General Service Bulletin

Modulating Gas Valve Adjustment

12.5-50 Ton Voyager II & III units

ATTENTION: Warnings, Cautions and Notices appear at appropriate sections throughout this literature. Read these carefully.

⚠**WARNING**: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠**CAUTION**: Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.

NOTICE: Indicates a situation that could result in equipment or property-damage only accidents.

Introduction

The purpose of this bulletin is to inform the field on how to properly set the modulating gas valve on Voyager II & Voyager III units. If the procedure below is not followed the unit may not burn properly and under some circumstances may be noisy. The setting of the gas valve is temperature sensitive so follow the procedure closely.

Discussion

This bulletin applies to 12.5-50 ton packaged gas/electric units ordered with the modulating gas heat option. 12.5-25 ton Voyager II units will have a "V" in the 9th digit of the model number. 25-50 ton Voyager III units will have an "M", "P", "R" or "T" in the 9th digit of the model number.

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Repair

⚠WARNING
Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

⚠WARNING
Hazardous Gases and Flammable Vapors!

Exposure to hazardous gases from fuel substances have been shown to cause cancer, birth defects or other reproductive harm. Improper installation, adjustment, alteration, service or use of this product could cause flammable mixtures or lead to excessive carbon monoxide exposure. To avoid hazardous gases and flammable vapors follow proper installation and set up of this product and all warnings as provided in this manual. Failure to follow all instructions could result in death or serious injury.

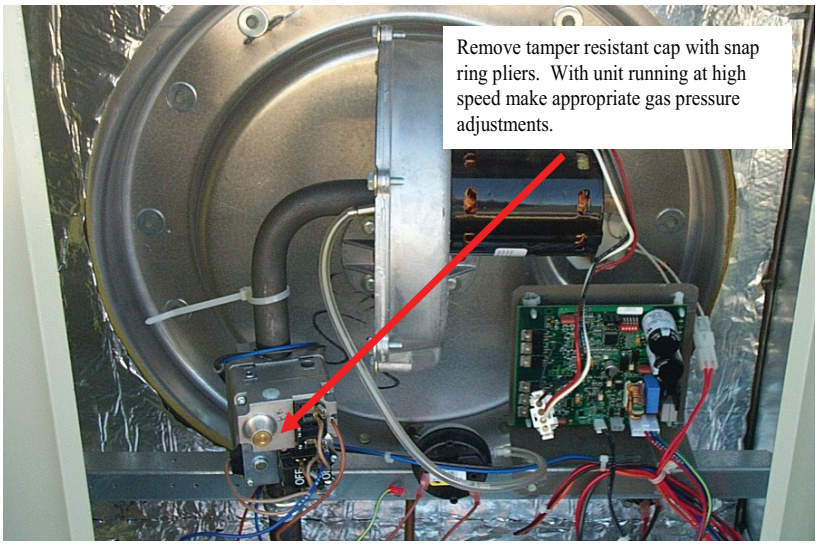
Required Tools

- Voltmeter
- Manometer capable of measuring in .001" w.c. increments, typical digital meters can not read accurately this low
- Snap ring pliers
- Jumper wire
- Temperature gauge

Steps:

1. Using the snap ring pliers remove the tamper resistant cap from the gas valve to gain access to the gas pressure adjustment screw.

Figure 1.



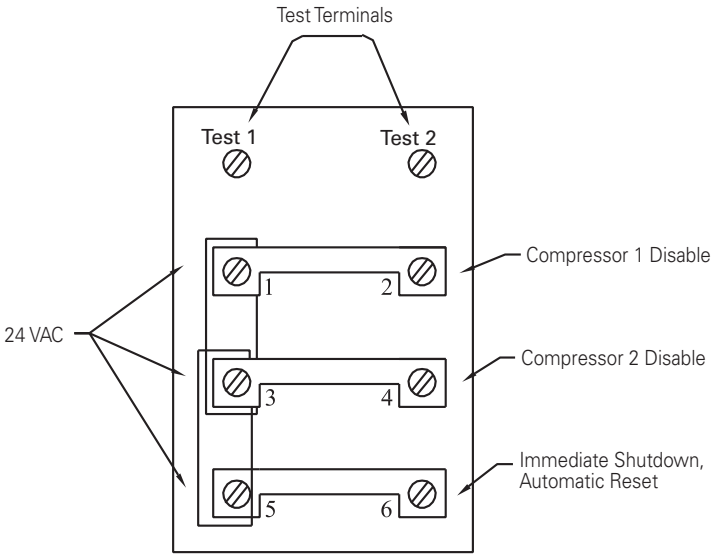
2. Attach liquid manometer gauge to the manifold (outlet) port of the gas valve.

Note: *It is not recommended performing this adjustment with a digital manometer. A digital manometer will not read accurately at 0.001" w.c. increments.*

3. Power the unit up and place the unit in the 2nd stage heating sequence by utilizing the Test Mode function. Refer to Tables 1 - 3 for the proper sequence of operations for the particular unit you are servicing.

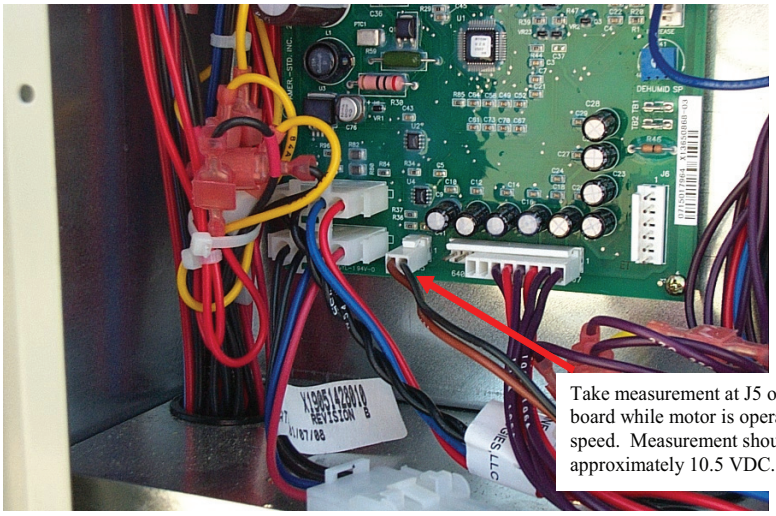
Note: *By placing a jumper from Test 1 to Test 2 for 3 continuous seconds nominal, allowing the unit to energize the mode for at least 2 seconds, then placing the jumper again, the unit can be scrolled through each step of the test mode. Any unused states shall be skipped.*

Figure 2. LTB layout with jumpers



4. Allow the unit to settle out by allowing it to run at high fire for 10-15 minutes before attempting any adjustments. Verify that unit is running at high fire, by measuring voltage between J5-1 and J5-2 on the RTOM board. Voltage should read approximately 10.5 VDC.

Figure 3.



Take measurement at J5 on the RTOM board while motor is operating at high speed. Measurement should read approximately 10.5 VDC.

5. Gas pressures should be adjusted as follows:
   a. If the ambient temperature is greater than 60 F° adjust the gas pressure to +0.050" w.c.
   b. If the ambient temperature is less than 60 F° adjust the gas pressure to +0.065" w.c.

Note: *Turn adjustment screw CCW to decrease the manifold gas pressure and CW to increase the gas pressure. On Voyager III units with two heat exchangers adjust only the gas pressure of the heat exchanger with modulating gas controls.*

6. Remove the unit from the test mode by shorting Test 1 and Test 2 for three seconds one time or by cycling power to the unit. LED2 on the RTRM module should now be solid green.
7. Adjust unit controls to bring on a normal call for heat from thermostat, zone sensor or BAS. If no issue exists re-install the tamper resistant cap.

Table 1. Gas/Electric Units 3-25 Ton

Step	Mode	IDM	Econ	CPR1	CPR2	HT1	HT2	Mod Gas*	ODM1	ODM2
1	Fan On	On	Min	Off	Off	Off	Off	Off	Off	Off
2*	Econ.	On	Open	Off	Off	Off	Off	Off	Off	Off
3	Cool 1	On	Min	On	Off	Off	Off	Off	On	**
4	Cool 2	On	Min	On	On	Off	Off	Off	On	**
5*	Reheat	On	Min	On	On	Off	Off	Off	On	**
6*	Heat 1	On	Min	Off	Off	On	Off	50%	Off	Off
7*	Heat 2	On	Min	Off	Off	On	On	100%	Off	Off

* With Optional Accessory
** "**Off**" if temperature falls below 60° (±2°)F, "**On**" if temperature rises above 65° (±2°)F.

Steps for optional accessories and modes not present in unit will be skipped.

Table 2. VAV Test Modes 27 1/2 - 50 Ton

TEST STEP	MODE	IGV/VFD(1)	FAN	ECON (2)	COMP 1	COMP 2	HEAT 1	HEAT 2	MOD GAS	VHR RELAY (3)	OHMS
1	IGV/VFD TEST	OPEN/100%	OFF	CLOSED	OFF	OFF	OFF	OFF	OFF	ON	2.2K
2	IGV/VFD TEST	CLOSED/OFF	OFF	CLOSED	OFF	OFF	OFF	OFF	OFF	ON	3.3K
3	MINIMUM VENTILATION	IN CONTROL(5)	ON	MINIMUM POSITION	OFF	OFF	OFF	OFF	OFF	ON	4.7K
4	ECONOMIZER	IN CONTROL	ON	OPEN	OFF	OFF	OFF	OFF	OFF	ON	6.8K
5	COOL STAGE 1	IN CONTROL	ON (5)	MINIMUM POSITION	ON(6)	OFF	OFF	OFF	OFF	ON	10K
6	COOL STAGE 2	IN CONTROL	ON (5)	MINIMUM POSITION	OFF(4)	ON (4)(6)	OFF	OFF	OFF	ON	15K
7	COOL STAGE 3	IN CONTROL	ON(5)	MINIMUM POSITION	ON(6)	ON(6)	OFF	OFF	OFF	ON	22K
8	HEAT STAGE 1	OPEN/100%(7)	ON (5)	CLOSED	OFF	OFF	ON(7)	OFF	50%	ON	33K
9	HEAT STAGE 2	OPEN/100%(7)	ON (5)	CLOSED	OFF	OFF	ON(7)	ON(7)	100%	ON	47K
10	RESET										

(1) The IGV/VFD will be controlled to the supply pressure setpoint unless test mode has been running for 6 minutes or longer. After 6 minutes, the IGV damper will be allowed to drive to 100% for step 8 and 9.
(2) The exhaust fan will turn on anytime the economizer damper position is equal to or greater than the exhaust fan setpoint.
(3) The VHR relay output will be energized at the start of the test mode to allow time for the VAV boxes to open. It takes 6 minutes for the boxes to drive from the full closed position to the full open position. The timing cannot be changed in the field.
(4) 27.5-35 ton units have 2 stages of mechanical cooling. Both compressors run during cool stage 2.
(5) The supply fan will not be allowed to go from an off state to an on state until the IGV are fully closed.
(6) The condenser fans will operate any time a compressor is ON providing the outdoor air temperatures are within normal operating range.
(7) The heat outputs will not be allowed to come on until the unit has been in test mode for at least 6 minutes and the IGV/VFD is at 100%.

Table 3. CV Test Modes (Also VAV w/o IGV) 27 1/2 - 50 Ton

TEST STEP	MODE	FAN	ECON (1)	COMP 1	COMP 2	HEAT 1	HEAT 2	MOD GAS	OHMS
1	MINIMUM VENTILATION	ON	MINIMUM POSITION	OFF	OFF	OFF	OFF	OFF	4.7K
2	ECONOMIZER TEST OPEN	ON	OPEN	OFF	OFF	OFF	OFF	OFF	6.8K
3	COOL STAGE 1	ON	MINIMUM POSITION	ON(2)	OFF	OFF	OFF	OFF	10K
4	COOL STAGE 2	ON	MINIMUM POSITION	OFF(3)	ON(2)(3)	OFF	OFF	OFF	15K
5	COOL STAGE 3	ON	MINIMUM POSITION	ON(2)	ON(2)	OFF	OFF	OFF	22K
6	HEAT STAGE 1	ON	CLOSED	OFF	OFF	ON	OFF	50%	33K
7	HEAT STAGE 2	ON	CLOSED	OFF	OFF	ON	ON	100%	47K

(1) The exhaust fan will turn on anytime the economizer damper position is equal to or greater than the exhaust fan setpoint.
(2) The condenser fans will operate any time a compressor is ON providing the outdoor air temperatures are within normal operating range.
(3) 27.5-35 ton units have 2 stages of mechanical cooling. Both compressors run during cool stage 2.

Questions

If you have questions and are a distributor or a commercial sales office, contact light commercial technical service in Clarksville. If you are not a distributor or a commercial sales office, contact the local distributor or a commercial sales office.

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