
CHALLENGER

Propane to Natural Gas Instructions



Kit Part Number: CCRKIT02

Kit Includes:

- Rating Label
- (3) Natural Gas Orifices
- T-15 Torx Wrench

Recommended Tools:

- Phillips-Head Screwdriver
- Standard Adjustable Wrenches
- Calibrated Combustion Analyzer

 **WARNING**

Indicates a potentially hazardous situation which, if ignored, can result in serious injury or substantial property damage.

NOTICE

Indicates special instructions on installation, operation or maintenance, which are important to equipment but not related to personal injury hazards.

 **WARNING**

This conversion kit shall be installed by a qualified service agency in accordance with the manufacturer's instructions and all applicable codes and requirements of the authority having jurisdiction. If the information in these instructions is not followed exactly, a fire, an explosion or production of carbon monoxide may result causing property damage, personal injury or loss of life. The qualified service agency is responsible for the proper installation of this kit. This installation is not proper and complete until the operation of the converted appliance is checked as specified in the manufacturer's instructions supplied with the kit.

 **CAUTION**

The gas supply shall be shut off prior to disconnecting the electrical power, before proceeding with the conversion.

 **WARNING**

For your safety, turn off electrical power supply at service panel and allow appliance to cool before proceeding. Failure to do so can cause severe personal injury or death.

 **WARNING**

Failure to follow instructions below can result in severe personal injury or damage if ignored:

- Instructions are for a qualified installer / service technician.
- Read all instructions before proceeding.
- Follow instructions in the proper order.

NOTICE

Upon completion of the conversion from Propane to Natural Gas, affix the new rating label included in the kit to the appliance just below the existing rating label on the right side jacket panel. DO NOT affix the new label over the existing rating label. Remove propane conversion labeling from the gas valve. Complete the Installation Record by recording the combustion reading in the CHALLENGER Installation and Maintenance Manual.

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Installation of the Natural Gas Orifice

1. Close the manual gas shut off valve to the appliance.
2. Turn off the electrical power supply to the appliance.
3. Remove the front panel by flipping down the control panel and loosening the two Phillips head mounting screw(s) at the control panel. Pull bottom of front panel forward to remove.
4. Disconnect the gas piping inside the CHALLENGER enclosure at the brass union located above the gas valve, and rotate piping towards the back of appliance, see Fig. 1.

NOTICE

The gas orifice is installed in a O-ring gasket. This O-ring gasket must be reinstalled when ever the gas orifice is changed. Use care not to damage the O-ring gasket.

5. Separate the O-ring gasket from the propane gas orifice and insert the appropriate brass natural orifice from Table 1 into the O-ring gasket.

NOTICE

The CHALLENGER appliances contain a propane gas orifice. This orifice must be removed prior to the installation of the natural gas orifice.

Table 1: Natural Gas Orifice

CHALLENGER MODEL	Propane Gas Orifice Size	Orifice Marking
CC50s	0.217" [5.50 mm]	550
CC85 or CC85s	0.256" [6.50 mm]	650
CC105 or CC105s	0.256" [6.50 mm]	650
CC125, CC125c or CC125s	0.285" [7.25 mm]	725
CC125H or CC125Hs	0.217" [5.50 mm]	550
CC150s	0.285" [7.25 mm]	725

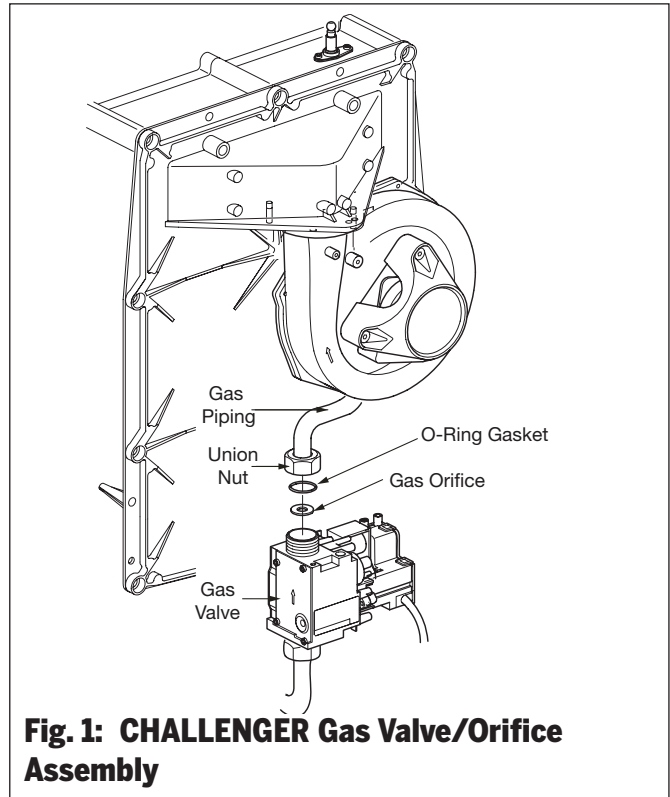


Fig. 1: CHALLENGER Gas Valve/Orifice Assembly

⚠ WARNING

Failure to retain the O-ring gasket on the gas orifice will cause an improper seal between the gas valve and the union resulting in a potential risk of a gas leak. Ensure unions at top and bottom of gas valve are tight. Any potential gas leakage may result in death, serious injury or substantial property damage.

⚠ WARNING

Ensure the proper orifice for natural gas is installed as given in Table 1. Failure to comply will affect input rate and combustion efficiency of the appliance which may result in death, serious injury or substantial property damage.

6. Install proper natural gas orifice/O-ring gasket assembly on the top of the gas valve.
7. Reconnect the gas piping on top of gas valve and tighten the brass union connections at the gas valve.

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- Open the manual gas shut off valve. Before placing the CHALLENGER back into operation check and test all gas connections for leaks. Repair leaks if found.



Do not check for gas leaks with an open flame. Use a bubble test. Failure to check for gas leaks can cause severe personal injury, death or substantial property damage.

Inspect Ignition Electrode



Prior to inspecting the ignition electrode, ensure all electrical power supply to the appliance is turned off to avoid electrical shock.

- Remove the ignition electrode using the T-15 Torx wrench.
- Remove any white oxides accumulated on the electrode using fine grit sandpaper or steel wool. If the electrode does not clean to a satisfactory condition, replace the ignitor.
- Check ignitor to Fig. 2
- When replacing the ignition electrode, ensure the gasket is in good condition and correctly positioned, replace gasket if necessary.

Check Inlet Gas Supply Pressure

- Turn on the electrical power supply to the CHALLENGER.
- Check the inlet gas supply pressure to the CHALLENGER at the gas valve (see Figs. 3 and 4 on page 5). Ensure a minimum pressure of 5" w.c [13 mbar] during flow conditions with all gas appliances firing including the CHALLENGER and a maximum pressure of 13" w.c [32 mbar] during non-flow conditions with all gas appliances off including the CHALLENGER.

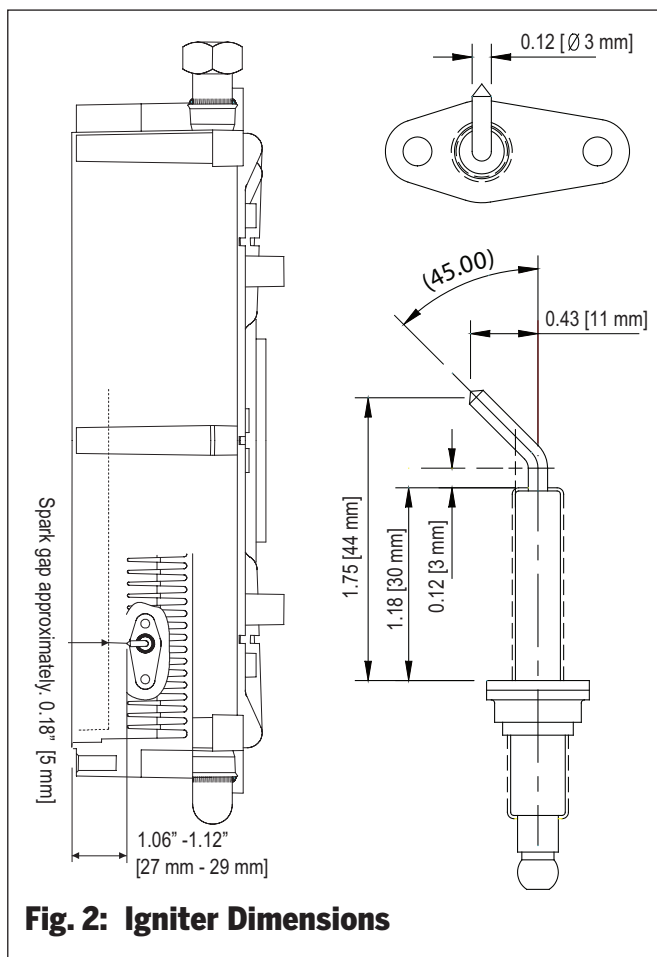


Fig. 2: Igniter Dimensions

Combustion Test and Adjustments

- The installer must perform a complete combustion check to ensure the following combustion levels are met at high and low input firing rates and the burner is operating at optimum conditions for propane gas.



The combustion testing and adjustments must be performed only by a qualified installer, service agency or the gas supplier. All combustion measurements must be performed with calibrated equipment to ensure proper readings and accuracy.

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Table 2: Recommended Combustion Levels

Combustion Levels		Natural Gas	Propane Gas
High Fire DOOR OFF*	CO ₂ Range	9% to 10.1%	10.5% to 11.1%
	CO ₂ Target	9.0%	10.8%
	O ₂ Range	3.0% - 5.0%	4.1% - 5.0%
	O ₂ Target	5.0%	4.5%
Low Fire	CO ₂ Range	0% - 0.4% < H.F 9.0% min.	0% - 0.4% < H.F 10.5% min.
	O ₂ Range	0% - 0.6% > H.F 5.0% max.	0% - 0.6% > H.F 5.0% max.
	CO Max.	100 ppm	150 ppm

* Door On can raise the maximum allowable CO₂ by 0.4 or lower the minimum allowable O₂ by 0.6.



Failure to perform a complete combustion test at both high and low input rates may result in incomplete combustion and the production of carbon monoxide, which can cause severe personal injury, death or substantial property damage.

- Manually place the appliance into high fire mode by pressing both the service button “” with “+” button simultaneously on the control panel display two times.



The control panel will display a H followed by the current appliance temperature when placed into high fire test mode.



The THROTTLE SCREW on the CHALLENGER’s gas valve works opposite than the PRESTIGE. If you turn the CHALLENGER’s THROTTLE SCREW clockwise you increase the input, CO₂ and CO of the appliance. EXERCISE CARE!

- If the combustion levels during high fire are outside the recommended combustion settings, adjust the THROTTLE SCREW (see Figs. 3 and 4 on page 5) using a T15 Torx wrench as follows:

Counter-clockwise adjustment of the THROTTLE SCREW at High Fire:

O₂ increases and CO₂ decreases

Clockwise adjustment of the THROTTLE SCREW at High Fire:

O₂ decreases and CO₂ increases

- Once the combustion level is set and recorded at high fire, manually place the appliance into low fire mode by pressing the service button “” with “-” button simultaneously on the control display once.



The control panel will display a L followed by the current appliance temperature when placed into low fire test mode.

- If the combustion levels during low fire are not within 0.0 to 0.4% CO₂ lower than the combustion level measured at high fire, remove the offset pressure cover screw and adjust the OFFSET SCREW (see Figs. 3 and 4 on page 5) using a T15 Torx wrench as follows:



The OFFSET SCREW adjustment on the CHALLENGER’S gas valve is very sensitive. A small adjustment will have a significant effect.

Counter-clockwise adjustment of the OFFSET SCREW at Low Fire:

O₂ increases and CO₂ decreases

Clockwise adjustment of the OFFSET SCREW at Low Fire:


O₂ decreases and CO₂ increases

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6. Confirm the combustion levels at both high fire and low fire meet the requirements listed in Table 2 on page 4.
7. Press the “+” and “-” button simultaneously to cancel high or low fire mode. Test mode will time out in approximately 10 minutes.
8. Replace offset cover screw.
9. Check the flame pattern through the inspection port on the left side of the heat exchanger. The flame should be blue and stable and should be the length of the burner.
10. Replace the front jacket panel and secure with the two Phillips head mounting screws at the control panel.

Measure Input

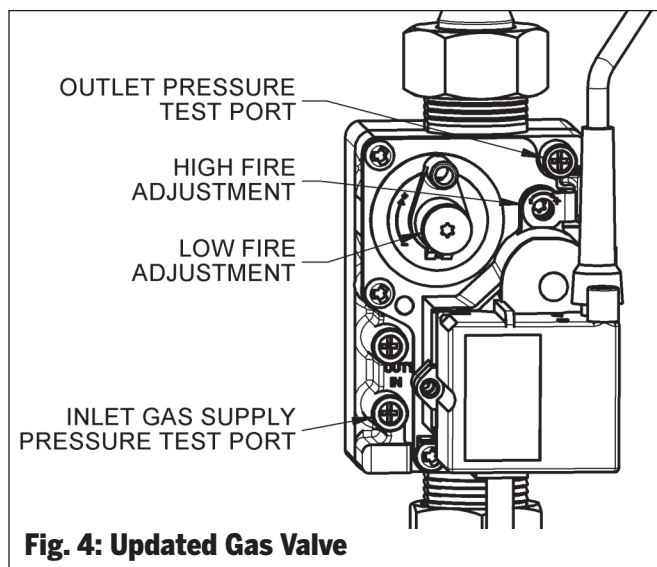
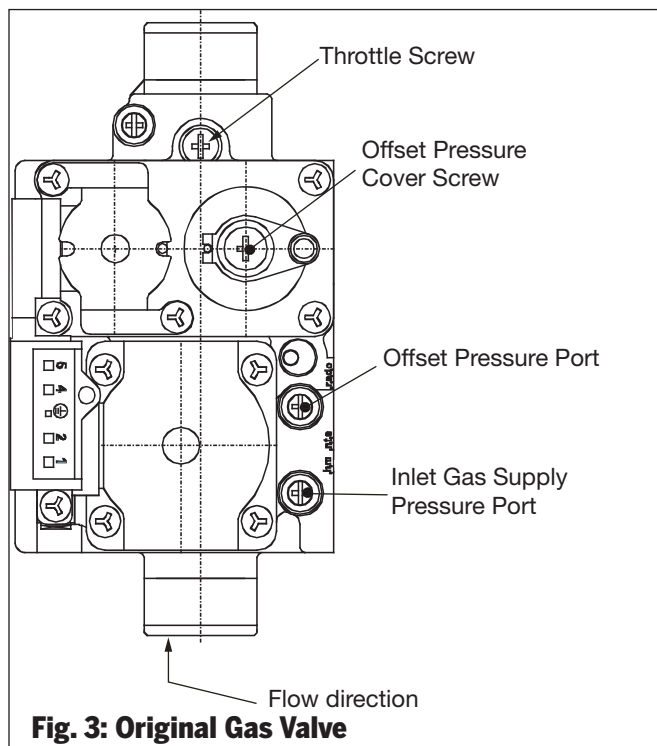
1. Ensure the appliance is firing at maximum firing rate. To manually place the appliance into high fire mode, press both the service button “” with “+” button simultaneously on the control panel display two times.

NOTICE

The control panel will display a H followed by the current appliance temperature when placed into high fire test mode.

2. Operate the appliance for approximately 5 minutes.
3. Turn off all gas appliances within the building, except the CHALLENGER.
4. At the gas meter, record the time required to use one cubic foot of gas.
5. Calculate Natural gas input using the following equation:

$$3600 \times 1000 / \text{number of second recorded for one cubic foot of gas} = \text{BTU/H.}$$



6. The BTU/H calculated should approximate the input rating listed on the appliance.
7. Press the “+” and “-” button simultaneously to cancel high or low fire mode. Test mode will time out in approximately 10 minutes.
8. Return appliance back to service.



One Triangle Lane ■ Blackwood, NJ 08012

P 856 228 8881 f 856 228 3584 W www.triangletube.com   