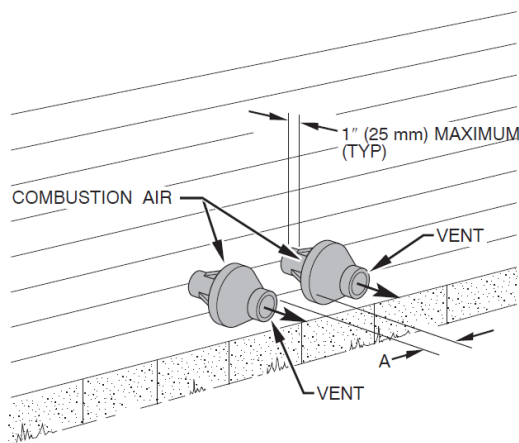


Fig. 9 - Concentric Vent and Combustion-Air Roof Termination (Dimension A as Touching or 2-in. (51 mm) Maximum Separation)

- d. Below the anticipated snow line (snow blocked terminations)
- e. Incorrect multiple termination spacing
- f. Re-circulation of products of combustion

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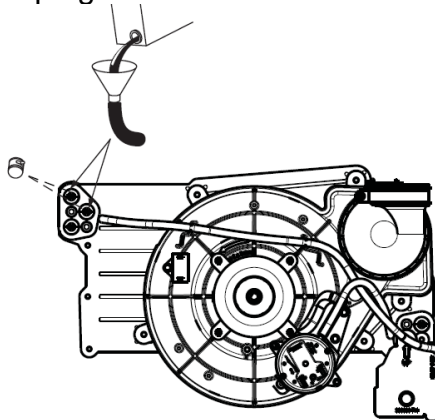
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1. Intake and exhaust pipes reversed
2. Any combination of a. through f. above

6. Vent or Combustion Air Pipe restricted
 - a. Vent/Combustion Air pipe(s) frozen
 1. Furnace oversized/short cycling
 2. See Item 5 above for other freeze-up causes
 - b. Foreign object restricting pipe
 - c. Furnace grossly over-sized

Condensate Trap

1. Remove and clean condensate trap
 - a. Remember to clean relief port of trap
 - b. Replace condensate trap gasket with part number 339806-401
2. Verify trap walls are sealed by filling up the trap one side at a time
3. Verify "Z" tube is not rotated upward to create an inverted trap
4. Prime both sides of the trap through the (2) top and middle drain outlets on the opposite corner of the collector box
 - a. Prime each side of the trap until water runs freely out of the condensate drain line
 - b. If you do not prime the trap properly, the furnace will fault out on a Code 31 until the trap primes
 - c. Remember to re-install the plugs in the collector box



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Fig. 63 - Priming Condensate Trap
(Appearance May Vary)

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Condensate Drain Piping

1. Common drain terminated above the waterline of a sump pump or a condensate pump
2. Verify indoor coil is not hard piped to furnace condensate drain
 - a. Separate furnace and indoor coil drains even if there is a relief tee for the indoor coil drain
 - b. Consider adding a relief tee to the furnace condensate drain pipe even if the condensate pipes are run separately as shown in TIC 2013-0007
3. Slope all drain lines to code approved drain point

Collector Box

1. Clean the Collector Box Pressure Switch port (located next to the trap)
2. Clean the Relief Port on the Collector Box (located at the opposite corner of the Collector Box)
3. Verify Collector Box is not cracked

Inducer Assembly

1. Drain any water collected in the inducer assembly
 - a. Dry out the inducer housing by blowing air from a shop vac through it
2. Verify there is no inducer outlet restrictor (remove vent elbow to verify) installed
 - a. Except 40,000 BTUH models with less than 10 ft. of TEL
3. Verify inducer has an "X" embossed on the housing, just below and to the right of the vent elbow.

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The inducer with an “X” embossed on it has a larger internal port. It is not necessary to re-drill the port on this inducer. See DSB 14-0004

- a. If the inducer does not have an “X” embossed on it:
 1. Refer to DSB 14-0002
 - b. Drill out the housing pressure switch port with a 5/32-in. and 3/16-in. drill bit
 - c. Be sure to spin the drill bit in the port to prevent rifling of the port

5. Clean out any debris or PVC shavings in the drain stubs on the back of the inducer

6. Remove the orange gasket from the inducer assembly.
 - a. Re-install it in the inducer inlet without pushing the gasket down into the pocket
 - b. Re-install the inducer assembly

7. Verify correct inducer inlet choke is installed in the inducer inlet

Input (BTUH)	Choke Diameter (mm)	Color
26,000	(3) 9.7 mm diameter holes	Translucent
40,000	44.45 mm	Black
60,000	31.75 mm	Black
80,000	No Choke	N/A
100,000	44.45 mm	Black
120,000	No Choke	N/A
140,000	No Choke	N/A

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8. Verify all (5) screws are used to re-install the inducer assembly
9. Make sure square pressure switch tub is installed on the rear pressure switch and is fully seated on the inducer housing pressure switch port.

Control Board

1. Verify control board has the latest revised Code 31 software.
 - a. Control board date code is 4016
 - b. Refer to DSB16-0018

Control Board Part Number	HK42FZ039	HK42FZ061	HK42FZ036	HK42FZ045
Software Version	Version 12	Version 4	Version 4	Version 4
Control Board Date Code	4016	4016	4016	4016

Example of Barcode, Software Version, Part Number & Date Code

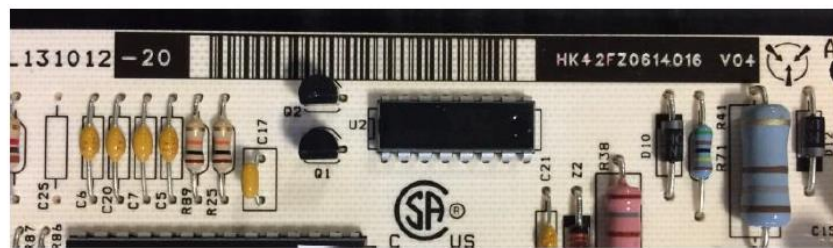
In this example:

The software version is 04

The part number is HK42FZ061

Produced in week 40 of 2016

Note: See Table 1 for production date codes



Measuring HXDP and Inducer Housing Pressure

1. A Magnehelic with a 0 to 2-in. scale is recommended
2. Tee into each switch separately, one at a time
3. Measure each switch separately

Verify Pressure Switch/Relief Tube connections

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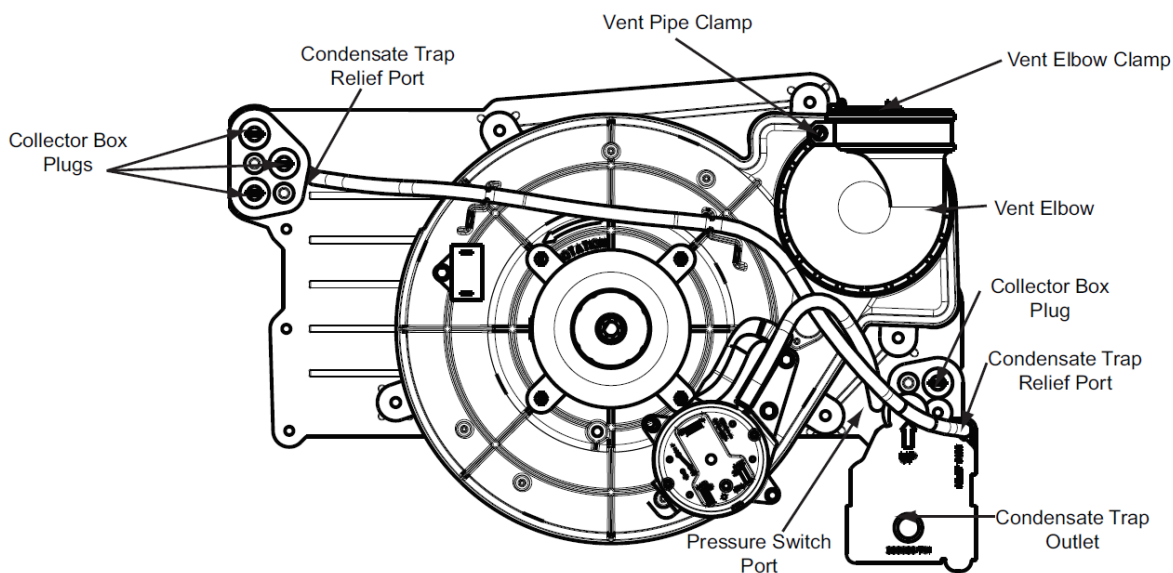
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1. Relief Tube (colored hose) from relief port on trap to opposite corner of Collector Box
2. Inducer Housing Pressure Switch Tube (square tube) from rear pressure switch to port on inducer housing
3. Collector Box Pressure Switch Tube from front pressure switch to port on Collector Box next to the trap



UPFLOW TRAP CONFIGURATION
1 & 2 Stage Units

Fig. 8 - Upflow Trap Configuration

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Technical Information

DSB 14-0002
DSB 14-0004
DSB 16-0018
TIC 2013-0007
TIC 2014-0002

References

Unit Installation Instructions

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