I. There are four types of handline nozzles used by our Department:

1) Automatic
2) Dual gallonage
3) Low pressure
4) Smooth bore

I. The automatic nozzles for handlines currently used by our Department include the Task Force Tips Handline Series, Dual-Force Series and Mid-Force Series. Automatic Nozzles are designed to maintain a constant nozzle pressure (100psi) throughout the flow range. An automatic nozzle maintains constant pressure similar to a relief valve. As pressure rises the control device inside the nozzle opens the baffle and allows more water to flow. As pressure decreases the baffle closes reducing the flow thereby maintaining a nozzle pressure sufficient for an effective stream. The nozzle operator does not control the nozzle pressure but controls the flow to the nozzle using the “D” handle shutoff and adjusts the stream pattern using the stream shaper. For safety reasons it is mandatory, that with the exception of adjusting the stream pattern, a hand must be kept on the “D” handle shutoff so the flow can be reduced if the nozzle reaction becomes too great.

CAUTION: Automatic nozzles receiving inadequate pressures may not provide the proper amount of water to sufficiently cool a burning fuel even though the stream visually appears to be adequate. Personnel are encouraged to flow their nozzles to learn what an adequate flow looks like, feel like and sounds like.

A. The **Handline series** is for use on 2 ½” handlines and has a water flow capacity of 50 to 350 GPM. It has a 1 ½” (NH) thread knurled female fitting. When used with 2 ½” hose, the tip is attached to a 2 ½” X 1 ½” bell reducer and a 2 ½” “D” handled shutoff.
B. The **Dual-Force series** is for use on 2 ½” handlines and has a water flow capacity of 70 to 250 GPM. It has a 1 ½” (NH) thread rocker lug female fitting. When used with 2 ½” hose, the tip is attached to a 2 ½” X 1 ½” bell reducer and a 2 ½” “D” handled shutoff.

![Dual-Force series](image)

C. The **Mid-Force series** is for use on 1 ¾” handlines and has a water for capacity of 70 to 200 GPM. It has a 1 ½” (NH) thread rocker lug female fitting **yellow** in color to indicate 1 ¾” handline use only. The tip is attached to a 1 ½” “D” handle shutoff.

![Mid-Force series](image)

The Dual-Force and Mid-Force tips are equipped with a knob at the tip of the nozzle marked “Standard” and “Low Pressure/Emergency”. With the water flow shut off, the operator may chose between the two mode selections, which will make a difference in nozzle pressure, water velocity, nozzle reaction and GPM delivered. In the “Standard” mode, the nozzle operates in the full automatic mode with a 100 psi operating nozzle pressure. In the “Low Pressure/Emergency” the nozzle is taken out of the full automatic mode reducing the operating pressure and increases nozzle reaction. This allows for greater flows at lower pressures.

Task Force Tips include a pressure assisted flush that allows the nozzle to be flushed without having to shut down the water flow. Once debris reaches the nozzle, the trapped material will cause poor stream quality, shortened reach and reduced flow. When these problems occur, turn the stream shaper counter-clockwise while flowing water past the full fog position, this will open up the flush and allow debris up to ⅛” to pass through the nozzle. The Gasket Grabber debris screen located at the base of the nozzle traps material larger than ⅛”. This should be checked before re-attaching the nozzle after reloading hose.
All Task Force Tips’ nozzles are factory lubricated with high quality silicone grease. This lubricant has excellent wash out resistance and long-term performance in firefighting nozzles. If the nozzle has been exposed to unusually hard or sandy water, the moving parts of the nozzle may be affected. Foam agents and water additives contain soaps and chemicals may also break down the factory lubrication. The moving parts of the nozzle should be checked on a regular basis for smooth and free operation, and for signs of damage. IF THE NOZZLE IS OPERATING CORRECTLY, THEN NO ADDITIONAL LUBRICANT IS NEEDED. Any nozzle that is not operating correctly should be immediately removed from service.

The field use of Break Free CLP lubricant will help to restore the smooth and free operation of the nozzle. However, these lubricants do not have the washout resistance and long-term performance of the silicone grease. Therefore, re-application of Break Free CLP is needed on a regular basis. CAUTION: Aerosol lubricants contain solvents that can swell O-Rings if applied in excess. The swelling can inhibit smooth operation of the moving parts. When used in moderation, as directed, the solvents quickly evaporate without adversely swelling the O-Rings.
PART ONE — COUPLING DOWN
Position the nozzle at a 45-degree angle with the COUPLING end down. Set the pattern to STRAIGHT STREAM then spray a 5-second burst into these areas:

#1 FRONT PATTERN CONTROL SEAL
Spray in between the pattern control and the barrel.

#2 PRESSURE CONTROL UNIT
Spray lube to face of pressure control unit.

While holding nozzle at the angle, wait 30 seconds for the lubricant to penetrate into the clearances. Rotate the shaper from straight stream to full flush several times, and then proceed to the next section.

PART TWO — COUPLING UP
Position the nozzle at a 45-degree angle with the BUMPER end down. Set the pattern to FLUSH and spray a 5-second burst in these areas:

#3 REAR SHAPER SEAL
Spray down the clearance between the label and the shaper guide.

#4 FLUSH MECHANISM SEAL
  a) Spray down into the nozzle. The aerosol extension tip will help direct the spray into clearances leading to the O-Ring.
  b) Rotate nozzle 90 degrees and spray another 5-second burst.

While holding nozzle at the angle, wait 30 seconds, then rotate the pattern control from straight stream to full flush several times. The pattern control should move freely and easily. The barrel cone should move forward to within 1/16” of the baffle before the shaper reaches straight stream position. Wipe off excess lubricant.

If This Procedure Does Not Restore Smooth And Free Operation the nozzle should be sent to the Pacoima Maintenance Facility for repairs.

2. Dual gallonage nozzles currently used by our department include the KK Bubble Cup, KK Twister and dual gallonage barrel nozzles. With these types of nozzles the gallonage and pattern are selected by rotating the stream shaper. To make this possible there are two steps machined into the stream shaper. By rotating the stream shaper clockwise the nozzle will shut-off. From the off position rotate the stream shaper counter-clockwise to achieve to lower GPM straight stream and fog patterns. Continuing to rotate the stream shaper counter counter-clockwise will achieve the higher GPM straight stream and fog patterns.
A. The **KK Bubble Cup** is a dual gallonage 10/40 GPM nozzle with a 1” (NH) female fitting. It is designed for 1” reel lines on those apparatus equipped with Class “A” foam capabilities or as a nozzle for 1½” wildland hose lays. The stream shaper slides outward from its normal position creating better foam application due to aeration within the nozzle.

![KK Bubble Cup Image]

B. The **KK Twister Series** is a dual gallonage 10/40 GPM nozzle with a 1” (NH) female fitting and may be used on 1” reel lines or as nozzle for 1½” wildland hose lays.

![KK Twister Series Image]

C. **Barrel nozzles**, which are for wildland hoselays, are named from their barrel shaped appearance and are anodized gray, black or red. They have NH female or NPSH (formally known as iron pipe) female fittings with ratings of 10/40 GPM or **8/24 GPM, WHICH SHOULD BE USED FOR LATERAL LAYS ONLY!**

![Barrel Nozzle Image]
3. The low-pressure nozzle currently used by our Department is the **Elkhart 205-BA Mystery** tip, which has a flow capacity of 200 GPM @ 75 PSI. The bumper is colored orange by the manufacturer to indicate the tip is for 1 ¾” hose-pack use and high-rise firefighting operations. It has a 1 ½” (NH) female fitting. Although a 1 ½” “D” handle shutoff is used with the tip, the nozzle may be opened by rotating the stream shaper clockwise and closed by rotating the stream shaper counterclockwise.

![Image of nozzle with orange bumper]

4. The **smooth bore tips** used by the Department are for 2 ½” handlines are 1” – 200 GPM, 1 1/8” – 250 GPM and 1 ¼” – 325 GPM. They are to be pumped at 50 PSI and used in conjunction with a 2 ½” “D” handle shutoff.

![Image of smooth bore tips]

5. General maintenance of the dual gallonage, low pressure and smooth bore nozzles include:

1. Clean with soap and water only.
2. Lubricate with Break Free lubricant or dry graphite only.
3. Any nozzle not operating smoothly after cleaning and/or lubrication shall be sent to the Pacoima Maintenance Facility.
Handline nozzle safety points:

A. All nozzles shall be operated with a “D” handled shut-off in place and a hand on it ready to control the flow except when adjusting the stream shaper. The exception to this is the Barrel nozzle, which does not use a “D” handle shut-off.

B. All nozzles should be visually and manually inspected daily by operating moving parts such as shut-offs and stream shapers.

C. All Task Force Tips with the “Standard” and “Low Pressure/Emergency” mode shall be left in the straight stream pattern when not in use to protect the plastic selector switch from damage if dropped.

D. The nozzles rated flow must match the rated flow of the hose that it is installed on.

E. 100 GPM is considered the minimum GPM for a structural interior attack line.

F. Personnel must drill with all nozzles. Look, listen and feel nozzles to recognize when operating an adequate stream flow.

II There are two types of portable ground monitors used by our Department:

1) The Fire Pro Model FP1200
2) The Akron Apollo Model 3414

1. The **Fire Pro Model FP1200** is a 1000 GPM rated monitor. It is equipped with either a 4” or 3 ½” (NH) female fitting for connection to a single 4” supply line and may be used with smooth bore tips @ 80 PSI or fog tips @ 100 PSI.
2. The **Akron Apollo Model 3414** is a 600 GPM rated monitor that is assigned to all Quint and Truck Companies. It is equipped with a 4” (NH) female fitting for connection to a single 4” supply line and may be used with smooth bore tips @ 80 PSI or fog tips @ 100 PSI. 

3. Portable ground monitor safety and maintenance:

   A. Rated GPMs should not be exceeded.
   B. Do not stand directly behind monitors while flowing water. Stand to the side and ensure adequate clearance is available should the monitor move backwards.
   C. Do not sweep monitors rapidly back and forth. Sweep in a slow controlled manner.
   D. Hose straps shall be used to secure hose to the monitor.
   E. Safety chains should be attached to an immovable object when possible.
   F. Clean with soap and water only.
   G. Lubricate as needed.
   H. Any monitor not operating smoothly after cleaning and/or lubrication shall be sent to the Pacoima Maintenance Facility.
LOS ANGELES COUNTY FIRE DEPARTMENT
INDIVIDUAL SKILLS ASSESSMENT
NOZZLES

NAME _______________________   EMP# _____________ DATE ________________

WORK LOCATION          BN ________ STATION __________  SHIFT ____________

OBJECTIVE:  1. To answer general information questions about each type of nozzle and portable ground monitor.
  2. To demonstrate the ability to flush debris and adjust pattern setting of each type of nozzle.
  3. To demonstrate the ability to prepare a nozzle for 2 ½", 1 ¾", 1 ½" and 1" hand line use.
  4. To demonstrate the ability to place a Firepro and Akron portable ground monitor in service using the correct hose lays and operational procedures.

EQUIPMENT NEEDED: Task Force Tips Handline, Dual-Force, Mid-Force; KK Bubble Cup; KK Twister series; Barrel nozzles; Elkhart 205-BA; 1", 1 1/8" and 1 ¼" Smooth bore tips. Firepro and Akron Apollo portable ground monitors.

DESCRIPTION OF EVALUATION:

Given: Wearing personal Safety Equipment, nozzles and portable ground monitors will be on the ground in order of size.
  1. Identify and answer general questions about each nozzle and monitor.
  2. Demonstrate ability to flush debris and adjust pattern setting for each nozzle.
  3. Demonstrate the ability to assemble each nozzle for 2 ½", 1 ¾", 1 ½" and 1" hand line use.
  4. Demonstrate the ability to place a Firepro and Akron portable ground monitor in service using the correct hose lays and operational procedures.

INDIVIDUALS NOT MEETING THE INDIVIDUAL SKILLS STANDARD WILL REQUIRE ADDITIONAL TRAINING IN THAT SKILL.

ASSESSMENT AREAS:

1. Identify and answer general questions about each type of nozzle.  Yes / No
2. Demonstrate ability to flush and adjust pattern of each type nozzle.  Yes / No
3. Demonstrate how to assemble each nozzle for handline use.  Yes / No
4. Demonstrate how to place a Firepro and Akron portable ground monitor into service using correct hose lays and operational procedures.  Yes / No

RATER _______________________________
LOS ANGELES COUNTY FIRE DEPARTMENT
INDIVIDUAL SKILLS ASSESSMENT
NOZZLES

RATERS ASSESSMENT QUESTIONS

1. The automatic nozzles are designed to maintain a constant nozzle pressure of …
   A. 95 PSI
   B. 100 PSI
   C. 105 PSI
   D. 110 PSI

2. The Task Force Tips Dual-Force series has a water flow capacity of …
   A. 50 – 250 GPM
   B. 70 – 200 GPM
   C. 70 – 250 GPM
   D. 50 – 200 GPM

3. The Task Force Tips Mid-Force series has a water flow capacity of …
   A. 50 – 200 GPM
   B. 50 – 250 GPM
   C. 70 – 250 GPM
   D. 70 – 200 GPM

4. The KK Bubble Cup and Twister series are what kind of nozzle?
   A. Automatic
   B. Low Pressure
   C. Combination
   D. Dual Gallonage

5. The minimum GPM for a structural interior attack line is?
   A. 125 GPM
   B. 100 GPM
   C. 150 GPM
   D. There is no minimum

6. All Task Force Tips with the “Standard and “Low Pressure/Emergency” mode shall be left in the ___________ pattern when not in use to protect the plastic selector switch.
   A. Straight Stream
   B. Fog
   C. Combination
   D. It does not matter
7. The Elkhart 205-BA Mystery tip is a __________ type nozzle rated at 200 GPM at ____ PSI?
   A. Low Pressure at 50 PSI
   B. Medium Pressure at 75 PSI
   C. Combination Pressure at 75 PSI
   D. Low Pressure at 75 PSI

8. The Fire Pro FP 1200 is a ______________ GPM rated portable ground monitor.
   A. 1200 GPM
   B. 1000 GPM
   C. 800 GPM
   D. 600 GPM

9. The Akron Apollo is a __________ GPM rated portable ground monitor.
   A. 1200 GPM
   B. 1000 GPM
   C. 800 GPM
   D. 600 GPM

10. All nozzles and portable ground monitors shall be cleaned with __________ only.
    A. Lacquer thinner
    B. Kerosene
    C. Soap and Water
    D. Solvent