INSTRUCTIONS

Carrier
A United Technologies Company

99TA526414 (for RCD use only)

Instruction Sheet Number: **99TA526414**

Description: Gas Valve and Manifold Kit

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Part Number/Name: SINGLE STAGE 327972-751, 752, 753, 754, 755, 756
TWO STAGE 327972-761, 762, 763, 764, 765, 766

NOTE: Read the entire instruction manual before starting the installation.

SAFETY CONSIDERATIONS

Installing and servicing heating equipment can be hazardous due to gas and electrical components. Only trained personnel should install or service heating equipment.

Untrained personnel can perform basic maintenance functions such as cleaning coils, or cleaning and replacing filters. All other operations should be performed by trained service personnel. When working on heating equipment, observe precautions in the literature, on tags, and on labels attached to the unit.

Recognize safety information. This is the safety-alert symbol ⚠. When you see this symbol on the unit and in instructions or manuals be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol ⚠. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies a hazard which **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **would** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Have a fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions.

⚠ WARNING

FIRE, EXPLOSION, ELECTRICAL SHOCK, AND CARBON MONOXIDE POISONING HAZARD

Failure to follow this warning could result in dangerous operation, serious injury, death, or property damage.

INTRODUCTION

This instruction covers the installation of a gas valve and manifold on non-condensing, 33.3” tall, mid-efficiency hot surface ignitor units. The correct gas valve and manifold kit must be used for the correct furnace model. Refer to Table 1.

DESCRIPTION AND USAGE

The gas valve and manifold kit can be utilized to replace a defective gas valve on Series A or Series 100 furnaces. This kit contains the following items:

Gas Valve
Manifold
Gas conversion spring(s) (propane use)
Mounting Screws (2)
Operating Label
Installation Instructions.

NOTE: The gas conversion spring included with this kit is intended for use only with the replacement gas valve included in this kit, and should only be used for furnaces previously converted for propane use. Furnace conversion for propane gas use requires a factory supplied gas conversion kit. Refer to unit rating plate for correct propane conversion kit.
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⚠ WARNING: Improper installation, adjustment, alteration, service, maintenance, or use can cause carbon monoxide poisoning, explosion, fire, electrical shock, or other conditions which could result in personal injury or death. Consult your distributor or branch for information or assistance. The qualified installer or agency must use only factory-authorized kits or accessories when servicing this

Table 1 – Kit usage

	Kit Number	
Furnace Size	**Single- Stage**	**Two-Stage**
45,000	327972-751	327972-761
70,000	327972-752	327972-762
90,000	327972-753	327972-763
110,000	327972-754	327972-764
135,000	327972-755	327972-765
155,000	327972-756	327972-766

Step 1-- Remove the gas valve and manifold assembly

A. Turn off electric supplies to unit and set thermostat to lowest setting or "OFF".

NOTE: More than 1 disconnect may be required to disconnect power to unit.

B. Remove outer door by loosening thumbscrew and pulling door forward.
C. Turn gas supply manual shut-off and electric switch on gas valve to "OFF".
D. Using a back-up wrench on the gas valve, disconnect the gas supply pipe from the gas valve.
E. Disconnect wires from gas valve. Note location for re-assembly. If gas valve has a low gas pressure switch (propane only) remove the 2 wires from the low gas pressure switch.

⚠ CAUTION

ELECTRICAL OPERATION HAZARD

Failure to follow this caution may result in unit damage or improper operation.

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

F. Remove screw that attaches the green/yellow ground wire through the manifold mounting tab to the burner box.
G. Support the manifold assembly while removing the remaining screw that attaches the manifold assembly to the burner box assembly.

NOTE: The hot surface igniter is **extremely** fragile. Failure to support the burner assembly could result in damage to the hot surface ignition.

H. Remove the gas valve/manifold assembly from burner box.

Step 2 -- Remove the orifices

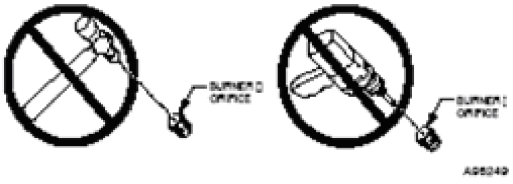
A. Remove orifices from previously removed manifold and set aside.
B. If original gas valve had a low gas pressure switch, remove switch and brass fittings from the valve and set aside.
C. Discard old manifold and gas valve assembly.
D. Install existing burner orifices into new manifold.

Do not use Teflon tape. Finger—tighten orifice at least one full turn to prevent cross—threading, then tighten with wrench. Do not over-tighten.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in unit damage. DO NOT re—drill or re-thread burner orifices. Improper drilling or repair may result in burrs, out—of—round holes, etc. Obtain new orifices if orifices must be changed.



Step 3 -- Assemble gas valve to manifold

A. Apply pipe dope sparingly to threaded end of new manifold
B. Thread gas valve onto manifold by hand at least two full turns to prevent cross threading.
C. Using a pipe wrench located near the threads and a back-up wrench on the square gas outlet of the valve, assemble new gas valve onto new manifold. Orient the gas valve so that the gas supply inlet faces left when viewed from the front. (See Fig.1)

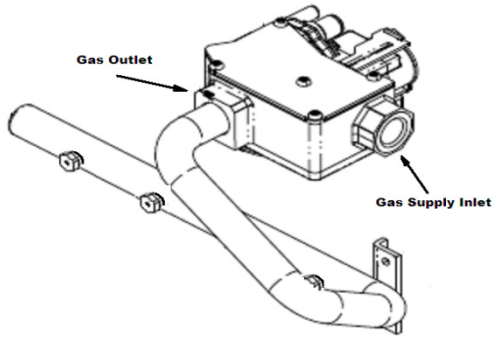


Fig 1- Gas Valve/ Manifold Assembly

Step 4 -- Installation of low gas pressure switch (propane units only)

Note: If the furnace does not utilize propane gas, skip Steps 4 and 5. Proceed to Step 6

NOTE: Use propane--gas--resistant pipe dope on models converted for propane usage to prevent gas leaks. DO NOT use Teflon tape.

A. Remove 1/8--in. (3 mm) pipe plug from inlet pressure tap on gas valve. (See Fig. 2 and 3)
B. Apply pipe dope sparingly to one end of 1/8--in. (3 mm) brass male coupling and install the doped end into 1/8--in. (3 mm) tapped opening in gas valve inlet pressure--tap. Tighten fitting with a small open—end wrench. (See Fig. 4.)
C. Apply pipe dope sparingly to opposite end of the 1/8--in. (3 mm) brass coupling. Install the female end of the female x female x male tee on the brass coupling. Tighten coupling finger tight. Use a small open-end wrench for final tightening.
D. Apply pipe dope sparingly to male end of brass tee. Install propane low gas pressure switch on male end of the female x female x male tee. (See Fig. 4) Tighten switch finger tight. Use a small open--end wrench on base of pressure switch for final tightening.
E. Connect a manometer to the open end of the tee installed in the gas valve. (See Fig. 4.)

Step 5 -- Convert gas valve regulator (propane only)

Note: If the furnace does not utilize propane gas, skip Steps 4 and 5. Proceed to Step 6.

SINGLE STAGE GAS VALVES:

A. Remove regulator seal cap. (See Fig. 2.)
B. Remove regulator adjustment screw.
C. Remove natural gas regulator spring (silver).
D. Install propane gas regulator spring included in kit (white) in gas valve
E. Install regulator adjustment screw
F. Turn regulator adjustment screw **clockwise (inwards) 8.5 turns**

NOTE: DO NOT reinstall regulator seal cap at this time.

TWO STAGE GAS VALVES:

A. Remove both regulator seal caps. (See Fig. 3.)
B. Remove both regulator adjustment screws.
C. Remove both natural gas regulator springs (silver).
D. Install propane gas regulator springs included in kit (white).
E. Install regulator adjustment screws.
F. Turn **low--heat** stage adjusting screw **clockwise (inwards) 9.5 turns**. This will increase the manifold pressure closer to the low--heat set point.
G. Turn **high--heat** stage adjusting screw **clockwise (inwards) 13.5 turns**. This will increase the manifold pressure closer to the high--heat set point.

NOTE: DO NOT reinstall regulator seal cap at this time.

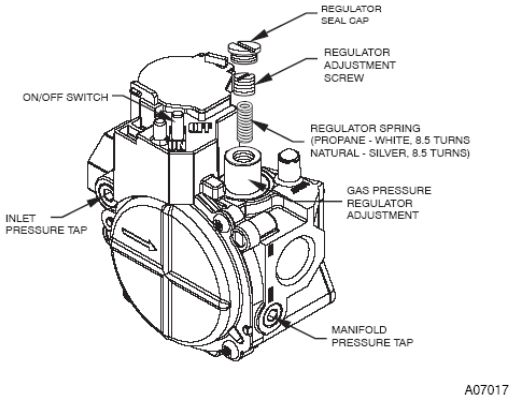


Fig. 2 – Single Stage J Valve

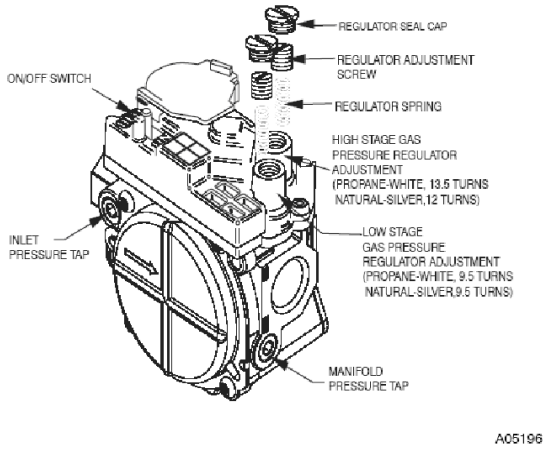


Fig. 3 - Two Stage J Valve

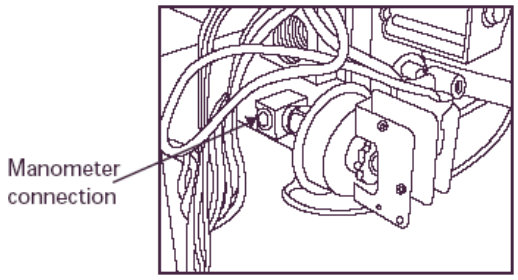


Fig. 4 - Low Gas Pressure Switch

Step 6--Installation of gas valve and manifold assembly

Note: The hot surface igniter is **extremely** fragile. Failure to support the burner assembly could result in damage to the hot surface ignition.

A. Ensure the 1 piece burner assembly is fully seated in the burner box by pushing the entire assembly forward until seated against stops at the rear of slots in the burner box side supports.
B. Insert the right end of the manifold into the mounting hole in the burner box
C. Swing the manifold into the burner box assembly while ensuring orifices properly insert into the retaining rings on the end of each burner.

Note: If manifold mounting tab does not mate up to burner box, the burner assembly may not be fully seated. Remove the manifold assembly and verify the burner assembly is fully seated forward in the burner box. Repeat steps 6-A through 6-C to install the manifold assembly.

D. Support the manifold assembly while installing the screws that attaches the manifold assembly to the burner box assembly.
E. Insert a screw through the green/yellow ground wire and manifold mounting tab to attach the manifold assembly to the left side of the burner box assembly.
F. Install the remaining screw through the manifold mounting tab, attaching the manifold assembly to the burner box assembly.
G. Connect wires to gas valve. Connect low gas pressure switch wires (if used). Refer to unit wiring diagram for correct wire locations.
H. Apply pipe dope sparingly to end of inlet gas supply pipe and connect gas supply pipe by hand to gas valve
I. Using a back-up wrench on the gas valve to prevent rotation and improper orientation of the manifold and orifices, tighten the connection of the gas pipe to the gas valve.
J. Turn gas supply manual shut-off and electric switch on gas valve to “ON”.
K. After all connections have been made, purge gas lines and check for leaks.

⚠ WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow this warning could result in personal injury, death, and/or property damage.

Never purge a gas line into a combustion chamber. Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections.

L. Leak test all gas connections with a commercially available soap solution made specifically for the detection of leaks to check all connections.
M. Turn gas supply manual shut-off and electric switch on gas valve to “OFF”.

Step 7 -- System Check Inlet Gas Pressure

NOTE: Inlet gas pressure must be between:

Natural Gas_____4.5-in.wc to 13.6-in.wc
Propane_____11.5-in.wc to 13.6-in.wc.

A. Connect manometer to the inlet pressure tap on gas valve or brass tee connected to the inlet pressure tap on gas valve (propane only). (See Fig. 2 and 3)

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in unit damage.

DO NOT operate furnace more than one minute to check inlet gas pressure, as conversion is not complete at this time.

For **Two--Stage** furnaces turn LHT switch on furnace control to ON. (See Fig. 5.)

For **Variable Speed** furnaces, turn setup switch SW1-2 on furnace control ON (See Fig. 6.)

B. Turn on furnace power supply.

NOTE: Blower will run for 90 sec if thermostat is set to call for heat when 120-v power is restored. A status code 12 will flash after 90 sec.
To clear status code:
Turn off power.
Turn thermostat “OFF” or below room setting to remove heat call.
Turn power back on and set thermostat to desired temperature.

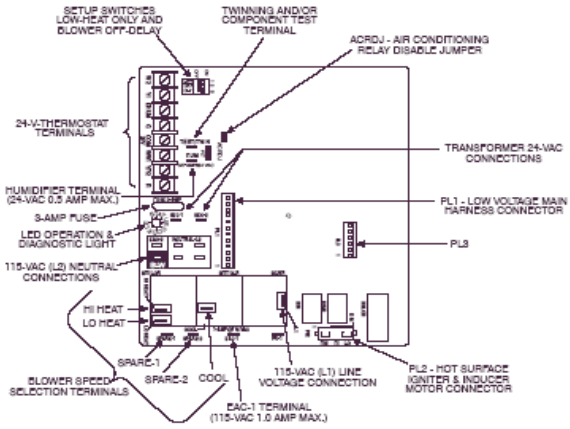
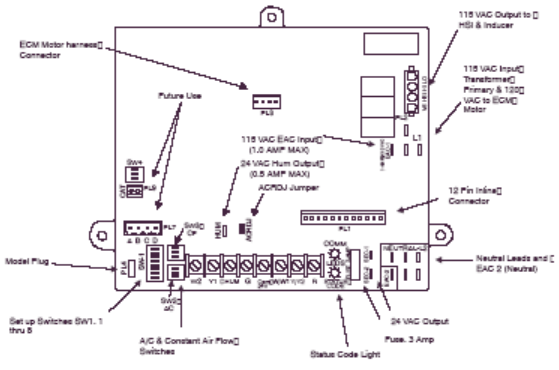


Fig. 5 - Two Stage Furnace Control



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Fig. 6 – Variable Speed Furnace Control

C. Turn gas supply manual shutoff valve to ON position.
D. Turn furnace gas valve switch to ON position.
E. Manually close blower door switch
F. Jumper R—W on single stage controls, or R--W/W1 and W2 thermostat connections on the 2--Stage and Variable Speed furnace control. (See Fig. 5 or 6)
G. When main burners ignite, confirm inlet gas pressure is between 4.5-in.wc and 13.6in.wc for natural gas, and between 11.5-in.wc and 13.6-in.wc for propane.
H. Remove jumper across thermostat connections to terminate call for heat.
I. Release blower door switch
J. Turn furnace gas valve switch to OFF position.
K. Turn gas supply manual shutoff valve to OFF position.
L. Turn off furnace power supply.
M. Remove manometer from inlet pressure tap.
N. Apply pipe dope sparingly to end of inlet gas pipe plug and install in gas valve or unused end of 1/8 in. brass tee. Use a small back--up wrench on tee when tightening gas inlet pipe plug. (See Fig. 2 - 4.)

NOTE: Use propane--gas--resistant pipe dope for models converted to propane to prevent gas leaks. DO NOT use Teflon tape.

Step 8 -- Gas Input Rate Information

Furnace input rate **MUST** be within +/-2% of the input indicated on the furnace rating plate. See furnace rating plate for input rate.
The gas input rate for propane is the same as for natural gas. The input rate for propane is determined by manifold pressure and orifice size.

For Natural Gas, refer to Rating plate located on furnace.

For Propane Gas, refer to Propane Conversion kit rating plate located on furnace.

Gas input rate on furnace rating plate is for installations at altitudes up to 2000 ft. In the U.S.A., the input rating for altitudes above 2000 ft. must be reduced by 4 percent for each 1000 ft. above sea level.

In Canada, the input rating must be derated by 10 percent for altitudes of 2000 ft. to 4500 ft. above sea level.

The Conversion Kit Rating Plate accounts for high altitude derate in the U.S and Canada.

Step 9 -- Set Gas Input Rate

A. Connect manometer to the outlet pressure tap on gas valve (See Fig. 2 and 3)
B. If not previously removed, remove caps that conceal adjustment screws for gas valve regulators (See Fig. 2 and 3)
C. Turn gas supply manual shutoff valve to ON position.
D. Turn furnace gas valve switch to ON position.
E. Turn on furnace power supply.
F. Manually close blower door switch.

SINGLE STAGE GAS VALVES:

NOTE: Gas valve should already have been pre-adjusted, from prior steps for single-stage gas valve).

A. Jumper R and W thermostat connections to call for heat.
B. Check manifold orifices for gas leaks when main burners ignite
C. Turn adjusting screw counterclockwise (outwards) to decrease manifold pressure or clockwise (inwards) to increase manifold pressure. When correct input is obtained, main burner flame should be clear blue, almost transparent.

NOTE: Gas valve regulator seal cap MUST be in place when checking input rate.

D. Remove jumper across R and W thermostat connections to terminate call for heat.
E. Release blower door switch.
F. Turn furnace gas valve control switch to “OFF” position.
G. Turn off furnace power supply.
H. Replace caps that conceal gas valve regulator adjustment screws.
I. Re-install blower access panel.
J. Remove manometer and replace manifold pressure tap plug. (See Fig.2)

NOTE: Use propane--gas--resistant pipe dope for models converted to propane to prevent gas leaks. DO NOT use Teflon tape.

K. Turn furnace gas valve control switch to ON position.
L. Turn on furnace power supply.
M. Set room thermostat to call for heat.
N. Leak test all gas connections with a commercially available soap solution made specifically for the detection of leaks to check all connections. .
O. Observe unit operation through two complete heating cycles. See sequence of operations outlined in furnace Installation, Start-up, and Operating Instructions.
P. Re-install outer door

TWO-STAGE GAS VALVES:

For **Two-Stage** furnaces turn LHT switch on furnace control to ON. (See Fig. 5.)

For **Variable-Speed** furnaces, turn setup switch SW1-2 on furnace control ON (See Fig. 6.)

Low Heat Adjustment

NOTE: Gas valve should already have been pre-adjusted, from prior steps for two--stage gas valve).

A. Jumper R and W/W1 thermostat connections to call for low stage heat. (See Fig. 5 and 6)
B. Check manifold orifices for gas leaks when main burners ignite.
C. Turn--low--heat adjusting screw counterclockwise (out) to decrease input rate or clockwise (in) to increase input rate. Main burner flame should be clear blue, almost transparent.

NOTE: Gas valve regulator seal caps MUST be in place when checking input rate.

High Heat Adjustment

D. Jumper R, W/W1 and W2 thermostat connections on control. (See Fig. 5 and 6) This keeps furnace in high--heat.
E. Turn high--heat adjusting screw counterclockwise (out) to decrease input rate or clockwise (in) to increase input rate. Main burner flame should be clear blue, almost transparent.

NOTE: Gas valve regulator seal caps MUST be in place when checking input rate.

F. Remove jumper across R, W/W1 and W2 after high--heat adjustment
G. Release blower door switch.
H. Turn furnace gas valve control switch to OFF position.
I. Turn off furnace power supply.
J. Replace caps that conceal gas valve regulator adjustment screws.
K. Turn setup switch LHT (two-stage) or SW1-2 (variable speed) to OFF position.
L. Re-install blower access panel.
M. Remove manometer and replace manifold pressure tap plug. (See Fig.3)

NOTE: Use propane--gas--resistant pipe dope for models converted to propane to prevent gas leaks. DO NOT use Teflon tape.

N. Turn furnace gas valve control switch to ON position.
O. Turn on furnace power supply.
P. Set room thermostat to call for heat.
Q. Leak test all gas connections with a commercially available soap solution made specifically for the detection of leaks to check all connections.
R. Observe unit operation through two complete heating cycles. See sequence of operations outlined in furnace Installation, Start-Up, and Operating Instructions.
S. Re-install outer door.

Step 10 -- System Check-Out

A. Set thermostat to “OFF”.
B. Remove outer door.
C. Initiate status code retrieval and component test by referring to the **“Service”** label located on the furnace.
D. If any status codes are flashed, refer to status code label on furnace.
E. Set thermostat to call for heat.
F. Allow unit to initiate a complete call for heat cycle.

For additional information, and a complete sequence of furnace operation, refer to furnace Installation, Start-Up and Operating Instructions.

G. After System Check-out is complete, set thermostat below room temperature
H. Verify that burner shuts down and blower completes selected off delay furnace time.
I. Verify furnace operates properly and set thermostat to desired room temperature.
J. Re-install outer door

Step 11 —Check Low Gas Pressure Switch Operation

The newly installed low gas pressure switch is a safety device used to guard against adverse burner operating characteristics that can result from low gas supply pressure. Switch opens at not less than 6.5-in.w.c. and closes at no greater than 10.2-in.w.c. This switch also prevents operation when the propane tank level
is low which can result in gas with a high concentration of impurities, additives, and residues that have settled to the bottom of the tank. Operation under these conditions can cause harm to the heat exchanger system. This normally open switch closes when gas is supplied to gas valve under normal operating pressure. The closed switch completes control circuit. Should an interruption or reduction in gas supply occur, the gas pressure at switch drops below low gas pressure switch setting, and switch opens. Any interruption in control circuit (in which low gas pressure switch is wired) quickly closes gas valve and stops gas flow to burners.
When normal gas pressure is restored, the system must be electrically reset to re-establish normal heating operation. Before leaving installation, observe unit operation through 2 complete heating cycles. During this time, turn gas supply to gas valve off just long enough to completely extinguish burner flame, then instantly restore full gas supply. To ensure proper low gas pressure switch operation, observe that there is no gas supply to burners until after hot surface ignitor begins glowing.