

# NATIONAL WILDFIRE COORDINATING GROUP

## EQUIPPING FIRE APPARATUS FOR USE IN THE WILDLAND/URBAN INTERFACE

### 1. SCOPE

1.1 Scope. This document identifies equipment and appliances, as well as training for personnel, for safe and effective cooperative operations of wildland and structural apparatus in the wildland/urban interface environment.

### 2. PUBLICATIONS

#### 2.1 Publications.

##### NWCG Publication

The following are reference documents:

S-130 - Firefighter Training  
S-190 - Introduction to Wildland Fire Behavior  
I-200 - Basic ICS  
S-205 - Fire Operations in the Urban Interface  
S-212 - Wildfire Power saws  
310-1 - NWCG Training and Qualifications System  
410-1 - Fireline Handbook  
416 - Standards for Survival

NWCG Training Publications and Full Courses are available from the National Interagency Fire Center, Great Basin Cache Supply Office, 3833 S. Development Ave., Boise, ID 83705. For a Catalog order NFES #3362.

##### NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

1901 - Fire Apparatus  
1906 - Wildland Fire Apparatus  
1963 - Fire Hose Connections  
1971 - Protective Clothing for Structural Firefighting  
1977 - Protective Clothing and Equipment for Wildland Fire Fighting

NFPA documents are available from NFPA, One Batterymarch Park, PO Box 9101, Quincy, MA 02269-9101.

2.2 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supercedes applicable laws and regulations unless a specific exemption has been obtained.

2.3 Paragraphs with an asterisk (\*) have explanatory information in section 4.

### 3. REQUIREMENTS

3.1 Engine classification. The NWCG Fireline Handbook, 410-1 has a classification system that types structure and wildland fire engines as well as water tenders

#### 3.2 Vehicle.

3.2.1 General. All fire apparatus shall conform to the laws and regulations of the United States and the authority having jurisdiction. Fire apparatus should conform to the applicable NFPA (1901 and 1906) purchasing and operations standards and NWCG member agency requirements. All vehicles should be reviewed periodically to evaluate their status in comparison to the updates in vehicle regulations and standards, and modifications made as necessary.

3.2.2 Safety. As a minimum the fire apparatus is required to have the following:

- Baffled water tank.
- Seatbelts for all personnel.

In addition, it is recommended that the apparatus have the following:

- Enclosed cab.
- Backup alarm.
- DOT emergency kit with reflective triangles, flares, fire extinguisher.
- First aid kit.
- No equipment in cab or all secured.
- Mirrors on both sides usable by driver.
- Spare tire.
- At least one scene work light.
- 360° reflective markings.
- Pull points clearly marked.

3.2.2.1\* Emergency vehicles. Fire apparatus requesting right-of-way on public roads shall be equipped with state compliant emergency warning lights and audible warning devices.

3.2.3\* GVWR. The vehicle shall not be operated above the manufacturer's gross vehicle weight rating (GVWR) fully loaded, including fuel, water, personnel, and equipment.

3.2.4\* Ground clearance. Due to the road conditions found in interface situations, it is recommended that only vehicles with high ground clearance and steep approach and departure angles be utilized. It is recommended that vehicles have a minimum approach/departure angles of 20°, a minimum axle clearance of 8", and a minimum ground clearance of 12".

3.3\* Equipment. In order to be more effective and enable various vehicles to work together, fire apparatus being utilized in an interface fire should consider carrying the following equipment, as part of their normal complement of tools:

- 2-1/2" NH x 1-1/2" NH (female-male) hydrant adapter.
- 2" NPSH x 1-1/2" NH (female-male) adapter.
- 1-1/2" NH x 1-1/2" NH double female.
- 1-1/2" NH x 1-1/2" NH double male.
- 1-1/2" NH x 1" NPSH (female-male) reducer.
- 1" NPSH x 1-1/2" NH (female-male) increaser.
- 1" NH x 1" NPSH (female-male) thread adapter.
- 1" NPSH x 1" NH (female-male) thread adapter.
- 1-1/2" NH x 1-1/2" NH x 1-1/2" NH gated wye.
- Hydrant wrench, adjustable.
- 1-1/2" - 2-1/2" Spanner wrench with gas shut-off slots.
- Bolt cutters (18" minimum).
- Wildland handtool per crew member.
- Class "A" foam capable
- Hose clamp for 1" and 1-1/2" hose.
- 1-1/2" nozzle to fit 1-1/2" hose.
- Draft hose.
- Strainer/foot valve for draft hose.
- Chainsaw, kit & fuel.
- Hose and ladder requirements should be based on current NWCG Engine Typing.

3.4\* Personal protective equipment (PPE). All firefighters shall be equipped with personal protective clothing that meets the performance characteristics of NFPA 1977. This includes a fire resistant shirt and pants or coveralls, helmet, eye protection, heavy-duty leather gloves, 8" tall laceup leather boots, and a fire shelter for each person. Wildland firefighting may involve long periods away from the apparatus and it is recommended that each person have a backpack for personal equipment and at least 2 quarts of drinking water.

3.5 Communications. At an interface incident, communications is critical for coordinating multiple agency response, as well as the safety of all personnel. It is recommended that as a minimum, each apparatus be equipped with a two-way radio with local mutual aid frequencies. The FCC has set aside the following frequencies as national Fire Mutual Aid frequencies: 154.265 (red), 154.280 (white), and 154.295 (blue).

3.6 Training. NWCG offers numerous training course on wildland operations, see the NWCG course catalog for more details. Refer to 310-1, NWCG Training and Qualification System or equivalent.

3.7 Staffing. The Engine Typing Standard in 410-1, NWCG Fireline Handbook identifies minimum staffing standards for each engine type.

#### 4. NOTES

This document is intended to provide an equipment guide to federal, state, local and private firefighting organizations. This allows for effective integration of all fire suppression resources.

A3.2.3. NFPA 1906 (1995 revision, paragraph A-3-2.1) recommends operating vehicles at less than the GVWR when intended for off-road use. Operating fully loaded engines off-road adversely impacts handling and braking, increases maintenance, and shortens the life of the vehicle.

A3.2.4 Incidents have occurred where vehicles with low-ground clearance have become high-centered while attempting to traverse unimproved roads. This occurrence can block access and exit of others.

A3.3 The equipment listed in 3.3 is primarily intended so that wildland and structure apparatus can physically connect to each other and support each other in interface operations. NFPA 1963 is the national standard for fire hose threads and connections, which use the designation "NH". Numerous other thread forms can be found throughout the country, the next most common is the national pipe thread, designated "NPSH". If the area from which the vehicle works commonly uses thread forms other than NH, it is recommended that thread adapters be carried, IN ADDITION to the ones listed by this document, to allow connection to NH threads. For example, the federal wildland firefighting agencies have standardized with NH thread except for 1" connections, which are commonly NPSH connections.

A3.4 An interface fire is a wildland fire in an area that has houses and other man-made structures intermixed with wildland fuels. Wildland firefighting often involves extended operation in elevated temperatures that make structural bunker gear impractical. The PPE described by NFPA 1977 was specifically designed for wildland firefighting. NWCG Publications Catalog, NFES 3362, lists other available firefighter safety publications.

## Engine and Water Tender Resource Types

### Minimum Requirements

#### Engine Types

Components	STRUCTURE ENGINES		WILDLAND ENGINES				
	1	2	3	4	5	6	7
<b>Pump Rating</b>							
minimum flow (gpm)	1000+	250+	150	50	50	30	10
at rated pressure (psi)	150	150	250	100	100	100	100
<b>Tank Capacity Range (gal)</b>	400+	400+	500+	750+	400-750	150-400	50-200
<b>Hose (feet)</b>							
2.1/2 inch	1200	1000	-	-	-	-	-
1.1/2 inch	400	500	500	300	300	300	-
1 inch	-	-	500	300	300	300	200
<b>Ladders</b>	48'	48'	-	-	-	-	-
<b>Master Stream (GPM)</b>	500	-	-	-	-	-	-
<b>Personnel (minimum)</b>	4	3	2	2	2	2	2

**Common additional needs. Request as needed.**

All wheel drive

Pump & Roll

High pressure pump (minimum 40 gpm @ 250 psi)

Class A Foam Proportioner

Compressed air foam system (CAFS) with minimum 40 cfm compressor.

Additional personnel

#### Water Tender Types

Components	Water Tender Types		
	1	2	3
Tank Capacity (gallons)	5000+	2500+	1000+
Pump Capacity (GPM)*	300+	200+	200+
Off Load Capacity (GPM)	300+	200+	200+
Max. Refill Time (minutes)	30	20	15

\* Portable pump acceptable.