	Inspection / Maintenance Procedure	
	Doc Number GAC - MP - 001	Revision Date : 25 Dec 2018 Revision : 1

The users are expecting to use manufacturers' manual to maintain their assets. These general maintenance procedures to test/inspect assets where no specific manuals are available. When using these procedures, remember that these documents may not specify every single detail of your asset.

Scope: Scope of these procedures cover most residential and/or commercial fixed assets. For mobile assets (like car, bike, RVs etc.) recommend to follow manufacturers' manuals. For pets and human assets recommend to follow medical professionals' recommendations.

How to use: To use maintenance procedure of any asset go through page by page or able to download the procedure and also can print from the link below

[Air Conditioner](#)

[Fireplace](#)

[Furnace with Pilot](#)

[Furnace without Pilot](#)

[Heat Pump](#)

[HVAC System](#)

[Water Heater with no Igniter](#)

[Water Heater with Igniter](#)


Test/Inspect Air Conditioner

Asset Category: HVAC

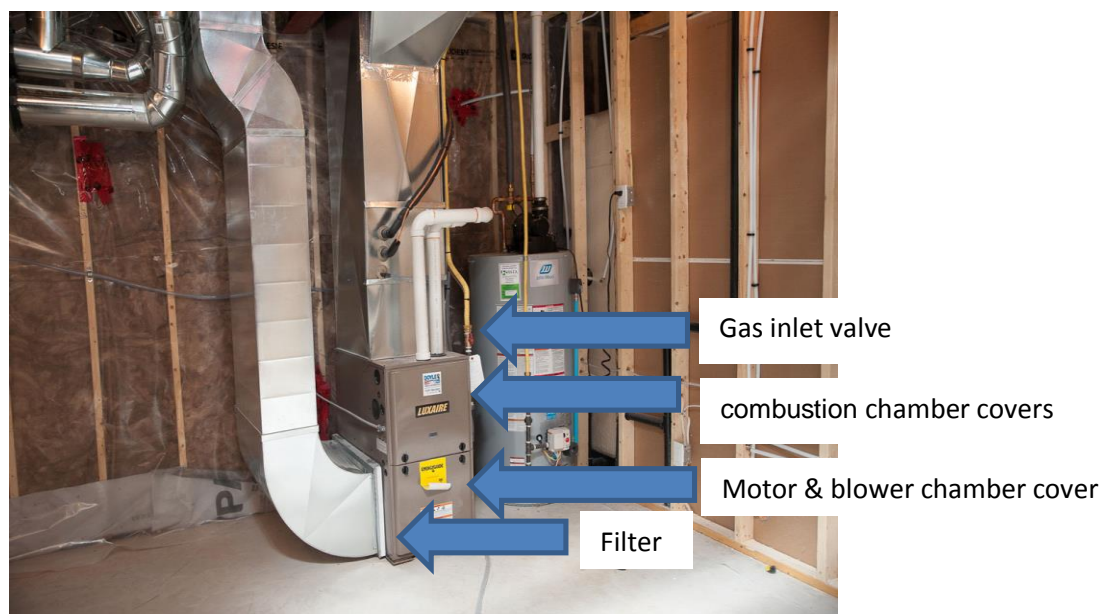
Asset Criticality: Critical asset. Regular maintenance is essential.

Scope	General maintenance procedure to test/inspect Air Conditioner where no specific manual available.
Precautions	<ul style="list-style-type: none"> Review manufacturers' manual for work and safety requirements Complete hazard / risk assessment prior to any maintenance / inspection / testing work
Tool Required	<ul style="list-style-type: none"> Screw drivers Cleaning brush and rag Vacuum cleaner Use proper PPE (e.g. Safety Glass & gloves)


Maintenance / Inspection / Testing Steps

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Step	Action
1.1	Turn OFF the electric switch of the furnace generally located in the ceiling or nearby. This is same/similar to a light switch
1.2	Open combustion and motor chamber covers by pushing up (may require a screw driver if there are screws)
1.3	Clean furnace ignition and motor chamber, gas nozzles and sensor as required.
1.4	Close combustion and motor chamber covers as there is a safety electric switch on the frame which receives contact with motor cover pressure
1.5	Visual check condensation unit (normally located outside of the building) and any sound from the Fan
1.6	Check filters and replace if needed
1.7	Check the thermostat and set to desire setting
1.8	Turn ON the electric switch of the furnace
1.9	Observe the operation of air conditioner and test cooling of the air circulation
1.8	Observe the full cycle until the air conditioner turns OFF
1.9	Best practice to follow the user manual of the air conditioner and recommend to call certified professional






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Common Failure & Troubleshooting

Failure	Troubleshooting
Air conditioner is not running	Check thermostat setting and electric connection are ON
Thermostat has no display or flashing	Open the cover, check loose connections and replace weak batteries
Blower fan making sound	Bearing may be worn out or broken, call certified technician
Condensation fan making sound	Bearing may be worn out or broken, call certified technician

End of Maintenance Procedure

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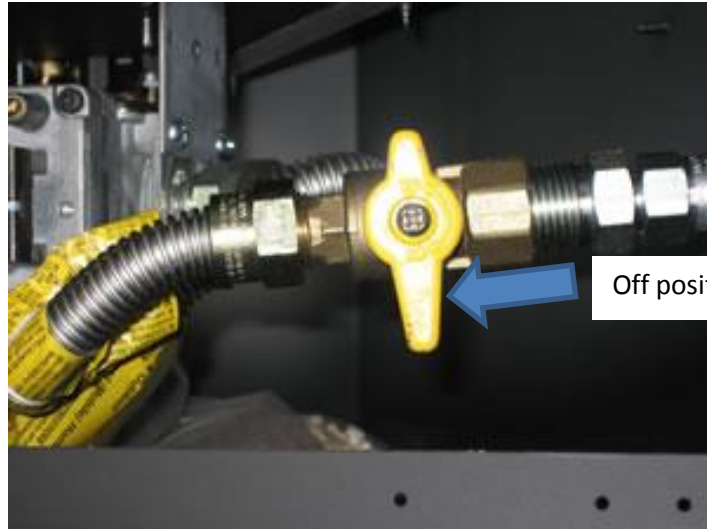
Test/Inspect Fireplace

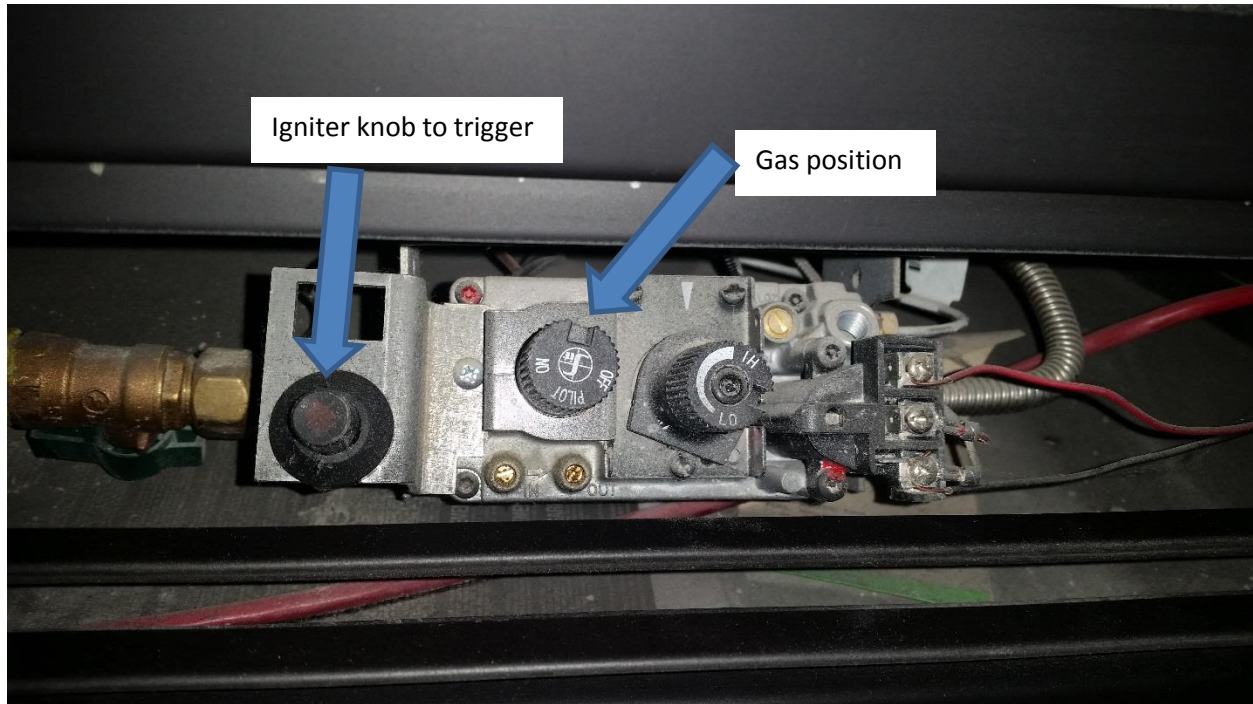
Asset Category: HVAC

Asset Criticality: Health & Safety. Regular maintenance is essential.

Scope	General maintenance procedure to test/inspect Fireplace where no specific manual available.
Precautions	<ul style="list-style-type: none"> Review manufacturers' manual for work and safety requirements Complete hazard / risk assessment prior to any maintenance / inspection / testing work
Tool Required	<ul style="list-style-type: none"> Cleaning brush and rag Vacuum cleaner BBQ lighter Use proper PPE (e.g. Safety Glass & gloves)

Maintenance / Inspection / Testing Steps	
Step	Action
1.1	Turn off inlet gas valve which will turn off PILOT light, which means inlet gas valve is working properly
1.2	Clean fireplace if required
1.3	Turn on the inlet gas valve
1.4	Turn the ignition valve knob to PILOT position, press and hold and trigger the igniter knob (sometime needs multiple trigger to ignite pilot light). When pilot light is ON and continue to hold for about a minute then release valve knob and turn it to the ON position for normal operation. Some fireplaces need BBQ lighter to manual ignite pitot instead of spark igniter.
1.5	Some fireplace has separate electrical switch on the wall to run
1.6	Best practice to follow the user manual and instruction written on the fireplace





Common Failure & Troubleshooting

Failure	Troubleshooting
Pilot off	Check inlet gas valve and ignition valve position ON. Follow the process to turn ON PILOT
Pilot ON process fail every time	Thermocouple may be weak or not working. Call certified technician
Gas smell	Gas leak. Turn OFF inlet gas valve and call certified technician


End of Maintenance Procedure

Test/Inspect Water Heater (with no igniter)

Asset Category: HVAC

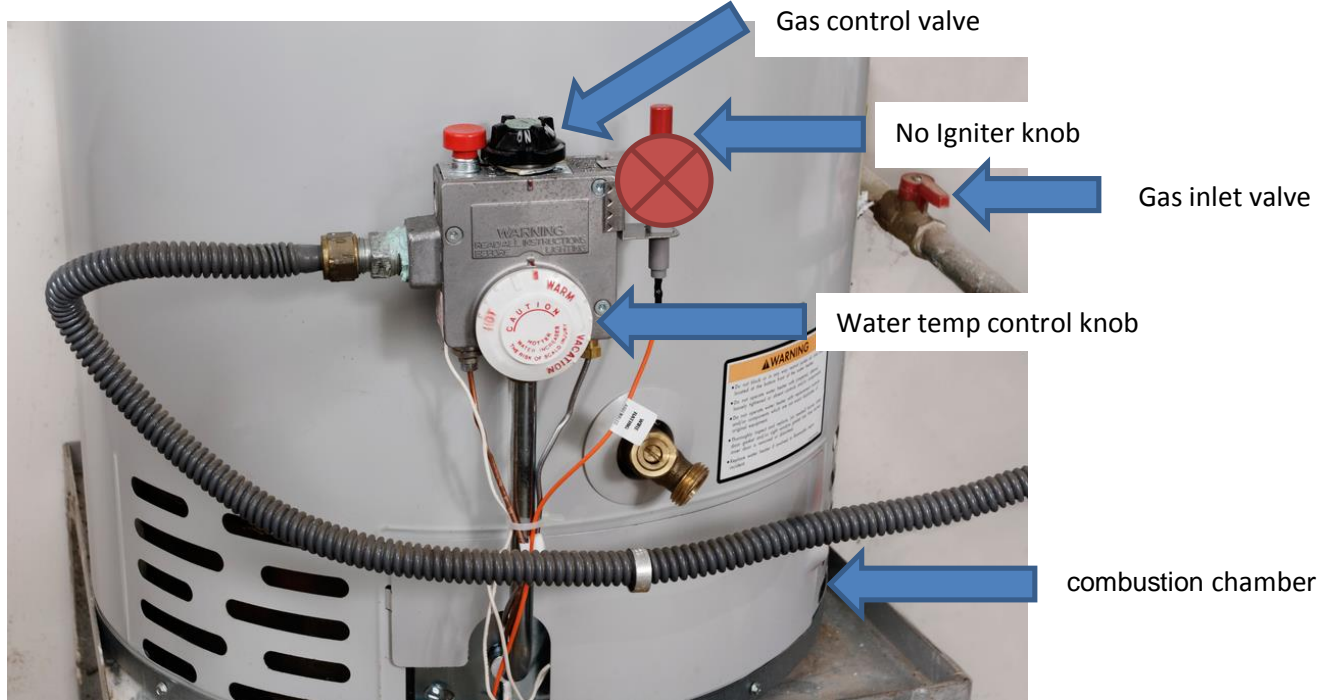
Asset Criticality: Critical asset. Regular maintenance is essential.


Scope	General maintenance procedure to test/inspect water heater (with no igniter) where no specific manual available.
Precautions	<ul style="list-style-type: none"> Review manufacturers' manual for work and safety requirements Complete hazard / risk assessment prior to any maintenance / inspection / testing work

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Tool Required	<ul style="list-style-type: none"> • Screw drivers • Cleaning brush and rag • Vacuum cleaner • BBQ lighter • Sly wrench • Use proper PPE (e.g. Safety Glass & gloves)
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Maintenance / Inspection / Testing Steps	
Step	Action
1.1	Turn off inlet gas valve which will turn off pitot, which means the inlet gas valve is working properly
1.2	Open combustion chamber cover with push/screw driver
1.3	Clean water heater combustion chamber if required. Clean dirt on combustion plate which prevent air flow
1.4	Turn on the inlet gas valve
1.5	Turn the gas control valve knob to PILOT position, press and hold, trigger the BBQ lighter to PILOT tip to light ON. When pilot light is ON and continue to hold for about a minute then release valve knob and turn to ON position for normal operation.
1.6	Close combustion chamber cover with push/screw driver
1.7	Check water heat control knob
1.8	Check corrosion and water leak
1.9	Check for water leak in and around the pipe and connections
2.0	Check pressure relief valve
2.1	Check leakage in drainage valve
2.2	Best practice to follow the user manual and instruction written on the water heater



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Common Failure & Troubleshooting

Failure	Troubleshooting
Pilot off	Check inlet gas valve and ignition valve position ON. Follow the process to turn ON PILOT
Pilot ON process fail every time	Thermocouple may be weak or not working. Call certified technician
Gas smell	Gas leak. Turn OFF inlet gas valve and call certified technician
Water leak from inside tank	Replace the water heater
Water leak to inlet and outlet connection	Repair/replace
Water leak to pressure relief valve	Replace the valve
Water leak to drainage valve	Replace valve

End of Maintenance Procedure


Test/Inspect Water Heater (with igniter)

Asset Category: HVAC

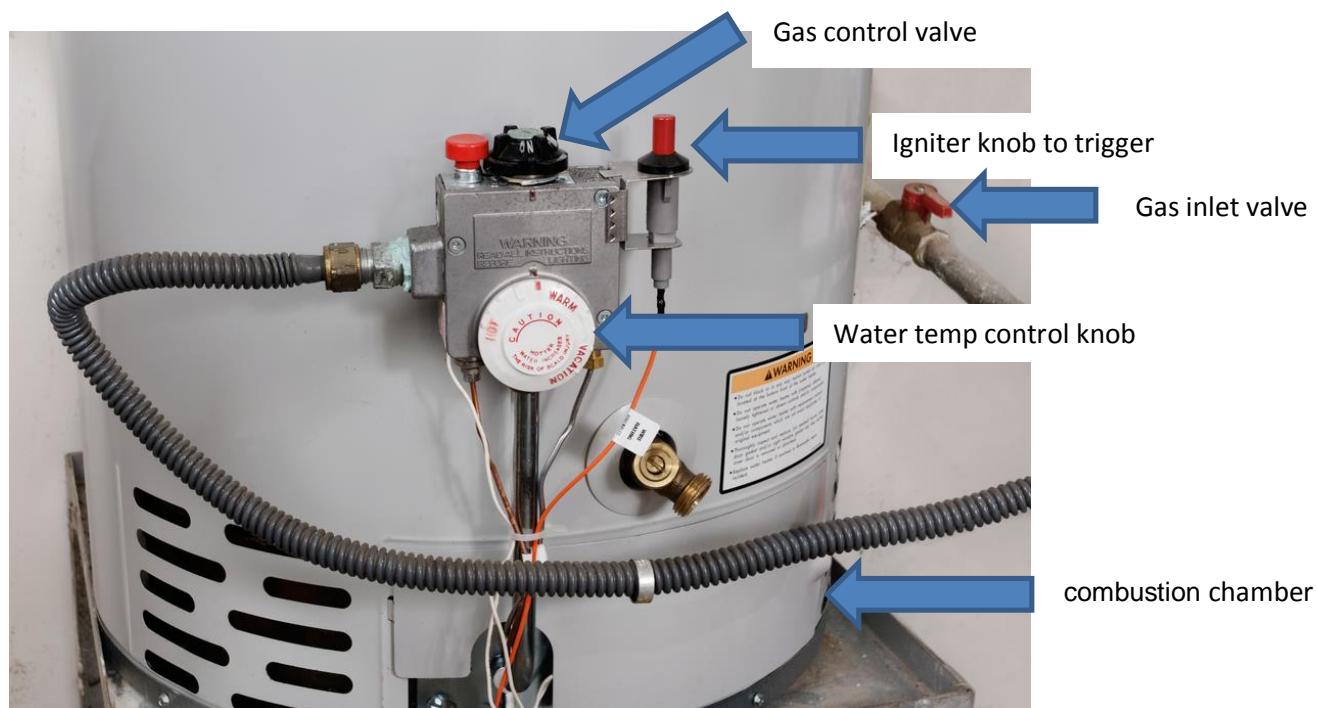
Asset Criticality: Critical asset. Regular maintenance is essential.

Scope	General maintenance procedure o test/inspect Water Heater (with igniter) where no specific manual available.
Precautions	<ul style="list-style-type: none"> Review manufacturers' manual for work and safety requirements Complete hazard / risk assessment prior to any maintenance / inspection / testing work
Tool Required	<ul style="list-style-type: none"> Screw drivers Cleaning brush and rag Vacuum cleaner Sly wrench Use proper PPE (e.g. Safety Glass & gloves)

Maintenance / Inspection / Testing Steps	
Step	Action
1.1	Turn off inlet gas valve which will turn off pitot, which means inlet gas valve is working properly
1.2	Open combustion chamber cover with screw driver
1.3	Clean water heater combustion chamber if require. Clean dirt on ignition plate which prevent air flow
1.4	Turn on the inlet gas valve

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1.5	Turn the gas control valve knob to PILOT position, press and hold and trigger the igniter knob (sometime need multiple trigger to ignite pilot light). When pilot light is ON and continue to hold for about a minute then release valve knob and turn to ON position for normal operation.
1.6	Close combustion chamber cover with push/screw driver
1.7	Check water heat control knob
1.8	Check corrosion and water leak
1.9	Check for water leak in and around the pipe and connections
2.0	Check pressure relief valve
2.1	Check leakage in drainage valve
2.2	Best practice to follow the user manual and instruction written on the water heater






Common Failure & Troubleshooting

Failure	Troubleshooting
Pilot off	Check inlet gas valve and ignition valve position ON. Follow the process to turn ON PILOT
Pilot ON process fail every time	Thermocouple may be weak or not working. Call certified technician
Gas smell	Gas leak. Turn OFF inlet gas valve and call certified technician
Water leak from inside tank	Replace the water heater
Water leak to inlet and outlet connection	Repair/replace
Water leak to pressure relief valve	Replace the valve
Water leak to drainage valve	Replace valve

End of Maintenance Procedure

Test/Inspect Furnace (with pilot)

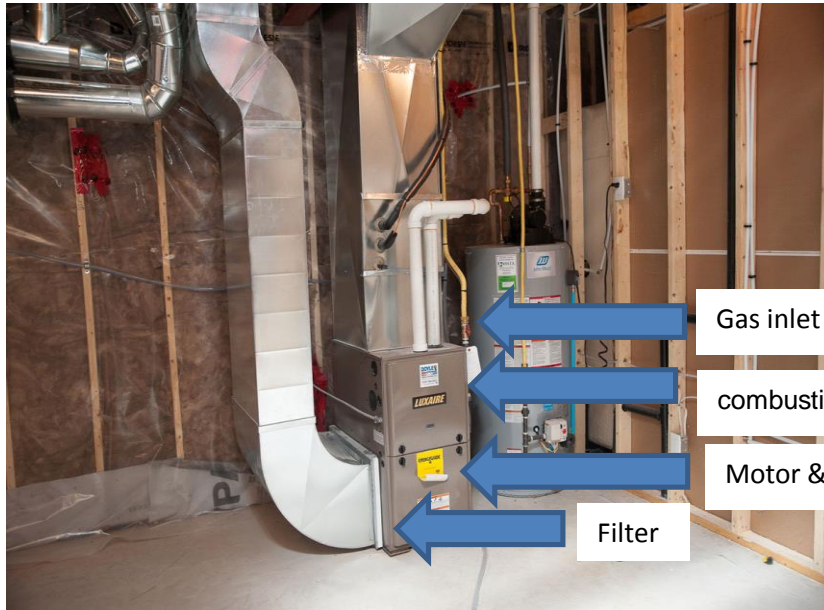
Asset Category: HVAC

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Asset Criticality: Critical asset. Regular maintenance is essential.

Scope	General maintenance procedure to test/inspect Furnace (with pilot) where no specific manual available.
Precautions	<ul style="list-style-type: none"> Review manufacturers' manual for work and safety requirements Complete hazard / risk assessment prior to any maintenance / inspection / testing work
Tool Required	<ul style="list-style-type: none"> Screw drivers Cleaning brush and rag Vacuum cleaner BBQ lighter Use proper PPE (e.g. Safety Glass & gloves)

Maintenance / Inspection / Testing Steps	
Step	Action
1.1	Turn OFF electric switch of the furnace generally located in the ceiling or nearby. This is same/similar as a light switch
1.2	Turn OFF inlet gas valve which will turn off pitot, which means the inlet gas valve is working properly
1.3	Open combustion chamber covers by pushing up (may require a screw driver if there are screws)
1.4	Clean furnace combustion chamber, gas nozzle and tip of thermocouple if required
1.5	Turn ON the inlet gas valve
1.6	Turn ON electric switch of the furnace
1.7	Turn the gas control valve knob to PILOT position, press and hold and fire BBQ lighter to PILOT tip to fire PILOT and continue to hold for about a minute then release valve knob and turn to ON position for normal operation.
1.8	Close the combustion chamber covers back to position
1.9	Check the thermostat and set around 220 C and wait for a complete cycle of furnace operation (fire turns ON and until blower fan OFF). After full cycle the PILOT will remains ON.
2.0	Check filter and replace if needed
2.1	Check motor belt, adjust or replace if required
2.2	There are furnaces without PILOT, follow user manual
2.3	Best practice to follow the user manual and instruction written on the furnace

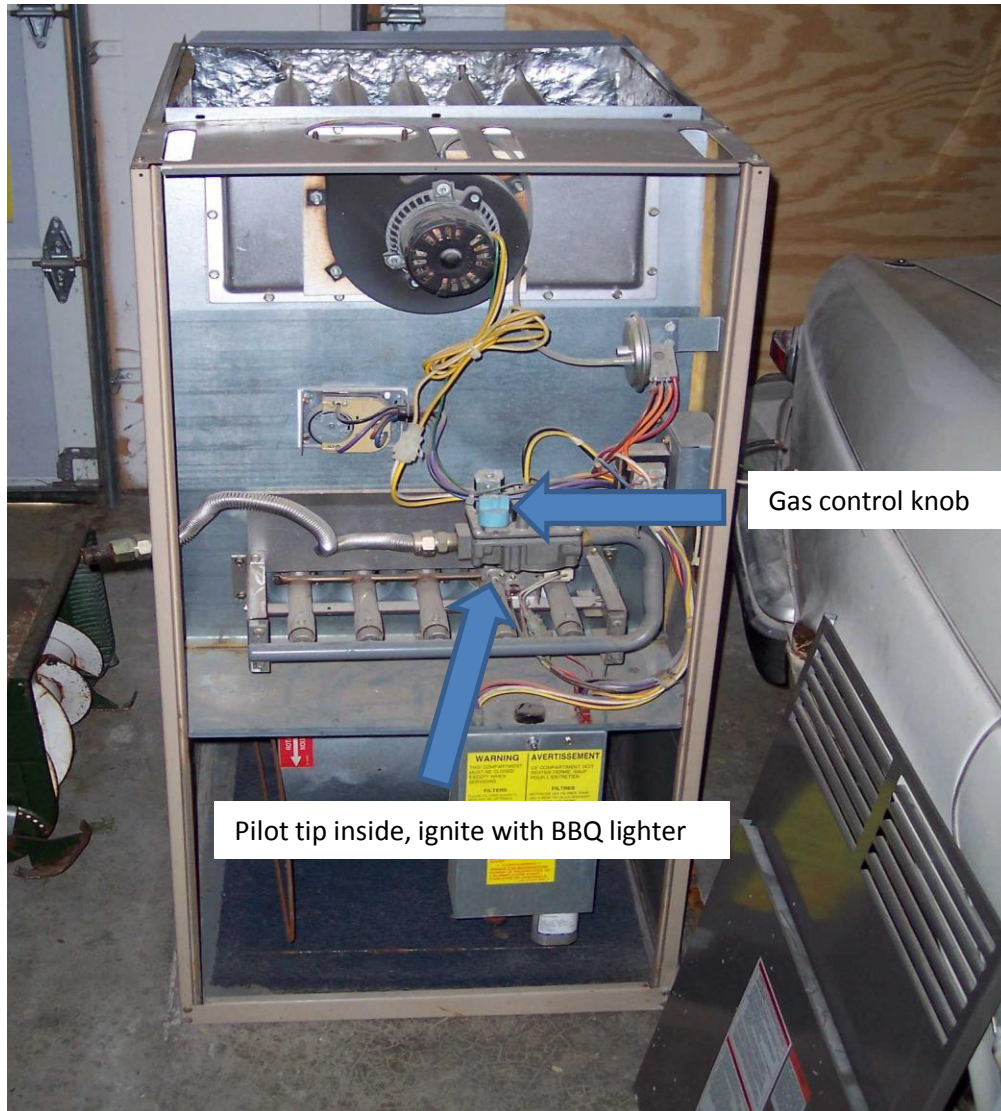


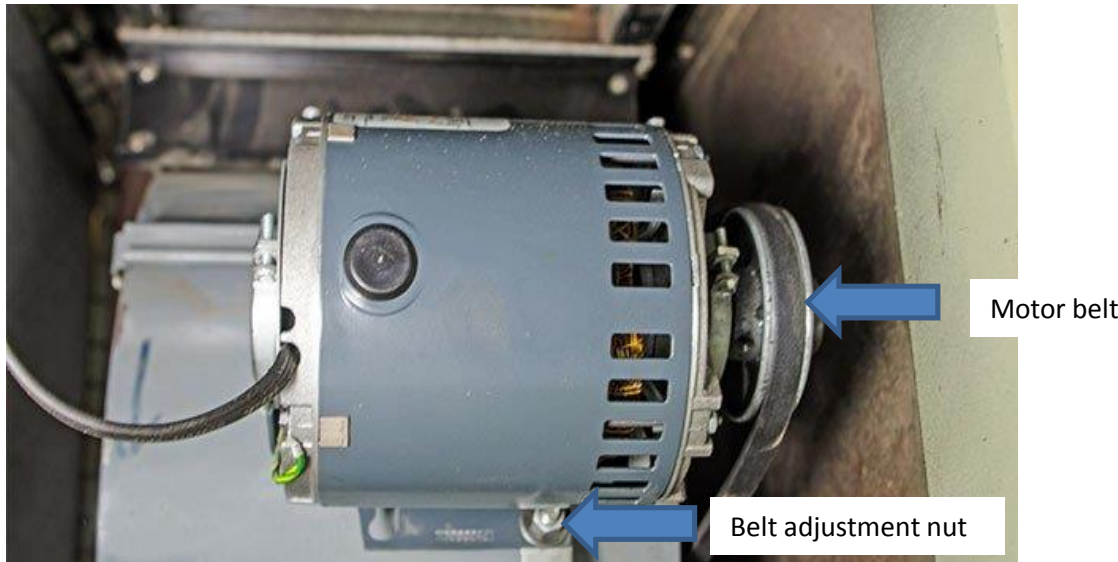
Gas inlet valve


combustion chamber covers

Motor & blower chamber cover

Filter





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Belt crack




← Fan switch

← Heat switch

Common Failure & Troubleshooting

Failure	Troubleshooting
Pilot off	Check inlet gas valve and ignition valve position ON. Follow the process to turn ON PILOT
Pilot ON process fails every time	Thermocouple may be weak or not working. Call certified technician
Gas smell	Gas leak. Turn OFF inlet gas valve and call certified technician
Belt loose or very tight	Adjust motor position to proper belt setting
Belt crack or very hard or making noise	Replace the belt with correct size
Blower fan making noisy sound	Bearing may be worn out or broken, call certified technician
There is not enough air flow to heating vents	<ul style="list-style-type: none"> Filter may be dirty and blocked, replace filter Check motor belt Check motor
Furnace not running	Check PILOT ON or OFF, Check thermostat setting, dirty filter, inlet electric switch OFF or ON, inlet air vent blocked in outside wall
Blowing cold air	Move thermostat switch heat position
Furnace continuously running	Move thermostat switch to AUTO position from ON/FAN
Furnace stops before it reaches to set temperature	Thermocouple or thermostat may not working
Thermostat has no display or flushing	Open the cover, check loose connections and replace weak

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	batteries
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End of Maintenance Procedure


Test/Inspect Furnace (without pilot)

Asset Category: HVAC

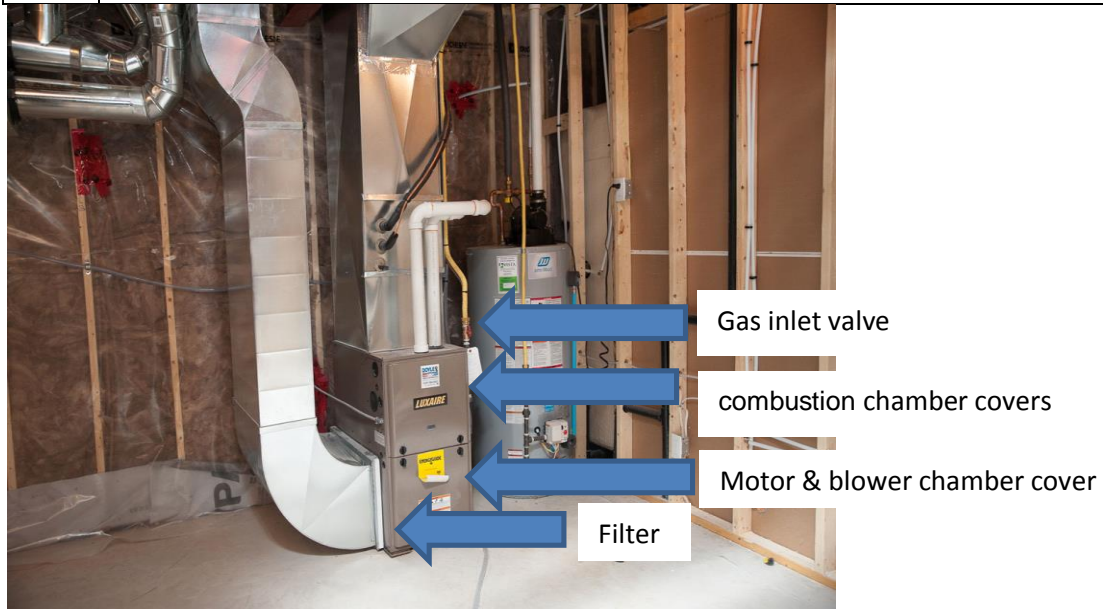
Asset Criticality: Critical asset. Regular maintenance is essential.

Scope	General maintenance procedure to test/inspect Furnace (without pilot) where no specific manual available.
Precautions	<ul style="list-style-type: none"> Review manufacturers' manual for work and safety requirements Complete hazard / risk assessment prior to any maintenance / inspection / testing work
Tool Required	<ul style="list-style-type: none"> Screw drivers Cleaning brush and rag Vacuum cleaner Use proper PPE (e.g. Safety Glass & gloves)

Maintenance / Inspection / Testing Steps	
Step	Action
1.1	Turn OFF electric switch of the furnace generally located in the ceiling or nearby. This is same/similar to a light switch
1.2	Open combustion and motor chamber covers by pushing up (may need screw driver if there are screws)
1.3	Clean furnace ignition and motor chamber, gas nozzles and sensor if required.
1.4	Close combustion and motor chamber covers as there is a safety electric switch on the frame which receives contact with motor cover pressure
1.5	Check the thermostat and set around 220 C
1.6	Turn ON electric switch of the furnace
1.7	Carefully observe the sequence of operation. Inlet air fan running, igniter glowing RED, gas flow start, furnace fire ON, blower fan ON, igniter OFF and continue normal operation
1.8	Observe the full cycle until the furnace turns OFF
1.9	Check filter and replace if needed

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2.0	Normally direct shaft motor connected to blower
2.1	Best practice to follow the user manual and instruction written on the furnace






Fan switch



Heat switch

Common Failure & Troubleshooting

Failure	Troubleshooting
Furnace is not running	<p>Furnace is not working, check different points</p> <ul style="list-style-type: none"> • Thermostat is in OFF position • Furnace inlet electric switch is in the OFF position • Turn ON them, if not working call certified technician
Furnace tries to run but stop in the middle	<p>Thermostat is around 20⁰ C setting and observe in the furnace</p> <ul style="list-style-type: none"> • Inlet air fan starts and quickly stop – inlet air may block, pressure switch may not works • Inlet air fan starts and igniter is not glowing – igniter may not works • Inlet air fan starts and igniter is glowing and fire starts then stop – thermostat may not work or sensor is dirty or weak • Inlet air fan starts and igniter is glowing and fire starts and blower fan does not start and the fire stops – blower's drive motor may be faulty • Air filter may be dirty, needs to be replace • Call certified technician
Blowing cold air	Thermostat switch move to Heat position

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Furnace continuously running	Thermostat switch move to AUTO position from ON/FAN
Furnace stops before it reaches to a set temperature	Sensor or thermostat may not working
Thermostat has no display or flashing	Open the cover, check loose connections and replace weak batteries
Blower fan making sounds	Bearing may be worn out or broken, call certified technician
Gas smell	Gas leak. Turn OFF the inlet gas valve and call certified technician

End of Maintenance Procedure

Test/Inspect Heat Pump

Asset Category: HVAC

Asset Criticality: Critical asset. Regular maintenance is essential.


Scope	General maintenance procedure to test/inspect Heat Pump where no specific manual available.
Precautions	<ul style="list-style-type: none"> Review manufacturers' manual for work and safety requirements Complete hazard / risk assessment prior to any maintenance / inspection / testing work
Tool Required	<ul style="list-style-type: none"> Screw drivers Lubricant Hammer Socket wrench set Pliers Use proper PPE (e.g. Safety Glass & gloves)

Maintenance / Inspection / Testing Steps	
Step	Action
1.1	Follow user manual for normal operation, test and inspection

Common Failure & Troubleshooting

Failure	Troubleshooting
Please check manufacturer troubleshoot guide	

End of Maintenance Procedure

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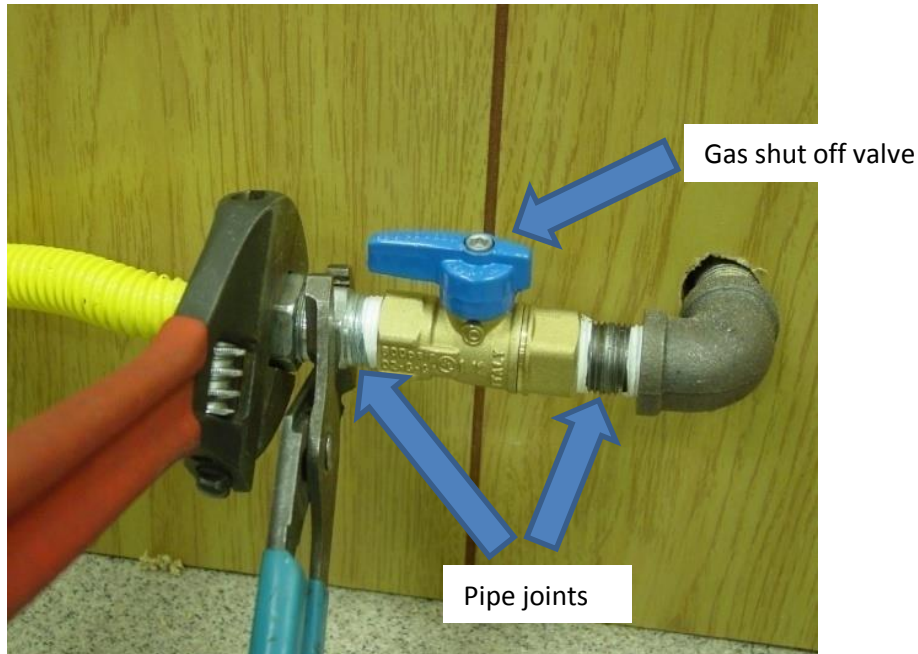
Test/Inspect HVAC System

Asset Category: HVAC

Asset Criticality: Critical asset. Regular maintenance is essential.


Scope	General maintenance procedure to test/inspect HVAC System where no specific manual available.
Precautions	<ul style="list-style-type: none"> Review manufacturers' manual for work and safety requirements Complete hazard / risk assessment prior to any maintenance / inspection / testing work
Tool Required	<ul style="list-style-type: none"> Screw drivers Plier Long nose plier Sly wrench Vacuum cleaner Duct cleaning agent Use proper PPE (e.g. Safety Glass & gloves)

Maintenance / Inspection / Testing Steps	
Step	Action
1.1	Test for gas leaks to all gas pipe joints and the gas shut off valves. There may be gas smell or can see bubble when spray duct cleaning agent to the joints and valve or use gas leak detector / BBQ lighter to see gas flame
1.2	Check all gas shut off valves are ON and pilots are ON (where applicable such as water heater, fireplace, furnace)
1.3	Check and clean all heating vents with duct cleaning agent and vacuum cleaner
1.4	Recommended to call certified professional



Common Failure & Troubleshooting

Failure	Troubleshooting
Gas smell	There is gas leak. Call certified professional to detect and repair
There is no gas to applicable equipment	Check gas shut off valves are in ON/OFF position or gas is disconnected, call to gas provider
Bad smell through the vents	Clean vent

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End of Maintenance Procedure
