

CHAPTER

3

General Regulations



The general requirements of *International Mechanical Code (IMC)* Chapter 3 include those related to installation, access, location, testing, support and clearances. General requirements also address plastic pipes, fittings, identification and labeling.

INSTALLATION OF EQUIPMENT AND APPLIANCES

Equipment such as piping, tubing and fittings are required to comply with the applicable referenced standards, specifications and performance criteria of the mechanical code. Additionally, each length of pipe, tubing and each pipe fitting utilized in a mechanical system shall bear the identification of the manufacturer. **[Ref. IMC 301.3 & 301.5]**

How can you know for sure that the materials used conform to the applicable standard identified in the code? Here is where the third-party certification comes into play. Such identification is what is most commonly referred to as a listing. That the product or material is listed provides confirmation that the product or material has been evaluated by a third-party certification agency. To better explain what a third-party certification agency is, let's consider the ICC Evaluation Services (ICC-ES PMG) program, which is one such agency that pertains to plumbing, mechanical and gas materials and products. The PMG listing mark (Figure 3-1) indicates that the product complies with applicable standards and codes and that ongoing inspections at the manufacturer's site are conducted to ensure that the quality of the product remains consistent.

The mechanical code requires listing and labeling for appliances, such as boilers, furnaces, condensing units, factory-built fireplaces, direct-fired heaters, cooking appliances and rooftop HVAC units to name a few. However, an exception directs the code user to Section 1101.2 specifically for listing and labeling of equipment and appliances used for refrigeration.

When equipment, materials or products are listed, this indicates that they have been tested and found suitable for a specified purpose or provides conformance by meeting an applicable standard. Additionally, equipment, materials or products are included in a list published by an organization concerned with evaluation of products or services and is acceptable to the code official. **[Ref. IMC 301.7 & IRC M1302]**

The label shown in Figure 3-2 informs the installer, mechanical inspector and the end user that the installed appliance has been tested and evaluated by an approved agency and has been determined to perform safely and efficiently when installed and operated in compliance with its listing. **[Ref. IMC 301.8 & IRC M1303]**



FIGURE 3-1 ICC-ES PMG mark.

You Should Know

The mechanical code contains requirements for oil, electric and solid fuel type appliances and equipment. The *International Fuel Gas Code* specifically references fuel-gas piping systems, appliances and equipment. **[Ref. IMC 301.6] •**

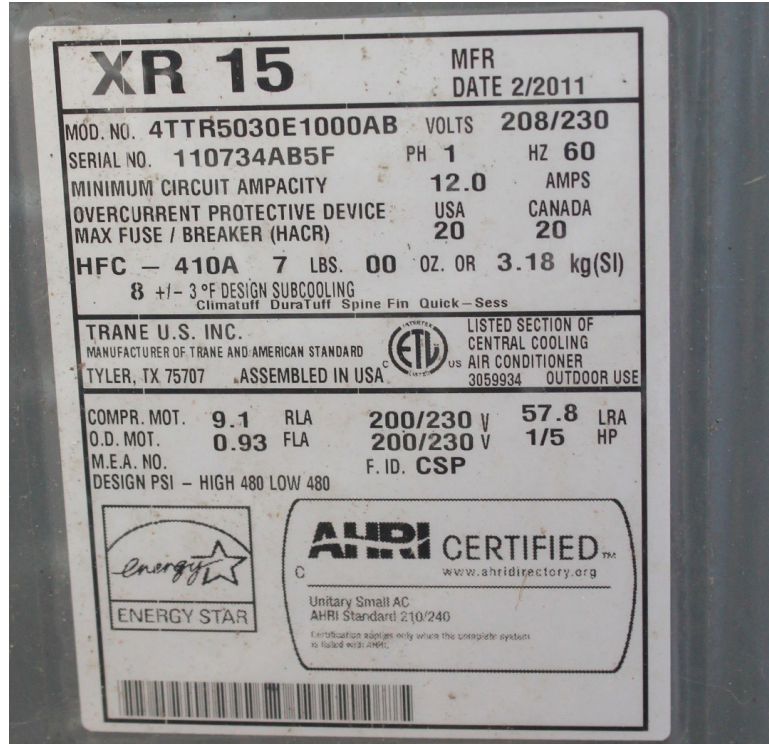


FIGURE 3-2 Appliance label.

You Should Know

Fuel-fired appliances are not located in, or obtain combustion air from, any of the following rooms or spaces:

1. Sleeping rooms
2. Bathrooms
3. Toilet rooms
4. Storage closets
5. Surgical rooms

See Exceptions in IMC Section 303.3. ●

Location and Installation of Equipment and Appliances

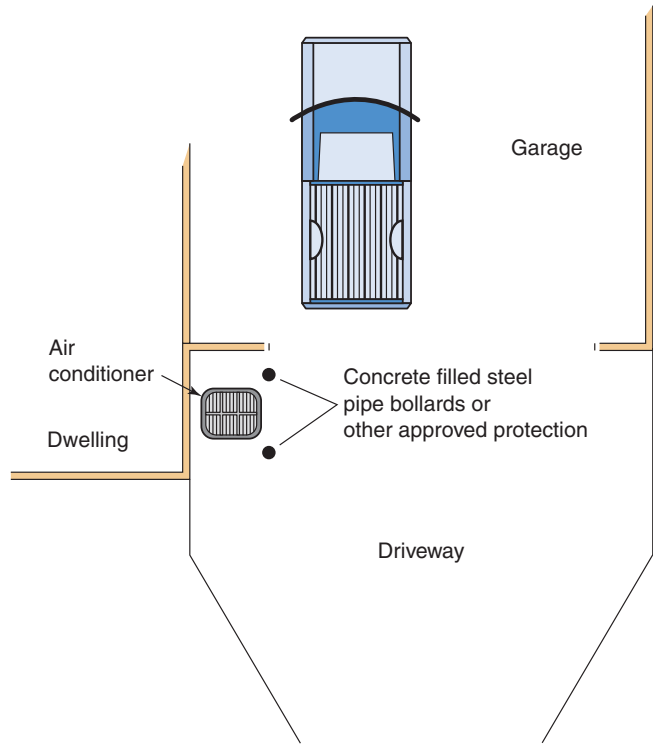
Mechanical systems and their components must be located as indicated by the manufacturer’s installation instructions for the listed equipment or appliances. Compare an appliance located in an indoor dry location in a mechanical room to an appliance located outdoors exposed to the weather. The listing and the manufacturer’s installation instructions help determine the proper location related to environmental conditions. However, the mechanical code also provides specific sections addressing prohibited appliance locations and appliances located in hazardous locations that must be observed as well.

[Ref. IMC 303.3, IFGC 303.3, IRC G2406]

Appliances are prohibited to be installed in locations where they may be subject to mechanical damage from vehicle impact. Approved barriers are permitted to be designed and installed to protect such appliances in these locations. [Ref. IMC 303.4, IFGC 303.4, IRC G2408]

For example, if an air-conditioning condensing unit is proposed to be located near a garage door (Figure 3-3), then the designer should design appropriate barriers strong enough to resist the type of impact anticipated and provide construction documents to the code official for review and approval.

In general, fuel-fired appliances are not permitted to be installed or to obtain combustion air from sleeping rooms, bathrooms, surgical rooms and storage closets. Exceptions allow direct-vent appliances that obtain all combustion air directly from the outdoors. Additionally a boiler, furnace or water heater are permitted to be installed in a room that opens into a bedroom or bathroom when all of the following conditions are met: a solid, weather-stripped self-closing door is installed and all combustion air is taken directly from the outdoors. The code also prohibits the space from being used for any other purpose, such as storage (Figure 3-4a). Appliances such as furnaces, boilers, space heaters, clothes dryers and water heaters are prohibited from being installed directly on the floor when located in hazardous locations and public garages, private garages, repair garages, automotive motor fuel-dispensing facilities and parking garages. The ignition source must be at least 18 inches above the floor surface on which the equipment or appliance rests (Figure 3-4b). [Ref. IMC 304.3, IFGC 303.3, IFGC 305.3, IRC G2408]



Protection from vehicle impact damage

FIGURE 3-3 Appliance vehicle impact protection.

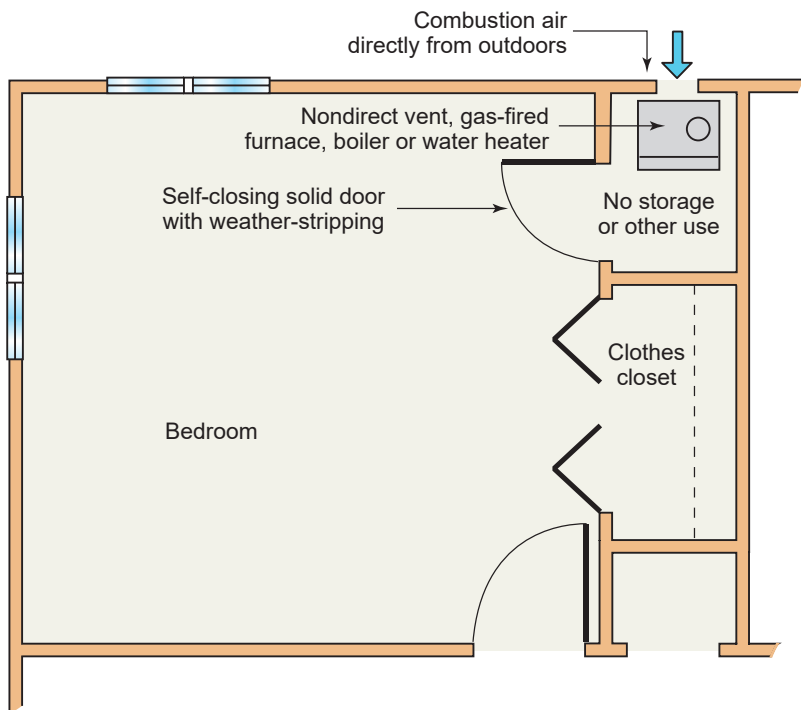


FIGURE 3-4a Appliance installed in a room or space that opens into a bedroom.

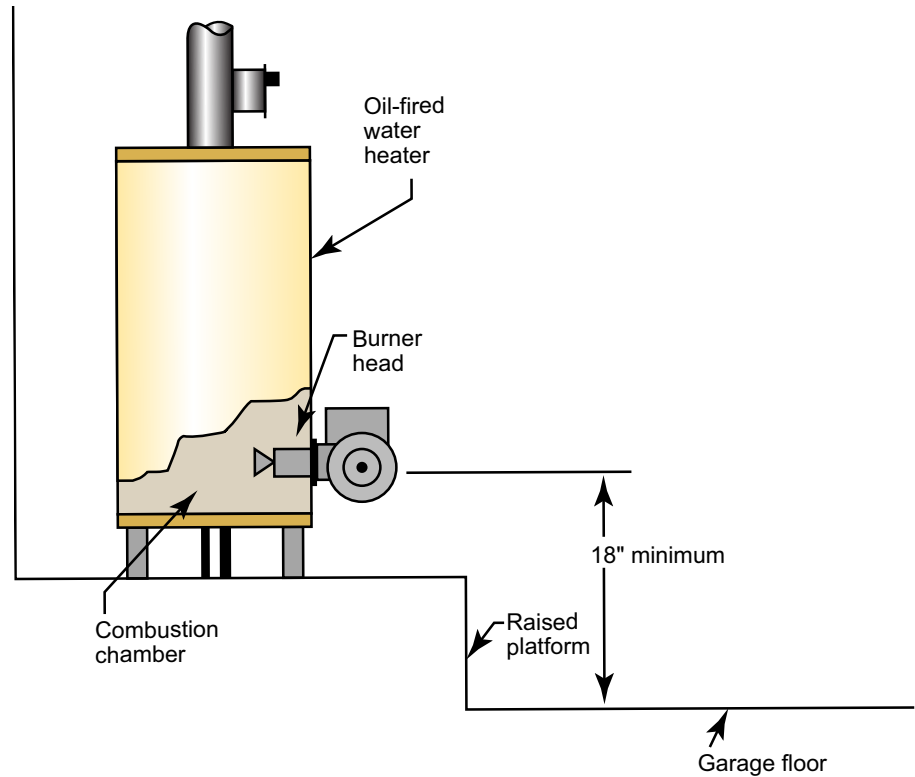


FIGURE 3-4b Elevation of ignition source.

Appliances located in public garages, motor fueling-dispensing facilities, repair garages or other areas frequented by motor vehicles shall be installed not less than 8 feet above the floor. If a motor vehicle is capable of passing under an appliance, the appliance must be installed at the clearances required by the appliance manufacturer and not less than 1 foot higher than the tallest vehicle garage door opening (Figure 3-5). [\[Ref. IMC 304.6 & IFGC 305.5\]](#)

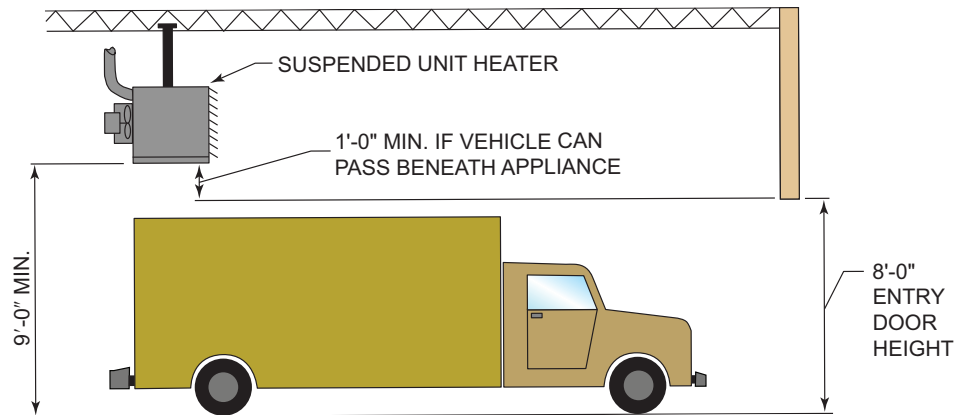


FIGURE 3-5 Appliance in a public garage.

Guards are required to provide protection for personnel working on or servicing equipment, appliances, components and roof hatch openings that are within 10 feet of a roof edge or open side that is more than 30 inches above the surface below. The guard must be constructed to extend not less than 30 inches beyond each end of components that require service. The top of the guard is to be located not less than 42 inches above the elevated surface adjacent to the guard (Figure 3-6). [Ref. IMC 304.9, 304.11 & IFGC 306.6]

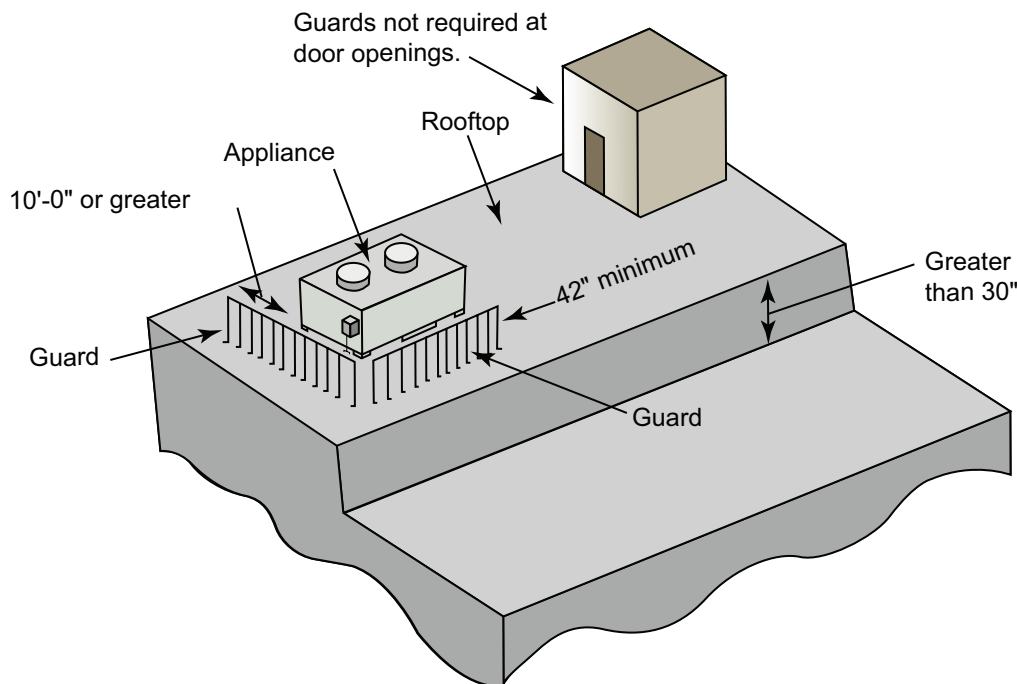


FIGURE 3-6 Guards required (elevation).

EQUIPMENT AND APPLIANCE ACCESS

Equipment and appliances, such as air-conditioning condensers, air handlers, controls devices, heat exchangers and other system components, must be accessible for inspection, service, repair and replacement. A level working space not less than 30 inches deep and 30 inches wide shall be provided in front of the control side to service an appliance (Figure 3-7). [Ref. IMC 306.1 & IFGC 306.1]

You Should Know

The purpose of this section is to protect the safety of service personnel while they are maintaining or replacing equipment. •

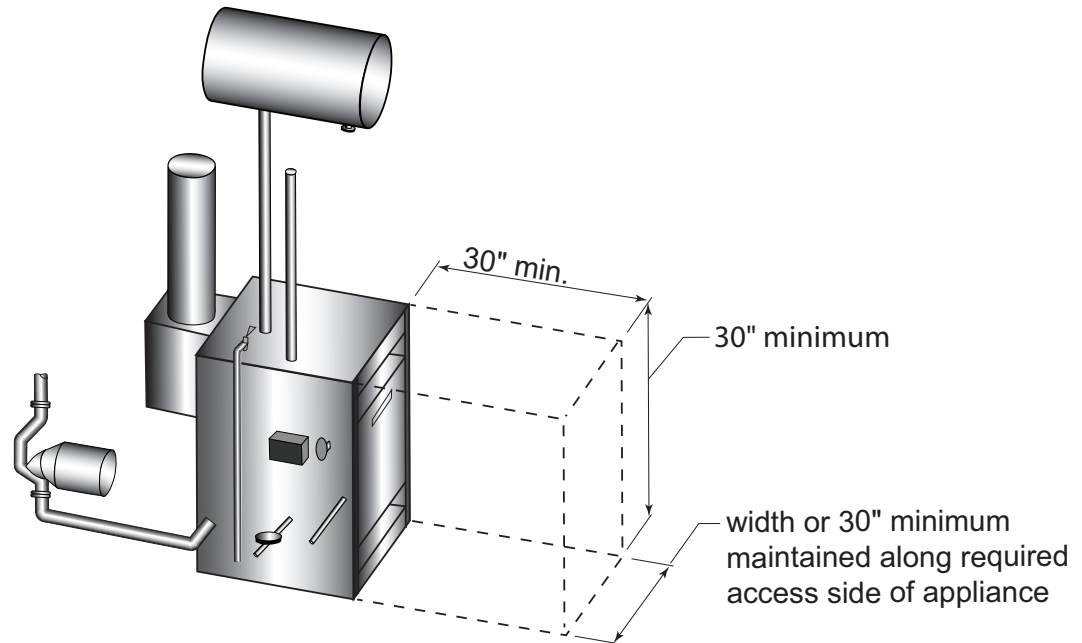


FIGURE 3-7 Appliance access.

Rooms with mechanical appliances must also be provided with minimum dimensions to access the appliances. Rooms will be provided with a door and an unobstructed passage-way measuring not less than 36 inches wide and 80 inches high. **[Ref. IMC 306.2, IFGC 306.2, IRC M1305]**

When appliances are installed in attic spaces, there is typically an access opening and not much room to approach the appliance to repair, replace or provide maintenance. A clear access opening dimensions must be not less than 30 inches by 22 inches, and large enough to allow removal of the largest appliance. The passageway cannot be less than 30 inches high and 22 inches wide and not more than 20 feet in length measured along the centerline of the passageway from the opening to the appliance. For example, consider accessing an appliance in an attic as indicated in Figure 3-8.

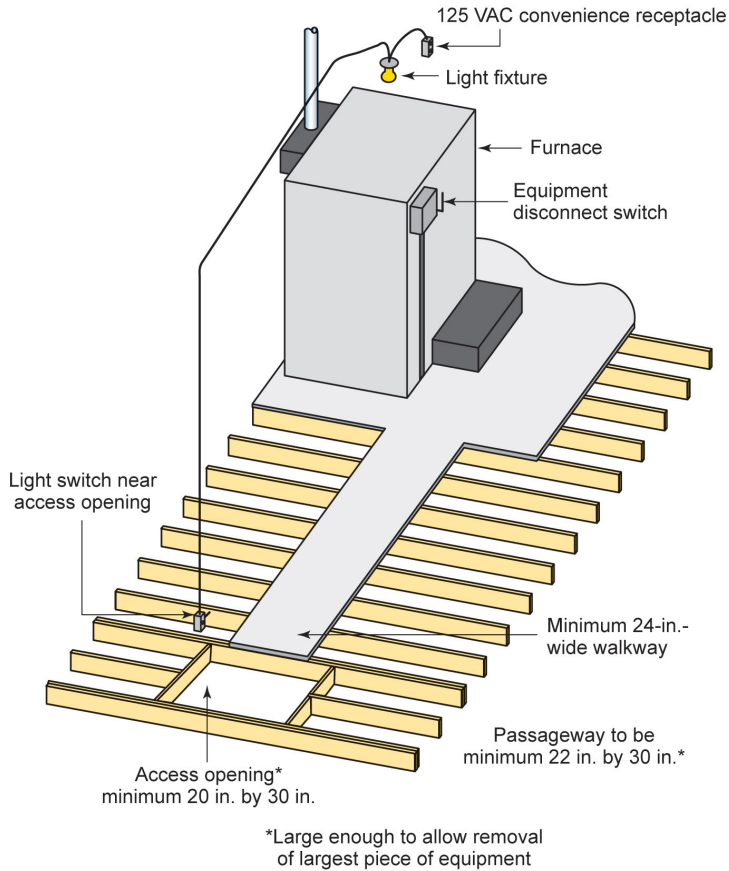


FIGURE 3-8 Appliance attic access.

It is very common that HVAC equipment and appliances will be designed and installed on flat building rooftops. Access to these appliances can usually be provided by means of a portable extension ladder where building heights are low (Figure 3-9).



FIGURE 3-9 Condensing unit on rooftop.