

# Alpine<sup>TM</sup> Residential Condensing Gas Boilers

## Annual Servicing Guidelines & Information\*

*(Updated July, 2015)*



\* For complete information including all cautions and warnings for the installation, operations, maintenance and servicing of Alpine Boilers, refer to the Alpine I&O provided with the boiler.

# Annual Inspection and Servicing Guidelines for Alpine Boilers

NOTE: In addition to the continuous and monthly inspections instructions provided in the Alpine Boiler "Installation, Operating and Service Instructions" (I&O) manual, the following steps should be performed by a service technical once every year. These are annual servicing guidelines. For complete information including all cautions and warnings for the installation, operations, maintenance and servicing of Alpine boilers, refer to the Alpine I&O manual provided with the boiler.

## Required Tool List

- |  |  |
|--|--|
| <input type="checkbox"/> Torx Star Bits and Driver (T-20 and T-25) | <input type="checkbox"/> Water Spray Bottle  |
| <input type="checkbox"/> 10mm Metric Socket and Drive (or wrench)  | <input type="checkbox"/> Nylon Stiff Bristle Brush (1/2" bristle min.)                         |
| <input type="checkbox"/> Pipe Wrenches (2) and/or Pump Pliers      | <input type="checkbox"/> Steel Wool  |
| <input type="checkbox"/> Phillips and Blade Type Screwdriver       | <input type="checkbox"/> Light Duty Air Sprayer<br>(or small shop vacuum reversed to blow air) |
| <input type="checkbox"/> Small Blade Screwdriver (Pocket Type)     | <input type="checkbox"/> Combustion Analyzer   |
| <input type="checkbox"/> Felt-Tip Pen or Marker                    | <input type="checkbox"/> Manometer   |
| <input type="checkbox"/> Shop Vacuum                               |  |

## Inspection and Servicing Steps:

(Follow all steps in Sections A through N in order.)

### A. Low Water Cutoff (LWCO)

- A1. If a low water cutoff (LWCO) is installed, test the device by pressing the "Test" button located on the end of the LWCO. The yellow light should come on and "Other Limits" will flash on the "Help Menu" on the Alpine boiler Display Screen.
- A2. If the "Yellow Light" does not come on, determine why the LWCO is not working properly. Repair or replace the LWCO as required.

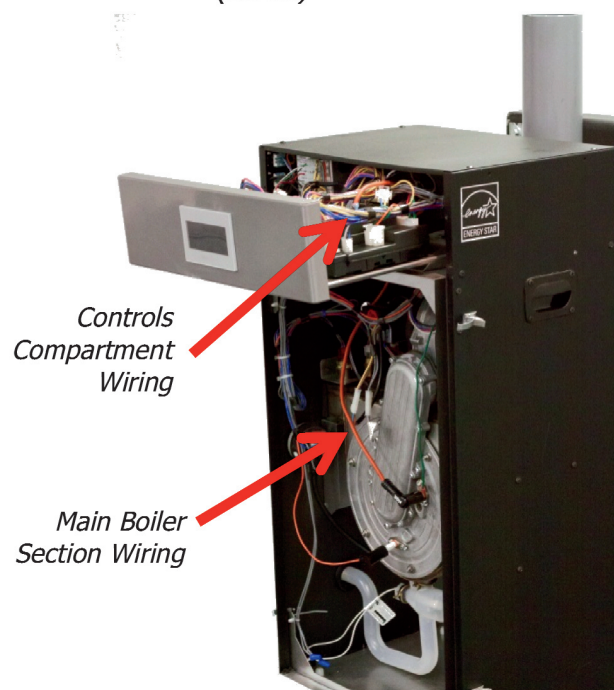


Sage2.1/2.2 Display  
on Alpine Boiler



### B. Boiler Wiring

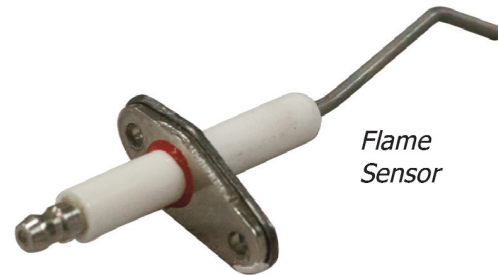
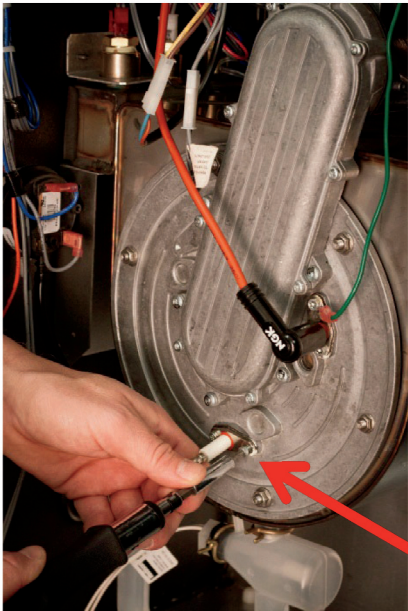
- B1. **WARNING:** Be sure to shut off all electricity coming to the boiler before proceeding.
- B2. Inspect all boiler and controls wiring to verify wires are in good condition and check to make sure all wire nuts and wire terminals are tight.



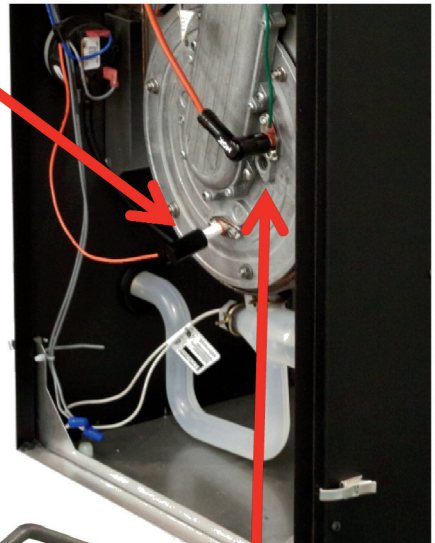


## C. Flame Sensor

- C1. Remove the wire boot from the flame sensor. Then, using a Torx #20 bit, remove the two screws and remove the flame sensor from the boiler.
- C2. Clean the flame sensor with steel wool. Do not use sand paper or sand cloth. Check the porcelain for cracks and carbon buildup.
- C3. Do not re-install sensor at this time.



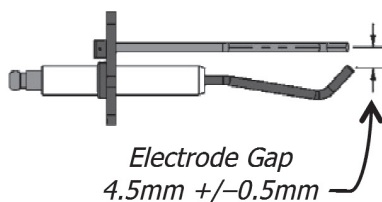
Flame Sensor



Igniter

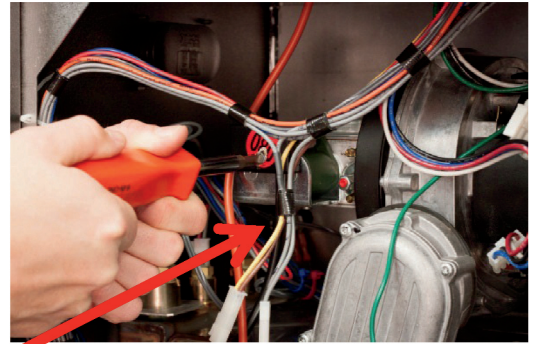
## D. Igniter

- D1. Remove wire boot and green ground wire from the igniter. Use a Torx #20 bit to remove the igniter from the boiler.
- D2. Clean igniter with steel wool. Do not use sandpaper or sand cloth. Check the porcelain for cracks and carbon build-up.
- D3. Adjust the igniter electrode gap to 4.5 mm  $\pm$  0.5 mm. If adjustment is required, adjust only the ground rod so as to not compromise the porcelain.
- D4. Do not re-install igniter at this time.



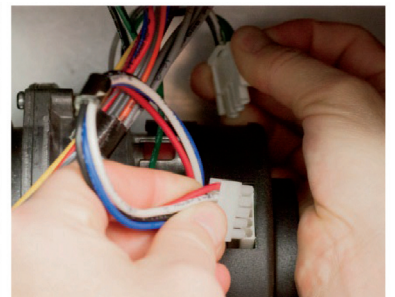
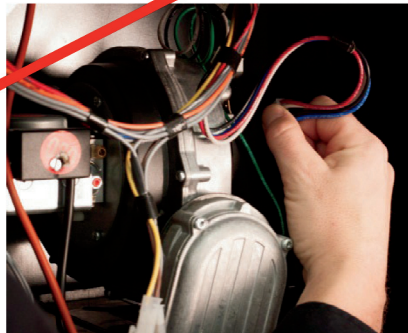
## E. Gas Line

- E1. **WARNING:** Be sure to shut off the gas supply to the boiler before proceeding.
- E2. Remove the gas line from the gas valve. Be sure to use a wrench to back up the gas valve while removing the gas line.



## F. Wiring Connectors

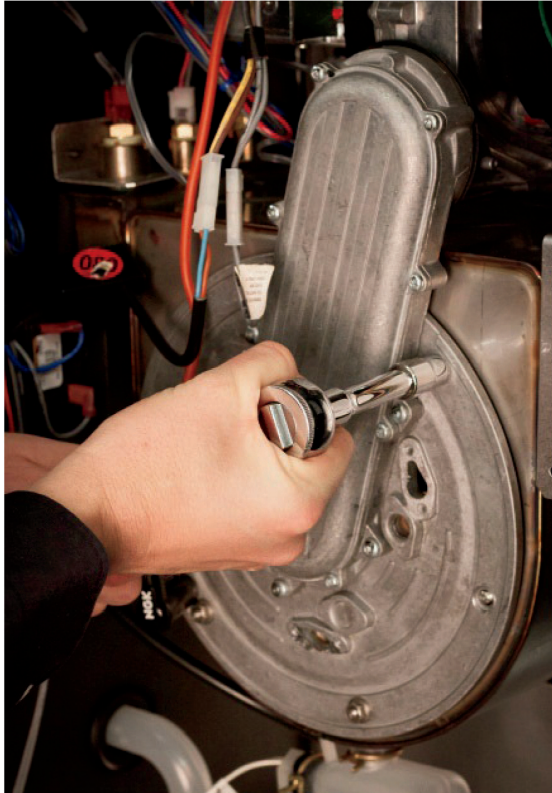
- F1. Remove the bolt from the wiring harness on the gas valve and unplug the harness.
- F2. Unplug the two molex wiring connectors from the fan assembly.



*Remove 2 Molex Connectors*

## G. Burner Assembly

- G1. Remove the six 10mm nuts from the circular burner plate.



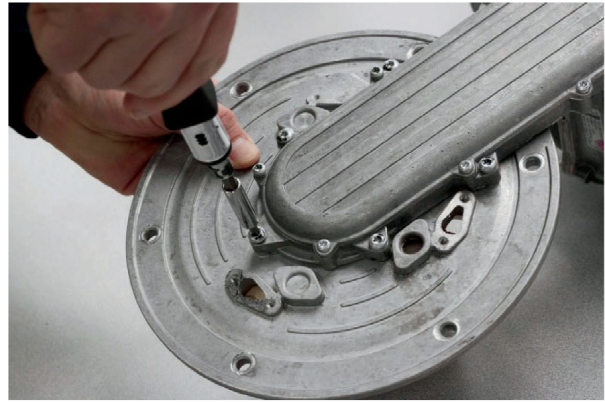
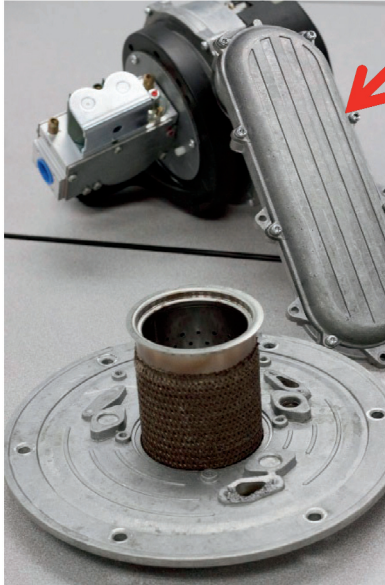
- G2. Separate the front half from the rear of the air/gas tube to access the inside of the burner.  
**CAUTION:** Be careful not to damage the gasket.





G3. Remove the air/gas burner hood from the circular burner plate by removing six #25 Torx bolts.

G4. Do NOT remove the fan assembly from the air/gas burner hood.



G5. Remove the burner.

Verify that all holes on the inside of the burner are clean.

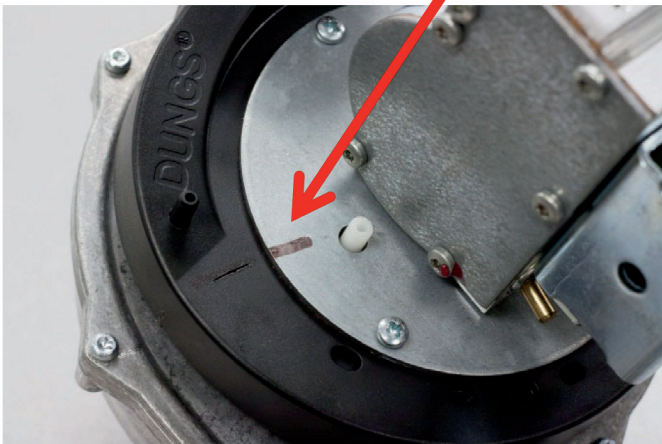
Gently wipe with a soft cloth or vacuum the outside of the burner.

If the burner shows signs of deterioration or distortion, replace the burner.



## H. Gas Valve Assembly

H1. Using felt-tip marker, make a hash mark from the gas valve mounting plate to the plastic shroud assembly as shown in the picture below. This will be one of the hash marks used for realignment upon re-assembly.



H2. Dis-assemble the gas valve from the fan assembly by removing the three (3) Phillips head screws.

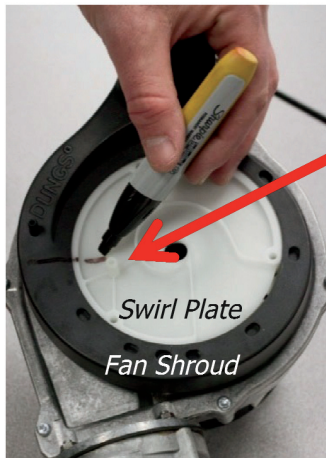
H3. Inspect the filter located on the gas valve inlet for any debris and clean as necessary.



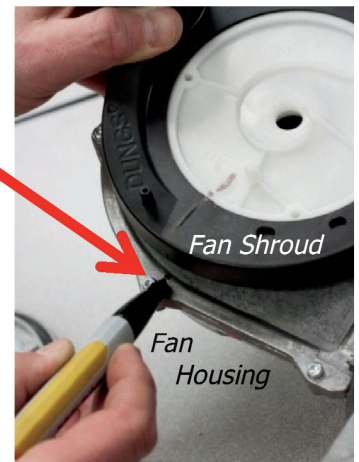


## I. Fan Assembly

- I1. Using a felt-tip marker, make a hash mark from the swirl plate to the outer fan shroud, and make a hash mark from the outer fan shroud to the fan housing.



*Make hash marks here.*



- I2. Carefully remove the outer fan shroud and lift out the swirl plate.



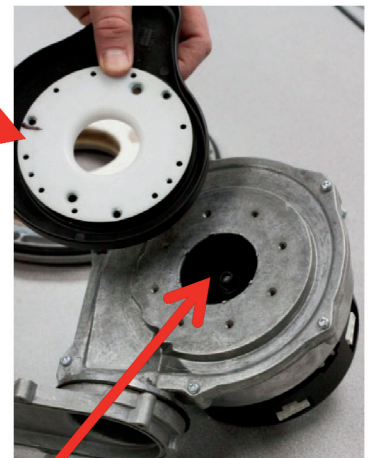
- I3. Inspect the parts and wipe clean if necessary. If the swirl plate fins are deteriorated, replace the swirl plate.



- I4. Using felt-tip marker, place a hash mark on the inner ring across to the rear shroud plate and continue the hash mark to the fan housing.



- I5. Remove the two (2) Phillips head screws, lift off the plate and inspect the fan blades for damage and debris.

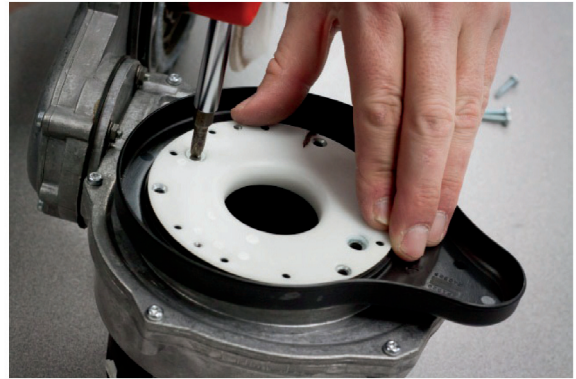


- I6. If the fan blades are dirty, wipe them clean; or if they are damaged, replace the fan.

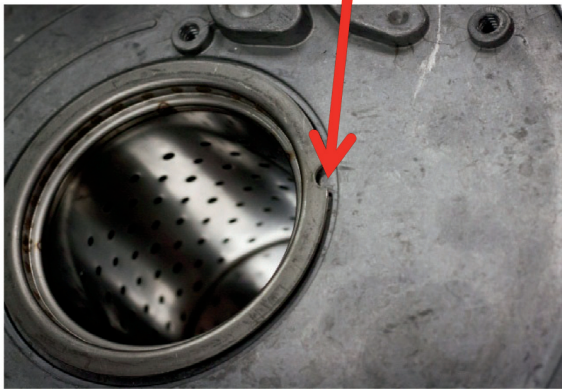


## J. Re-Assembly of Fan/Gas Valve

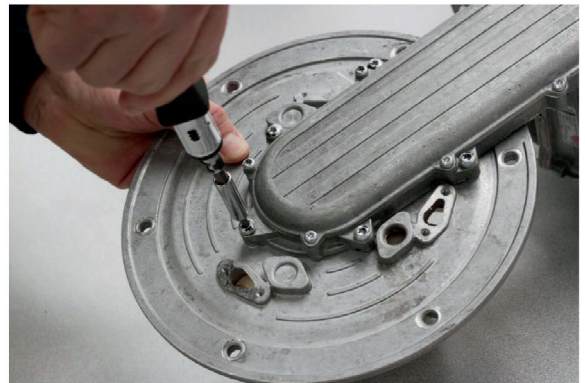
- J1 Re-assemble the fan/gas valve assembly in reverse order of disassembly – making sure the hash marks that were made when disassembling the unit are properly lined up.



- J2. Re-install the burner by properly lining up the notch on the burner with the tab on the heat exchanger.



- J3 Re-install the rear air/gas complete with the fan/gas valve assembly to the burner plate using the Torx #25 bolts.



- J4. Verify that the burner head seal is in good shape. If not, replace the burner head seal.

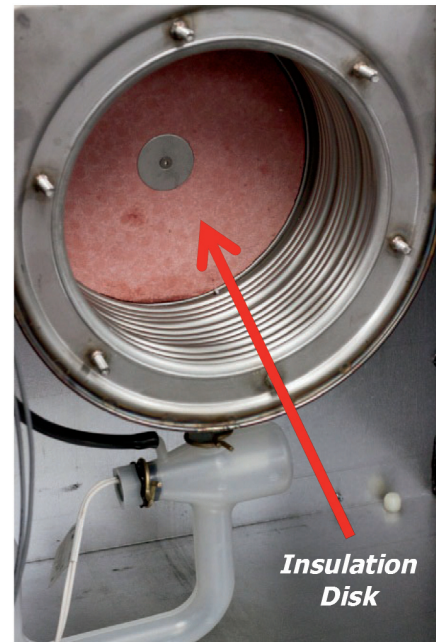


- J5. Re-attach the front burner gas/air plate with the #20 Torx bolts.



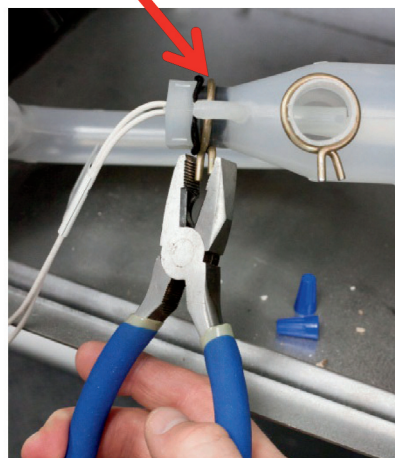
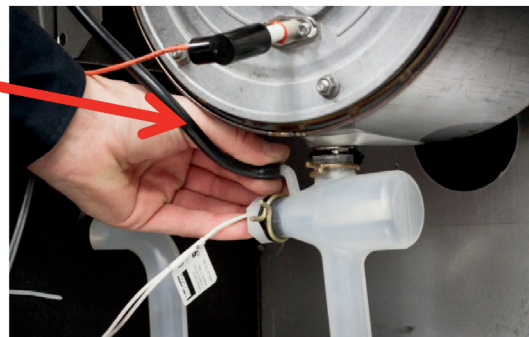
## K. Heat Exchanger

- K1. Inspect the heat exchanger. Clean and vacuum any debris found on the surfaces. A soft nylon brush may be used for cleaning, but do not use metal bristle brushes. Also, clean between heat exchanger tubes.
- K2. The heat exchanger surfaces may be cleaned by flushing with clean water. Do not use any cleaning agents or solvents. NOTE: The insulation disk may be left in place for cleaning but it **MUST** be protected from water when flushing since water will damage the insulation disk. Drain and flush the insides of the heat exchanger and the condensate collector.
- K3. Remove any insulation disk protection that was used while flushing the heat exchanger surfaces.



## L. Condensate Trap

- L1. Remove the air tubing from the condensate trap (that connects to the air pressure switch).
- L2. Remove the condensate trap by loosening the compression coupling on the discharge side of the trap and releasing the spring clamp on the top of the trap.
- L3. Remove the float switch from the trap by loosening the spring clamp.
- L4. Clean the switch assembly.
- L5. Flush and clean the trap assembly.
- L6. Flush or blow out the condensate line to allow free flow of condensate.

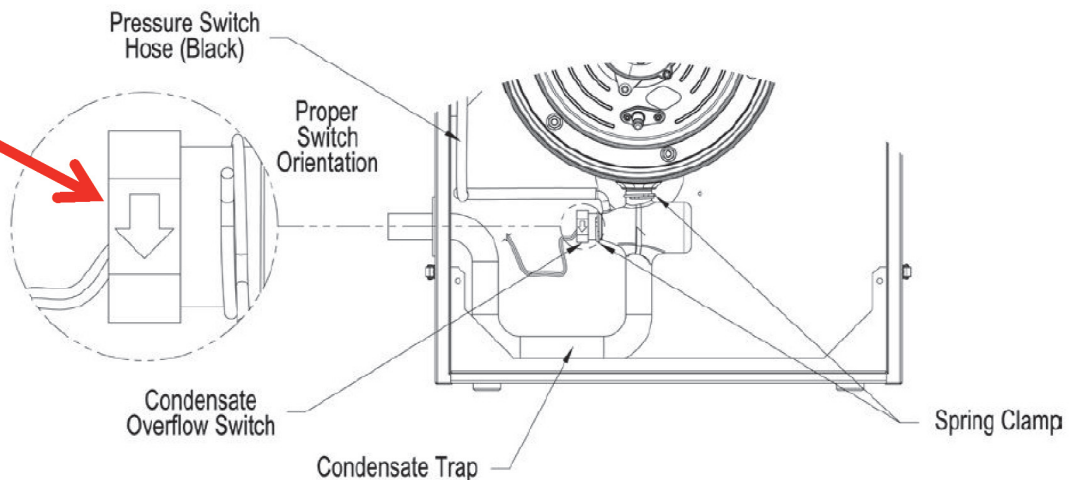




- L7. If a condensate pump is used, be sure to clean the pump basin and check the float assembly for proper operation.
- L8. If a condensate neutralizer is used, flush or replace the limestone chips and clean out the neutralizer if needed.

- L9. Re-install the float switch with the arrow pointing down...

Arrow is located on the plastic nut that holds the float in the condensate trap. Use silicone sealant on the threads and re-install the spring clamp.



- L10. Slide the condensate trap back onto the stub on the bottom of the heat exchanger. Use silicone sealant and secure with the spring clamp.

## M. Final Re-Assembly & Inspections

- M1. Inspect and replace, if needed, the inner and outer gaskets and insulation on the burner plate.
- M2. Re-install the gas valve/fan/burner plate assembly using the six -10mm nuts torqued to 3.69 ft. lbs. (44.25 in.lbs.) following the torque pattern shown in Figure 1. Start and end with #1.
- M3. Re-install the igniter assembly using a new gaskets if needed.
- M4. Re-install the spark wire boot onto the igniter along with the green ground wire.
- M5. Re-install the flame sensor using a new gasket if needed
- M6. Connect the flame sensor boot to the flame sensor.
- M7. Re-connect the two wire molex plugs into the fan assembly.
- M8. Re-connect the gas valve harness to the gas valve and secure with the bolt that had been removed.
- M9. Re-attach the gas line to the gas valve. Be sure to back up the gas valve with a second wrench.
- M10. Verify that the vent and air intake pipes are clear of obstructions and are within specifications and have the proper pitch per manufacturer's instructions.

Re-install Gas Valve/Fan/Burner Plate

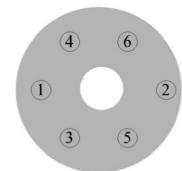


Figure 1

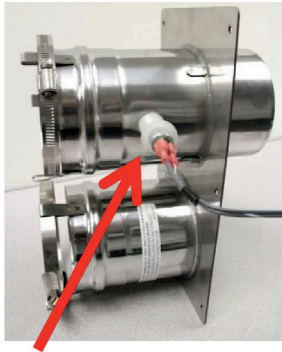


Re-install Igniter



Re-install Flame Sensor

- M11. Locate the boiler flue temperature sensor cap. For floor mounted boilers, it can be found on the top vent connector pipe on the rear of the boiler. For wall hung Alpine boilers, the vent elbow and flue temperature sensor cap are located behind the access panel located on the rear, left-hand side of the boiler. Four (4) screws need to be removed for access.



*Top Vent Connector and Flue Temperature Sensor Cap – Floor Mount Boilers*



*Vent Elbow and Flue Temperature Sensor Cap – Wall Mount Boilers*

- M12. **IMPORTANT:** If the color of the flue temperature sensor cap is WHITE, it **must** be discarded and replaced with a BLACK cap provided with the service kit. To replace the WHITE cap follow instructions M13 through M19. If the flue temperature sensor cap is BLACK, verify it is free from leakage, deterioration and/or corrosion. If this cap is satisfactory, skip Steps M13–M19 and proceed to Step M20. If this cap needs to be replaced follow instructions in Steps M13 thru M19.

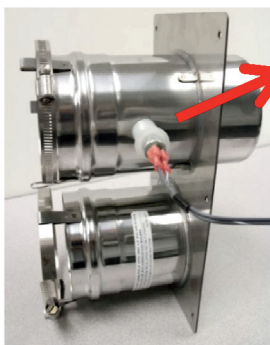
- M13. To replace the WHITE flue temperature sensor cap, slide off the cap with the temperature sensor. NOTE: The temperature sensor wiring does **not** need to be disconnected from the temperature sensor (see pictures in Step M14).

*Discard  
WHITE cap*

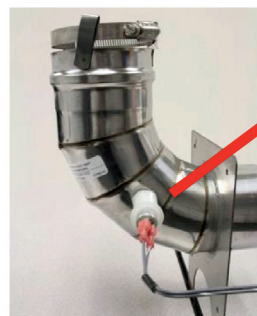


*Replace with  
BLACK cap*

- M14. Remove the cap from the temperature sensor.



*Removal of WHITE cap on floor mounted boilers.*



*Removal of WHITE cap on wall mounted boilers.*



- M15. Using the Molykote 111 Compound grease supplied with the BLACK cap in the service kit, evenly lubricate the inside of the BLACK cap.

- M16. Also apply Molykote grease to the tip of the existing flue temperature sensor.

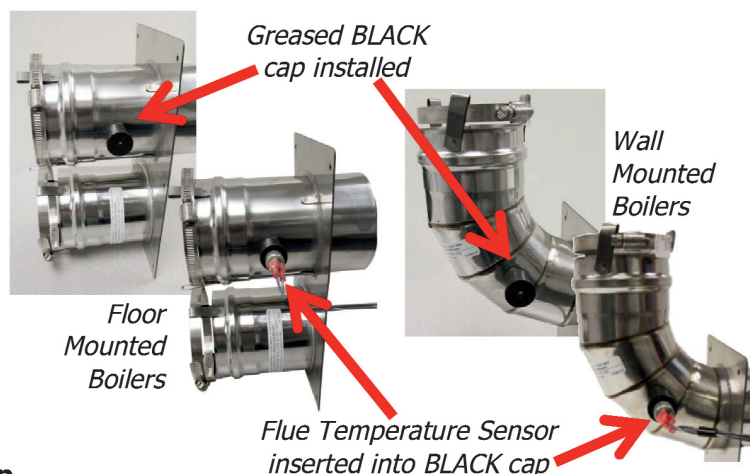


### **! WARNING**

Apply supplied Molykote 111 Compound grease to flue temperature sensor cap inside surface when the sensor cap is replaced. Failure to apply the grease could result in cap deterioration from flue gas condensate exposure.

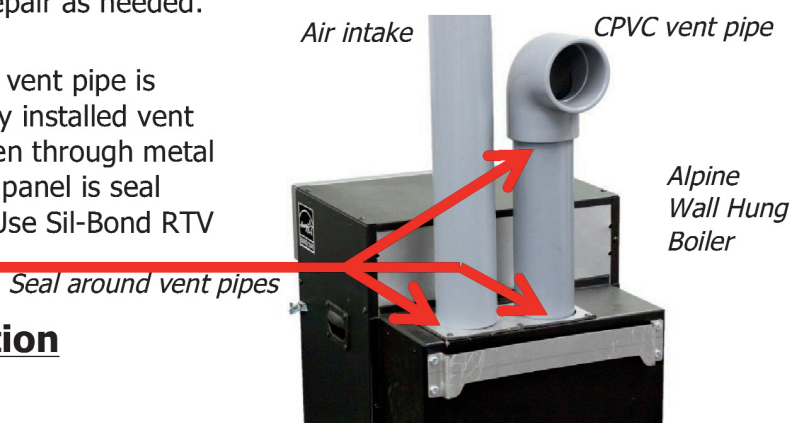


- M17. Insert the greased cap using a cork-screw motion onto the vent stub until the cap bottoms out.
- M18. Insert the flue temperature sensor all the way into the BLACK cap (should bottom out) and make sure the vent sensor wires are properly connected.
- M19. For wall hung boilers, replace the cover plate with the four (4) screws removed in Step M11.



**This completes the replacement of the flue temperature sensor vent cap.**

- M20. Inspect vent connections and vent connector to heat exchanger seals to verify that they are free from leakage and deterioration. Repair as needed.
- M21. For wall hung Alpine boilers, ensure the vent pipe is firmly inserted into female end of factory installed vent connector 90° elbow and securely tighten through metal strap clamp and ensure the rear access panel is seal tight and leak free, replace if needed. Use Sil-Bond RTV 4500 silicon to seal around the pipes.



## **N. Checking for Proper Operation**

- N1. Turn on the gas and check for leaks.
- N2. Turn on the electricity to the boiler.
- N3. Establish a demand for the boiler to heat. (e.g. raise thermostat)
- N4. Check to assure that the gas pressure is within specifications and adjust if needed.
- N5. Use a combustion analyzer and adjust the boiler to specifications per the manufacturer's instructions in the Alpine boiler I&O Manual.
- N6. Verify using the Sage2 control display panel that all the safety devices and sensors are working properly and that the boiler is operating normally.

**NOTE:** For complete information including all cautions and warnings for installation, operations, maintenance and servicing of Alpine boilers, refer to the Alpine I&O manual provided with the boiler.

## **APPENDIX**

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