

# DEALER SERVICE BULLETIN

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**Number:** DSB 14-0002

**Issued:** 1/20/14

**Title:**35" Condensing Gas Furnace Nuisance Pressure Switch Tripping

## **PRODUCT CATEGORY:**

Single stage and two stage 35" condensing gas furnaces

## **MODELS AFFECTED:**

**All sizes except the 140k input** in the following model families:

Carrier: 59SC2A, 59SC2B, 59SC5A, 59SP5A, 59TP5A, 59TN6A

Bryant: 912SA, 912SB, 915SA, 925SA, 925TA, 986TA

Payne: PG92SAS, PG92SBS, PG95SAS, PG95XAT

Serial Numbers: 2711A to 5313

## **SITUATION:**

The inducer housing pressure switch (HPS) on single stage models is opening during furnace operation. This appears to the homeowner as a non-functioning furnace. Site visits and testing have determined the primary cause of this issue to be installation related; specifically, incorrect venting and condensate drainage. However, it is possible for nuisance pressure switch tripping to occur from the following phenomenon.

Condensed flue gas droplets can migrate into the inducer housing pressure port. Most installations pull in cold combustion air during the inducer pre-purge. The cold air chills the inducer housing, which causes flue gas condensation droplets to form during the first few minutes of operation. The condensation droplets can migrate into the pressure tap and tube (through the capillary affect) and momentarily block the pressure signal to the inducer HPS. If the furnace runs long enough, the inducer housing heats up enough to prevent condensation droplet formation.

Condensation droplets can form during the first few minutes after a call for heat. If the pressure switch opens within the first few minutes, the furnace does not provide enough heat to keep the home warm.

Two stage models that start on high stage can experience the same issue as single stage models. Two stage models that start in low stage, then transition to high stage, do not experience nuisance switch tripping from condensate droplets. The HPS is called the high heat pressure switch on two stage models.

Modulating furnaces do not use inducer housing pressure, so the field corrective action does not apply.

**SOLUTION:**

**The field corrective action is only applicable to the above listed models that are installed per the Installation Instructions and TIC2013-0007 and exhibiting nuisance inducer HPS tripping.** The field corrective action will not resolve pressure switch tripping due to one or more of the following:

- vent and combustion air system design or installation
- incorrect condensate drain design or installation
- improper furnace pitch and missing cabinet seals
- inadequate home ventilation.

These issues must be resolved prior to attempting the field corrective action on the inducer housing.

If nuisance pressure switch tripping continues to occur following verification that the unit is installed per the installation instructions, the field corrective action is to enlarge the inner diameter of the inducer HPS port. A permanent corrective action will be qualified and implemented at a later date. A second informational SMB will be issued when the permanent corrective action is implemented.

Field training for proper venting is being developed and will be issued Spring 2014.

**Field Action:**

**The field corrective action is only applicable to the above listed models that are installed per the Installation Instructions and TIC2013-0007 and exhibiting nuisance inducer housing pressure switch tripping.** The field corrective action will not resolve pressure switch tripping due to one or more of the following:

- vent and combustion air system design or installation
- incorrect condensate drain design or installation
- improper furnace pitch and missing cabinet seals
- inadequate home ventilation.

These issues must be resolved prior to attempting the field corrective action on the inducer housing.

The field corrective action is to enlarge the inner diameter of the inducer HPS port. It is possible to irreparably damage the inducer housing if the procedure is not carefully followed, so special care is needed. Complete the procedure exactly as explained.

Required tools: ruler, tape, 5/32" drill bit, 3/16" drill bit and a power drill turned to the lowest speed.

To enlarge the pressure port:

1. Remove the pressure switch assembly from the inducer assembly. Remove 1 screw and disconnect two tubes and remove wires. Label each tube to ensure proper assembly later.
2. Remove the inducer assembly from the furnace. Disconnect vent pipe, disconnect inducer motor wire harness and remove 5 screws.

3. Locate the pressure switch port on the inducer housing. See figure below.



4. Mark each drill bit (two) at a depth of 1 ½" with a piece of tape. See picture below.



5. Use the 5/32" drill bit to initially enlarge the port. Do not exceed the depth of 1 ½". **Ensure the drill is straight, on the lowest speed and follows the existing hole.** See picture below. Do not skip this step. Starting with the 3/16" drill bit may damage the pressure port beyond repair.



6. Use the 3/16" drill bit to enlarge the port. Do not exceed the depth of 1 1/2"  
**Ensure the drill is straight, on the lowest speed and follows the existing hole.** See picture below.



7. Re-install the inducer assembly. Attach with 5 screws, connect inducer motor wire harness and connect vent pipe.
8. Re-install the pressure switch assembly. Attach 1 screw and connect tubes and switch wires.
9. Prime the condensate trap and verify unit operation. Note: To measure pressure switch operation with upper door installed, remove a 7/8" knockout and route the tube through the knockout and seal with tape. When complete, install a standard conduit knockout plug in the casing.

# TECHNICAL INFORMATION COMMUNICATION



Quality and Continuous Improvement

**Number:** TIC2013-0007

**Date:** 10/1/2013

**Title:** New 35" Condensing Furnace Condensate Drain

**Product Category:** Heating Products

## Products Affected

New 35" condensing gas furnaces

## Situation

When a common drain pipe is used for evaporator coil and condensing gas furnace condensate, installers are not providing or locating the air gap (standpipe) between the evaporator coil and gas furnace condensate drain pipes as required in the condensing gas furnace Installation Instructions. No air gap (standpipe) or an incorrectly located air gap (standpipe) results in nuisance furnace pressure switch trips.

The condensing furnace Installation Instructions uses the plumbing term "open standpipe". Some installers may not be familiar with this term, resulting in a misinterpretation of Figure 13 in the Installation Instructions.

In some cases, plumbers are installing the drain pipe without reviewing Installation Instructions. Some plumbers are not aware of the furnace condensate drain requirements and install the drain pipe incorrectly.

## Technical Information

The furnace blower creates positive pressure in the evaporator coil. The coil drain port is open to the positive pressure area within the coil cabinet. Air flowing through the evaporator coil enters the coil condensate drain pipe. This air pressurizes the condensate pipe preventing consistent condensate flow from the condensing furnace drain. See Figure 1.

When furnace condensate flows against positive pressure in the drain pipe, furnace pressure becomes erratic. This can result in the pressure falling below the pressure switch break point. Under high static duct pressure, furnace condensate can back up into the trap, collector box and inducer; which opens the pressure switch.

Only trained and qualified personnel should design, install, repair and service HVAC systems and equipment. All national standards and safety codes must be followed when designing, installing, repairing and servicing HVAC systems and equipment. It is the responsibility of the Dealer to ensure local codes, standards, and ordinances are met.

# TECHNICAL INFORMATION COMMUNICATION

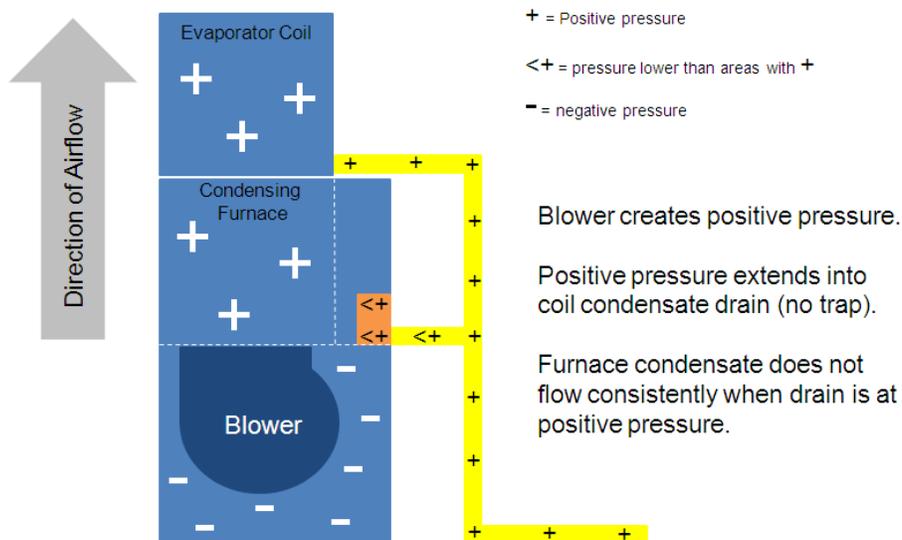


Figure 1: Drain Pipe Pressurization

**Open Standpipe:** An open standpipe is used to relieve condensate drain pressurization and prevent damage to the furnace. The Installation Instructions for the new condensing furnace platform shows an “open standpipe” between the evaporator coil and furnace condensate drain pipe as shown below. An “open standpipe” is a vertical pipe that is open at the upper end. See Figure 2. The opening relieves pressure in the pipe below the opening. The opening also provides a location for condensate to exit the drain pipe in the event of a downstream drain pipe blockage. This prevents damage to furnace components.

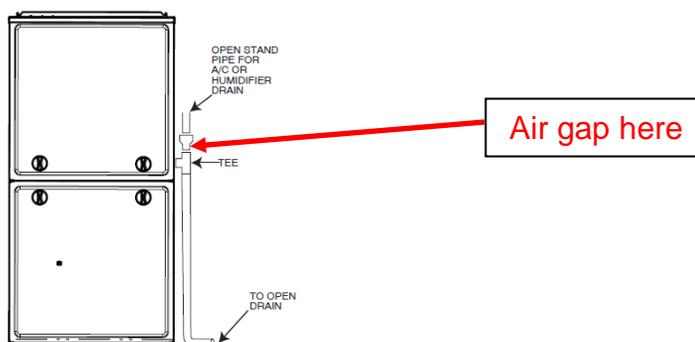


Fig. 1.3 - Example of Field Drain Attachment

Figure 2: Drain Diagram from Installation Instructions

To ensure free furnace condensate flow, pressure in the evaporator coil drain pipe must be relieved BEFORE the furnace condensate pipe joins the evaporator coil drain pipe. To prevent component damage in the event of a blocked drain pipe, an air gap must be provided near the furnace. See Figure 3.

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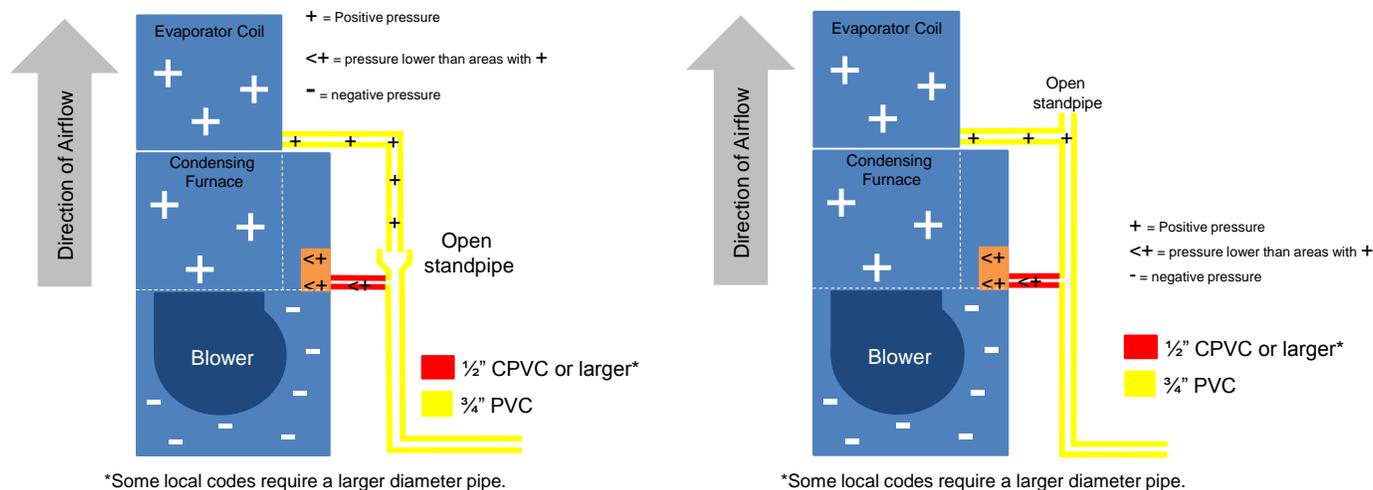


Figure 3: Open Standpipe Configurations

**Do not seal an open standpipe.** A seal prevents pressure relief resulting in nuisance pressure switch tripping. Also, in the event of a blocked drain pipe, condensate will back up into the furnace and damage internal components.

**An evaporator coil trap is NOT an alternate solution to drain pipe pressurization.** A trap on the evaporator coil condensate drain pipe prevents airflow from pressurizing the drain pipe after the trap. However, the evaporator coil trap can dry out during the winter resulting in a pressurized condensate drain pipe.

It is acceptable to run separate condensate drain pipes for the evaporator coil and furnace, provided a standpipe is installed on the furnace condensate pipe. A standpipe is also recommended for the evaporator coil drain. See Figure 4.

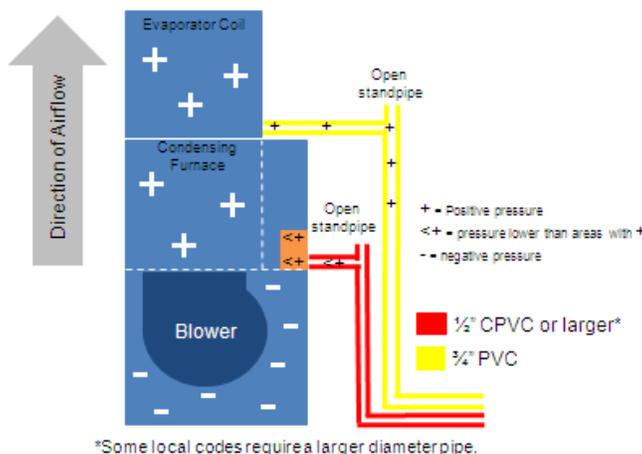


Figure 4: Separate Condensate Drain Pipes

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# TECHNICAL INFORMATION COMMUNICATION

The following configurations will trip the gas furnace pressure switch and are not recommended. See Figures 5.

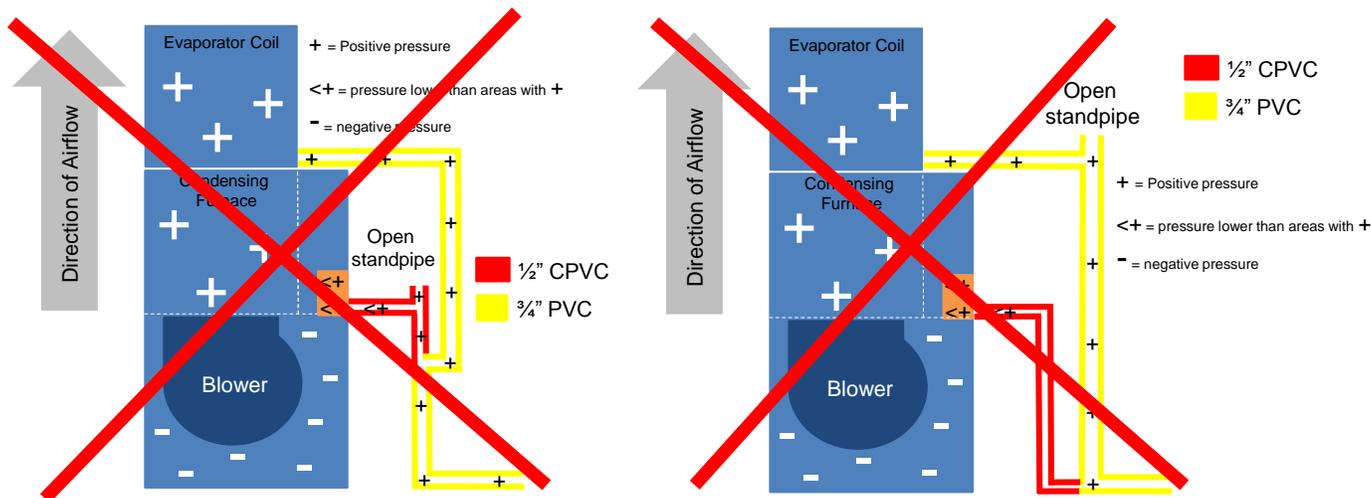


Figure 5: Drain Configurations That Are Not Recommended

**Warranty Coverage:** Warranty does not cover component damaged due to a blocked drain pipe.

**THIS WARRANTY DOES NOT COVER:**

1. Labor or other costs incurred for diagnosing, repairing, removing, installing, shipping, servicing or handling of either defective parts, or replacement parts, or new units.
2. Any product purchased over the Internet.
3. Normal maintenance as outlined in the installation and servicing instructions or Owner's Manual, including filter cleaning and/or replacement and lubrication.
4. Failure, damage or repairs due to faulty installation, misapplication, abuse, improper servicing, unauthorized alteration or improper operation.
5. Failure to start due to voltage conditions, blown fuses, open circuit breakers, or damages due to the inadequacy or interruption of electrical service.
6. Failure or damage due to floods, winds, fires, lightning, accidents, corrosive environments (rust, etc) or other conditions beyond the control of Company.
7. Parts not supplied or designated by Company, or damages resulting from their use.

**References**

New 35" Condensing Furnace Installation Instructions  
Evaporator Coil Installation Instructions

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