Utah Fire Service Certification System

APPARATUS DRIVER/OPERATOR PUMPER & AERIAL

CERTIFICATION STANDARD

November 19, 2025

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The Certification Council would like to recognize and extend a voice of appreciation to the following fire service professionals for their work on the Apparatus Driver/Operator certification standard. These individuals devoted many hours to reviewing the National Fire Protection Association (NFPA) 1010 standard, certification test banks, and curriculum textbooks to develop the wording for the skills in this standard.

Thank you.

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INTRODUCTION

The Utah Fire and Rescue Academy (UFRA) has evolved into a dynamic organization that provides fire and emergency service–related training, professional accredited certification, and resource assistance. The Utah Fire Service Certification System (UFSCS) has been administered by UFRA since the system's inception in the early 1980s. The governing body for the firefighter certification system in the state of Utah is the Utah Fire Service Certification Council (UFSCC). The members of the council represent various areas of the state as well as a variety of department types.

The entire system is based on international professional job performance standards from NFPA and NWCG. Fire service training must be utilized to its maximum potential. Any overlap, fragmentation, and lack of basic structure must be eliminated. Standardization is the natural complement and necessity. Testing takes place all over the state of Utah and is usually scheduled by fire department training officers for members of one or more local agencies to test at their own facilities using their own equipment.

The Utah Fire Service Certification System creates uniformity through certification. Certification allows a fire service professional to be a part of the National Registry (Pro Board and IFSAC), which verifies that a person has been trained at a national standard. Firefighters, hazardous materials responders, and rescue personnel can earn various certifications. Volunteer, part-time, and career firefighters must all meet the same standard to certify. Most fire departments in Utah have certified personnel even though there is no law requiring it.

> "Certification from an accredited entity is a statement of success, an indisputable mark of performance belonging to individual fire service professionals. Each successful candidate for certification from an accredited entity knows that he or she has been measured against peers and meets rigorous national standards. Certification affords the individual a uniformity and portability of qualifications. In addition, the creditability of an organization is enhanced by having members certified to national consensus standards."
>
> —theproboard.org
>
> IFSAC "provides accreditation to entities that certify the competency of and issue certificates to individuals who pass examinations based on National Fire Protection Association (NFPA) fire service professional qualifications and other standards approved by the Assembly."
>
> —ifsac.org

The following certification requirements are based on the objectives listed in NFPA 1010, *Standard on Professional Qualifications for Firefighters* (National Fire Protection Association, 2024), as verified and adopted by the Utah Fire Service Certification Council (UFSCC).

Through these national standards and certification, firefighters and fire departments have a tool to measure specific levels of skills, abilities, and knowledge. The UFSCC believes that by participating in this certification program, firefighters and fire departments will be better prepared to provide quality life safety and fire protection for their communities.

APPARATUS DRIVER/OPERATOR-PUMPER STANDARD

ADO-PUMPER CERTIFICATION REQUIREMENTS

Entrance Requirements

Certification at the Apparatus Driver/Operator (ADO)-Pumper level is a unique process. Because of the method and manner NFPA has established for becoming certified, candidates must complete the prerequisites and/or requirements for the specialty areas as set forth in NFPA 1010 (2024). In order to certify at the ADO-Pumper level, candidates must fulfill the following requirements:

1. Complete entrance requirements.
2. Meet the prerequisites and be certified in Firefighter I, Hazardous Materials Awareness, and Hazardous Materials Operations with the UFSCC.
3. Set up and maintain department records.
4. Train on the required written and practical objectives.
5. Pass a department in-house practical skills examination.
6. Meet any other training requirements/prerequisites as defined by the Certification Council.
7. Pass both written and practical skills examinations administered by the Certification Council.
8. Request ADO-Pumper certification.
9. Request recertification at the end of each 3-year certification period.

Physical Fitness Requirements

The UFSCC acknowledges the importance of and need for physical fitness requirements as listed in NFPA 1010, *Standard on Professional Qualifications for Firefighters*, 2024 edition. Many agencies and departments have existing policies, regulations, etc. already in place regarding these requirements. The handling of physical fitness requirements is a **LOCAL MATTER**, outside the authority and jurisdiction of the UFSCC. The Certification Council will not check, test, evaluate, or determine how individual agencies meet these requirements. Some departments have found it necessary to waive any type of physical fitness requirements due to their own special needs. As a local decision, this is permitted. However, due to the amount of physical, mental, and emotional stress inherent in this profession, **the Utah Fire Service Certification Council strongly recommends careful evaluation before altering or doing away with any existing physical fitness requirements.**

Here are some of the entrance requirements outlined in NFPA 1010 (2024), chapter 1:

1. Meet the minimum educational requirements established by the authority having jurisdiction.
2. Utah Fire Service Certification Council Policy 11.3 requires that a candidate be at least 18 years of age to test and be certified.
3. Meet the medical requirements of NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments* (2022), as determined by the medical authority of the AHJ.
4. Physical fitness requirements for entry-level personnel should be developed and validated by the authority having jurisdiction. Physical fitness requirements should be in compliance with applicable Equal Employment Opportunity regulations and other legal requirements.

Occupational Safety and Health Requirements

The requirements listed in NFPA 1500 (2021), chapter 7, are:

1. Meet the Protective Clothing and Protective Equipment requirements of NFPA 1500, Policy 7.13.1, A.7.13.1.
2. Meet OSHA 29 CFR 1910.134(g) on the use of respirators (under "Prohibiting conditions that may result in facepiece seal leakage"): "Respirators shall **not** be worn when conditions prevent a good face seal."
3. Meet OSHA 1910.134 (g)(1)(i)(A) occupational safety and health regulatory requirements.

Additional Requirements

The following additional training requirements **must** be met before certification at the ADO-Pumper level will be issued by the UFSCC.

1. The fire apparatus driver/operator shall be licensed to drive all vehicles they are expected to operate in accordance with Utah state law.
2. The fire apparatus driver/operator shall be subject to periodic medical evaluations, as required by NFPA 1500, *Standard on Fire Department Occupational Safety, Health, and Wellness Program*, Section 8, to determine if they are medically fit to perform their duties.

Department Training Officers

For a department to enroll in the certification process, it is necessary for the department to assign training officers. It is recommended that the department assign at least two personnel as training officers, to coordinate and provide certification training.

Department training officers shall be certified at the level they are teaching. In addition, the Certification Council strongly recommends that training officers and instructors be state certified at the Instructor I level.

Department training officers will be responsible for certification training. Their primary responsibility will be to teach, evaluate, and in-house test department personnel on the skill and evolution requirements for each level of certification training.

Departments who **do not** have certified personnel to act as training officers for certification training should contact the Utah Fire & Rescue Academy at (801) 863-7709 for assistance in setting up and monitoring certification training.

The final entrance requirement is to complete the Intent to Participate form (see Appendix I) and return it to the Certification Council. Remember, participation in the certification process is **VOLUNTARY**. Once you have enrolled, you can withdraw if desired.

If a department is already participating in the Utah Fire Service Certification System, it will not be necessary to file another Intent to Participate form.

ADO-PUMPER DEPARTMENT TRAINING

The position of apparatus driver is one that requires a high level of skill and knowledge. The training that is given to and received by the candidate should be of the highest quality and degree. All training received must meet the requirements of NFPA 1010 (2024)—including the sections listed in the chapters—and cover the skills approved by the UFSCC contained in this Utah certification standard.

All training received must be documented and recorded in the Training Record. The skills and Training Record must be completed for each person. All department in-house testing must be conducted following the UFSCS Policies and Procedures.

To prepare the candidate to successfully pass the state certification exam, the course material should be based on NFPA 1010 (2024) and IFSTA, *Pumping and Aerial Apparatus Driver/Operator Handbook,* 4th edition. The state certification exam will be scheduled upon receiving an Examination Request form from the department training officer or administrator at the conclusion of the course.

Written Objectives

The written objectives for ADO-Pumper are covered in the following texts:

- IFSTA, *Pumping and Aerial Apparatus Driver/Operator Handbook,* 4th edition
- NFPA 1010, *Standard on Professional Qualifications for Firefighters,* 2024 edition

There are numerous methods departments have used to help prepare their personnel for the written examination. Considering the high level of skill and knowledge that is required of an apparatus driver, the Certification Council recommends that candidates participate in a comprehensive class and receive instruction on both skills and written requirements.

Skill Objectives

Each candidate **must** be trained and evaluated in the performance of **all** skills as found in this Utah certification standard. Each of the skill objectives shall be completed swiftly, safely, and with competence, as defined below:

- **Swiftly.** Each skill objective must be completed within the allotted time.
- **Safely.** Each skill objective must be completed safely. Conduct that could injure an individual or damage equipment is unacceptable. Equipment should be checked prior to skills testing or training to see that it is safe and functional.
- **With Competence.** Each skill objective must be performed in accordance with this Utah certification standard. This includes performing the proper steps in sequence. Competence will be measured in accordance with the UFSCS skill objectives.

Department Training Records

Each candidate shall have a current, accurate, and complete Training Record on file with the department which indicates that they have been trained on all skill objectives. **The Training Record must be completed in its entirety for the candidate to be permitted to test.** Training Records may be completed on a computer or by hand. Departments may set up their own Training Records, use the one provided in this standard, or use the fillable Training Record found online on UFRA's website. If a department chooses to set up their own Training Record it must meet the following requirements:

1. Indicate the certification level and its corresponding NFPA standard number and edition.
2. Include a signature line for the candidate, which attests that all skills have been trained on and a complete in-house comprehensive exam was administered and passed.
3. Include a signature line for the chief/training officer, which attests that the candidate has been trained on all skills and a complete in-house comprehensive exam was administered and passed.
4. Include a line to record the date the Training Record was completed.
5. List all the skills from this Utah certification standard for this level. Include columns indicating the training dates, training instructors, dates of exams, exam instructors, and whether the candidate passed each exam (see the Training Record examples in this standard).

Department In-House Skills Examinations

At the completion of the department's skills training, the department is required to hold an in-house skills examination for the level being trained. This is a comprehensive in-house skills test conducted by the department training officers. This test is to ensure that skill mastery has been maintained from the beginning to the end of the training process, and to prepare candidates for the state examination. Training officers may utilize other personnel to assist in administering the exam. However, they must be certified at the level they are in-house testing.

Proctor instructions for the examination are in Appendix H in this standard. In-house testers shall follow the proctor instruction sheet to ensure uniformity and fairness during the exam. It is recommended that candidates be given two attempts at any skill. **If they fail on the second try, then they have failed the evaluation and are required to go through additional training by the department trainer.** No training, teaching, or coaching is allowed during the test. After the evaluation, using the test to teach and

train is recommended.

If skill weaknesses are evident, the department should conduct additional training and hold a new department in-house skills examination to ensure their personnel have fully mastered all required skills. Only those individuals who successfully pass the department's skills test will be allowed to participate in the Certification Council's skills spot check examination. Department Training Records must show that all candidates have successfully passed the in-house exam.

ADO-PUMPER CERTIFICATION EXAMINATIONS

After completion of the training process, the chief/administrator can request testing for the candidate using the Examination Request form (see Appendix I). The candidate will then have three attempts to pass the written examination. A separate request must be sent to the Certification Office for each attempt. Request forms must reach the Certification Office no later than 30 days prior to the examination date. The entire examination process must be completed within one year of the first written exam date.

Written Examinations

The written examination is a randomly generated **100-question** test covering the written objectives of the ADO-Pumper standard. A minimum score of 70% is required to pass the certification exam. Candidates failing the first attempt of the written exam will be permitted to retest no sooner than 30 days from the date of the last exam. Three attempts are allowed to pass the exam. A candidate who fails the written examination three times has failed the certification process and must wait one year from the date of the last failed exam before reentering testing. Exam results are forwarded to the chief/administrator within 30 days following receipt of the completed exam.

SAMPLE WRITTEN EXAMINATION QUESTION

Being aware of all that is happening at the sides and to the rear of the apparatus are techniques of:

A. Aggressive driving
B. Offensive driving
C. Defensive driving
D. Responsive driving

Skills Spot Check Examinations

The skills spot check examination has two steps: a department records check and the skills spot check examination itself. A Certification tester appointed by the Utah Fire Service Certification Council conducts the examination.

Training Records are checked. If records are inadequate, corrective action must be taken before proceeding to the next step. The records must meet minimum requirements and are checked for the following:

1. The candidate has been trained in each skill and evolution for the level being evaluated.
2. A department training officer has signed off each skill.
3. The candidate has passed a department in-house skills examination.

The skills spot check examination is graded on a 100% pass/fail basis. Each skill must be performed within the allotted time, safely, and with the proper steps being done in sequence.

Candidates are spot checked on the following: one live fire evolution, two examination evolutions, and one skill. No prior notification of the skills being tested will be given. Candidates are given two attempts (if necessary) to perform each skill. If they fail on the second try, then they have failed the examination. Candidates who fail the second attempt must wait **30 days** before the third and final attempt. Candidates

taking third attempts will test on the skill they missed plus an additional skill from the section of the standard they failed. **No training, teaching, or coaching is allowed during this state test.**

During the skills examination, a SPOTTER will be used. The purpose of having a spotter assist while backing an apparatus is to protect life and property. The spotter should alert the driver if property damage or damage to the apparatus could occur. The spotter will NOT direct the driver when to stop during a test.

Please note: **"Striking the cone"** includes striking any part of the cone (including its base).

Candidates who have failed the third attempt of the written examination or the skills examination have failed the certification process and must wait **one year** from the date of the failed third attempt to reenter state testing. The candidate will begin testing with a new **first attempt** of the written examination, following a request for examination. If a candidate wishes to enter a new course, the candidate may petition the Certification Office to reenter the certification examination process no sooner than 120 days after their **third attempt** failure. In the petition, candidates must explain the reason(s) behind their request to reenter the process.

ADO-PUMPER CERTIFICATION/RECERTIFICATION

When all requirements for certification have been met, applicants are eligible to be certified. The

chief/administrator may apply to the Utah Fire Service Certification Council for certification for those candidates who have successfully completed the certification training/testing process. Requests for state certification must be submitted to the Certification Office using the Certification/Recertification Request form (see Appendix I). The names are then checked against the official state records to ensure that each individual listed has met all requirements and prerequisites.

Prerequisites for ADO-Pumper Certification

To qualify to train for a certain level, candidates must have completed the prerequisites of Firefighter I and/or NWCG FFT1. The ADO-Pumper certification will not be issued until candidates have fulfilled this requirement.

Training Level	Trains on NFPA 1010	Prerequisites
Apparatus Driver/Operator-Pumper	Chapters 11, 12	Firefighter I and/or NWCG FFT1

Certifications are valid for a three-year period. Each responder certified in ADO-Pumper may renew certification by having the chief/administrator of the participating agency submit a Certification/ Recertification Request (see Appendix I).

Certified candidates should participate in at least 36 hours of structured class and skills training per year to maintain competency and stay current on their skills. This 36 hours is for all certified levels combined, not 36 hours for each individual level. **A total of 108 hours of training is required** for the previous three-year certification period.

For more information on Utah firefighter certification, contact the:
Utah Fire Service Certification Council
Utah Fire & Rescue Academy
3131 Mike Jense Parkway, Provo, UT 84601
801-863-7709
www.uvu.edu/ufra

ADO-PUMPER CERTIFICATION CHECKLIST

ENTRANCE REQUIREMENTS

- ❑ Each candidate has met the requirements listed in NFPA 1010 (2024).
- ❑ Each candidate has met the additional requirements as required by NFPA 1010:
  1. A valid driver's license
  2. A medical evaluation as required by NFPA 1500, Section 8
- ❑ The department has filed an Intent to Participate form with the UFSCC.
- ❑ Each candidate has trained in the level's written objectives.

DEPARTMENT TRAINING RECORDS

- ❑ Each candidate has a Training Record on file with the department that shows:
  1. A learning experience in each skill objective
  2. Dates of training
  3. Initials of instructors
- ❑ Each candidate has trained in the level's written objectives.

DEPARTMENT IN-HOUSE SKILLS EXAMINATION

- ❑ Each candidate has successfully completed an in-house skills examination.
- ❑ Exam results are documented in department Training Records.

ADDITIONAL TRAINING/PREREQUISITE REQUIREMENTS

- ❑ Each candidate is certified as Firefighter I and/or NWCG FFT1.

CERTIFICATION EXAMINATIONS

- ❑ Each candidate has passed the UFSCC written examination.
- ❑ Each candidate has passed the UFSCC skills and/or evolution examination.
- ❑ A spot check examination was administered by an approved UFRA Certification tester.

CERTIFICATION

- ❑ The chief/administrator has requested certification for candidates using the Certification/Recertification Request form.

ADO-PUMPER SKILL OBJECTIVES

PREVENTIVE MAINTENANCE

For the skills in this section, the AHJ must be able to provide a safe testing environment for the candidates and accept all liability for candidate safety.

1. **Perform and document routine tests, inspections, and servicing functions on specified systems and components a fire department apparatus (Pumper).**

   A. Fire department apparatus-pumper

   REFERENCE: NFPA 1010, 2024 edition, 11.2.1, 11.2.2

   CONDITION: Given a fire department pumping apparatus, inspection form or check- off sheet. Sample check-off sheet provided in **Appendix A or a department check-off sheet that covers all items listed below.**

COMPETENCE:

- Check batteries for fluid level and corrosion (if **maintenance** free,check indicator for correct color).
- Check braking system for fluid level/drain air tanks of water.
- Check Suspension (clips, shackles, leaf springs, U-bolts, etc.)
- Check coolant system for fluid level, leaks, and cleanliness.
- Check electrical system for corrosion and tight connections.
  - Siren and other warning devices.
  - Headlights, running lights, and turn signal flashers.
  - Emergency warning lights.
- Check fuel level.
- Check hydraulic fluids for fluid level and leaks, if applicable.
- Check engine oil for fluid level and leaks.
- Check transmission for fluid level and leaks.
- Check power steering for fluid level and leaks.
- Check other fluid levels, as appropriate.
- Check tires for pressure and wear.
- Check steering system for range of motion and looseness.
- Check engine belts for tightness and wear.
- Check tools, appliances, and equipment, fixed equipment, lighting.
- Check windshield wiper blades and fluid.
- Start apparatus and monitor gauges and other control devices.
- Identify, document, and report deficiencies found.
- Check foam tank for level and leaks in system (if applicable).
- Check primer oil, if applicable.
- Exercise all pump valves.
- Check and clean intake strainers/anode.
- Check pump gearbox/transfer case for proper oil level and traces ofwater.
- Start apparatus and place apparatus in pump gear.
- Operate the pump primer with all pump valves closed.
- Operate the transfer valve while pumping from booster tank or otherwater source (if applicable).

- Check pump shaft for excessive leaks, if applicable.
- Operate the pump pressure control device(s). (Intake/discharge/pressure governor as applicable).
- Properly fill-out inspection form

TIME: 30 minutes

DRIVING OPERATIONS

Notice: The driving skills in this standard are used to determine a candidate's qualification to become certified by the Utah Fire Service Certification Council at the level of ADO-Pumper Apparatus. The passing of these skills does not qualify a candidate for any other certification or licensure, such as a commercial driver's license (CDL) and is not intended to certify, verify, or approve an individual's ability to drive fire apparatus on state or federal highways. The responsibility to determine who will drive fire apparatus resides with the local fire department or the authority having jurisdiction.

2. Operate a fire department pumper so that the vehicle is safely operated in compliance with all applicable state and local laws and departmental rules and regulations.

REFERENCE: NFPA 1010, 2024 edition, 11.3.1, 11.3.6

CONDITION: Given a fire department pumping apparatus and a predetermined route on a public way that incorporates the maneuvers and features specified below, ones that the driver/operator is expected to encounter during normal operations: four left turns and four right turns, a straight section of an urban business street or a two-lane rural road at least one mile in length, one through-intersection and two intersections where a stop has to be made, one railroad crossing, one curve either left or right, a section of limited-access highway that includes a conventional ramp entrance and exit and a section of road long enough to allow two lane changes, a downgrade steep enough and long enough to require down-shifting and braking, an upgrade steep enough and long enough to require gear changing to maintain speed, and one underpass or low clearance or bridge.

COMPETENCE:

- Adjust and use mirrors.
- Use seat belts for all occupants.
- Observe all posted speed limits.
- Maintain safe following distances.
- Maintain control of the vehicle while accelerating, decelerating, and turning under any weather conditions.
- Stop fully at all stop signs or stop lights.
- Use turn signals.
- Keep apparatus in correct lane of travel.
- Monitor all gauges so vehicle is operated within manufacturer's specifications.
- Complete skill in allotted time.

TIME: As determined by route

SPOTTER INSTRUCTIONS: Skills 3 through 5 will be tested on a controlled and unobstructed training ground. Duties of the spotter for testing purposes may be different from the spotter's duties during normal operations. The purpose of having a spotter assist while backing an apparatus is to protect life and property. The spotter should alert the driver if property damage or damage to the apparatus could occur. Because the training ground is a controlled and unobstructed environment, the spotter will NOT direct the driver when to stop during a test unless damage might occur. A spotter assisting the driver in completing the skill will result in an automatic failure for the driver. It is the intent of certification testing to assess whether the driver is aware of the dimensions of the apparatus.

3. Back a vehicle from a roadway into restricted spaces, on both the right and left sides of the vehicle, with restricted horizontal and vertical clearances (Alley Dock).

REFERENCE: NFPA 1010, 2024 edition, 11.3.2

CONDITION: Given a fire department pumping apparatus, a spotter (used as a guide and safety to direct the apparatus when backing only), cones, and a restricted space 12 feet wide requiring 90-degree right- or left-hand turns from a 40-foot-wide roadway, so that the vehicle is parked within the restricted area without the driver having to stop and adjust travel and without striking the cones. A marker should be placed on the ground, on the left side of the apparatus, to mark where the front left tire should be spotted, and where to stop the apparatus and park.

COMPETENCE:

- Adjust and use mirrors for backing.
- Ensure that driver and passengers are wearing seat belts.
- Use a spotter when backing apparatus (for safety only).
- Stop apparatus so center of the left front wheel is within 6" of the center of the marker.
- Do not strike the cones (including the base of the cones).
- Complete skill in allotted time.

TIME: 5 minutes

4. Maneuver a vehicle around obstructions on a roadway while moving forward and in reverse (Serpentine).

REFERENCE: NFPA 1010, 2024 edition, 11.3.3

CONDITION: Given a fire department pumping apparatus, a spotter (used as a guide and safety to direct the apparatus when backing only), cones, and a roadway with obstructions so that the vehicle is maneuvered through the obstructions without stopping and without striking cones. The spacing between cones should be the apparatus length plus 2 feet (base to base).

COMPETENCE:

- Adjust and use mirrors for backing.
- Ensure that driver and passengers are wearing seat belts.
- Use a spotter when backing apparatus (for safety only).
- Do not strike the cones (including the base of the cones).
- Complete skill in allotted time.

TIME: 5 minutes

5. Turn a vehicle around 180 degrees within a confined space with restricted horizontal and vertical clearances (Confined Space Turnaround).

REFERENCE: NFPA 1010, 2024 edition, 11.3.4

CONDITION: Given a fire department pumping apparatus, a spotter (used as a guide and safety to direct the apparatus when backing only), cones, and an area where vehicle cannot make a U-turn without stopping and backing up, so that the vehicle is turned 180 degrees without crossing over or striking cones

COMPETENCE:

- Adjust and use mirrors for backing.
- Ensure that driver and passengers are wearing seat belts.
- Use a spotter when backing apparatus (for safety only).
- Do not cross over or strike the cones, including the base of the cone.
- Complete skill in allotted time.

TIME: 5 minutes

PUMPING OPERATIONS

6. Produce an effective fire stream from a:

A. Handline from a fire hydrant as a source of water

REFERENCE: NFPA 1010, 2024 edition, 12.4.3, 12.4.4, 12.4.5

CONDITION: Given a fire department pumping apparatus, supply hose (2½" or larger), a

minimum of 100 feet of 1½" or 1¾" attack line, appropriate fittings and tools, a pre-established water supply not connected to the inlet, and an operator plus 1 firefighter to assist with hydrant and 1 firefighter to assist with hoseline

COMPETENCE:

- Stop apparatus, set brake.
- Engage pump.
- Chock wheels.
- Engage tank to pump (department standard).
- Operate the volume/pressure transfer valve if applicable.
- Open correct discharge valve and charge appropriate attack line.
- Gradually develop pump discharge pressure in attack line.
- Make supply line connection to intake.
- Signal hydrant for water.
- Smooth transition from tank water to hydrant supply (monitor valves, gauges, and throttle).
- Set discharge relief valve or pressure governor and address auxiliary cooling system as needed per department standard.
- Monitor discharge pressure.
- Establish and verbalize correct PDP (within +/- 10 psi) and the method used to determine PDP.
- Complete skill in allotted time.

TIME: 5 minutes

B. Master stream from a fire hydrant as a source of water

REFERENCE: NFPA 1010, 2024 edition, 12.4.3, 12.4.4, 12.4.5

CONDITION: Given a fire department pumping apparatus, supply hose (2½" or larger), appropriate fittings and tools, a mounted master stream device or portable pre-established water supply not connected to the inlet, and an operator plus 1 firefighter to assist with hydrant and 2 firefighters to assist with hoselines and master stream device (if portable master stream device is used)

COMPETENCE:

- Stop apparatus, set brake.
- Engage pump.
- Chock wheels.
- Engage tank to pump (department standard).
- Operate the volume/pressure transfer valve if applicable.
- Make supply line connection.
- If using portable master stream device, set up device away from apparatus using a minimum of 100 feet of supply hose.
- Properly secure device.
- Signal for water from hydrant.
- Open appropriate discharge valve(s).
- Gradually develop pump discharge pressure to master stream device.
- Set discharge relief valve or pressure governor and address auxiliary cooling system as needed per department standard.

- Monitor discharge pressure.
- Establish and verbalize correct PDP (within +/- 10 psi) and the method used to determine PDP.
- Complete skill in allotted time.

TIME: 5 minutes

C. Handline while drafting from a portable water tank

REFERENCE: NFPA 1010, 2024 edition, 12.4.3, 12.4.4, 12.4.5

CONDITION: Given a fire department pumping apparatus, hard suction intake hose, appropriate fittings and tools, a 10-foot ladder, a portable water tank, 100 feet of 1½" or 1¾" attack line, and an operator plus 2 firefighters to assist with setting up equipment

COMPETENCE:

- Position apparatus at drafting location.
- Connect sections of hard suction hose together (department standard).
- Connect strainer to hard suction hose, attach rope (department standard).
- Connect to apparatus, tighten all connections.
- Place ladder into static water source, if necessary.
- Lower intake hose into static source.
- Engage pump.
- Operate the volume/pressure transfer valve if applicable.
- Pick up draft.
- Gradually open appropriate valve to charge handline and address auxiliary cooling system as needed per department standard.
- Flow water from handline or master stream device for 1 minute at appropriate pressure.
- Establish and verbalize correct PDP (within +/- 10 psi) and the method used to determine PDP.
- Complete skill in allotted time.

TIME: 10 minutes

7. Establish a relay pumping evolution and produce an effective water supply.

REFERENCE: NFPA 1010, 2024 edition, 12.4.5

CONDITION: Given 2 fire department apparatus with 200 feet of 12½" or larger hose, appropriate hose adapters and appliances, and a 4-firefighter team (2 firefighters per apparatus), with an "attack" pumper positioned 200 feet from a "source" pumper. The candidate being evaluated will be at the source pumper.

COMPETENCE:

- Position "source" pumper at water source (hydrant or draft location).
- Ensure supply lines from source pumper are connected to attack pumper.
- Establish water supply to "source" pumper intake.

- All pumpers except source pumper: open a discharge to exhaust air from lines.
- Engage pump and operate the volume/pressure transfer valve if applicable.
- Set discharge relief valve or pressure governor and address auxiliary cooling system as needed per department standard.
- Pump the required discharge pressure from the source pumper to the attack pumper based on the max distance/constant pressure relay method.
- Through radio communication, ensure that the attack pumper has water flowing from the discharge opening at an appropriate pressure (20 psi intake as a minimum).
- Correctly shut down relay (from attack to source).
- Complete skill in allotted time.

TIME: 10 minutes

8. Produce a foam fire stream so that properly proportioned foam is delivered. (Use the competency that is appropriate for the type of foam equipment that the department has.)

REFERENCE: NFPA 1010, 2024 edition, 12.4.6

CONDITION: Given a fire department pumping apparatus, foam concentrate, foam eductor, foam nozzle, or other portable foam-producing equipment, with the hoseline set up and a 2-firefighter team to man the hoseline

COMPETENCE:

- Set concentrate percentage on the proportioner.
- Place pick-up tube in foam container.
- Ensure that the nozzle flow rate and eductor flow rate match.
- Set appropriate pump discharge pressure.
- Ensure back pressure does not exceed 65% to 70% of rated eductor inlet pressure.
- Deliver properly proportioned foam.
- Clean/flush system when skill is completed (not included in time limit).
- Establish and verbalize correct PDP (within +/- 10 psi) and the method used to determine PDP.
- Complete skill in allotted time.

-OR-

- Set concentrate percentage on the proportioner.
- Set metering valve.
- Set appropriate pump discharge pressure.
- Deliver properly proportioned foam.
- Clean/flush system when skill is complete (not included in time limit).
- Establish and verbalize correct PDP (within +/- 10 PSI) and the method used to determine PDP.
- Complete skill in allotted time.

TIME: 5 minutes

9. **Supply water to a fire sprinkler or standpipe system so that water is supplied to the system at the correct volume and pressure.**

REFERENCE: NFPA 1010, 2024 edition, 12.4.7

CONDITION: Given a fire department pumping apparatus, 2 lengths of 2½" or 3" hose, additional hose tools or appliances, a pre-established water supply not connected to the inlet, and a 2-firefighter team to make connection from apparatus to FDC

COMPETENCE:

- Position and stop apparatus, set brake.
- Engage pump.
- Chock wheels.
- Open tank to pump (department standard).
- Operate the volume/pressure transfer valve if needed.
- Open correct discharge valve and charge appropriate supply lines to FDC.
- Make supply line connection to intake.
- Signal hydrant for water.
- Gradually develop pump discharge pressure in supply lines.
- Set discharge relieve valve or pressure governor per department standard.
- Monitor discharge pressure and operate pump pressure cooling systems as needed.
- Establish and verbalize correct PDP (within +/- 10 psi) and the method used to determine PDP.
- Complete skill in allotted time.

TIME: 5 minutes

10. **Demonstrate safety procedures for mounting; use of seat belts, hearing protection, and other safety equipment on apparatus; and safely dismounting fire apparatus.**

REFERENCE: NFPA 1010, 2024 edition, 11.1, 12.4.1

CONDITION: Wearing full structural firefighter protective clothing, given a fire apparatus equipped with seat belts, radio headsets, or other noise barriers

COMPETENCE:

- Use handrails and steps to mount apparatus.
- Properly fasten seat belts.
- Don hearing protection if needed.
- Use handrails and steps to dismount apparatus.
- Complete skill in allotted time.

TIME: 3 minutes

11. **Demonstrate the ability to operate at an emergency scene.**

REFERENCE: NFPA 1010, 2024 edition, 12.4.2

CONDITION: Beginning in the apparatus in a seated position (engineer/pumper operator), wearing PPE (per AHJ), given a report of a traffic accident, and traffic and scene control devices and equipment. Follow AHJ's SOPs.

COMPETENCE:

- Position apparatus to protect the scene (per AHJ).
- Use handrails and steps to dismount apparatus.
- Identify situation hazards and safety measures.
- Deploy traffic and scene control devices.
- Select proper tool(s) and equipment.
- Carry tools in a safe manner.
- Establish and operate in the protected work area as directed.
- Maintain scene safety.
- Complete skill in allotted time.

TIME: 1 minute

12. Demonstrate a hand lay of supply line 2½" or larger from a pumper to a water source.

REFERENCE: NFPA 1010, 2024 edition, 12.4.3

CONDITION: Wearing full structural firefighter protective clothing, given appropriate equipment to connect to a hydrant, an appropriate length of supply hose, and a 2-firefighter team

COMPETENCE:

- Shoulder load hose from hose bed, approximately 50' between firefighters if necessary.
- Lay entire length with no kinks or tangles.
- Connect to hydrant.
- Fully open and close the hydrant.
- Complete skill in allotted time.

TIME: 5 minutes

13. Demonstrate hydrant-to-pumper hose connections in order to supply a:

A. Forward hose lay

REFERENCE: NFPA 1010, 2024 edition, 12.4.3

CONDITION: Wearing full structural firefighter protective clothing, given a 2½" or larger supply hose, gate valves, spanner wrenches, a hydrant wrench, and an apparatus operator (not being tested)

COMPETENCE:

- Select correct equipment to connect to hydrant.
- Loop hose around hydrant, secure hose.
- Signal apparatus operator to proceed.
- Connect hydrant gate valves.

- Open hydrant completely, flush (open gradually to prevent water hammer).
- Charge hose line (slowly) when signal is given.
- Shut hydrant down slowly to prevent water hammer and check drain.
- The apparatus operator makes all pumper connections.
- Complete skill in allotted time.

TIME: 3 minutes

B. Reverse hose lay

REFERENCE: NFPA 1010, 2024 edition, 12.4.3

CONDITION: Given the assignment of water supply. Wearing full structural firefighter protective clothing, given a 2½" or larger supply hose, gate valves, spanner wrenches, a hydrant wrench, a 2-firefighter team, and an apparatus operator (not being tested).

COMPETENCE:

- Remove and ground 50 feet of supply hose from apparatus.
- Kneel on hose and signal apparatus operator to proceed to hydrant.
- At the hydrant, select correct equipment to connect to hydrant.
- Connect hydrant gate valves.
- Open hydrant completely, flush (open gradually to prevent water hammer).
- Charge hose line (slowly) when signal is given by apparatus operator.
- Shut hydrant down slowly to prevent water hammer and check drain.
- The apparatus operator makes all pumper connections.
- Complete skill in allotted time.

TIME: 3 minutes

14. Demonstrate the ability to operate radio equipment and distinguish between routine or emergency traffic.

REFERENCE: NFPA 1010, 2024 edition, 12.2.1, 12.2.2

CONDITION: Given a scenario, mobile/portable radio equipment (ensuring channel is recorded and monitored), follow AHJ's SOPs.

COMPETENCE:

- Ensure radio power is on.
- Set to correct channel.
- Adjust volume.
- Adjust squelch (if radio is equipped).
- Perform radio check according to the AHJ's SOPs (simulate).
- Demonstrate the ability to transmit and receive messages—according to the AHJ.
- Determine if it is routine or emergency traffic and follow AHJ terminology and procedures accordingly.
- Ensure information is accurate and clear.
- Complete skill in allotted time.

TIME: 1 minute

UTAH FIRE SERVICE CERTIFICATION SYSTEM
APPARATUS DRIVER/OPERATOR-PUMPER

NFPA 1010, 2024 Edition

ADO-PUMPER

TRAINING RECORD/IN-HOUSE COMPREHENSIVE EXAM

Candidate Name:	**Department:**
Candidate Signature:	**Date of Completion:**
Chief/Training Officer Name:	**Chief/Training Officer Signature:**

This form may be completed on a computer but must be printed out for the Certification tester to verify on test day. Date of completion and signatures of the chief/training officer and candidate must be original signatures. Signatures attest that all skills have been trained on and a complete in-house comprehensive exam was administered and passed. Falsification of signatures or any component of this document may result in the revocation, suspension, or denial of certification.

SECTION	TRAINING RECORD		IN-HOUSE COMPREHENSIVE EXAMS			SKILLS
	DATE	INST.	DATE	INST.	PASS	
PREREQUISITE						Firefighter I and/or NWCG FFT1
PREVENTIVE MAINTENANCE						1. Perform and document routine tests, inspections, and servicing functions on a fire department apparatus and for the pumping system on the apparatus.
DRIVING OPERATIONS						2. Operate a fire department pumper so that the vehicle is safely operated in compliance with all applicable state and local laws and departmental rules and regulations.
						3. Back a vehicle from a roadway into restricted spaces, on both the right and left sides of the vehicle, with restricted horizontal and vertical clearances (Alley Dock).
						4. Maneuver a vehicle around obstructions on a roadway while moving forward and in reverse (Serpentine).
						5. Turn a vehicle around 180 degrees within a confined space with restricted horizontal and vertical clearances (Confined Space Turnaround).
PUMPING						6A. Produce an effective fire stream from a handline from a fire hydrant as a

OPERATIONS						source of water.
						6B. Produce an effective fire stream from a master stream from a fire hydrant as a source of water.
						6C. Produce an effective fire stream from a handline while drafting from a portable water tank.
						7. Establish a relay pumping evolution and produce an effective water supply.
						8. Produce a foam fire stream so that properly proportioned foam is delivered. (Use the competency that is appropriate for the type of foam equipment that the department has.)
						9. Supply water to a fire sprinkler or standpipe system so that water is supplied to the system at the correct volume and pressure.
						10. Demonstrate safety procedures for mounting; use of seat belts, hearing protection, and other safety equipment on apparatus; and safely dismounting fire apparatus.
						11. Demonstrate the ability to operate at an emergency scene.
						12. Demonstrate a hand lay of supply line 2½" or larger from a pumper to a water source. 13A. Demonstrate hydrant-to-pumper hose connections in order to supply a forward hose lay. 13B. Demonstrate hydrant-to-pumper hose connections in order to supply a reverse hose lay. 14. Demonstrate the ability to operate radio equipment and distinguish between routine or emergency traffic.

APPARATUS DRIVER/OPERATOR-AERIAL STANDARD

ADO-AERIAL CERTIFICATION REQUIREMENTS

Entrance Requirements

In order to certify within the Utah Apparatus Driver/Operator (ADO) Aerial program, candidates must fulfill the following requirements:

1. Complete entrance requirements.
2. Set up and maintain department records.
3. Train on the required written and practical objectives.
4. Pass a department in-house practical skills examination.
5. Meet any other training requirements/prerequisites as defined by the Certification Council.
6. Pass both written and practical skills examinations administered by the Certification Council.
7 Request ADO-Aerial certification.
8. Request recertification at the end of each 3-year certification period.

Physical Fitness Requirements

The UFSCC acknowledges the importance of and need for physical fitness requirements as listed in NFPA 1010, *Standard on Professional Qualifications for Firefighters*, 2024 edition. Many agencies and departments have existing policies, regulations, etc. already in place regarding these requirements. The handling of physical fitness requirements is a **LOCAL MATTER**, outside the authority and jurisdiction of the UFSCC. The Certification Council will not check, test, evaluate, or determine how individual agencies meet these requirements. Some departments have found it necessary to waive any type of physical fitness requirements due to their own special needs. As a local decision, this is permitted. However, due to the amount of physical, mental, and emotional stress inherent in this profession, **the Utah Fire Service Certification Council strongly recommends careful evaluation before altering or doing away with any existing physical fitness requirements.**

Here are some of the entrance requirements outlined in NFPA 1010, 2024 edition, chapter 1:

1. Meet the minimum educational requirements established by the authority having jurisdiction.
2. Utah Fire Service Certification Council Policy 11.3 requires that a candidate be at least 18 years of age to test and be certified.
3. Meet the medical requirements of NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments* (2022), as determined by the medical authority of the AHJ.
4. Physical fitness requirements for entry-level personnel should be developed and validated by the authority having jurisdiction. Physical fitness requirements should be in compliance with applicable Equal Employment Opportunity regulations and other legal requirements.

Occupational Safety and Health Requirements

The requirements listed in NFPA 1500 (2021), chapter 7, are:

1. Meet the Protective Clothing and Protective Equipment requirements of NFPA 1500, Policy 7.13.1, A.7.13.1.
2. Meet OSHA 29 CFR 1910.134(g) on the use of respirators (under "Prohibiting conditions that may result in facepiece seal leakage"): "Respirators shall **not** be worn when conditions prevent a good face seal."
3. Meet OSHA 1910.134 (g)(1)(i)(A) occupational safety and health regulatory requirements.

Additional Requirements

The following additional training requirements **must** be met before certification at the ADO-Aerial level will be issued by the UFSCC.

1. The fire apparatus driver/operator shall be licensed to drive all vehicles they are expected to operate in accordance with Utah state law.

2. The fire apparatus driver/operator shall be subject to periodic medical evaluations, as required by NFPA 1500, *Standard on Fire Department Occupational Safety, Health, and Wellness Program*, Section 8, to determine if they are medically fit to perform their duties.

Department Training Officers

For a department to enroll in the certification process, it is necessary for the department to assign training officers. It is recommended that the department assign at least two personnel as training officers, to coordinate and provide certification training.

Department training officers shall be certified at the level they are teaching. In addition, the Certification Council strongly recommends that training officers and instructors be state certified at the Instructor I level.

Department training officers will be responsible for certification training. Their primary responsibility will be to teach, evaluate, and in-house test department personnel on the skill and evolution requirements for each level of certification training.

Departments who **do not** have certified personnel to act as training officers for certification training should contact the Utah Fire & Rescue Academy at (801) 863-7709 for assistance in setting up and monitoring certification training.

The final entrance requirement is to complete the Intent to Participate form (see Appendix I) and return it to the Certification Council. Remember, participation in the certification process is **VOLUNTARY**. Once you have enrolled, you can withdraw if desired.

If a department is already participating in the Utah Fire Service Certification System, it will not be necessary to file another Intent to Participate form.

ADO-AERIAL DEPARTMENT TRAINING

The position of apparatus driver for an aerial device is one that requires a high level of skill and knowledge. The training that is given to and received by the candidate should be of the highest quality and degree. All training received must meet the requirements of NFPA 1010 (2024)—including the sections listed in the chapters—and cover the skills approved by the UFSCC contained in this Utah certification standard.

All training received must be documented and recorded in the Training Record. The skills and Training Record must be completed for each person. All department in-house testing must be conducted following UFSCS Policies and Procedures.

To prepare the candidate to successfully pass the state certification examination, the course material should be based on NFPA 1010 (2024) and IFSTA, *Pumping and Aerial Apparatus Driver/Operator Handbook,* 4th edition. The state certification exam will be scheduled upon receiving an Examination Request form from the department training officer or administrator at the conclusion of the course.

Written Objectives

The written objectives for ADO-Aerial are covered in the following texts:

- IFSTA, *Pumping and Aerial Apparatus Driver/Operator Handbook,* 4th edition
- NFPA 1010, *Standard on Professional Qualifications for Firefighters,* 2024 edition

There are numerous methods departments have used to help prepare their personnel for the written examination. Considering the high level of skill and knowledge that is required for an apparatus driver/operator, the Certification Council recommends that candidates participate in a comprehensive class and receive instruction on both skills and written requirements.

Skill Objectives

Each candidate **must** be trained and evaluated in the performance of **all** skills as found in this Utah certification standard. Each of the skill objectives shall be completed swiftly, safely, and with competence as defined below:

- **Swiftly.** Each skill objective must be completed within the allotted time.
- **Safely.** Each skill objective must be completed safely. Conduct that could injure an individual or damage equipment is unacceptable. Equipment should be checked prior to skills testing or training to see that it is safe and functional.
- **With Competence.** Each skill objective must be performed in accordance with this Utah certification standard. This includes performing the proper steps in sequence. Competence will be measured in accordance with the UFSCS skill objectives.

Department Training Records

Each candidate shall have a current, accurate, and complete Training Record on file with the department which indicates that they have been trained on all skill objectives. **The Training Record must be completed in its entirety for the candidate to be permitted to test.** Training Records may be completed on a computer or by hand. Departments may set up their own Training Records, use the one provided in this standard, or use the fillable Training Record found online on UFRA's website. If a department chooses to set up their own Training Record, it must meet the following requirements:

1. Indicate the certification level and its corresponding NFPA standard number and edition.
2. Include a signature line for the candidate, which attests that all skills have been trained on and a complete in-house comprehensive exam was administered and passed.
3. Include a signature line for the chief/training officer, which attests that the candidate has been trained on all skills and a complete in-house comprehensive exam was administered and passed.
4. Include a line to record the date the Training Record was completed.
5. List all the skills from this Utah certification standard for this level. Include columns indicating the training dates, training instructors, dates of exams, exam instructors, and whether the candidate passed each exam (see the Training Record examples in this standard).

Department In-House Skills Examinations

At the completion of the department's skills training, the department is required to hold an in-house skills examination for the level being trained. This is a comprehensive in-house skills test conducted by the department training officers. This test is to ensure that skill mastery has been maintained from the beginning to the end of the training process, and to prepare candidates for the state examination. Training officers may utilize other personnel to assist in administering the exam. However, they must be certified at the level they are in-house testing.

Proctor instructions for the examination are in Appendix H in this standard. In-house testers shall follow

the proctor instruction sheet to ensure uniformity and fairness during the exam. It is recommended that candidates be given two attempts at any skill. **If they fail on the second try, then they have failed the evaluation and are required to go through additional training by the department trainer.** No training, teaching, or coaching is allowed during the test. After the evaluation, using the test to teach and train is recommended.

If skill weaknesses are evident, the department should conduct additional training and hold a new department in-house skills examination to ensure their personnel have fully mastered all required skills. Only those individuals who successfully pass the department's skills test will be allowed to participate in the Certification Council's skills spot check examination. Department Training Records must show that all candidates have successfully passed the in-house exam.

ADO-AERIAL CERTIFICATION EXAMINATIONS

After completion of the training process, the chief/administrator can request testing for the candidate using the Examination Request form (see Appendix I). The candidate will then have three attempts to pass the written examination. A separate request must be sent to the Certification Office for each attempt. Request forms must reach the Certification Office no later than 30 days prior to the examination date. The entire examination process must be completed within one year of the first written exam date.

Written Examinations

The written examination is a randomly generated **100-question** test covering the written objectives of the ADO-Aerial standard.

A minimum score of 70% is required to pass the certification exam. Candidates failing the first attempt of the written exam will be permitted to retest no sooner than 30 days from the date of the last exam. Three attempts are allowed to pass the exam. A candidate who fails the written examination three times has failed the certification process and must wait one year from the date of the last failed exam before reentering testing. Exam results are forwarded to the chief/administrator within 30 days following receipt of the completed exam.

SAMPLE WRITTEN EXAMINATION QUESTION

Large scale defensive operations often require the use of:

A. Elevated master streams
B. Large diameter hose
C. Large fire streams
D. All of the above

Skills Spot Check Examinations

The skills spot check examination has two steps: a department records check and the skills spot check examination itself. A Certification tester appointed by the Utah Fire Service Certification Council conducts the examination.

Training Records are checked. If records are inadequate, corrective action must be taken before proceeding to the next step. The records must meet minimum requirements and are checked for the following:

1. Candidate has been trained in each skill and evolution for the level being evaluated.
2. A department training officer has signed off each skill.
3. Each candidate has passed a department in-house skills examination.

The skills spot check examination is graded on a 100% pass/fail basis. The test is graded in the following three areas:

- **Swiftly.** Each skill objective must be completed within the allotted time.
- **Safely.** Each skill objective must be completed safely. Conduct that could injure an individual or damage equipment is unacceptable. Equipment should be checked prior to skills testing or training to see that it is safe and functional.
- **With Competence.** Each skill objective must be performed in accordance with this Utah certification standard. This includes performing the proper steps in sequence. Competence will be measured in accordance with the UFSCS skill objectives.

Candidates are spot checked on three skills picked at random. No prior notification of the skills being tested will be given. Candidates are given two attempts (if necessary) to perform each skill. If they fail on the second try, then they have failed the examination. Candidates who fail the second attempt must wait **30 days** before the third and final attempt. Candidates taking third attempts will test on the skill they missed plus an additional skill from the section of the standard they failed. **No training, teaching, or coaching is allowed during this state test.**

During the skill examination a **SPOTTER** will be used. The purpose of having a spotter assist while backing an apparatus is to protect life and property. The spotter should alert the driver if property damage or damage to the apparatus could occur. The spotter will **NOT** direct the driver when to stop during a test.

Candidates who have failed the third attempt of the written examination or the skills examination have failed the certification process and must wait **one year** from the date of the failed third attempt to reenter state testing. The candidate will begin testing with a new **first attempt** of the written examination, following a request for examination. If a candidate wishes to enter a new course, the candidate may petition the Certification Office to reenter the certification examination process no sooner than 120 days after their **third attempt** failure. In the petition, candidates must explain the reason(s) behind their request to reenter the process.

ADO-AERIAL CERTIFICATION/RECERTIFICATION

When all requirements for certification have been met, applicants are eligible to be certified. The chief/administrator may apply to the Utah Fire Service Certification Council for certification for those candidates who have successfully completed the certification training/testing process. Requests for state certification must be submitted to the Certification Office using the Certification/Recertification Request form provided (see Appendix I). The names are then checked against the official state records to ensure that each individual listed has met all requirements and prerequisites.

Prerequisites for ADO-Aerial Certification

To qualify to train for a certain level, candidates must have completed the prerequisites.

Training Level	Trains on NFPA 1010	Prerequisite
Apparatus Driver/Operator-Aerial	Chapter 11 & 13	Apparatus Driver/Operator-Pumper

Prior to certification at the ADO-Aerial level, applicants must be state certified through the Utah Fire Service Certification System at the ADO-Pumper level.

Training and certification at these levels may be achieved at any time during the ADO-Aerial training process. ADO-Aerial certification will not be issued until candidates have fulfilled this requirement.

Certifications are valid for a three-year period. Each certified apparatus driver/operator may renew certification by having the chief/administrator of the participating agency submit a Certification/ Recertification Request (see Appendix I).

Certified candidates should participate in at least 36 hours of structured class and skills training per year to maintain competency and stay current on their skills. This 36 hours is for all certified levels combined, not 36 hours for each individual level. **A total of 108 hours of training is required** for the previous three-year certification period.

For more information on Utah firefighter certification, contact:
Utah Fire Service Certification Council
Utah Fire & Rescue Academy
3131 Mike Jense Parkway, Provo, UT 84601
801-863-7709, www.uvu.edu/ufra

ADO-AERIAL CERTIFICATION CHECKLIST

ENTRANCE REQUIREMENTS

- ❑ Each candidate has met the requirements listed in NFPA 1010 (2024).

- ❑ Each candidate has met the additional requirements as required by NFPA 1010:
  1. A valid driver's license
  2. A medical evaluation as required by NFPA 1500, Section 8

- ❑ The department has filed an Intent to Participate form with the UFSCC.

- ❑ Each candidate has trained in the level's written objectives.

DEPARTMENT TRAINING RECORDS

- ❑ Each candidate has a Training Record on file with the department that shows:
  1. A learning experience in each skill objective
  2. Dates of training
  3. Initials of instructors

- ❑ Each candidate has trained in the level's written objectives.

DEPARTMENT IN-HOUSE SKILLS EXAMINATION

- ❑ Each candidate has successfully completed an in-house skills examination.

- ❑ Exam results are documented in department training records.

ADDITIONAL TRAINING/PREREQUISITE REQUIREMENT

- ❑ Each candidate is certified at the Apparatus Driver Operator-Pumper level.

CERTIFICATION EXAMINATIONS

- ❑ Each candidate has passed the UFSCC written examination.

- ❑ Each candidate has passed the UFSCC skills and/or evolution examination.

- ❑ A spot check examination was administered by an approved UFRA Certification tester.

CERTIFICATION

- ❑ The chief/administrator has requested certification for candidates using the Certification/Recertification Request form.

ADO-AERIAL SKILL OBJECTIVES

PREVENTIVE MAINTENANCE

For the skills in this section, the AHJ must be able to provide a safe testing environment for the candidates and accept all liability for candidate safety.

1. Perform and document routine tests, inspections, and servicing functions on a:

A. Fire department apparatus-aerial

REFERENCE: NFPA 1010, 2024 edition, 11.2.1

CONDITION: Given a fire department aerial apparatus, hand tools, inspection form or checklist (may use checklist in Appendix A).

COMPETENCE:

- Check batteries for fluid level and corrosion (If maintenance-free, check indicator for correct color).
- Check braking system for fluid level and drain air tanks of water as applicable.
- Check suspension (clips, shackles, leaf springs, U-bolts, etc.).
- Check coolant systems for fluid levels, leaks, and cleanliness.
- Check electrical system for corrosion and tight connections: siren and other warning devices, headlights, running lights, turn signals, and emergency warning lights.
- Check fuel level.
- Check hydraulic fluid for fluid level and leaks, if applicable.
- Check engine oil for fluid level and leaks.
- Check transmission for fluid level and leaks.
- Check power steering for fluid level and leaks.
- Check other fluid levels as appropriate.
- Check tires for pressure and wear.
- Check steering system for range of motion and looseness.
- Check engine belts for tightness and wear.
- Check tools, appliances, equipment, fixed equipment, and lighting.
- Check windshield wiper blades and fluid.
- Start apparatus, monitor gauges, and control devices.
- Identify, document, and report deficiencies found (verbally per AHJ requirements).
- Complete skill in allotted time.

TIME: 20 minutes

B. Fire department aerial device system

REFERENCE: NFPA 1010, 2024 edition, 13.2.1

CONDITION: Given a fire department aerial apparatus, appropriate hand tools, and inspection form or checklist (may use checklist in Appendix A), determine readiness of aerial device on an aerial apparatus.

COMPETENCE:

- Check pulleys/cable system (if applicable).
- Check aerial device hydraulic system(s).
- Check hydraulic fluid level.
- Operate PTO shift.
- Operate aerial device.
- Check slides/slide blocks and/or rollers (if applicable).
- Check for adequate lubrication of the aerial device.
- Check stabilizing system(s).
- Check aerial device safety systems/interlocks.
- Check leveling gauges.
- Check breathing air system (if applicable).
- Check communication system.
- Check nozzle/waterway (if applicable).
- Check tools, appliances, equipment, fixed equipment, and lighting.
- Identify, document, and report deficiencies as found, per AHJ.
- Complete skill in allotted time.

TIME: 20 minutes

DRIVING/OPERATING

2. Operate a fire department aerial apparatus so that the vehicle is safely operated in compliance with all applicable state and local laws and departmental rules and regulations.

REFERENCE: NFPA 1010, 2024 edition, 11.3.1, 11.3.6

CONDITION: Given a fire department aerial apparatus and a predetermined route on a public way that incorporates the maneuvers and features specified below, ones that the driver/operator is expected to encounter during normal operations: four left turns and four right turns, a straight section of urban business street or a two-lane rural road at least one mile in length, one through- intersection and two intersections where a stop has to be made, one railroad crossing, one curve either left or right, a section of limited-access highway that includes a conventional ramp entrance and exit and a section of road long enough to allow two lane changes, a downgrade steep enough and long enough to require down-shifting and braking, an upgrade steep enough and long enough to require gear changing to maintain speed, and one underpass or low clearance or bridge

COMPETENCE:

- Adjust and use mirrors.
- Use seat belts for all occupants.
- Observe all posted speed limits.
- Maintain safe following distances.
- Maintain control of the vehicle while accelerating, decelerating, and turning during any weather conditions.
- Stop fully at all stop signs or stop lights.

- Use turn signals.
- Keep apparatus in correct lane of travel.
- Monitor all gauges so vehicle is operated within manufacturer's specifications.
- Complete skill in allotted time.

TIME: As determined by route

3. Back a vehicle from a roadway into restricted spaces, on both the right and left sides of the vehicle, with restricted horizontal and vertical clearances (Alley Dock).

REFERENCE: NFPA 1010, 2024 edition, 11.3.2, 11.3.5

CONDITION: Given a fire department aerial apparatus, spotter (used as a guide and safety to direct the apparatus when backing only), cones, and a restricted space 12 feet in width, requiring 90-degree right- or left-hand turns from the roadway, so that the vehicle is parked within the restricted area without having to stop and adjust travel and without striking cones. A marker should be placed on the ground, on the left side of the apparatus, to mark where the front left tire should be spotted and where to stop the apparatus and park.

COMPETENCE:

- Adjust and use mirrors for backing.
- Ensure driver/passengers are wearing seat belts.
- Use a spotter when backing apparatus (for safety only).
- Stop apparatus by aligning center of left tire within 6 inches of the center of the mark on the ground that indicates where the apparatus should be stopped and parked.
- Do not strike cones (including the base of the cones).
- Complete skill in allotted time.

TIME: 5 minutes

4. Maneuver a vehicle around obstructions on a roadway while moving forward and in reverse (Serpentine).

REFERENCE: NFPA 1010, 2024 edition, 11.3.3

CONDITION: Given a fire department aerial apparatus, a spotter (used as a guide and safety to direct the apparatus when backing only), 4 cones, and a large area or roadway to operate, so that the vehicle is maneuvered around the cones without stopping and without striking any cones. The distance between cones should be the length of the aerial apparats plus 2 feet. Measure distance between cones from the base of the cones.

COMPETENCE:

- Adjust and use mirrors for backing.
- Ensure driver/passengers are wearing seat belts.
- Use a spotter when backing apparatus (for safety only).

- Do not strike cones (including the base of the cones).
- Complete skill in allotted time.

TIME: 5 minutes

5. Turn a vehicle around 180 degrees within a confined space with restricted horizontal and vertical clearances (Confined Space Turnaround).

REFERENCE: NFPA 1010, 2024 edition, 11.3.4, 11.3.5

CONDITION: Given a fire department aerial apparatus, a spotter (used as a guide and safety to direct the apparatus when backing only), cones, and an area where vehicle cannot make a U-turn without stopping and backing up, so that the vehicle is turned 180 degrees without passing over or striking cones. The turnaround area should be square and be the length of the aerial apparatus plus 20 feet.

COMPETENCE:

- Adjust and use mirrors for backing.
- Ensure driver and passengers are wearing seat belts.
- Use a spotter when backing apparatus (for safety only).
- Do not strike cones (including the base of the cones).
- Complete skill in allotted time.

TIME: 5 minutes

AERIAL OPERATIONS

6. Maneuver an aerial apparatus so it is properly positioned for safe aerial device (platform or ladder) deployment, for rescue and ventilation activities for:

A. Window operations

REFERENCE: NFPA 1010, 2024 edition, 13.3.1, 13.3.2, 13.3.3

CONDITION: Given an aerial apparatus, an incident location, an assignment, and a spotter. The spotter is there only to assist the operator in guiding the aerial device to the objective.

Aerial Ladder: Elevate, rotate, and extend device and lower it to target area. Extend it 6 feet above roof (ladder should be within 6–12 inches of edge of roof for skills testing purposes only, following AHJ policies and procedures) for rescue or ventilation operations.

Platform: Elevate, rotate, extend, and lower platform so it is level with roof for rescue or ventilation operations.

COMPETENCE:

- Position aerial apparatus for operation (upwind, out of collapse zone, in correct position for grade/terrain).
- Assess overhead hazards for deployment of aerial device (i.e., overhead

wires, power lines, and trees). Must verbalize.

- Set parking brake and engage PTO. Chock wheels if applicable.
- Verbalize assessment of surface conditions for stabilizing purposes.
- Stabilize apparatus using stabilizing device and use leveling gauge.
- Switch selector valve to aerial device, if not automatic.
- Verbalize weight restrictions while operating aerial device.
- Elevate, rotate, extend, and lower aerial device so it is level with windowsill for rescue operations.
- Elevate, rotate, extend, and lower aerial device to side of window for ventilation purposes.
- The skill time stops when the objective has been met.
- The skill is completed when the aerial device is retracted, lowered, and bedded.
- Complete skill in allotted time.

TIME: 10 minutes

B. Roof operations

REFERENCE: NFPA 1010, 2024 edition, 13.3.1, 13.3.2, 13.3.3

CONDITION: Given a fire department aerial apparatus, an incident location, an assignment, and a spotter. The spotter is there only to assist the operator in guiding the aerial device to the objective.

Aerial Ladder: Elevate, rotate, and extend device and lower to target area. Extend it 6 feet above roof (ladder should be within 6–12 inches of edge of roof for skills testing purposes only, following AHJ policies and procedures) for rescue or ventilation operations.

Platform: Elevate, rotate, extend, and lower platform so it is level with roof for rescue or ventilation operations.

COMPETENCE:

- Position aerial apparatus for operation (upwind, out of collapse zone, in correct position for grade/terrain).
- Assess overhead hazards for deployment of aerial device (i.e., overhead wires, power lines, and trees). Must verbalize.
- Set parking brake and engage PTO. Chock wheels if applicable.
- Verbalize assessment of surface conditions for stabilizing purposes
- Stabilize apparatus using stabilizing devices and use leveling gauge.
- Switch selector valve to aerial device, if not automatic.
- Verbalize weight restrictions while operating aerial device.
- Elevate, rotate, extend, and lower device to target based on assignment. Extend an aerial ladder 6 feet above roof. Extend a platform so it is level with roof.
- The skill time stops when the objective has been met.
- The skill is completed when the aerial device is retracted, lowered, and bedded.
- Complete skill in allotted time.

TIME: 10 minutes

C. An elevated master stream

REFERENCE: NFPA 1010, 2024 edition, 13.3.1, 13.3.2, 13.3.3, 13.3.5

CONDITION: Given a fire department aerial apparatus, an incident location, an assignment, a pre-established water supply not connected to the inlet, and a spotter. The spotter is there to assist the operator in guiding the aerial device to the objective and may assist at the hydrant.

COMPETENCE:

- Position aerial apparatus for operation (upwind, out of collapse zone, in correct position for grade/terrain).
- Assess overhead hazards for deployment of aerial device (i.e., overhead wires, power lines, and trees). Must verbalize.
- Set parking brake and engage PTO. Chock wheels if applicable.
- Verbalize assessment of surface conditions for stabilizing purposes.
- Stabilize apparatus using stabilizing devices and use leveling gauge.
- Switch selector valve to aerial device, if not automatic.
- Verbalize weight restrictions while operating aerial device.
- Make water supply connection to apparatus and call for water.
- Activate water flow to nozzle.
- Establish and verbalize correct PDP (within +/- 10 psi) and the method used to determine PDP (if equipped with a pump).
- Adjust nozzle position, pattern, and flow to create an effective water stream.
- The skill time stops when the objective has been met
- The skill is completed when the aerial device is retracted, lowered, and bedded
- Complete skill in allotted time.

TIME: 10 minutes

7. Lower an aerial device using the emergency operating system until it is safely lowered to its bedded position (simulated emergency).

REFERENCE: NFPA 1010, 2024 edition, 13.3.4

CONDITION: Given an aerial apparatus and a situation that would require emergency action (i.e., a loss of power or engine failure), a 2-firefighter team (operator and assistant). The apparatus engine should be off, and the batter switch and ignition switch should be on.

COMPETENCE:

- Verbalize notifying incident command of the situation (such as a loss of apparatus power).
- Demonstrate activation of auxiliary system per manufacturer recommendations.
- Verbalize procedure to raise, retract, rotate, and lower aerial device to bedded position using auxiliary system.
- Verbalize procedure to lift outriggers using auxiliary system.
- Verbalize appropriate EPU cycle time (time on vs. time off).
- Complete skill in allotted time.

TIME: 5 minutes

UTAH FIRE SERVICE CERTIFICATION SYSTEM
APPARATUS DRIVER/OPERATOR-AERIAL

NFPA 1010, 2024 Edition

ADO-AERIAL

TRAINING RECORD/IN-HOUSE COMPREHENSIVE EXAM

Candidate Name:	**Department:**
Candidate Signature:	**Date of Completion:**
Chief/Training Officer Name:	**Chief/Training Officer Signature:**

This form may be completed on a computer but must be printed out for the Certification tester to verify on test day. Date of completion and signatures of chief/training officer and candidate must be original signatures. Signatures attest that all skills have been trained on and a complete in-house comprehensive exam was administered and passed. Falsification of signatures or any component of this document may result in the revocation, suspension, or denial of certification.

SECTION	TRAINING RECORD		IN-HOUSE COMPREHENSIVE EXAMS			SKILLS
	DATE	INST.	DATE	INST.	PASS	
PREREQUISITE						ADO-Pumper
PREVENTIVE MAINTENANCE						1A. Perform and document routine tests, inspections, and servicing functions on a fire department apparatus-aerial.
						1B. Perform and document routine tests, inspections, and servicing functions on a fire department aerial device system.
DRIVING/ OPERATING						2. Operate a fire department aerial apparatus so that the vehicle is safely operated in compliance with all applicable state and local laws and departmental rules and regulations.
						3. Back a vehicle from a roadway into restricted spaces, on both the right and left sides of the vehicle, with restricted horizontal and vertical clearances (Alley Dock).

						4. Maneuver vehicle around obstructions on a roadway while moving forward and in reverse (Serpentine).
						5. Turn a vehicle around 180 degrees within a confined space with restricted horizontal and vertical clearances (Confined Space Turnaround).
AERIAL OPERATIONS						6A. Maneuver aerial apparatus for safe device deployment for window operations.
						6B. Maneuver aerial apparatus for safe device deployment for roof operations.
						6C. Maneuver aerial apparatus for safe device deployment for an elevated master stream.
						7. Lower aerial device using emergency operating system until it is safely lowered to its bedded position (simulated emergency).

APPENDIX A
WEEKLY EMERGENCY VEHICLE REPORT

Weekly Emergency Vehicle Report

Department _____ Station _____

Apparatus Number _____ Type _____

		Day of the Week/Date	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Engine Comp.	1.	Radiator Coolant							
	2.	Engine Oil Level							
	3.	Transmission Fluid							
	4.	Power Steering Fluid							
	5.	Belts/Pulleys							
	6.	Hoses and Hydraulic Lines							
	7.	Air Filter							
	8.	Batteries							
	9.	Other Hydraulic Fluids							
	10.	Engine (loose wires, etc.)							

In the Cab	1.	Fuel Level							
	2.	Odometer Reading							
	3.	Brakes							
	4.	Air Pressure							
	5.	Battery Voltage							
	6.	Check Gauges							
	7.	Check Switches							
	8.	Siren/Horn/Siren Brake							
	9.	Steering Wheel Play							
	10.	Mirrors							
	11.	Panel Lights							
	12.	Interior Lights							
	13.	Radio							
	14.	Heater/AC Controls							

Walk Around	1.	General Body Condition							
	2.	Suspension							
	3.	Steering Linkage							
	4.	Listing/Fluid Leaks							
	5.	Emergency Lights							
	6.	Vehicle Lights							
	7.	Spot/Scene Lights							
	8.	Wiper Blades/Washer Fluid							
	9.	Tires (Press/Tread)							
	10.	Ground Ladders							
	11.	Tools/Fixed Equipment							
	12.	**Start Apparatus/Monitor**							
	13.	Driver Initials/Badge#							

Aerial Inspection		Day of the week	Mon	Tues	Wed	Thu	Fri	Sat	Sun
	1	Hydraulic Fluid Level							
	2	Hydraulic System/PTO							
	3	Stabilizers and Pads							
	4	Interlocks							
	5	Leveling Gauges							
	6	Aerial Control Stations							
	7	Operate Aerial							
	8	Visual Inspection							
	9	Slides/Slide Blocks/Rollers							
	10	Nozzle/Waterway							
	11	Communication System							
	12	Master Stream Controls							
	13	Spot Lights/Flood Lights							
	14	Lubrication							
	15	Cables							
	16	Pulleys							
	17	Rams/Cylinders							
	18	Hydraulic Hoses/Tubing							
	19	Breathing Air							
	20	Attached Tools/Equipment							
	21	E.P.U. Operation (weekly)							

Pump Check								
1	Tank Water Level							
2	Foam Level							
3	Primer Oil Level							
4	Pump Transfer Case Oil Level							
5	Intake Strainers/Anode							
6	Relief Valve Strainer							
7	Operate all Valves/Drains							
8	Primer Operation							
9	Operate Transfer Valve							
10	Check pump shaft for excessive leaks							
11	Pump Operation							
12	Relief valve/Governor Op.							
13	LDH Bleeder							

Remarks By Person Completing Form	Date	Name

APPENDIX B
ADO-PUMPER DRIVING SKILLS DIAGRAMS/INSTRUCTIONS

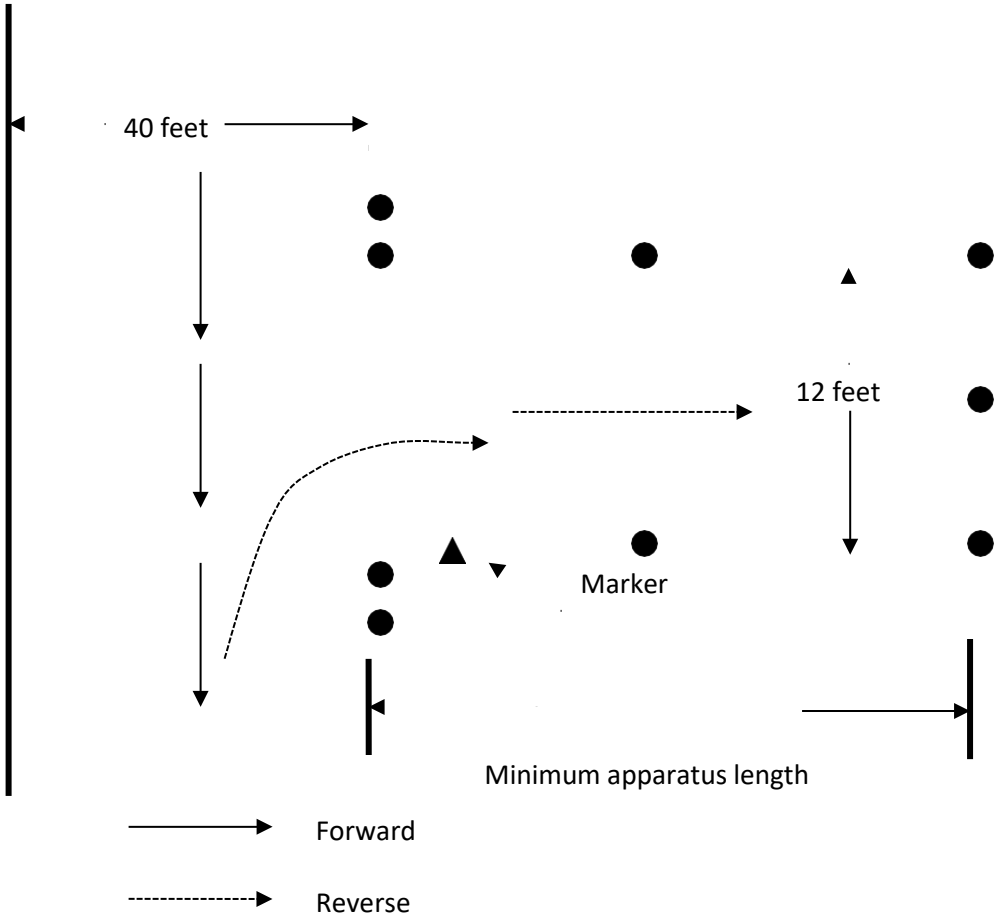
ALLEY DOCK IN A PUMPER

The Alley Dock measures a driver's ability to drive past a simulated dock or stall, back the apparatus into the space provided, and stop smoothly.

Instructions: Drive past the stall on either the left or right, then back the apparatus into the restricted area without having to stop and pull forward and without striking cones. Front bumper may not pass over the border of the 40 ft. roadway. NOTE: "Striking the cone" includes any part of the cone (including the base).

NOTE: Always use a spotter when backing fire apparatus. When apparatus is moving forward, the spotter must be either properly seated in the apparatus with all safety restraints fastened or outside of the coned area.

*Measure distance between cones from the base of the cones.



SERPENTINE IN A PUMPER

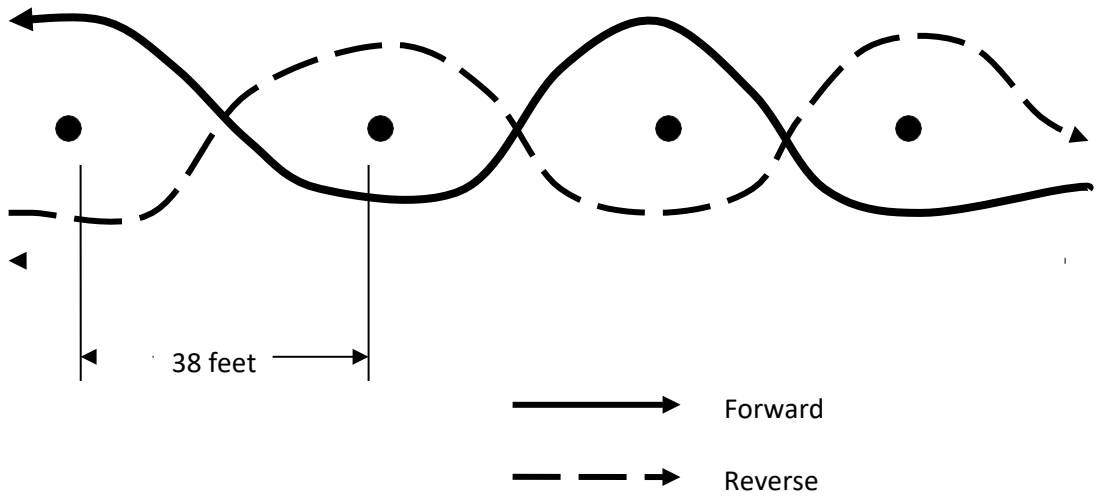
The Serpentine exercise measures a driver's ability to steer the apparatus in close limits without stopping.

Instructions: The driver will drive the apparatus along the left side of the cones in a straight line and stop just beyond the last cone. The driver then should back the apparatus between the markers by passing to the left of cone #1, to the right of cone #2, to the left of cone #3, and to the right of cone #4. At this point the driver should stop the vehicle and then drive it forward between the markers by passing to the left of cone #4, to the right of cone #3, to the left of cone #2, and to the right of cone #1. NOTE: "Striking the cone" includes any part of the cone (including the base).

NOTE: Always use a spotter when backing fire apparatus. When apparatus is moving forward, the spotter must be either properly seated in the apparatus with all safety restraints fastened or outside of the coned area.

*Measure distance between cones from the base of the cones.

*Spacing of cones should be 38 feet from base to base. For apparatus lengths that exceed 36 feet, the course may be modified to apparatus length plus 2 feet (base to base).



DIMINISHING CLEARANCE IN A PUMPER

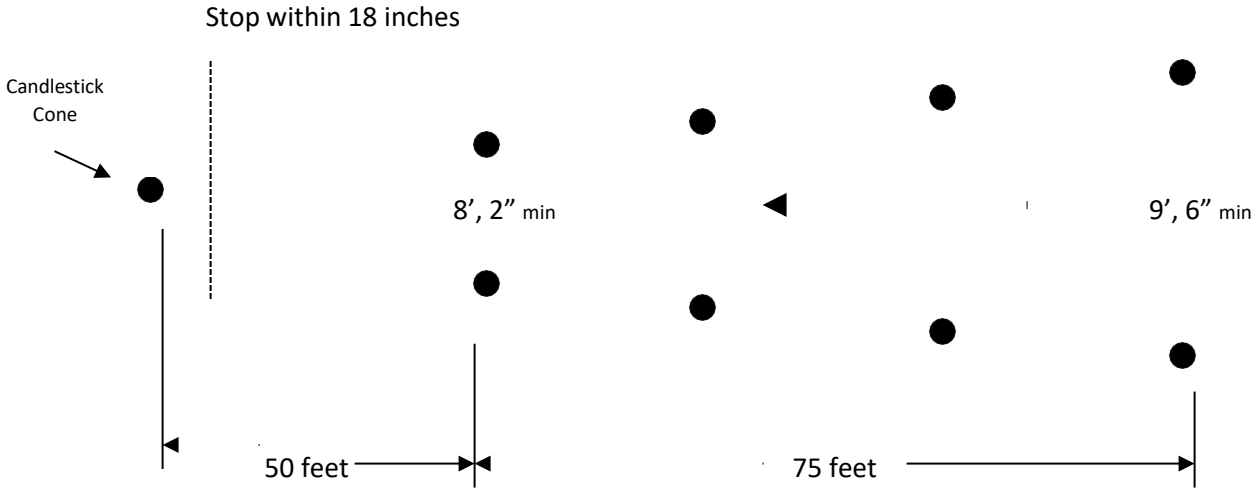
The Diminishing Clearance exercise measures a driver's ability to steer the apparatus in a straight line, to judge distance from wheel to object, and to stop at a finish line.

Instructions: The course is created by arranging 2 rows of cones to form a lane 75 ft. long. The lane varies in width from 9 ft. 6 in. to a diminishing clearance of 8 ft. 2in. The finish cone should have an extended flag/candlestick cone so the driver can see the finish cone from cab. The driver should maneuver the apparatus through this lane without touching the cones. The apparatus should be stopped at a finish cone 50 ft. beyond the last cone, within 18 in. of the finish cone. No portion of the vehicle should protrude beyond this point. NOTE: "Striking the cone" includes any part of the cone (including the base).

NOTE: Width measurements for this skill may be modified due to the varying widths of apparatus. Modification should be based on the track width of the apparatus being used for training. To obtain a final width, measure the apparatus being used and add 2 inches on each side the track width (from bulge to bulge on the widest axle) and that will be the final width for training and testing purposes. For example, if an apparatus has a track width of 8 feet 4 inches wide, then the final set of cones should be 8 feet 8 inches.

*Establish a center line, mark off 75 feet, set the two ends of the Alley up, and then sight in the middle cones to line them up. The Alley is in a "V" shape: one side is not straight with the other side angled.

*Measure distance between cones from the base of the cones.



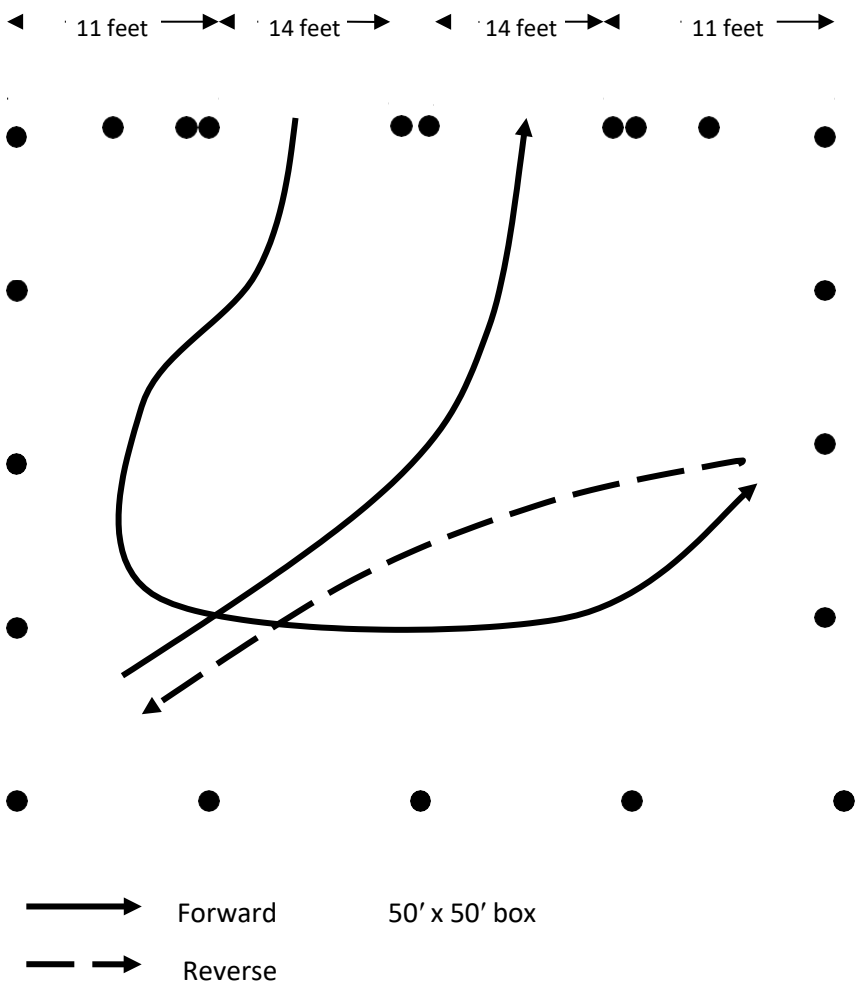
CONFINED SPACE TURNAROUND IN A PUMPER

The Confined Space Turnaround exercise measures the driver's ability to turn the vehicle around in a confined space without striking obstacles.

Instructions: The course is created by making a 50 ft. square area with a 14 ft. wide entry and exit. The driver moves into the area from the entry point, turns the vehicle 180 degrees, and leaves the area through the exit. There is no limitation on the number of times the driver can maneuver the vehicle to accomplish this skill, but no portion of the vehicle should extend over the boundary lines of the space and no cones shall be struck. NOTE: "Striking the cone" includes any part of the cone (including the base).

NOTE: Always use a spotter when backing fire apparatus, for safety purposes. When apparatus is moving forward, the spotter must be either properly seated in the apparatus with all safety restraints fastened or outside of the coned area.

*Measure distance between cones from the inside base of the cones.



APPENDIX C
ADO-AERIAL DRIVING SKILLS DIAGRAMS/INSRUCTIONS

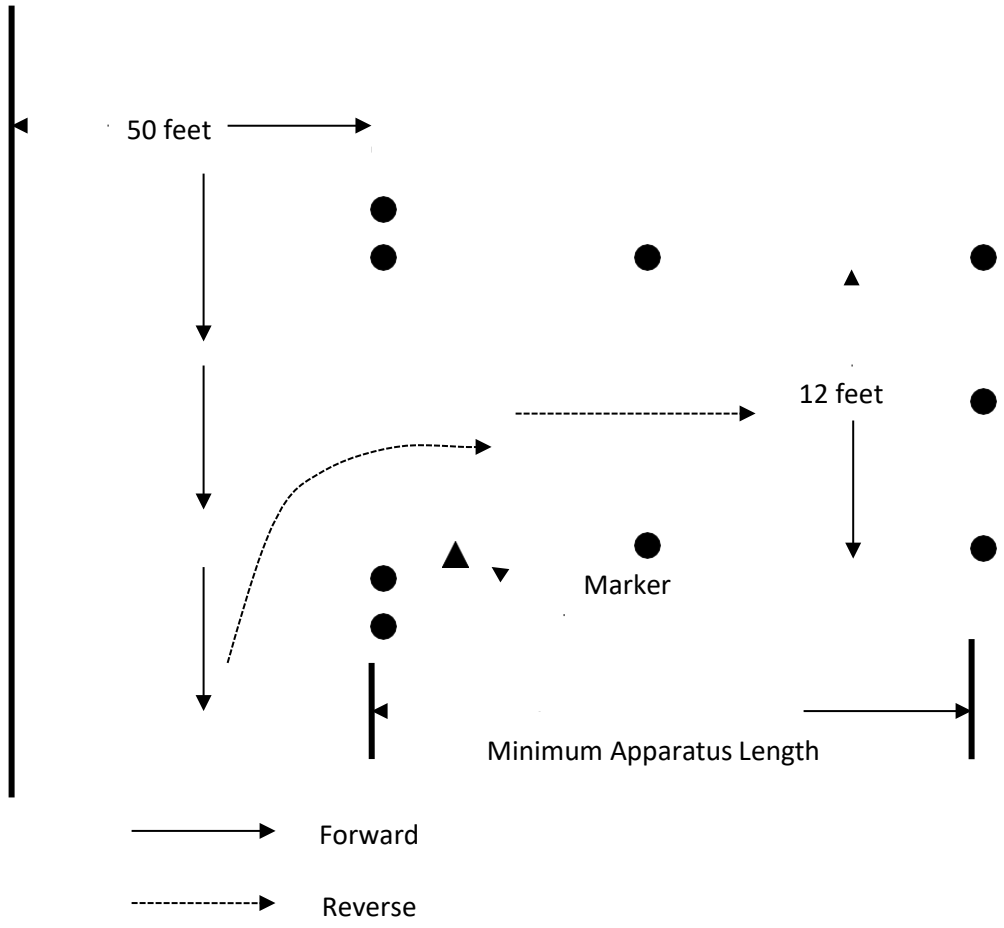
ALLEY DOCK IN AN AERIAL

The Alley Dock measures a driver's ability to drive past a simulated dock or stall, back the apparatus into the space provided, and stop smoothly.

Instructions: Drive past the stall on either the left or right, then back the apparatus into the restricted area without having to stop and pull forward and without striking cones. NOTE: "Striking the cone" includes any part of the cone including the base.

NOTE: Always use a spotter when backing fire apparatus. When apparatus is moving forward, the spotter must be either properly seated in the apparatus with all safety restraints fastened or outside of the coned area. The front bumper may not pass over the border of the 50 ft. roadway.

*Measure distance between cones from the base of the cones.



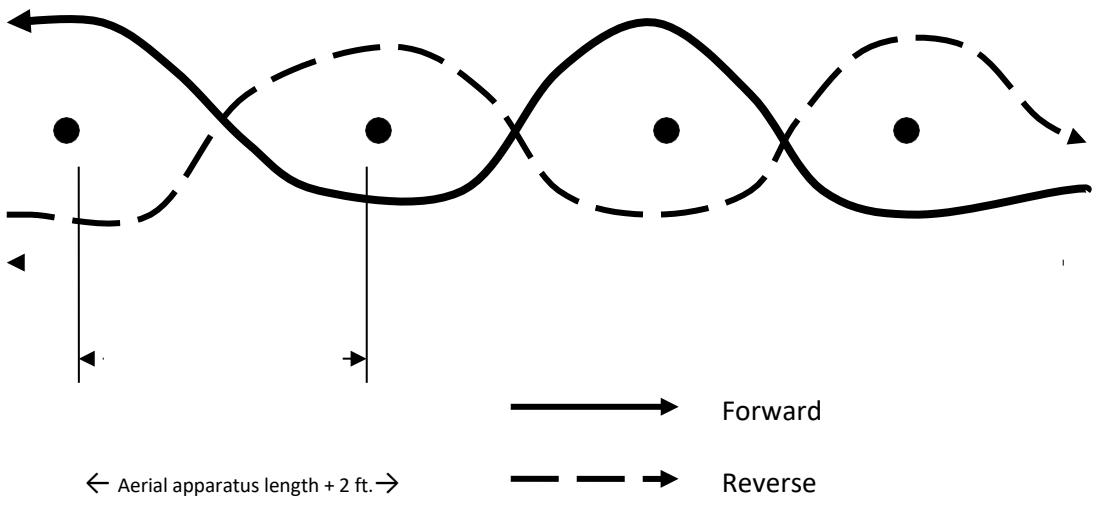
SERPENTINE IN AN AERIAL

The Serpentine exercise measures a driver's ability to steer the apparatus in close limits without stopping.

Instructions: The driver will drive the apparatus along the left side of the cones in a straight line and stop just beyond the last cone. The driver then should back the apparatus between the markers by passing to the left of cone#1, to the right of cone #2, to the left of cone #3, and to the right of cone #4. At this point the driver should stop the vehicle and then drive it forward between the markers by passing to the left of cone #4, to the right of cone #3, to the left of cone #2, and to the right of cone #1. This must be completed without striking cones. NOTE: "Striking the cone" includes any part of the cone including the base.

NOTE: Always use a spotter when backing fire apparatus. When apparatus is moving forward, the spotter must be either properly seated in the apparatus with all safety restraints fastened or outside of the coned area.

*Measure distance between cones from the base of the cones. Distance between cones should be aerial apparatus length plus 2 ft.



DIMINISHING CLEARANCE IN AN AERIAL

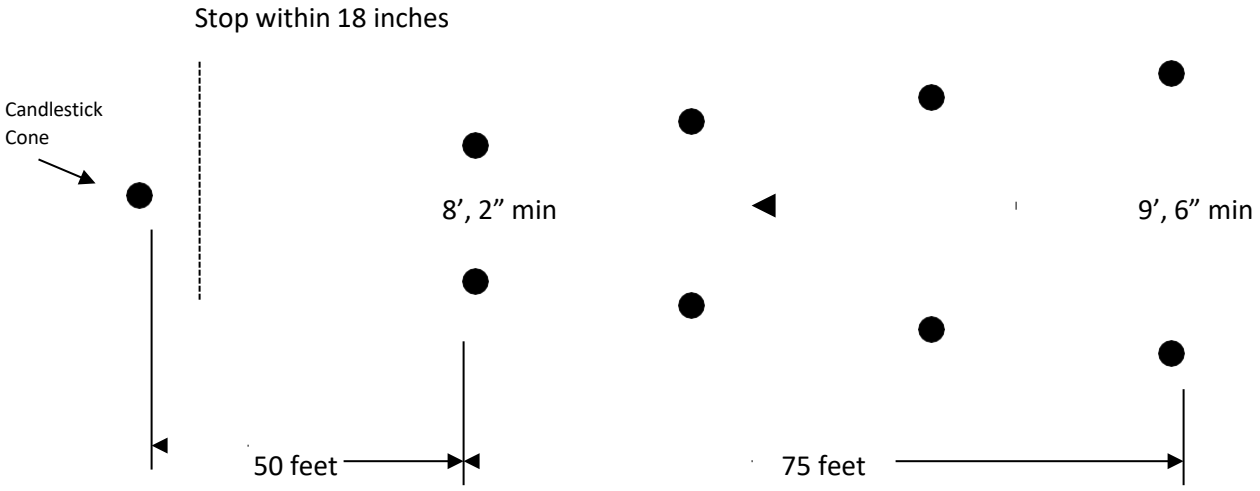
The Diminishing Clearance exercise measures a driver's ability to steer the apparatus in a straight line, to judge distances from wheel to object, and to stop at a finish line.

Instructions: The course is created by arranging 2 rows of cones to form a lane 75 feet long. The lane varies in width from 9 feet 6 inches to a diminishing clearance of 8 feet 2 inches. The driver should maneuver the apparatus through this lane without touching the cones. The apparatus should be stopped at a finish cone 50 feet beyond the last cone with the bumper of the apparatus within 18 inches of the finish cone. No part of the apparatus should protrude beyond this point and this must be completed without striking cones. NOTE: "Striking the cone" includes any part of the cone including the base.

NOTE: Width measurements for this skill may be modified due to the varying widths of apparatus. Modification should be based on the track width of the apparatus being used for training. To obtain a final width, measure the apparatus being used and add 2 inches on each side of the track width. That will be the final width for training and testing purposes. For example, if an apparatus has a track width of 8 feet 4 inches wide, then the final set of cones should be 8 feet 8 inches.

*Establish a center line, mark off 75 feet, set the two ends of the Alley up, and then sight in the middle cones to line them up. The Alley is in a "V" shape: one side is not straight with the other side angled.

*Measure distance between cones from the base of the cones.



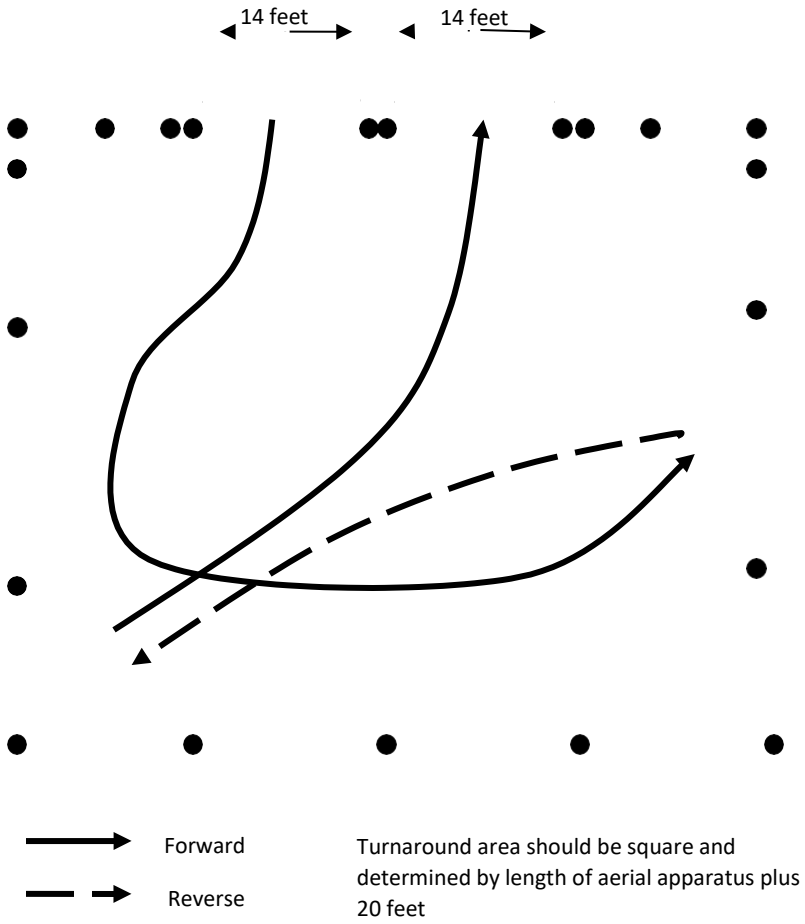
CONFINED SPACE TURNAROUND IN AN AERIAL

The Confined Space Turnaround exercise measures the driver's ability to turn the vehicle around in a confined space without striking obstacles.

Instructions: The course is created by making a square area based on the length of the aerial apparatus plus 20 feet. The entry and exit width is 14 feet. The driver moves into the area from the entry point, turns the vehicle 180 degrees, and leaves the area through the exit. There is no limitation on the number of times the driver can maneuver the vehicle to accomplish this skill, but no portion of the vehicle should extend over the boundary lines of the space and no cones shall be hit. NOTE: "Striking the cone" includes any part of the cone including the base.

NOTE: Always use a spotter when backing fire apparatus. When apparatus is moving forward, the spotter must be either properly seated in the apparatus with all safety restraints fastened or outside of the coned area.

*Measure distance between cones from the base of the cones.



APPENDIX D
FIRE FLOW FORMULAS

Friction Loss per 100' Fire Hose: $FL = CQ^2$

GPM	1½″ Hose	1¾″ Hose	2½″ Hose	3″ Hose w/ 2½″ coups	4″ Hose	5″ Hose	6″ Hose
100	24.0	15.5	2.0				
125	37.5	24.2	3.1	1.2			
200		62.0	8.0	3.2			
250		96.8	12.5	5.0			
300			18.0	7.2	1.8		
350			24.5	9.8	2.4		
400			32.0	12.8	3.2	1.3	
450				16.2	4.1	1.6	
500				20.0	5.0	2.0	1.2
600				28.8	7.2	2.9	1.8
700				39.2	9.8	3.9	2.4
800				51.2	12.8	5.1	3.2
900				64.8	16.2	6.5	4.0
1,000					20.0	8.0	5.0
1,100					24.2	9.7	6.0
1,200					28.8	11.5	7.2
1,300					33.8	13.5	8.4
1,400					39.2	15.7	9.8
1,500					45.0	18.0	11.2

Solid Stream Nozzle Flow Rates: $GPM = 29.7\ d^2 \sqrt{NP}$

Tip size (inches)	Tip size (decimal)	Handline flow @ 50 psi	For field use round to	Master stream @ 80 psi	For field use round to
1/2	0.5	52	50		
5/8	0.625	82	80		
3/4	0.75	118	120		
7/8	0.875	161	160		
15/16	0.9375	184	180		
1	1	210	200		
1 1/8	1.125	266	250		
1 1/4	1.25	328	325	415	400
1 3/8	1.375			502	500
1 1/2	1.5			597	600
1 5/8	1.625			701	700
1 3/4	1.75			814	800
1 7/8	1.875			933	900
2	2			1,063	1,000

Fire Hose Friction Loss Coefficients, Single Line

Hose Diameter and Type	Coefficient (C)
¾″ booster	1,100
1″ booster	150
1¼″ booster	80
1½″	24
1¾″ with 1½″ couplings	15.5
2″	8
2½″	2
3″ with 2½″ couplings	0.8
3″ with 3″ couplings	0.677
3½″	0.34
4″ hose	0.2
4½″ hose	0.1
5″ hose	0.08
6″ hose	0.05

Standpipe Friction Loss Coefficients

4″ pipe	0.374
5″ pipe	0.126
6″ pipe	0.052

Nozzle Pressures

Solid stream nozzles – handline	50 psi
Solid stream nozzles – master streams	80 psi
Fog nozzles – most types	100 psi

*Fog nozzle pressures may vary by manufacturer.

Friction Loss Allowances: Appliances, Apparatus, Systems

Master stream appliances flowing at capacity	25 psi
Aerial devices	25 psi
Wye and manifold appliances flowing >350 GPM	10 psi
Standpipe system	25 psi

Fire Hose Friction Loss Coefficients, Siamese Lines of Equal Length

Hose Diameter and Type	Coefficient (C)
Two 2 ½″	0.5
Three 2 ½″	0.22
Two 3″ with 2 ½″ couplings	0.2
One 3″ with 2 ½″ couplings, one 2 ½″	0.3
One 3″ with 3″ couplings, one 2 ½″	0.27
Two 2 ½″, one 3″ with 2 ½″ couplings	0.16
Two 3″ with 2 ½″ couplings, one 2 ½″	0.12

Additional Water Available from Hydrant

$$\text{Percent drop} = \frac{(\text{static pressure} - \text{residual pressure}) \times 100}{\text{Static pressure}}$$

Percent Decrease of Intake Pressure	Additional Water Pump Available
0–10%	3 times amount being delivered
11–15%	2 times amount being delivered
16–25%	Same as amount being delivered
25%+	Less than amount being delivered

First Digit Method

Get the static pressure, open the line, get the residual pressure.
Subtract the residual pressure from the static pressure = psi drop.
Multiply the first digit of the static by 1, 2, or 3 = volumes available.

If the psi drop is = or < 1st digit x 1 = 3 like volumes are available.
If the psi drop is = or < 1st digit x 2 = 2 like volumes are available.
If the psi drop is = or < 1st digit x 3 = 1 like volume is available.
Any psi drop greater than 1st digit x 3 = no additional water available.

Area, Volume, and Weight

Capacity = 7.5 gallons x cubic feet
- Capacity = volume in gallons
- 7.5 = number of gallons per cubic foot
- cubic feet = area filled with water

Capacity = L x W x D x 7.5
- Capacity = volume in gallons of rectangular storage
- L = length in feet
- W = width in feet
- D = depth in feet
- 7.5 = number of gallons per cubic foot

Capacity = $\pi \times r^2 D \times 7.5$
- Capacity = volume in gallons of cylindrical storage
- r = radius in feet
- D = average depth in feet (or length of horizontal tank)
- 7.5 = number of gallons per cubic foot

Weight = 62.5 lbs. x cubic feet
- Weight = total weight of water
- 62.5 = pounds per cubic foot of water
- Cubic feet = area filled with water

$A = \pi r^2$
- A = area of circle in square inches
- r = radius of circle in inches
- π = the constant pi = 3.1416

Velocity, Flow, and Friction Loss

$V = 12.1 \sqrt{NP}$
- V = flow velocity in feet per second
- 12.1 = a constant
- NP = nozzle pressure in pounds per square inch

$GPM = 29.7 \times d^2 \times \sqrt{NP}$
- GPM = discharge in gallons per minute
- 29.7 = a constant for fire protection nozzles
- d = nozzle diameter in inches
- NP = nozzle pressure in pounds per square inch

$FL = CQ^2L$
- FL = friction loss in pounds per square inch
- C = friction loss coefficient for type and size of hose(s)
- Q = flow rate in hundreds of gallons per minute
- L = hose length in hundreds of feet

Q = GPM/100
- Q = flow rate in hundreds of gallons per minute
- GPM = actual flow through hose
- 100 = a constant

L = hose length/100
- L = hose length in hundreds of feet
- Hose length = actual length of hose
- 100 = a constant

$C = FL/Q^2$
- C = friction loss coefficient for hose
- FL = friction loss in pounds per square inch
- Q = flow rate in hundreds of gallons per minute
- L = hose length in hundreds of feet

Elevation pressure = 0.5 H

Elev. press. = elevation pressure in psi
0.5 = a constant
H = height in feet

Elevation pressure = 5 psi x (number of stories -1)

PDP = NP + TPL

PDP = pump discharge pressure in psi
NP = nozzle pressure in psi
TPL = total pressure loss in psi (appliance, friction, and elevation losses)

$NR = 1.57\ d^2NP$

NR = solid stream nozzle reaction in pounds
1.57 = a constant for solid stream nozzles
d = nozzle diameter in inches
NP = nozzle pressure in pounds per square inch

$NR = 0.0505\ GPM \sqrt{NP}$

NR = fog nozzle reaction in pounds
0.0505 = a constant for fog nozzles
GPM = actual flow in gallons per minute
NP = nozzle pressure in pounds per square inch

L = 1.13 Hg

L = height of lift in feet
1.13 = a constant
Hg = inches of mercury

$$\text{Pressure correction} = \frac{\text{lift + total intake friction loss}}{2.3}$$

$NPDP_{PPS}$ = PDP – intake pressure

$NPDP_{PPS}$ = net pump discharge pressure at positive pressure source
Intake pressure = intake pressure from positive pressure source

$NPDP_{Draft}$ = PDP + pressure correction

$NPDP_{Draft}$ = net pump discharge pressure at draft
Pressure correction = pressure correction for draft

FL per 100 feet = Q^2

FL = friction loss in 100 feet of 3″ hose
Q = flow in hundreds of gallons per minute

FL per 100 feet = $Q^2/5$

FL = friction loss in 100 feet of 4″ hose
Q = flow in hundreds of gallons per minute

FL per 100 feet = $Q^2/10$

FL = friction loss in 100 feet of 5′ hose
Q = flow in hundreds of gallons per minute

APPENDIX E
RELAY CHART

Maximum Distance Relay

Implementing a Maximum Distance Relay Operation

Step 1. Determine relay distance.
Step 2. Determine required flow.
Step 3. Determine maximum distance between pumpers.
Step 4. Divide relay distance by maximum distance from Table 1, round result up, and add one additional pumper.
Step 5. Position attack pumper.
Step 6. Position source at "key" hydrant.
Step 7. Lay out hose and place relay pumpers at intervals determined by Table 1.
Step 8. All pumpers except source pumper: open a discharge to exhaust air from the lines.
Step 9. Source pumper throttles up to proper PDP.
Step 10. 1st relay pumper: close unused discharge once a steady stream of water flows through it, then throttle up to proper PDP.
Note: All successive relay pumpers follow the same procedure.
Step 11. All drivers/operators: set intake relief valves, as needed.
Step 12. Attack pumper: adjust PDP to supply attack lines.
Note: Maintain water flow during temporary shutdowns by using one or more discharges as waster or dump lines.

Example: (1,000 gpm relay over 10,000 feet using 5" LDH) 10000 ÷ 2050 = 4.87(5)+1=6 pumpers total

Table 1. Maximum Distance Relay Lengths (in Feet)

Flow in gpm	One 2½	One 3	One 4	One 5	Two 2½s	One 2½, One 3	Two 3s
250	1,440	3,600	13,200	33,000	5,760	9,600	14,400
500	360	900	3,300	8,250	1,440	2,400	3,600
750	160	400	1,450	3,670	640	1,050	1,600
1,000	90	225	825	2,050	360	600	900
1,250*	50	140	525	1,320	200	375	500

Maximum Distance Relay Pump Discharge Pressure

2½ & 3 inch: maintain 200 psi PDP
4 & 5 inch: maintain 185 psi PDP
****1,250 gpm requires a 1,750 gpm pump to achieve. *PDP accounts for 20 psi residual pressure for the next pumper in the relay.***

Key Positions in a Relay Operation

Source pumper: positioned at the "key" hydrant
Relay pumper(s): spaced evenly throughout the relay at intervals determined from Table 1
Attack pumper: placed at a forward "key" attack position

1 mile = 5,280 feet

Constant Pressure Relay (Maximum Volume)

Implementing a Constant Pressure Relay Operation

Step 1. Position attack pumper.
Step 2. Position source pumper at "key" hydrant.
Step 3. Lay out hose and place relay pumpers at 750-foot intervals.
Step 4. All pumpers except source pumper: open a discharge to exhaust air from the lines.
Step 5. Source pumper: throttle up to 175 psi.
Step 6. 1st relay pumper: close unused discharge once a steady stream of water flows through it, then throttle up to 175 psi.
Note: All successive relay pumpers follow the same procedure.
Step 7. All drivers/operators: set intake relief valves, if needed.
Step 8. Attack pumper: adjust PDP to supply attack lines.
Note: Maintain water flow during temporary shutdowns by using one or more discharges as waste or dump lines.

Maximum Volume at 750 feet (by Hose Layout)

	One 2½	One 3	One 4	One 5	Two 2½s	One 2½, One 3	Two 3s
Max flow	321 gpm	508 gpm	1,017 gpm	1,607 gpm	643 gpm	830 gpm	1,017 gpm

Maximum Volume Relay Pump Pressure

Source and relay pumpers: maintain 175 psi
Attack pumper: adjust PDP as needed, making sure to dump excess pressure
PDP accounts for 20 psi residual pressure for the next pumper in the relay.

Key Positions in a Relay Operation

Source pumper: positioned at the "key" hydrant
Relay pumper(s): spaced evenly throughout the relay at intervals of 750 feet
Attack pumper: placed at a forward "key" attack position

1 mile = 5,280 feet

APPENDIX F
INTAKE HOSE DRAFTING CHART

ALLOWANCES FOR FRICTION LOSS INTAKE HOSE			
Rated Capacity of Pump (gpm)	**Diameter of Hose Intake (inches)**	**For Every 10′ of Intake Hose**	**Allowance (in ft.) for Each Additional 10′ of Intake Hose**
500	4 4½	6 3½	+1 +½
750	4 5	7 4½	+1½ +1
1,000	4½ 5 6	12 4½ 4	+2½ +1½ +½
1,250	5 6	12 ½ 6½	+2 +½
1,500	**5 (dual) 6 (dual)**	**4½ 2**	**+1 +½**
1,750	5 (dual) 6 (dual)	6½ 3	+1 +½
2,000	**5 (dual) 6 (dual)**	**8 4**	**+1½ +½**

From Table 11.2a in IFSTA, ADO-P, Ch. 11, "Drafting Guidelines"

It is important to know the difference in elevation between the pump and the water source when drafting water from a pond or stream. When drafting water, the air at atmospheric pressure is removed from the hose line, creating a vacuum (negative pressure) within the pump chamber. The atmospheric pressure (weight of air) on the water's surface forces the water up through the suction hose to the pump.

The maximum height to which an engine or pump can lift water is determined by the atmospheric pressure. At sea level, the atmosphere exerts an average pressure of 14.7 pounds per square inch (psi). Atmospheric pressure will vary due to changes in the weather. However, these changes tend to moderate themselves so that the average pressure will tend to go back toward 14.7 pounds per square inch. That is why it is safe to use this value of 14.7 pounds per square inch as a constant for calculations.

Maximum lift: 14.7 x 2.304

Attainable lift: current elevation x 2.304

(From http://math.fire.org/index.php?option=com_content&view=article&id=32&Itemid=46)

APPENDIX G
SEVEN-STEP BRAKE SYSTEM CHECK GUIDE

Seven-Step Brake System Check Guide

(Adapted from the Utah CDL handbook)

1. Test low-pressure warning

With the engine off, electrical power on, and enough air pressure that the low-pressure signal is not on, step on and off of the brake pedal to reduce air pressure to the point that the low air alarm activates. This should be before the air pressure drops below 60 psi.

2. Testing the spring brakes

Continue to step on and off the brake pedal to reduce the air pressure. The yellow parking brake knob should pop out when the air pressure reaches the 20–40 psi range.

3. Test air pressure buildup

Start the engine and engage the fast idle (900–1100 rpm). Air pressure should build into the 85–100 psi range within 45 seconds in a dual air system. Larger air systems may take longer. Check the manufacturer's specifications.

4. Test for air leaks

With the air system fully charged, turn off the engine and release the parking brake. After the initial pressure drop, observe air pressure for one minute. Pressure drop of >2 psi in one minute may be a problem or indicate a leak.

Apply moderate braking pressure and hold for one minute. After the initial pressure drop, observe air pressure for one minute. Pressure drop of >3 psi in one minute may be a problem or indicate a leak.

5. Test air compressor governor operation

Start engine and engage the fast idle (900–1100 rpm). Observe air pressure rise until the compressor cuts out (typically 125 psi). With the engine still running, slowly step on and off the pedal to reduce the air pressure to the point where the air compressor starts building air again (typically 100 psi). Check manufacturer's specifications for exact pressures.

6. Test parking brake

Apply the parking brake and remove the wheel chocks. Place transmission in gear and gently raise engine rpms to a fast idle to see if the parking brake holds. The apparatus should not move.

7. Test service brakes

Release the parking brakes. Move the apparatus forward at about 5 mph. Firmly apply the brakes. Note any pull to one side, unusual feel, or delay in stopping.

APPENDIX H
IN-HOUSE PROCTOR INSTRUCTIONS

Proctor Instructions for In-House Comprehensive Examinations

As the training officer for your department, you are authorized by the Certification Council to conduct an in-house skills examination (100%) for this level of certification. You must be certified to the level that you are testing. For example, if you're FF II, you can test both FF I and II, Awareness and Operations. The in-house skills examination must be completed and signed off prior to the actual certification spot check exam (administered by a UFRA Certification tester).

- **Prior to conducting the test, review each candidate's Training Record.**
  It is important that before doing this in-house training skills test, the candidate has completed training in all areas for the level being tested.

- **Select and brief a safety officer.**
  Select a safety officer to assist you during the test. This person is there to protect the candidates from injury during the testing process, is not taking the test, and is not assisting with the testing process. The safety officer must be qualified at the level being tested.

To better evaluate the skills being tested and determine the candidate's readiness for the <u>state spot check exam</u>, follow these in-house exam instructions:

1. This is a TEST and there should be NO COACHING or TRAINING during the testing process. If a candidate fails to perform a skill, that skill will count as a first attempt failure and they will be given a second attempt. If they fail a second attempt, they need to be retrained on that skill and tested again. Only **qualified** candidates that have passed with **100%** should be allowed to take the state spot check exam.

2. Before beginning the testing process, conduct a meeting with all candidates and review the testing process. Explain that this is a test and that the same process being used for the in-house exam will be used during the state exam.

3. Designate two separate areas for students testing: one area for those who are in the testing process and one area for those who have not yet begun the testing process. If separate areas are not available, make sure someone is in the room to ensure that students do not discuss the testing material. Make sure these areas have no training manuals or other reference materials for students to look at while awaiting testing.

4. To evaluate a candidate's performance, use the following as a guide:
   a. The skill is completed in the allotted time.
   b. Competence is shown by completing all performance criteria.
   c. Safety is a priority while completing the skill.

5. At each test station, the tester will read the skill to be demonstrated, the condition to be met, and the time limit to complete each skill. This information is contained in the skill section of each standards packet. Do this with each student as they come to each testing station. Ask for any questions. As each skill is tested and completed, sign it off in the section provided on the candidate's Training Record.

By conducting the in-house skills examination in this manner, you will prepare your candidates to successfully pass the state spot check exam. This will also ensure that Training Records are current and that only those who are truly prepared take the certification examination.

APPENDIX I
CERTIFICATION FORMS AND FEES

LOCATING CERTIFICATION FORMS & FEES

Certification forms and fees are located on UFRA's website at UVU.edu/UFRA under "Certification": https://www.uvu.edu/ufra/certification/certification_forms.html