

Type 7 Fire Engine Slip-On Only Specification

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Record of Revisions

<u>Date</u>	<u>Revision Summary</u>
February 2010	<ul style="list-style-type: none">• Initial Release
February 2011	<ul style="list-style-type: none">• Revision
April 2015	<ul style="list-style-type: none">• Added Table of Contents• Added Record of Revisions since February 2011• Specified material for fuel tank• Specified location of control panel• Revised warranty requirement to ten years
February 2016	<ul style="list-style-type: none">• Updated Format• Added Electronic Liquid Level Gauge for water and foam (if equipped)• Removed sight gauge requirement• Added “minimum” to the pump to tank plumbing diameter• Added requirement for FS approved spark arrestor certification• Amended maximum length dimension to 78 inches• Modified wording for fill tower hinge placement• Moved “Information Plates and Labels” into separate heading• Amended low pressure shut-down switch to conform with manufacturer's specifications• Added option of either a 30-0-300 (minimum) or 30-0-400 gauge.
Future Revisions	<ul style="list-style-type: none">• Added 4-digit equipment number• Additional revisions to be added here

1 — General

1.1 General Statement

1.1.1 The self-contained slip-on firefighting unit shall consist of a water storage tank, auxiliary engine-driven centrifugal pump, fuel cell, hose reel and control panel. The slip-on shall be mounted to a utility, platform or pickup bed. A canvas cover shall be included to fit the entire unit. Water tank capacity and optional foam proportioner shall be as-specified by the procuring activity.

1.2 Chassis Requirements

1.2.1 Minimum chassis Gross Vehicle Weight Requirement:

1.2.1.1 50 gallon slip-on unit: 9,700 pounds gross vehicle weight requirement

1.2.1.2 125 gallon slip-on unit: 12,000 pounds gross vehicle weight requirement

2 — Slip-On Unit

2.1 Firefighting Unit Specification

2.1.1 The following specifications are for a complete slip-on firefighting unit. The entire slip-on unit shall be mounted on a square aluminum tubular frame that supports the water storage tank and platform, and accommodates forklift blades or has integral lifting points. The slip-on unit shall have maximum dimensions of 78 inches long by 48 inches wide \pm 0.25 inches.

2.2 Components

2.2.1 All fasteners and adjustable plumbing brackets used shall be stainless steel. All tubing shall use metal fittings, rated to 500 pounds per square inch and requiring no special tools. No underside nuts or bolts shall be used. Non-slit corrugated loom shall cover all water and foam auxiliary lines.

2.3 Pump and Plumbing

2.3.1 The following pump, plumbing, controls, gauges, and accessories shall be provided as indicated. The plumbing requirements outlined below shall be considered a minimum standard, and shall be followed by the apparatus manufacturer without exception:

2.3.2 All plumbing components shall be fabricated from galvanized steel with full-flow quarter turn ball valves. Drop-out valves are not required. Apparatus manufacturer's option shall include stainless steel or brass plumbing, and drop-out valves. If slip-on unit is equipped with a foam proportioner the plumbing shall be stainless steel or brass.

2.4 Valve Labeling

2.4.1 Valves shall be labeled as outlined under "Valve Numbering System" in NWCG (National Wildfire Coordinating Group) Fire Equipment Working Team's "Water Handling Equipment Guide," latest edition. This labeling shall be accomplished through the use of identification tags. The tags shall be self-adhesive, and shall be installed on the pump control panel. The tags shall be placed adjacent to the components in such a way as to clearly distinguish the item that they are identifying. Valves shall be labeled with valve number and description as follows:

Label	Description
#1	Tank to Pump
#2	Pump to Tank
#3	Discharge
#4	Hose Reel
#6	Hand Primer
#8	Suction

2.5 Booster Hose Reel

- 2.5.1 One booster hose reel, with a capacity of 100 feet of NFES 1220 hose (1-inch NPSH couplings, ¾-inch inside diameter) or 100 feet of 1-inch inside diameter REELTEX®, shall be provided and mounted on the frame. The reel shall be compatible with REELTEX® hose. Chrome outriggers, spools and roller assemblies shall be installed on both sides of the reel (driver and passenger sides).
- 2.5.2 The reel shall be provided with a 12-volt electric rewind and brake.

2.6 Pump

- 2.6.1 An auxiliary air-cooled engine-driven centrifugal pump powered by a 4-cycle California Air Resources Board (CARB) compliant electric start engine with backup recoil starter shall be provided and fixed mounted.
- 2.6.2 The pump unit shall be equipped with a low pressure shutdown switch set at manufacturer's recommended safe pressure; a USFS-qualified spark arrestor; and a two gallon; minimum 10 gauge aluminum fuel cell. The fuel cell may be integrated with engine or stand-alone.

2.7 Pump Specifications

- 2.7.1 The pump shall be capable of delivering the minimum performance requirements from the tank, and at a 5 foot lift through 24 feet of 1½-inch suction hose and a suction strainer.
- 2.7.2 Minimum pump performance:
- 30 gallons per minute at 150 pounds per square inch discharge pressure
 - 50 gallons per minute at 100 pounds per square inch discharge pressure
 - 200 pounds per square inch minimum shutoff pressure

2.8 Primer

- 2.8.1 The slip-on unit shall be equipped with either a manual hand diaphragm primer, or an exhaust primer or an electric primer. The primer shall be connected to the intake-side of the pump and shall be equipped with an internal or external check valve. The primer shall develop 17 inches of HG vacuum, prime and pump water from a 10 foot lift in 30 seconds maximum and prime and pump water from a 17 foot lift.

2.9 Pump Discharge and Intake Plumbing

- 2.9.1 The nominal sizes of the plumbing supplying the pump and discharges shall be as follows:
- Overboard suction — 1½-inch NH

- Discharge — 1½-inch NH
- Hose reel — 1-inch NPSH

2.9.2 The tank to pump line shall be 1½-inch. The pump to tank line shall be minimum of 1-inch. The pump intake shall be equipped with a Y strainer or a debris strainer at the #8 Overboard Suction valve. The pump shall have flexible intake and discharge connections. No humps are permitted in the suction plumbing. The pump pressure discharge gauge connection shall be located prior to any check valve. Check valves shall be installed on all pump discharges. A ½-inch pump cooler line shall be installed and plumbed to the tank fill [Link: see Figure 1](#)

2.9.3 The pump shall have a drain, labeled #11, at the bottom of the pump volute that will fully drain the pump. All plumbing, including the pump, shall be capable of being drained for winterization by opening all valves, including the pump volute drain valve.

2.9.4 All visible quarter turn ball valves shall be in the closed position when the valve handle is perpendicular to the run of the pipe and in the open position when the handle is parallel to the run of the pipe. Blind valves shall be labeled “open” and “closed.”

2.10 Control Panel

2.10.1 A brushed stainless steel control panel shall be provided and located side-facing on the passenger's side. The panel shall be appropriately sized with the controls positioned in a methodical, user-friendly format. The panel shall have an extended top to assist in weather protection and to house the panel light.

2.10.2 The control panel shall be equipped with the following minimum features:

- Panel light
- Electronic Liquid Level Gauge for water and foam (if equipped)
- Hour meter
- Ignition/start/stop switches
- Throttle, twist type
- Choke
- Pressure gauge: 30-0-300 P.S.I. (minimum) or 30-0-400 P.S.I., Grade B, 2½-inch minimum, freeze protected, liquid-filled (internal vibration-damped) gauge, with drain and test gauge connection installed at connection to gauge
- Primer (not required if equipped with an exhaust primer)
- Low pressure shut down switch
- Foam proportioner controls (if equipped)

2.10.3 All controls shall be accessible from the ground without climbing onto the utility, platform or pickup bed.

2.11 Information Plates and Labels

2.11.1 The following information plates/labels, shall be permanently affixed to the unit:

2.11.1.1 Operating instructions [Link: see Figure 2](#)

2.11.1.2 Pump performance

2.11.1.3 General information: 1) center of gravity location with water, 2) weight of unit with and without water, and 3) safety considerations

2.12 Hose Storage

2.12.1 An aluminum diamond plate or poly compartment or tray shall be provided on the slip-on unit. The compartment or tray shall accommodate 200 feet of 1-inch synthetic hose, a 1-inch shutoff valve (NFES 1201) and a 1-inch combination nozzle (NFES 1081). The compartment or tray shall allow the hose to be pre-connected to the #3 discharge.

3 — Option: Foam Proportioning System

3.1 Foam Proportioning System

- 3.1.1 The pump system shall be provided with an automatic regulating proportioner capable of proportioning Class A foam concentrate from 0.1 to 1% into the discharge-side of the pump. The system shall have a 5 gallon foam capacity. The system controls shall have a positive “off” position to prevent foam flow when foam is not desired. The foam proportioning system shall be equipped and installed so foam solution cannot return to, or reach, the water storage tank or water supply.

4 — Water Tank

4.1 Water Tank Fabrication

4.1.1 The water tank shall be fabricated from non-corrosive stress relieved polypropylene, U.V. stabilized for maximum protection. Materials used shall be compatible with firefighting foams, retardants and wetting agents.

4.2 Tank Independent of the Platform Structure

4.2.1 The tank shall be designed to be completely independent of the platform structure. All joints and seams shall be nitrogen-welded inside and out. All exposed edges on the tank and fill tower shall be rounded off to a ¼-inch radius.

4.3 Manual Fill Tower

4.3.1 The tank shall have a manual fill tower, with a debris strainer, located on the rear top of the tank on the passenger's side. The fill tower cap shall be provided with hinges placed on the cab side. The fill tower shall be constructed of same material as the rest of the tank and shall have a minimum dimension of 4 inches by 4 inches outer perimeter. The water tank shall be vented with 0.5 square inch minimum and meet the baffling requirements of NFPA 1906, latest edition.

4.4 Tank Capacity

4.4.1 The water tank shall have a usable capacity of 50 gallons or 125 gallons.

5 — Apparatus Finish and Color

5.1 Painted Surfaces and Finish

- 5.1.1 Contractor-painted surfaces shall be cleaned, primed and painted to match the vehicle on which the slip-on unit is mounted.
- 5.1.2 The apparatus manufacturer shall install the 4-digit equipment number on the control panel. The equipment number shall be provided by the government.

6 — Manuals and Drawings

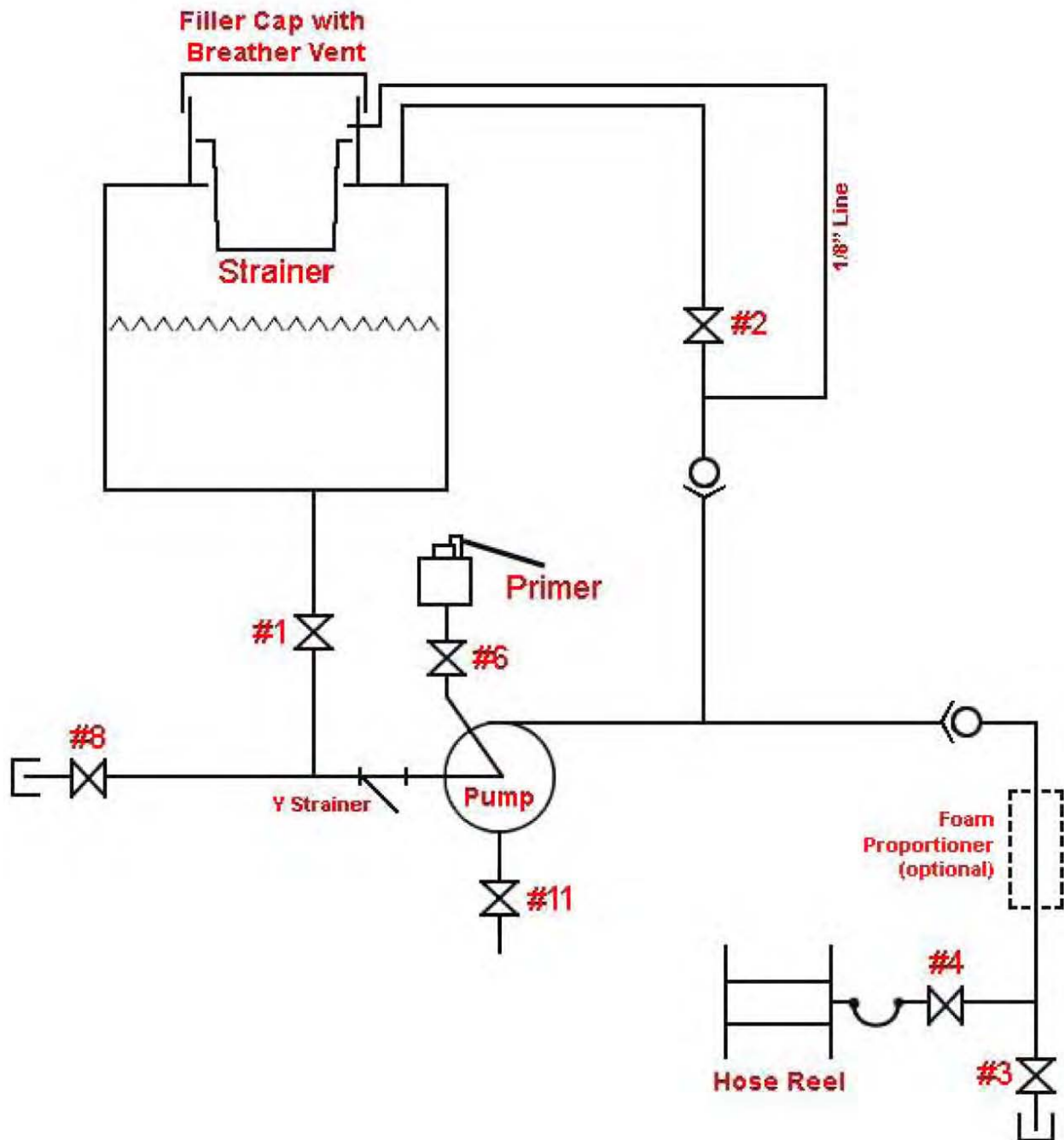
6.1 The following specified materials shall be provided with the completed slip-on unit:

6.1.1 One manufacturer's operation and service manual, to include:

- Manufacturer's Record of Construction
- Warranty Registration and Information
- Operator Safety Information
- Pump Operation and Troubleshooting Instructions
- Foam System Operation Instruction
- Component Literature (i.e.: hose reel, etc.)
- Pump Test Certificate, Weight Certificate, Service Parts Replacement List
- Forest Service Spark Arrestor Certification

7 — Plumbing Schematic

Figure 1
Plumbing Schematic, Type 7 Slip-on Unit



8 — Operating Instruction Plate

Figure 2
 Operating Instruction Plate

Operating Instructions							O - Open
							X - Close
Valve Number	1	2	3	4	6	8	
Tank to Fire	O	X	O	O	X	X	
Suction to Fire	X	X	O	O	X	O	
Suction to Tank	X	O	X	X	X	O	
Drain Plumbing	X	O	O	O	O	O	
Drain Tank and Plumbing	O	O	O	O	O	O	
To Drain Pump, Open Valve No. 11							
To Prime, Set Valves for Suction to Fire, or Suction to Tank, Open No. 6 and Operate Primer. Close No. 6 when Primed.							

9 — Warranty Provisions

9.1 Ten Year Apparatus Warranty

9.1.1 All materials and workmanship herein specified, including all equipment furnished, shall be guaranteed for a period of ten years after the acceptance date of the apparatus, unless otherwise noted, with the exception of any normal maintenance services or adjustments which shall be required.

9.1.2 Under this warranty, the apparatus manufacturer shall be responsible for the costs of repairs to the apparatus that have been caused by defective workmanship or materials during this period.

9.1.3 This warranty shall not apply to the following:

- Failures resulting from the apparatus being operated in a manner, or for a purpose not recommended by the apparatus manufacturer.
- Loss of time or use of the apparatus, inconvenience, or other incidental expenses.
- Any apparatus which has been repaired or altered outside of the apparatus manufacturer's factory in any way that affects its stability, or which has been subject to misuse, negligence, or accident.

9.2 Water Tank Warranty

9.2.1 The polypropylene water tank that is specified to be supplied with this slip-on unit shall be warranted by the water tank manufacturer for a "lifetime" period from the date that the slip-on is put into service. The manufacturer shall repair, at no cost to the purchaser, any problems caused by defective materials and/or workmanship. The warranty shall cover the reasonable costs of removing the water tank from the apparatus and reinstalling it after the completion of the covered warranty repairs, but shall not cover any liability for the loss of service or downtime costs.