

## Tankless Gas Condensing Water Heater

### Fuel conversion instructions to convert from natural gas to Propane (LP) gas

Read and follow all instructions. Save these instructions for future reference.

#### WARNING:

This conversion kit shall be installed by a qualified service agency\* in accordance with manufacturer's instructions and all applicable codes and requirements of the authority having jurisdiction. The information in these instructions must be followed to minimize the risk of fire or explosion or to prevent property damage, personal injury or death. The qualified service agency is responsible for the proper installation of this kit. The 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.

#### SAFETY PRECAUTIONS

- Read these instructions and the water heater instruction manual before installing this fuel conversion kit.
- Use this fuel conversion kit for only the intended purpose as described in these instructions.
- Be sure to install your water heater properly in accordance with local codes and the installation instructions provided.
- DO NOT attempt to repair or replace any other parts not provided in this fuel conversion kit.
- All servicing should be referred to a qualified technician.

\* A qualified service agency is any individual, firm, corporation or company which either in person or through a representative is engaged in and is responsible for the connection, utilization, repair or servicing of gas utilization equipment or accessories; who is experienced in such work, familiar with all precautions required, and has complied with all of the requirements of the authority having jurisdiction.

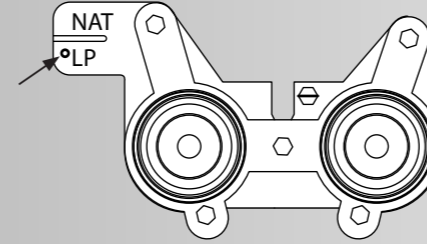
FOR CANADA, THE CONVERSION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROVINCIAL AUTHORITIES HAVING JURISDICTION AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST CAN B149.1 NATURAL GAS AND PROPANE GAS INSTALLATION CODE.

AP19636 Rev 01

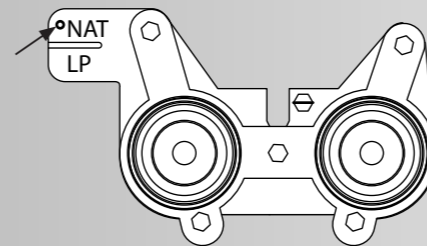
#### Orifice identification

A dimple mark besides the gas type, indicates which gas can be used with the orifice plate.

##### LP Gas Orifice Plate



##### Natural Gas Orifice Plate



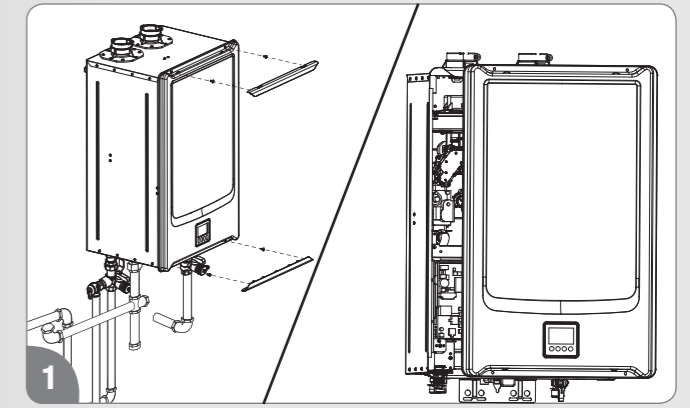
Front view of orifice plates.

\*See table for orifice size.

#### WARNING:

DO NOT modify an orifice plate. Tampering or modifying the plate could result in serious injury or death.

#### Fuel Conversion Procedure:



Turn water heater off. Unplug the water heater from electrical outlet or disconnect the electric power at the circuit breaker. Turn off water supply to water heater, and then turn off gas supply to water heater.

Remove the top and bottom plastic covers, and the four screws. Then remove the front cover from the heater.

1  
2

These fuel conversion instructions are ONLY for the following tankless gas water heaters beginning with:

RTGH-S	RTGH-SR
CRTGH-S	CRTGH-SR
RUTGH-S	RUTGH-SR
CRUTGH-S	CRUTGH-SR
CRMTGHS	CRMTGHSR
CECOHS	CECOHSR
ECERTGH-S	ECERTGH-SR

The installation of this Fuel Conversion kit requires that the installer have the following tools.

#### DO NOT ATTEMPT INSTALLATION WITHOUT THESE TOOLS.

1. Magnetic Phillips head screwdriver
2. Combustion analyzer or digital manometer
3. Permanent marker
4. 1/2" or 4mm Allen wrench
5. Gas leak detector

This water heater is configured for Natural Gas from the factory. If conversion to Propane (LP) Gas is required, the conversion kit supplied with the water heater shall be used.

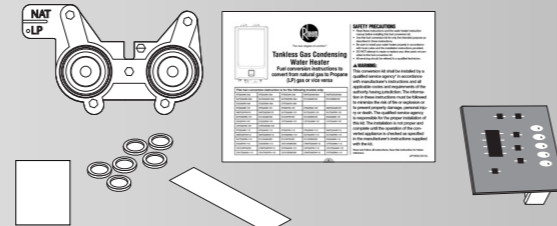
#### NOTICE:

Gas pressure at inlet of heater should never exceed 14" w.c. (3.5 kPa). See the following table for recommended gas pressures.

Type of gas	Recommended Inlet gas pressures In.W.C. (kPa)	
	Minimum	Maximum
Natural	4.0 (1.0 kPa)	10.5 (2.6 kPa)
LP	8.0 (2.0 kPa)	13.0 (3.2 kPa)

#### Conversion kit contains the following parts:

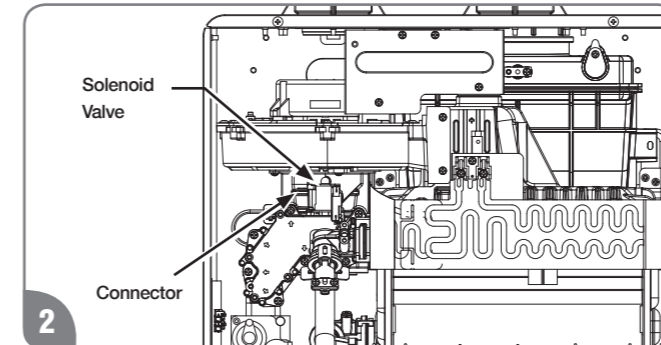
1. Orifice plate \* (LP) – 1
2. Fuel conversion label – 1
3. Fuel conversion instruction sheet – 1
4. Spare gaskets - 6
5. Gas chip for LP - 1
6. Supplement Rating Label – 1
7. LP label – 1
8. Spare screws - 3



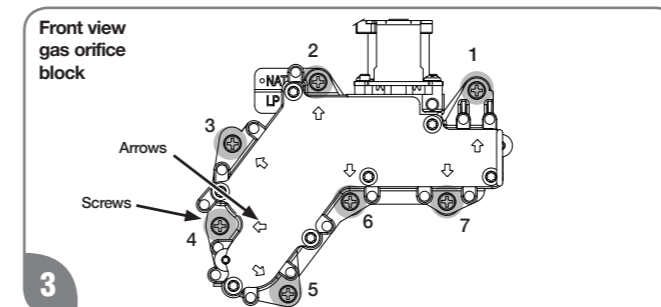
\*See table below for gas orifice opening size.

Input of water heater	NG		LP	
	1 Stage	2 Stage	1 Stage	2 Stage
	In (mm)			
All Inputs	0.132 (3.35)	0.217 (5.5)	0.106 (2.7)	0.201 (5.1)

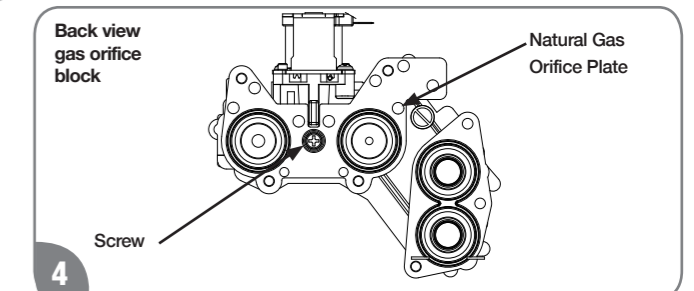
3  
4



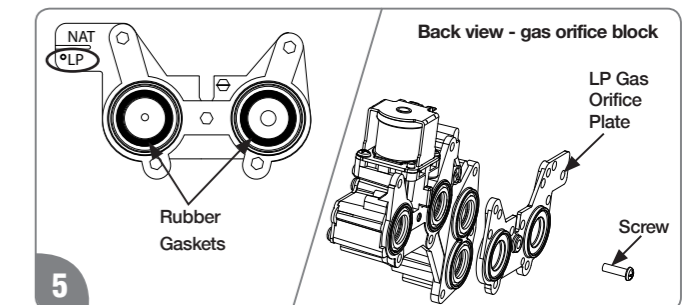
Locate the solenoid valve shown in figure above and disconnect the connector with black and yellow wires, there is no need to remove any other wires or connectors.



Carefully remove gas orifice block by loosening the seven black "Pan Phillip head" screws shown above. Arrows on the front plate of the gas orifice block point to the screws that needs to be removed. DO NOT remove any other screws. Save the seven screws in a safe place for re-installation of the orifice block.



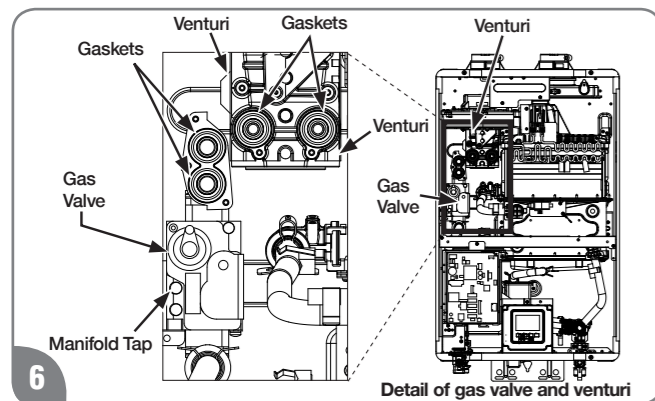
Turn the gas orifice block so you can see the orifice plate and the screw holding the orifice plate to the gas orifice block. Remove the screw in the middle and remove the natural gas orifice plate.



Find the LP orifice plate in the kit. Refer to "Orifice Identification" on page 3. In addition to a dimple mark, LP orifice plate has a blue marking. Find gaskets in the kit, place 2 gaskets on the LP orifice plate. Install the LP orifice plate on to the gas orifice block. To ensure a leak free joint verify both gaskets on the LP orifice plate are

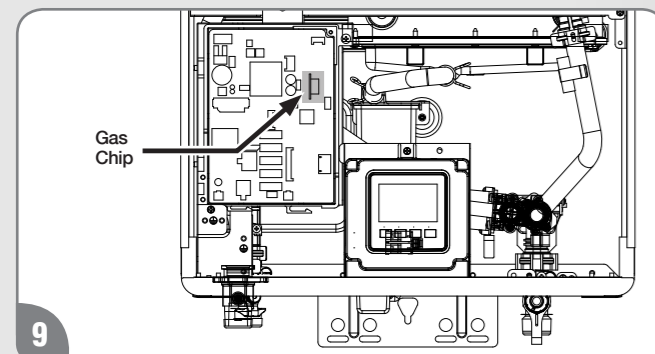
in place and are in good condition, before attaching the LP orifice plate. Use the 3/16" long screw removed at step 4 to secure the orifice plate to the gas orifice block, DO NOT use different screw type or length. 3 spare screws are included in this kit. These screws can be used at steps 5 and 7.

**NOTICE:**  
Install the orifice plate in the right orientation.

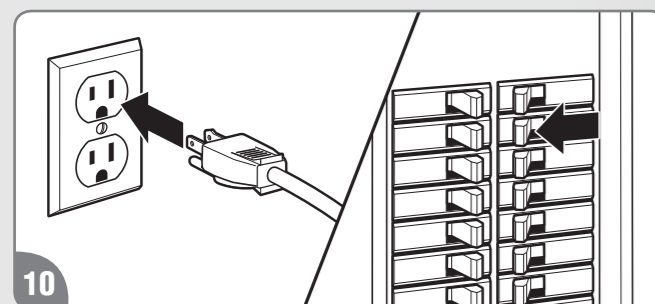


Place 2 gaskets on the venturi, and 2 gaskets on the gas valve. To ensure a leak free joint, verify 2 gaskets on the venturi and 2 gaskets on the gas valve are in place and are in good condition, before attaching the gas orifice block.

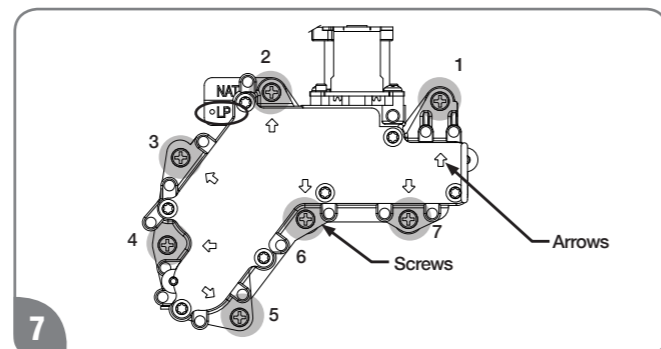
**NOTICE:**  
Water pipe and other parts removed to show detail of venturi and gaskets.



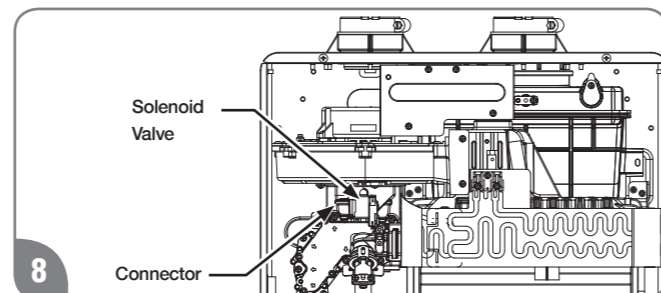
Remove the gas chip on the control board, and replace it with the gas chip provided in this conversion kit. The new chip should say "LP". Confirm "LP" after the gas chip is installed.



Plug the water heater back into the power outlet. Follow the instructions provided in the water heater U&C manual to turn on heater and set the required temperature.

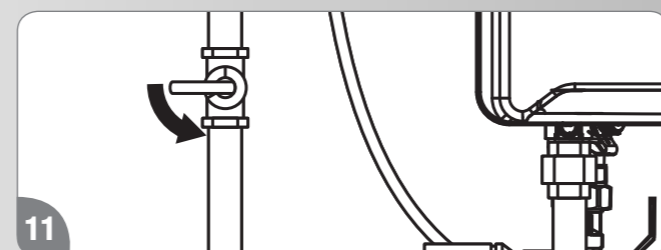


Attach gas orifice block to the venturi and gas valve using the seven screws removed in step 3. Tighten all seven screws, evenly. DO NOT over tighten, as this might damage the screws or other components. Confirm the installed orifice plate is LP. See "Orifice Identification" to identify the orifice plate.

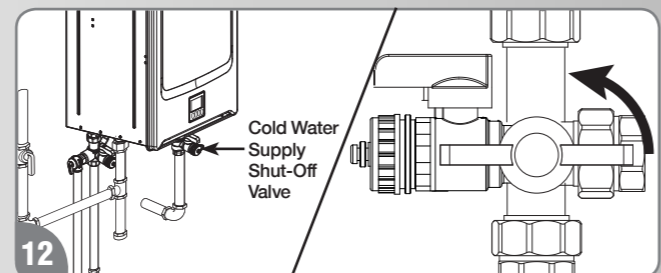


Find the connector with black and yellow wires which was disconnected at step 2, and reconnect the connector back to the solenoid valve.

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Verify no gas leaks on gas valve with gas leak detector. Turn on the gas supply to the water heater.

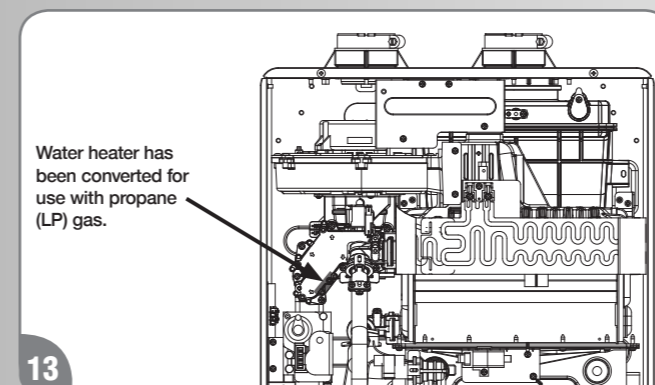


Turn on the water supply to the water heater.

Measure and adjust the gas/air ratio by following "Gas/Air Ratio Adjustment" described on pages 8 through 12.

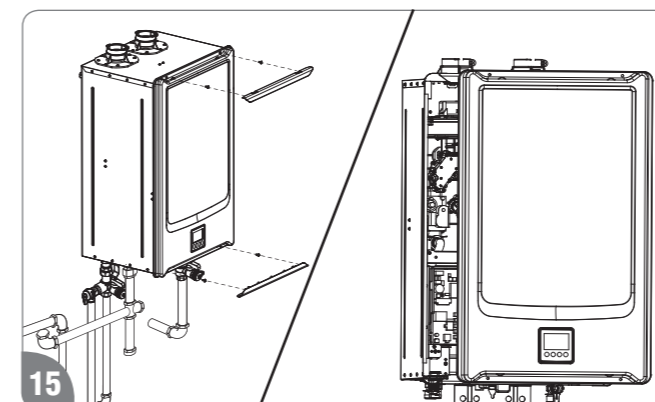
DO NOT move to the next step until gas/air ratio is properly adjusted.

**DANGER:**  
Improper gas/air ratio can cause severe personal injury, death or substantial property damage.

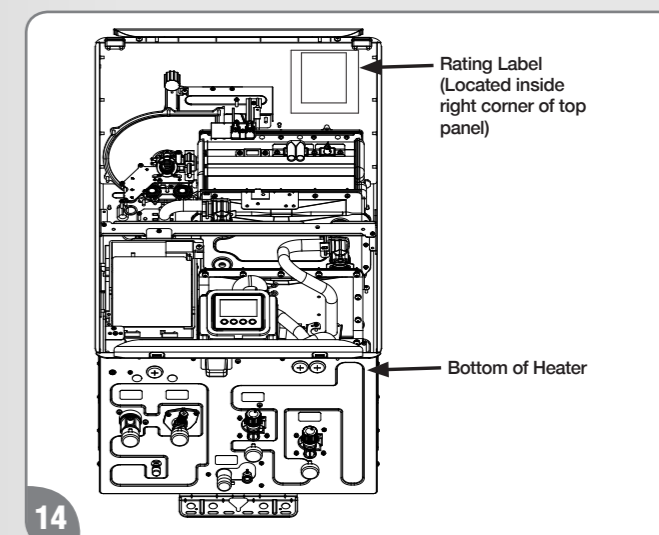


Apply the included conversion label shown above on the gas orifice block to indicate that the heater has been converted to LP gas.

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8



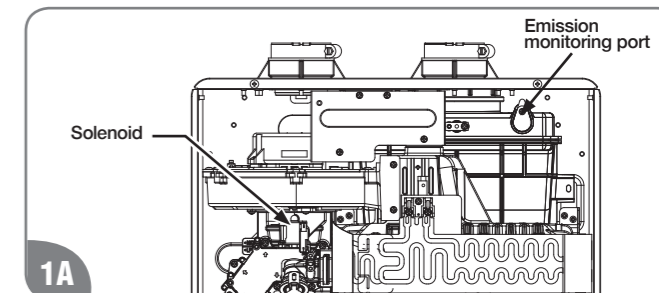
Reinstall the front cover on the heater. Reinstall 4 screws and plastic covered removed in step 1.



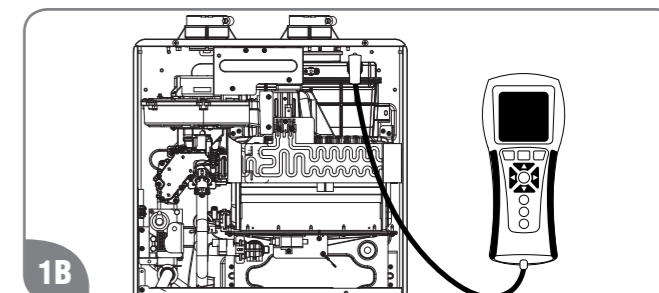
Apply the included supplement rating label inside right corner of side panel near the existing rating label. DO NOT apply the supplement rating label over the existing rating label. The supplement rating label says, "This water heater was converted on (A) to LP gas by (B)." Fill out blanks (A) and (B) with a permanent marker. (A) Conversion day (DD/MM/YYYY), and (B) Name & Address of agent making the conversion (responsible for the correctness of this conversion).

### Gas / Air Ratio Adjustment Option 1. Using Combustion Analyzer

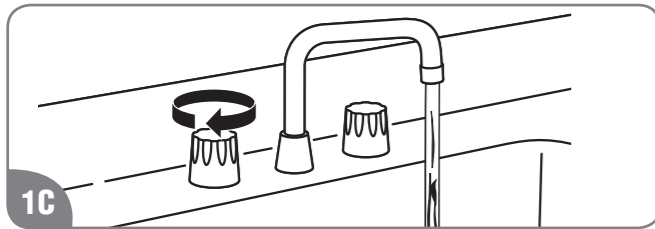
To confirm a water heater has a proper gas/air ratio, gas/air ratio should be confirmed or adjusted by following either option 1 or 2.



Loosen and remove the screw, rotate the plate and remove the gasket to access the emissions monitoring port as shown in illustration above.



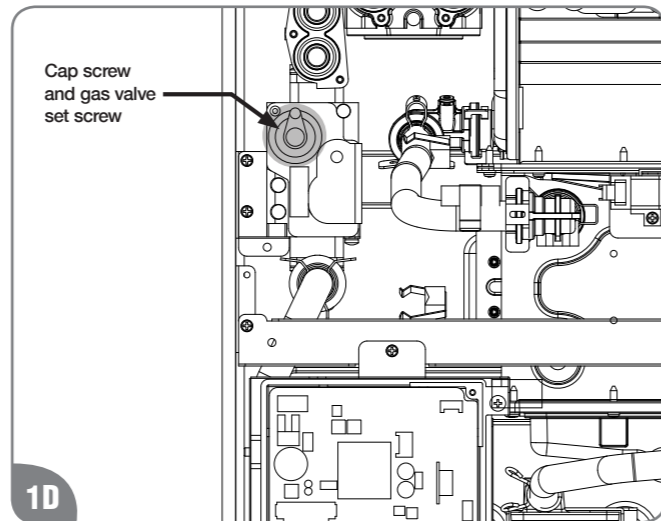
Insert the analyzer into the port illustration as shown above.



1C Fully open one hot water faucet, and set the water heater to operate at 1L mode referring to “Setting the operation mode” on page 13 and 14.

Run the tankless unit for at least 5 minutes and measure CO<sub>2</sub> value, compare it with the following table. If the CO<sub>2</sub> value is between min and max CO<sub>2</sub>, move to the next step. If the CO<sub>2</sub> value is not between min and max CO<sub>2</sub>, the gas valve needs to be adjusted.

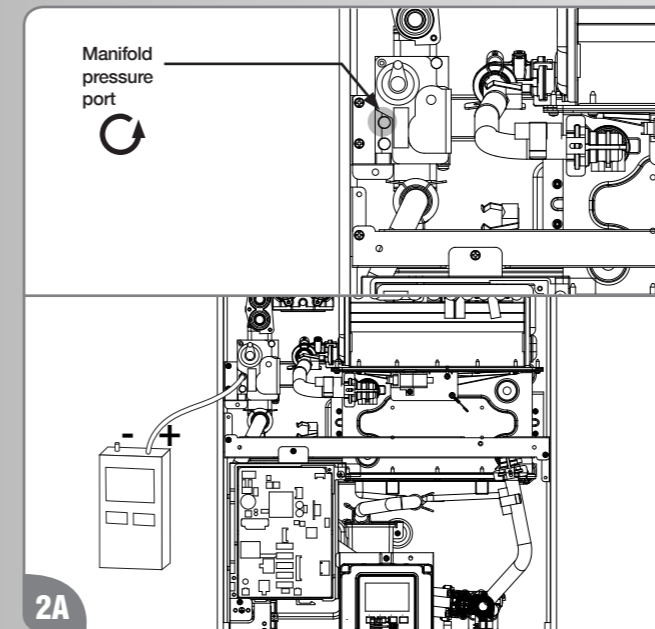
Fuel	2H Mode		1L Mode	
	Max CO <sub>2</sub> (%)	Min CO <sub>2</sub> (%)	Max CO <sub>2</sub> (%)	Min CO <sub>2</sub> (%)
LP	11.1	9.3	12.5	9.3



1D Locate the cap screw, and loose and remove the cap screw by 5/32" or 4 mm Allen wrench, and the gas valve set screw is now visible. Use the same Allen wrench to rotate the gas valve set screw by no more than 1/4 turn clockwise or counterclockwise. Turning clockwise increases CO<sub>2</sub> and counterclockwise decreases. Confirm CO<sub>2</sub> is within the range per table on page 9.

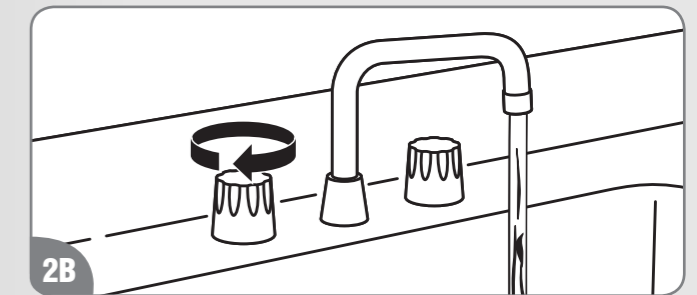
**⚠ DANGER:**  
Improper gas valve setting can cause severe personal injury, death or substantial property damage.

### Option 2. Using Manometer



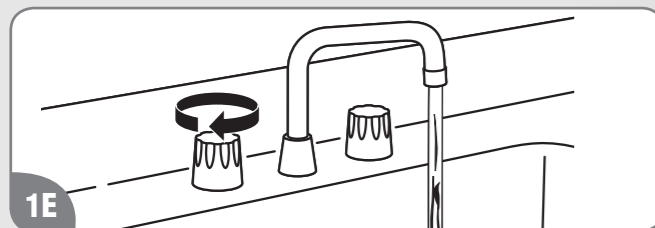
2A Open the manifold pressure port by loosening the screw two turns as shown above. Connect a manometer to the manifold pressure port.

**⚠ WARNING:**  
DO NOT remove the screw at the manifold pressure port.



2B Fully open one hot water faucet, and set the water heater to operate at 1L mode referring to “Setting the operation mode” on page 13 and 14. Run the tankless unit for at least 5 minutes, measure the manifold pressure at 1L mode, and compare it with the following table. If the manifold pressure is between min and max manifold pressure, move to the next step. Otherwise, the gas valve needs to be adjusted.

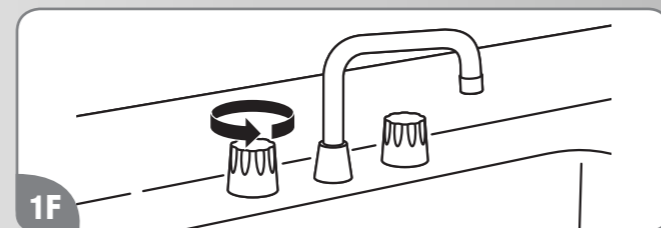
Manifold Pressure at 1L Mode		
Fuel	Max (In. W.C.)	Min (In. W.C.)
LP	+0.002	-0.002



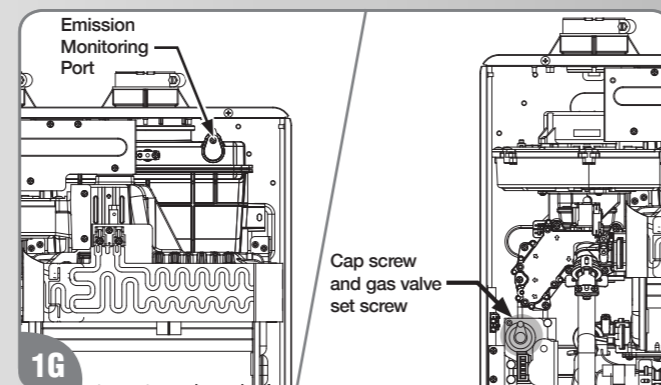
1E Fully open at least four hot water faucets, and set the water heater to operate at 2H model referring to “Setting the operation mode” on page 13 and 14. Measure CO<sub>2</sub> value and compare it with the table on page 9. If CO<sub>2</sub> value is between min and max CO<sub>2</sub> values, move to next step. If CO<sub>2</sub> value is not between min and max CO<sub>2</sub> values, the gas valve needs to be adjusted. Use the Allen wrench to rotate the gas valve set screw by no more than 1/4 turn clockwise or counterclockwise. Turning clockwise increases CO<sub>2</sub> and counterclockwise decreases. Confirm CO<sub>2</sub> is between min and max CO<sub>2</sub>. Go back to steps 1C and 1D and confirm CO<sub>2</sub> at 1L mode is between min and max CO<sub>2</sub>. Contact national service department listed on page 15 if CO<sub>2</sub> at 1L or 2H is not between min and max CO<sub>2</sub> after steps 1C through 1E are repeated twice.

Use a portable gas leak detector to check if there are any gas leaks in the cabinet.

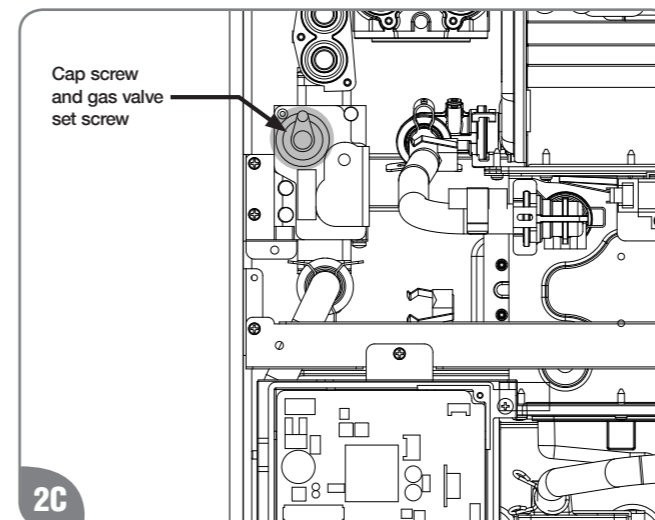
**⚠ WARNING:**  
At 2H mode, outlet water can be hot. DO NOT touch hot water and hot water faucet to avoid scalding.



1F Close the hot water fixtures, the water heater should stop heating.



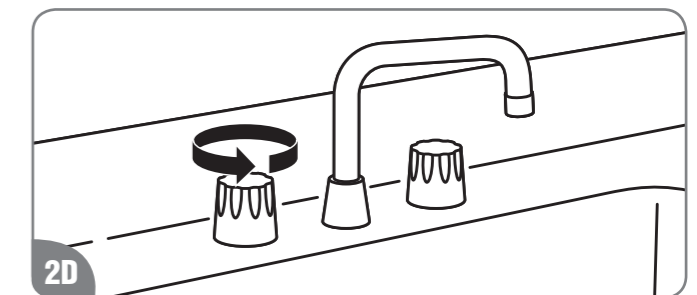
1G Disconnect the analyzer from the emission monitoring port. Reinstall the screw removed at step 1A and the cap screw removed at step 1D. Make sure the operation mode is back to the factory setting referring to “Setting Operating Mode” on page 13 and 14.



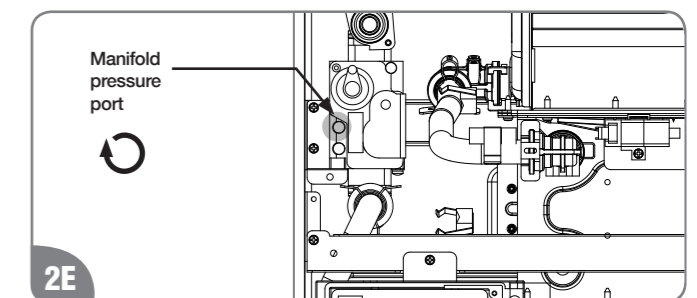
2C Locate the cap screw, and loose and remove the cap screw by 5/32" or 4 mm Allen wrench. The gas valve set screw is now visible. Use the same Allen wrench to rotate the gas valve set screw until the manifold pressure is within the range per table of Manifold Pressure at 1L Mode.

Use a portable gas leak detector to check if there are any gas leaks in the cabinet.

**⚠ DANGER:**  
Improper gas valve setting can cause severe personal injury, death or substantial property damage.



2D Close the hot water fixture, the water heater should stop heating.



2E Disconnect the manometer from the manifold pressure port, and tighten the screw. Reinstall the cap screw removed at step 2C.

