

Chapter 14 Firefighting Equipment

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Introduction

The agency wildland fire program equipment resources include engines, dozers, water tenders, and other motorized equipment for fire operations.

Policy

Each state/region will comply with established standards for training, equipment, communications, organization, and operating procedures required to effectively perform arduous duties in multi-agency environments and various geographic areas.

Approved foam concentrate may be used to improve the efficiency of water, except near waterways where accidental spillage or over spray of the chemical could be harmful to the aquatic ecosystem, or other identified resource concerns.

Firefighting Engines

Operational Procedures

All engines will be equipped, operated, and maintained within guidelines established by the Department of Transportation (DOT), regional/state/local operating plans, and procedures outlined in *BLM Manual H-9216, Fire Equipment and Supply Management*, or agency equivalent. All personnel assigned to agency fire engines will meet all gear weight, cube, and manifest requirements specified in the *National Mobilization Guide*.

Fire Engine Staffing

An ENGB will be with every engine, and the minimum staffing is two individuals for Type 4, 5, 6, 7, engines.

For Type 3, engines, minimum staffing is three individuals, including an Engine Boss.

- **BLM - Fire Engine Staffing**
 - For BLM engine staffing requirements see Chapter 2.
- **FWS - Fire Engine Staffing**
 - Minimum staffing for Type, 6 and 7 engines (on Refuge lands) is one ENOP and one FFT2. A minimum of one ICT5 must be available on the engine crew.
- **NPS - Fire Engine Staffing**
 - For NPS engine staffing requirements see Chapter 3.
- **FS - A Single Resource Boss may supervise a type 6 or 7 engine.**

1 Engine Typing

2 Engine Typing and respective standards are identified in the *NWCG Fireline Handbook, 410-1*.

- 3
4 • *FS - See <http://www.fs.fed.us/fire/equipment/engine-models/models.html> for description of Forest Service national engine standards.*

6

7 Driving Standard

8 Refer to driving standards in Chapter 07.

9

10 Engine Water Reserve

11 Engine Operators will maintain at least 10 percent of the pumpable capacity of the water tank for emergency engine protection and drafting.

13

14 Chocks

15 At least one set of wheel chocks will be carried on each engine and will be properly utilized whenever the engine is parked or left unattended. This includes engine operation in a stationary mode without a driver "in place."

18

19 Fire Extinguisher

20 All engines will have at least one 5 lb. ABC rated (minimum) fire extinguisher, either in full view or in a clearly marked compartment.

22

23 Nonskid Surfaces

24 All surfaces will comply with National Fire Protection Association (*NFPA*) 1906 *Standard for Wildland Fire Apparatus* requirements.

26

27 First Aid Kit

28 Each engine shall carry, in a clearly marked compartment, a fully equipped 10-person first aid kit.

30

31 Gross Vehicle Weight (GVW)

32 Each engine will have an annually certified weight slip in the vehicle at all times. Weight slip will show individual axle weights and total GVW. Operators of engines and water tenders must ensure that the maximum certified GVW is never exceeded, including gear, personnel and fuel. The NFPA 1906 standard of 250 pounds for each person and their personal gear will be used to calculate the loaded weight.

- 38 • *FS - Refer to FSH 7109.19, Chapter 30 for calculation of Rough Road Factor reduction for driving on rough or unsurfaced roads.*

- 40 • *NPS - A copy of the annual certified weight slip must be sent to the Fire Equipment and Facilities Specialist at the FMPC in Boise prior to the vehicle being put into service each season.*

43

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1 Speed Limits

2 Posted speed limits will not be exceeded.

3

4 Lighting

5 Headlights and taillights shall remain illuminated at all times while the vehicle is
6 in motion. All new orders for fire engine apparatus will include an overhead
7 lighting package in accordance with agency standards. Lighting packages will
8 meet NFPA 1906 standards (6.8, 2006 edition). Engines currently in service
9 may be equipped with overhead lighting packages. A red, white, and amber
10 combination is the accepted color scheme for fire. Lighting packages containing
11 blue lights are reserved for law enforcement and are not allowed on fire
12 vehicles.

13

14 Emergency Light Use

15 Emergency lighting will be used only during on site wildland fire operations or
16 to mitigate serious safety hazards. Overhead lighting and other emergency
17 lighting must meet state code requirements, and will be illuminated whenever
18 the visibility is reduced to less than 300 feet.

- 19 • *BLM - Emergency lighting may be used during a response to an incident or*
20 *to mitigate serious safety hazards. If emergency lighting is to be used it*
21 *must be approved by State Director and meet all state and local emergency*
22 *services training and certification requirements. Overhead lighting and*
23 *other emergency lighting must meet state code requirements.*

- 24 • *FS - See FSM 5120 and 5135 for red lights and siren policy.*

25

26 Fuel Use, Storage and Transportation

27 Guidance and direction for the use, storage, and transportation of fuel can be
28 found in the interagency interim policy *Interagency Transportation Guide for*
29 *Gasoline, Mixed Gas, Drip Torch Fuel, and Diesel* at:
30 <http://www.fs.fed.us/t-d/fueltran/> (Use t-d as user and password logins)

31

32 Fire Engine Maintenance Procedure and Record

33 Apparatus safety and operational inspections will be accomplished either on a
34 post-fire or daily basis. Offices are required to document these inspections.
35 Periodic maintenance (as required by the manufacturer) shall be performed at
36 the intervals recommended and properly documented. All annual inspections
37 will include a pump gallons per minute (GPM) test to ensure the pump/plumbing
38 system is operating at desired specifications.

39

40 Engine Inventories

41 An inventory of supplies and equipment carried on each vehicle is required to
42 maintain accountability and to obtain replacement items lost or damaged on
43 incidents. The standard inventory for engines is found in Appendix R

44

45

1 **Water Tenders**

2

3 **Water Tender Staffing Standards**

4

5 **Water Tender Non-Tactical**

- 6 • **Qualifications:** CDL (tank endorsement).
- 7 • **Staffing:** A water tender (Support) may be staffed with a crew of one
8 driver/operator when it is used in a support role as a fire engine refill unit or
9 for dust abatement. These operators do not have to pass the Work Capacity
10 Test (WCT) but are required to take annual refresher training.

11

12 **Water Tender Tactical**

13 Tactical use is defined as “direct fire suppression missions such as pumping
14 hoselays, live reel use, running attack, and use of spray bars and monitors to
15 suppress fires.”

- 16 • **Qualifications:** ENOP, CDL (tank endorsement)
- 17 • **Staffing:** Tactical water tenders will carry a minimum crew of two:
 - 18 • One ENOP
 - 19 • One Engine Module Member

20

21 **Dozers/Tractor Plows**

22

23 **Dozer/Tractor Plow Training and Qualifications**

24 Agency personnel assigned as dozer/tractor plow operators will meet the
25 training standards for a Firefighter 2 (FFT2). This includes all safety and annual
26 refresher training. While on fire assignments, all operators and support crew
27 will meet PPE requirements including the use of aramid fiber clothing, hard
28 hats, fire shelters, boots, etc.

29

30 **Dozer/Tractor Plow Physical Fitness Standards**

- 31 • **BLM** - *All employee dozer/tractor plow operators will meet the WCT*
32 *requirements at the Moderate level before accepting fire assignments.*
- 33 • **FWS** - *See the Fire Management Handbook*
- 34 • **FS** - *FS dozer operators refer to 5134.32.*

35

36 **Dozer/Tractor Plow Operational Procedures**

- 37 • Agency owned and operated dozer/tractor plows will be equipped with
38 programmable two-way radios, configured to allow the operator to monitor
39 radio traffic.
- 40 • Agency dozer/tractor plows with non-red carded operators and all contract
41 dozer/tractor plows will have agency supplied supervision when assigned to
42 any suppression operations.
- 43 • Contract or offer-for-hire dozers must also be provided with radio
44 communications, either through a qualified dozer/tractor plow boss or an

- 1 agency-supplied radio. Contract dozer/tractor plows will meet the
2 specifications identified in their agreement/contract.
- 3 ● Operators of dozer/tractor plows and transport equipment will meet DOT
4 certifications and requirements regarding the use and movement of heavy
5 equipment, including driving limitations, CDL requirements, and pilot car
6 use.

7

8 **All Terrain Vehicles (ATV)/Utility-Terrain Vehicles (UTV)**

9 The operation of ATV/UTV can be high risk and their use needs to be evaluated
10 to determine if it is essential to accomplish the mission and not as a matter of
11 convenience.

12

13 Because of the high risk nature, agencies have developed specific operational
14 policy (refer to current agency policy). Common policy requirements for
15 wildland fire operations are highlighted below:

- 16 ● Specific authorization for ATV/UTV use is required.
- 17 ● All personnel authorized to operate an ATV/UTV must first complete
18 agency specific or manufacturers training in safe operating procedures and
19 appropriate PPE.
- 20 ● Re-evaluation/Re-certification - Operators shall be re-evaluated every three
21 years. Infrequent users (less than 16 hours of riding a year) shall have a
22 check ride prior to scheduled use of an ATV/UTV.

23

24 **Required PPE includes:**

- 25 ● ATV Helmet - For ATV use, helmets must meet DOT or Snell M2005
26 certification. ATV Helmet - Helmets meeting DOT, ANSI-90, or SNELL
27 M-95 are required.
- 28 ● ATV/Fire Helmet - For wildland firefighters on fire line duty, helmets must
29 meet Snell SA2005 certification. Helmets worn by wildland firefighters on
30 fire line duty must be lined by Nomex©/Aramid type fire-resistant material.
- 31 ● Use of half "shorty" helmets require a JHA/RA for fireline use and must
32 include justification for its use. Refer to MTDC Tech Tip publication, A
33 Helmet for ATV Operators with Fireline Duties (0651-2350-MTDC).
- 34 ● UTV Head Protection - Helmets must meet DOT or Snell M-2005 unless:
35 UTV Head Protection - Helmets meeting DOT, ANSI-90, or SNELL M-95
36 approved are required unless:
- 37 ● Approved ROPS Cab/brush cage is permanently installed on the vehicle
38 then a hard hat meeting NFPA 1977 and ANSI Z 89.1 standards may be
39 worn with chin straps secured in place under chin.
- 40 ● *BLM - UTV is equipped with Roll over protection system (ROPS) and is*
41 *operated on moderate terrain at moderate speeds then a hard hat meeting*
42 *NFPA 1977 and ANSI Z 89.1 standards may be worn with chin straps*
43 *secured in place under chin.*

- 1 ● **BLM** - *Administrative use (low speeds on smooth travel surfaces), e.g.*
2 *campgrounds, base camps; UTV operators are not required to wear hard*
3 *hats or a helmet.*
- 4 ● **NPS** - *Approved helmets are required for UTV operations that are rated*
5 *moderate (amber) or high (red) using the "ORV Risk Assessment Tool"*
6 *included in the NPS Off-Highway Vehicle Policy*
- 7 ● Eye protection (goggles, face shield, or safety glasses) based upon JHA/RA.
- 8 ● Leather gloves
- 9 ● Yellow aramid shirt
- 10 ● Aramid trousers
- 11 ● Wildland fire boots
- 12 ● ATV/UTV operator shall carry a personal communication device (e.g. two-
13 way radio, cellular phone, or satellite phone).
- 14 ● ATV - do not carry passengers on ATVs.
- 15 ● UTV - carry no more passengers in a UTV than the number of seats
16 installed by the manufacturer. The operator and each passenger must have
17 their own seatbelt and it must be fastened at all times when the vehicle is in
18 motion.
- 19 ● Loads shall be mounted and secured as to not affect the vehicle's center of
20 gravity. See agency specific policy for hauling liquid cargo.
- 21 ● Load weights shall not exceed manufacturer's recommendations.
- 22 ● ATV/UTV loading and transport - see agency specific policy.
- 23 ● A JHA/RA must be completed and approved by the supervisor prior to
24 vehicle operation.
- 25 ● **BLM** - *Refer to BLM Manual 1112-1, Chapter 27 Off-Highway Vehicles.*
26 *<http://web.blm.gov/internal/wo-700/wo740/policy.html>*
- 27 ● **FS** - *Refer to FSH6709.11*
- 28 ● **FWS** - *Use of hardhats requires a JHA for fireline use and must have*
29 *Project Leader approval and include justification for its use. Refer to*
30 *MTDC Tech Tip publication, A Helmet for ATV Operators with Fireline*
31 *Duties (0651-2350-MTDC). Exceptions to the above stated policy should*
32 *only be used in rare instances. Motorcycle helmets will be used for all*
33 *loading and unloading operations.*
- 34 ● **NPS** - *Refer to Reference Manual 50B Occupational Health and Safety,*
35 *Section 6.1 Off-Highway Vehicle Safety*
36 *<http://inside.nps.gov/waso/custommenu.cfm?lv=2&prg=46&id=5898>.*

37 38 **Vehicle Cleaning/Noxious Weed Prevention**

39 To reduce the transport, introduction, and establishment of noxious weeds or
40 other biological contaminants on the landscape due to fire suppression activities,
41 fire suppression and support vehicles should be cleaned at a designated area
42 prior to arriving and leaving the incident. Onsite fire equipment should be used
43 to thoroughly clean the undercarriage, fender wells, tires, radiator, and exterior

1 of the vehicle. The cleaning area should also be clearly marked to identify the
2 area for post fire control treatments, as needed.

3

4 **Fire Remote Automated Weather Stations**

5 Fire Remote Automated Weather Stations (FRAWS) are portable weather
6 stations that pack up into a single container and may be utilized in any location
7 to monitor local weather conditions. FRAWS are intended for use on or near the
8 fireline and are rapidly relocated to points desired by Fire Behavior Analyst
9 (FBAN) for real time weather data.

10

11 National resource FRAWS systems are cached at the National Interagency Fire
12 Center (NIFC) and may be ordered through standard equipment resource
13 ordering systems. Maintenance and recalibration of these stations must be
14 coordinated with the NIFC Remote Sensing/Fire Weather Support Unit
15 (RSFWSU).

16

17 **Aerial Ignition Devices**

18 Information on types of aerial ignition devices, operational guidelines and
19 personnel qualifications may be found in the *Interagency Aerial Ignition Guide*.

20

21 **Ground Ignition Devices**

- 22 • *BLM - Guidance and direction for use and procurement of approved ground*
23 *ignition equipment and the transportation and dispensing of drip torch fuel*
24 *can be found in the Drip Torch Fuel Transportation and Dispensing*
25 *Direction.*
- 26 • *NPS - Agency direction may be found in the 04/04/03 Memorandum Y14*
27 *(9560) Aerial and Ground Ignition Equipment.*
- 28 • *FWS - specific information on ignition devices may be found in the January*
29 *28, 2003 Memorandum: "Direction for Use and Purchase of Aerial and*
30 *Ground Ignition Equipment."*
- 31 • *FS - direction is found in FSH 5109.32a and 6709.11.*