



State of Ohio
Weatherization Program
Standards

Section **MOBILE HOME MECHANICAL
SYSTEMS INSPECTION**

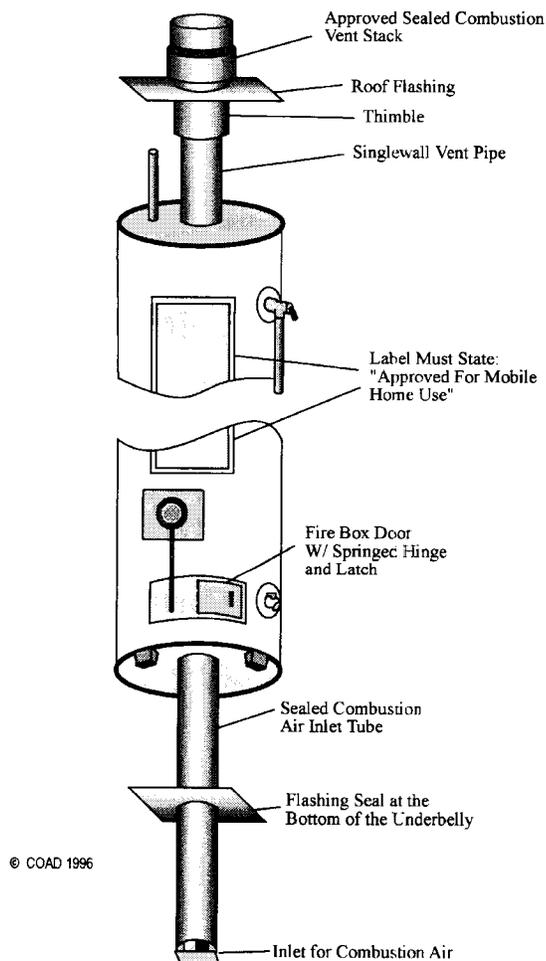
Subject **Domestic Hot Water**

APPROVED MOBILE HOME GAS DHW UNITS 601-4.1

Determine if the gas DHW unit is approved for use in mobile homes. An existing DHW unit is approved for mobile home use if the tank is accessible from the outside and the compartment is isolated from the living area, and there is sufficient combustion air according to NFPA 54 code requirements.

**approved gas DHW
unit
601-4.1a**

Mobile Home
Sealed Combustion Domestic Hot Water (DHW) Tank



If it is not, no weatherization work may be performed until it is replaced.



FUEL SUPPLY 601-4.2

fuel availability
601-4.2a

Fuel must be available to begin the inspection process of the DHW heater.

fuel leakage, gas
601-4.2b

Use a combustible gas leak detector to determine if propane or natural gas is leaking from all accessible gas supply lines and gas-fired appliances. Verify every suspected leak with soap bubble solution. Determine the source and severity of the problem.

major gas leaks
601-4.2c

If the gas leak is major (see 1504 Abbreviations and Definitions), immediately inform the customer and leave the dwelling. Contact the fuel vendor and have the problem corrected. Document all actions taken in the customer file.



No weatherization work may be done until major gas leaks are corrected.

minor gas leaks
601-4.2d

If the gas leak is minor (see 1504 Abbreviations and Definitions), inform the customer and have the problem corrected.

fuel leakage, oil
601-4.2e

Visually check for fuel leakage in kerosene and fuel oil DHW units. These must be approved for mobile homes.

Btu input
601-4.2f

Test to determine if the gas DHW unit is over- or under-fired by clocking the meter on gas units and calculate the actual Btu input. On propane units, take a gas pressure test, measure the orifice, and calculate the actual Btu input. Determine corrective measures.

ELECTRICAL POWER SUPPLY 601-4.3

main power safety
601-4.3a

Inspect the main electrical power supply to the electric tank to determine that it is safe.

dedicated circuit
601-4.3b

Inspect the wiring to the DHW unit and determine whether the electrical line to the heating unit is a dedicated circuit that is properly sized and fused. If no dedicated circuit exists, it is not necessary to install one unless the wiring is in poor condition, there is a history of circuit failure, or the unit is to be replaced.

hazardous wiring
601-4.3c



Visually inspect all wiring at, or in, the DHW unit to detect charred, frayed or missing wire insulation and improper or loose connections. If the wiring is hazardous, inform the customer of the problem and have the problem corrected.

DHW UNIT CLEARANCES 601-4.4

Note whether combustion-type DHW tanks are located with the required clearances from combustible materials PMI or the appropriate NFPA code. If they are not, have the DHW tank moved to achieve required distance from combustible surfaces.

unit clearances
601-4.4a

VENT SYSTEM VISUAL INSPECTION 601-4.5

Visually inspect the vent system to determine that it extends from the DHW unit to outside the dwelling. Look for serious corrosion or rust, cracks, holes and loose, unsealed, or disconnected sections. Determine that venting is in compliance with the applicable code, Part 3280.707 (d) (1) or (2) of the HUD Mobile Home Construction and Safety Standards for Energy Efficiency.

vent system, visual inspection
601-4.5a

Inspect the vent connections to make sure that they are securely fastened.

vent connections
601-4.5b

Inspect the bottom of the DHW unit to determine if the combustion air inlet is connected and in good condition.

combustion air
601-4.5c

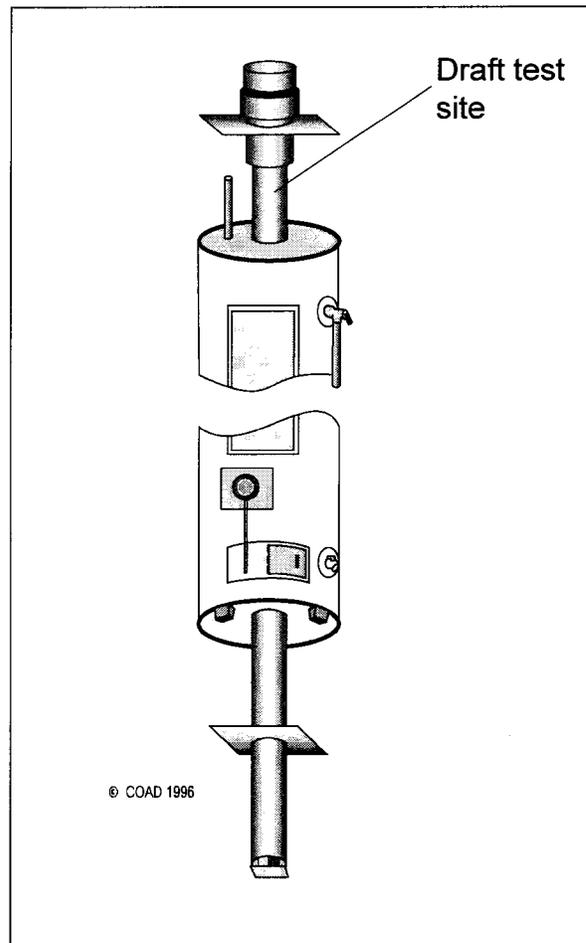
DRAFT TESTING 601-4.6

Start the DHW unit. Insert the draft probe into the hole in the vent pipe above the draft diverter and start the DHW unit (See Figure 601-4.6). After two minutes, measure the draft and determine whether the draft reading is within the acceptable ranges identified in Table 601-4.6.

draft
601-4.6a

Table 601-4.6 Draft Test Locations and Acceptable Readings

DHW Unit Type	Draft Gauge Probe Placement	Worst Case Acceptable Draft Readings at Listed Outdoor Temperatures (F)				
		< 20	21-40	41-60	61-80	> 80
Gas Atmospheric Appliances	Flue (after diverter)	-5 Pa	-4 Pa	-3 Pa	-2 Pa	-1 Pa
Gas Power Burners		-.02 w. c."	-.016 w. c."	-.012 w. c."	-.008 w. c."	-.004 w. c."
Oil Burners	Flue (before Barometric Damper) or draft diverter	-15 Pa -.06 w. c."	-13 Pa -.053 w. c."	-11 Pa -.045 w. c."	-9 Pa -.038 w. c."	-7 Pa -.03 w. c."



COMBUSTION SAFETY & EFFICIENCY TESTING 601-4.7

CO testing
601-4.7a

With the DHW unit operating, insert the sampling probe in the appropriate location. Measure and record the amount of CO in the flue gasses. More than 100 ppm in the flue is not permitted.

combustion analysis
601-4.7b

With the DHW unit operating, insert the sampling probe into the same hole drilled for the draft test. The combustion test analysis measurements must be PMI, or:

- i. Oxygen (O_2), 4-9%
- ii. Net Stack Temperature, 300-600° F
- iii. Carbon Monoxide (CO), 100 ppm maximum
- iv. Smoke Test (oil) 1 or less

WATER TANK CONDITION 601-4.8

Determine if the tank is leaking water. If it is leaking, it may be replaced using HWAP Health and Safety funds.

tank leakage
601-4.8a

Determine whether a pressure relief valve and a discharge pipe are present. If the relief valve and/or the discharge pipe is not present and there is an existing location for them, have them installed. If the relief valve and/or discharge pipe are not present and there is no existing location for them, have them installed in the hot water line.

**pressure relief valve/
discharge pipe**
601-4.8b

Do not call for insulation on tanks that have a manufacturer's warning against adding additional insulation.

**tank insulation
warning**
601-4.8c

Determine whether the tank is insulated. Measure the tank to determine the amount of insulation needed to cover the tank.

tank insulation
601-4.8d

Examine the temperature setting on the gas valve or thermostat. Consult with the customer to determine if lowering of the temperature can be accomplished without affecting the customer's life-style.

**temperature
setting**
601-4.8e

CEE

Turn up the thermostat to activate the water heating system. For combustion-type equipment, determine whether flame roll-out is occurring (see 1506-8).

flame roll-out
601-4.8f

If the DHW tank is a gas-fired model, determine whether the gas valve is functioning properly.

gas valve
601-4.8g

Determine whether the thermostat is operating properly.

thermostat
601-4.8h

DHW DISTRIBUTION 601-4.9

Inspect the water lines leading into and out of the water tank to determine whether they are leaking. If water lines are leaking, inform the customer and repair the leaks.

water lines
601-4.9a

CEE

Determine whether there is insulation present on the first six feet of both the hot and cold water lines.

water line insulation
601-4.9b

Examine plumbing fixtures to determine if they are leaking. If plumbing fixtures are leaking, inform the customer. Repair of hot water leaks is mandatory. Determine whether cold water leaks are contributing to moisture problems.

fixture leaks
601-4.9c

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low-flow devices
601-4.9d

CEE

Examine plumbing fixtures to determine whether low-flow devices are present. Consult the customer to determine whether low-flow devices can be installed in the shower and at sink fixtures.

**consumer energy
education**
601-4.9e

CEE

Provide consumer energy education to the customer regarding management of hot water usage.