

NFPA 1002

Apparatus Equipped with Fire Pump Performance Skill Sheets

Practical Skills Checklist:

#	Objective	Reference	Task	<input checked="" type="checkbox"/>
1.	5.1.2	Preventative Maintenance	Perform the visual and operational checks on the systems and components	<input type="checkbox"/>
2.	5.2.1	Respond on Apparatus	Respond on apparatus to an emergency scene	<input type="checkbox"/>
3.	5.2.2	Operate Safely in Work Area	Establish and operate in work areas at emergency and nonemergency scenes	<input type="checkbox"/>
4.	5.2.3	Connect a FD Pumper	Connect a fire department pumper to a water supply as a member of a team	<input type="checkbox"/>
5.	5.2.4	Hand or Master Streams	Produce effective hand or master streams	<input type="checkbox"/>
6.	5.2.5	Relay Pumping	Pump a supply line of 2 ½ in. (65 mm) or larger	<input type="checkbox"/>
7.	5.2.6	Foam Streams	Produce an effective foam fire stream	<input type="checkbox"/>
8.	5.2.7	Sprinkler/Standpipe Systems	Supply water to fire sprinkler and standpipe systems, given specific system information and a fire department pumper	<input type="checkbox"/>
			Pass/Fail	<input type="checkbox"/>

Skill #1 - Preventative Maintenance

1002 Pump Operator (2017 Edition)

Objectives 5.1.2

Perform the visual and operational checks on the systems and components specified in the following list in addition to those in 4.2.1, given a fire department pumper, its manufacturer's specifications, and policies and procedures of the jurisdiction, so that the operational status of the pumper is verified.

Tasks: You will conduct the routine tests, inspections and servicing of a department apparatus equipped with a fire pump. **(5.1.2)**

Setting: Fire Hall

Tools/Equipment: Apparatus equipped with a fire pump, department SOPs.

Attainment Standard: Successful competition of the Steps listed below.

Requisite Skill	Elements/Steps	FIRST TEST		RETEST	
		Pass	Fail	Pass	Fail
1. Inspection					
Operational Status verified on: - Water tank & other extinguishing agent levels (if applicable) - Pumping systems - Foam systems	<ul style="list-style-type: none"> Ability to use hand tools as required Recognize system problems and deficiencies Correct and report any deficiency noted according to local SOP's 				
PASS/FAIL					

Skill #2 – Respond on Apparatus

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Objectives 5.2.1

Respond on apparatus to an emergency scene, given safety equipment as provided by the AHJ, so that the apparatus is correctly mounted and dismounted and seat belts are used while the vehicle is in motion.

Tasks: You will use each piece of provided safety equipment. **(5.2.1)**

Setting: Fire Hall.

Tools/Equipment: Fire apparatus, personal protective equipment, hearing protection, eye protection for those not in enclosed cabs, and SCBAs for those departments that require firefighters to don SCBAs while enroute to the emergency.

Attainment Standard: Successful competition of the Steps listed below.

Requisite Skill	Elements/Steps	FIRST TEST		RETEST	
		Pass	Fail	Pass	Fail
1. Mounting Apparatus					
Ability to use each piece of provided safety equipment while mounting the apparatus.	<ul style="list-style-type: none"> • Safely mounted apparatus, using handholds and steps • Close door, safety bar, or gate to cab or compartment • Assumed seated position and used seat belt • Donned additional equipment if provided 				
2. Dismounting Apparatus					
Ability to use each piece of provided safety equipment while dismounting the apparatus.	<ul style="list-style-type: none"> • Wait for order(s) before leaving apparatus. • Checked for on-coming traffic before dismounting • Safely dismounted apparatus, using handholds and steps 				
PASS/FAIL					

Skill #3 – Work at Emergency Scene

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Objectives 5.2.2

Establish and operate in work areas at emergency and nonemergency scenes, given safety equipment, traffic and scene control devices, emergency and nonemergency scenes, traffic and other hazards, an assignment, and SOPs, so that procedures are followed, safety equipment is utilized, protected work areas are established as directed using traffic and scene control devices, and the driver/operator performs assigned tasks only in established, protected work areas.

Tasks: You will use safety equipment, deploy traffic and scene control devices, dismount apparatus, establish and operate in the protected work areas. **(5.2.2)**

Setting: Fire Hall.

Tools/Equipment: Apparatus equipped with a fire pump, department SOPs.

Attainment Standard: Successful competition of the Steps listed below.

Requisite Skill	Elements/Steps	FIRST TEST		RETEST	
		Pass	Fail	Pass	Fail
1. Use Personal Protective Clothing					
Ability to use personal protective clothing	<ul style="list-style-type: none"> • Donned PPE • PPE worn according to manufacturer's guidelines • All straps and buckles secured 				
2. Survey Scene for Hazards					
	<ul style="list-style-type: none"> • Survey emergency scene for hazards according to department SOPs. • Identify potential for injury based on identified hazards. • Verbalize a plan for mitigation of hazards. 				
3. Dismount Apparatus					
Dismount apparatus	<ul style="list-style-type: none"> • Checked for on-coming traffic, safely dismounted the apparatus 				

Skill #3 continued...

Requisite Skill	Elements/Steps	FIRST TEST		RETEST	
		Pass	Fail	Pass	Fail
4. Operate as Directed					
Operate in the protected work area as directed	<ul style="list-style-type: none"> Performed tasks as per IC 				
5. Deploy Traffic and Scene Control Devices					
Deploy traffic and scene control devices	<ul style="list-style-type: none"> Survey emergency scene for hazards according to department SOPs. Deployed traffic control devices as per SOP's Verbalize how structure, roadway emergency scenes, and traffic hazards would be treated and isolated. Verbalize dynamic nature of scene safety. Describe measures to ensure continued scene safety. 				
PASS/FAIL					

Skill #4 – Connect Fire Department Pumper to a Water Supply

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Objectives 5.2.3

Connect a fire department pumper to a water supply as a member of a team, given supply or intake hose, hose tools, and a fire hydrant or static water source, so that connections are tight and water flow is unobstructed.

Tasks: The ability to hand lay a supply hose, connect and place hard suction hose for drafting operations, deploy portable water tanks as well as the equipment necessary to transfer water between and draft from them, make hydrant-to-pumper hose connections for forward and reverse lays, connect supply hose to a hydrant, and fully open and close the hydrant. **(5.2.3)**

Performance Conditions: The candidate will correctly select the necessary supply hoses, secure the required hose tools and appliances, and make positive connections to the pumper.

Setting: Training area or other safe location with water supply

Tools/Equipment: Pumper with operator, supply hose, PPE, hose tools and appliances

Attainment Standard: Successful competition of the Steps listed below.

Requisite Skill	Elements/Steps	FIRST TEST		RETEST	
		Pass	Fail	Pass	Fail
1. Lay Hose					
The ability to hand lay a supply hose	<ul style="list-style-type: none"> Select correct hose(s) Protects couplings Lays hose so that access to scene by other vehicles not blocked 				
2. Suction Hose					
Connect and place hard suction hose for drafting operations	<ul style="list-style-type: none"> Suction hose(s) tightly connected Strainer/float used 				
3. Portable Tanks					
Deploy portable water tanks as well as the equipment necessary to transfer water between and draft from them	<ul style="list-style-type: none"> Select level location with good access Connect/place suction hose as per local SOP's Use strainer/float as per local SOP's Place and secure siphon device 				

Skill #4 continued...

Requisite Skill	Elements/Steps	FIRST TEST		RETEST	
		Pass	Fail	Pass	Fail
1. Hydrant Connections					
Make hydrant-to-pumper hose connections for forward and reverse lays	Forward Lay <ul style="list-style-type: none"> • Dismount vehicle safely • Remove a sufficient length of supply hose(s) per local SOP's • Secure hose and hydrant tools • Wrap and secure hose(s) around hydrant • Signal operator to proceed Reverse Lay • Dismount vehicle safely • Secure hose and hydrant tools • Attach reverse couplings as per local SOP's or deploy preloaded reverse lay hose load • Remove a sufficient length of supply hose(s) per local SOP's • Secure hose at pumper as per local SOP's • Remount vehicle safely • Connect supply hose(s) to pumper with reverse couplings as required • Separate sufficient hose to make pumper - hydrant connection 				
2. Connect to Hydrant					
Connect supply hose to a hydrant	<ul style="list-style-type: none"> • Flush hydrant per local SOP's • Remove cap(s) on outlets(s) to be used • Connect supply hose • Tighten caps on unused outlets • Open hydrant slowly 				
3. Operate Hydrant					
Fully open and close the hydrant	<ul style="list-style-type: none"> • Tighten hydrant outlet caps not used • Fully open hydrant • Fully close hydrant • Check for drainage • Replace cap 				
PASS/FAIL					

Skill #5 - Hand or Master Streams

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Objectives 5.2.4

Produce effective hand or master streams, given the sources specified in the following list, so that the pump is engaged, all pressure control and vehicle safety devices are set, the rated flow of the nozzle is achieved and maintained, and the apparatus is continuously monitored for potential problems.

- Internal Tank
- Pressurized Source
- Static Source
- Transfer from Internal Tank to external source

Tasks: In this exercise you will correctly position your apparatus at static and pressurized water sources. You will make the correct supply hose connections; provide the proper fire flows to both hand lines and master streams; operate pressure control devices (relief valve) and the volume/pressure transfer valve (as applicable). **(5.2.4)**

You will also make a transition from the internal water tank to an external supply.

On arrival you will layout handlines and master stream appliances as directed.

Setting: Training area

Tools/Equipment: Apparatus, hydrant, static water supply, apparatus tank, hose, nozzles and appliances.

Attainment Standard: Successful completion of all Elements/Steps

Requisite Skill	Elements/Steps	FIRST TEST		RETEST	
		Pass	Fail	Pass	Fail
HAND OR MASTER STREAMS					
1. Position Apparatus					
The ability to position a fire department pumper to operate at a fire hydrant and at a static water source	<ul style="list-style-type: none"> • Safely position apparatus the correct distance from water source • Set parking brake • Chock wheels 				
2. Power Transfer from Vehicle Engine to Pump					
Transfer power from vehicle engine to pump	<ul style="list-style-type: none"> • Select appropriate settings and place in correct gear • Water flowing to pump 				

Skill #5 Continued...

Requisite Skill	Elements/Steps	FIRST TEST		RETEST	
		Pass	Fail	Pass	Fail
3. Draft (Connect to Water Supply)					
Operate from static and from pressurized water sources	Note: <ul style="list-style-type: none"> Observe that drains are closed and that water tank is not overflowing if connected to hydrant. Check that tank-to-pump valve is opened to flood pump. Participant may start pumping on tank and switch to other source as indicated by evaluator (see Step 7) 				
<i>Internal Water Source:</i>	<ul style="list-style-type: none"> Open tank-to-pump valve 				
Hydrant or other Pressurized <i>Water Source:</i>	<ul style="list-style-type: none"> Connect hydrant gate and hose to hydrant and intake Open hydrant Note: <ul style="list-style-type: none"> Ensure hydrant has been flushed in accordance with local SOP's 				
<i>Static Water Source:</i>	<ul style="list-style-type: none"> Suction hose(s) tightly connected Strainer/float used Operate primer 				
4. Operate Pumper Pressure Control Systems					
Operate pumper pressure control systems	Establish Flows <ul style="list-style-type: none"> Minimum 1400 l/min for master stream <ul style="list-style-type: none"> Solid stream 560 kPa (80 psi) Fog stream 700 kPa (100 psi) Flow for hand line will depend on nozzle <ul style="list-style-type: none"> Solid stream 350 kPa (50 psi) Fog Stream 700 kPa (100 psi) 				

Skill #5 Continued...

Requisite Skill	Elements/Steps	FIRST TEST		RETEST	
		Pass	Fail	Pass	Fail
	<ul style="list-style-type: none"> Pressures must be adjusted accordingly to allow for friction loss of hose length, appliances, and devices. Valves are opened slowly to prevent water hammer <p>Gages</p> <ul style="list-style-type: none"> Monitor vacuum, tank level, static water level, pressure, and RPM <p>Relief Valve</p> <ul style="list-style-type: none"> Set relief valve 				
5. Operate the Volume/Pressure Transfer Valve (Multistage Pumps only)					
Operate the volume/pressure transfer valve (multistage pumps only)	<ul style="list-style-type: none"> V/P valve operated slowly (with slight reduction in RPM as required) Ensure correct pressure is maintained in all outlets when pump is transferred from volume to pressure modes 				
6. Operate Auxiliary Cooling Systems					
Demonstrate correct use of auxiliary cooling equipment when engine/pump overheating	<ul style="list-style-type: none"> Open cooler control valve Observe gage to confirm temperature drop 				
7. Transition from Internal to External Water Source					
Make the transition between internal and external water sources	<ul style="list-style-type: none"> Slowly close tank-to-pump valve while opening intake valve Maintain required pressure and volume to working hose lines during transition 				
8. Assemble Hose Lines, Nozzles, Valves and Appliances					
Assemble hose lines, nozzles, valves and appliances	<ul style="list-style-type: none"> Connect following hose, nozzles and appliance(s) <ul style="list-style-type: none"> One 90m (300ft) master stream device supplied with minimum two 65mm (2-1/2") lines One 45m (150 ft), 68mm (2-1/2") hand line 				
PASS/FAIL					

Skill #6 - Relay Pumping

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Objectives 5.2.5

Pump a supply line of 65mm (2 ½ in.) or larger, given a relay pumping evolution the length and size of the line and the desired flow and intake pressure, so that the correct pressure and flow are provided to the next pumper in the relay.

Tasks: You will operate the source pumper in a relay pumping exercise by supplying the correct pressure and flows needed at the relay pump. The exercise is based on the size and number of supply lines laid out as directed by the evaluator and the characteristics of the water supply available to you. **(5.2.5)**

Setting: Training area or other safe closed area.

Tools/Equipment: Two apparatus equipped with a fire pump, Hydrant, static water supply, apparatus tank, hose

Attainment Standard: Successful completion of the Steps listed below.

Requisite Skill	Elements/Steps	FIRST TEST		RETEST	
		Pass	Fail	Pass	Fail
1. Inspection					
Ability to position pumper to operate at a fire hydrant and/or at a static water source.	<ul style="list-style-type: none"> • Consideration prior to pumper placement should include: <ul style="list-style-type: none"> o Largest pumper at water source o Distance between water source and fire o Hose diameter o Pumper(s) capacities o Terrain • Make forward or reverse lay as required 				
2. Power transfer from vehicle engine to pump					
Transfer power from vehicle engine to pump	<ul style="list-style-type: none"> • Select appropriate settings and place in correct gear • Water flowing to pump 				

Skill #6 continued...

Requisite Skill	Elements/Steps	FIRST TEST		RETEST	
		Pass	Fail	Pass	Fail
3. Draft/Connect to Water Supply					
<p>Note: Drains closed, water tank not overflowing if connected to hydrant, Open tank valve to flood pump – may start pumping on tank and switch to other source as indicated by evaluator Ensure hydrant has been flushed in accordance with local SOP's</p>	<p>Hydrant</p> <ul style="list-style-type: none"> • Connect hydrant gate and hose to hydrant and intake • Open hydrant <p>Static</p> <ul style="list-style-type: none"> • Connect suction hose(s) (tight) and strainer • Operate primer <p>Internal tank</p> <ul style="list-style-type: none"> • Open tank valve 				
4. Operate Pumper Pressure Control Systems					
Establish and maintain required volume and pressure for effective hose streams	<p>Establish Flows</p> <ul style="list-style-type: none"> • Select appropriate settings and in correct gear • Water flowing to pump • Slowly open valves – observe hose • Pumper receiving water open unused discharge port • Air is allowed to escape from discharge port and port then closed • Pump at water source engaged and delivers water at 175 psi (1225 Kpa), second and subsequent pumpers engage pumps in order from closest to source and deliver water at 175 psi (1225 Kpa) • Each pump operator sets the pressure regulating device and maintains a constant (175 psi/1225 Kpa) • Attack pumper adjusts discharge pressure utilizing secondary ports • Pressures must be adjusted accordingly to allow for friction loss of hose length, appliances, and devices. • Valves are opened slowly to prevent water hammer 				

Skill #6 continued...

Requisite Skill	Elements/Steps	FIRST TEST		RETEST	
		Pass	Fail	Pass	Fail
	Gages <ul style="list-style-type: none"> • Monitor vacuum, tank level, static water level, pressure, and RPM • Ensure intake pressure does not drop below 20 psi (140 Kpa) or pump cavitation will occur 				
5. Operate the Volume/Pressure Transfer Valve (Multistage Pumps only)					
Operate the volume/pressure transfer valve (multistage pumps only)	Operate the volume/pressure transfer valve (multistage pumps only)				
6. Operate Auxiliary Cooling Systems					
Demonstrate correct use of auxiliary cooling equipment when engine/pump overheating	<ul style="list-style-type: none"> • Open cooler control valve • Observe gage to confirm temperature drop 				
7. Transition from Internal to External Water Source					
Change water source from tank to pump	<ul style="list-style-type: none"> • Slowly close tank-to-pump valve while opening intake valve • Maintain required pressure and volume to working hose lines during transition 				
8. Assemble Hose Lines, Nozzles, Valves and Appliances					
Ensure hoses connected, secure/controlled and ready to use	<ul style="list-style-type: none"> • Connect hose lays based on target volume to be flowed 				
PASS/FAIL					

Skill #7 - Foam Streams

1002 Pump Operator (2017 Edition)

Objectives 5.2.6

Produce a foam fire stream, given foam-producing equipment, so that proportional foam is provided.

Task: The ability to operate foam proportioning equipment and connect foam stream equipment. (5.2.6)

Setting: Training area

Tools/Equipment: Apparatus equipped with a fire pump and foam appliances.

Training area, live liquid pool fire (Class B) or foam test apparatus.

Attainment Standard: Successful competition of the Elements/Steps listed below.

Requisite Skill	Elements/Steps	FIRST TEST		RETEST	
		Pass	Fail	Pass	Fail
1. Position Apparatus					
Position pumper at safe location to action fire	Consideration prior to pumper placement should include: <ul style="list-style-type: none"> • Uphill/upwind of spill • Close enough for hose length limits • Access to sufficient water source 				
2. Operate Foam Proportioning Equipment					
Use on-board or hand-held foam system equipment to produce an effective foam stream Note: <ul style="list-style-type: none"> • Base exercise on a Class B hydrocarbon fire 100m² (1000ft²) in size • Use AFFF foam at 3% concentration • Establish application rate of 410l/m (100gpm) • Ensure manual eductor is capable of minimum 340l/m (90gpm) flow 	<ul style="list-style-type: none"> • Select proper foam concentrate based on fuel burning • Select proper foam concentration • Establish amount of concentrate required based on size (area) of fire • Adjust pump to provide proper flow rate or- ensure manual eductor and nozzle have matching flow rates • Position concentrate pails for use by eductor operator • Supply foam stream for 1 minute min 				

Skill #7 continued....

Requisite Skill	Elements/Steps	FIRST TEST		RETEST	
		Pass	Fail	Pass	Fail
3. Connect Foam Stream Equipment					
Properly connect and deploy foam stream equipment Note: A spill of 100m ² (1000ft ²) requires a minimum flow rate of 410L/m (100gpm) of foam mixed at 3% for successful suppression	Manual Eductor <ul style="list-style-type: none"> • Attach hose line and nozzle to inductor, avoid kinks • Length of attack line should not exceed manufacturer's recommendations 				
PASS/FAIL					

Skill # 8 - Sprinkler/Standpipe Systems

1002 Pump Operator (2017 Edition)

Objectives 5.2.7

Supply water to fire sprinkler and standpipe systems, given specific system information and a fire department pumper, so that water is supplied to the system at the correct volume and pressure.

Task: The ability to position a fire department pumper to operate at a fire hydrant and at a static water source, power transfer from vehicle engine to pump, draft, operate pumper pressure control systems, operate the volume/pressure transfer valve (multistage pumps only), operate auxiliary cooling systems, make the transition between internal and external water sources, and assemble hose lines, nozzles, valves, and appliances. **(5.2.7)**

Setting: Training area

Tools/Equipment: Apparatus equipped with a fire pump and foam appliances, training area, live liquid pool fire (Class B) or foam test apparatus.

Attainment Standard: Successful competition of the Elements/Steps listed below.

Requisite Skill	Elements/Steps	FIRST TEST		RETEST	
		Pass	Fail	Pass	Fail
1. Position Apparatus					
Position a fire department pumper to operate at a fire hydrant and at a static water source	Consideration prior to pumper placement should include: <ul style="list-style-type: none"> • water source location • FDC location 				
2. Power transfer from vehicle engine to pump					
Transfer power from vehicle engine to pump	<ul style="list-style-type: none"> • Select appropriate settings and place in correct gear • Water flowing to pump 				
3. Draft/Connect to Water Supply					
Note: Drains closed, water tank not overflowing if connected to hydrant, Open tank valve to flood pump – may start pumping on tank and switch to other source as indicated by evaluator Ensure hydrant has been flushed in accordance with local SOP's	Hydrant <ul style="list-style-type: none"> • Connect hydrant gate and hose to hydrant and intake • Open hydrant Internal tank • Open tank valve 				

Skill #8 continued...

Requisite Skill	Elements/Steps	FIRST TEST		RETEST	
		Pass	Fail	Pass	Fail
4. Operate Pumper Pressure Control Systems					
Establish and maintain required volume and pressure for effective hose streams	<ul style="list-style-type: none"> • Select appropriate settings and in correct gear • Water flowing to pump • Slowly open valves – observe hose • Operator sets the pressure regulating device at calculated supply pressure 				
5. Operate the Volume/Pressure Transfer Valve (Multistage Pumps only)					
Position a fire department pumper to operate at a fire hydrant and at a static water source	Consideration prior to pumper placement should include: <ul style="list-style-type: none"> • water source location • FDC location 				
6. Operate Auxiliary Cooling Systems					
Use V/P transfer valve	<ul style="list-style-type: none"> • V/P valve operated slowly (with slight reduction in RPM as required) • Ensure correct pressure is maintained in all outlets when pump is transferred from volume to pressure modes 				
7. Transition from Internal to External Water Source					
Demonstrate correct use of auxiliary cooling equipment when engine/pump overheating	<ul style="list-style-type: none"> • Open cooler control valve • Observe gage to confirm temperature drop 				
8. Assemble Hose Lines, Nozzles, Valves and Appliances					
Change water source from tank to pump	<ul style="list-style-type: none"> • Slowly close tank-to-pump valve while opening intake valve • Maintain required pressure and volume to working hose lines during transition 				

Skill #8 continued...

Requisite Skill	Elements/Steps	FIRST TEST		RETEST	
		Pass	Fail	Pass	Fail
9. Establish Flow					
Establish flow at standpipe hand line nozzle Note: Approximately 35 kpa (5 psi) should be added to the desired nozzle pressure for each floor above the standpipe connection and for each 30 metres of attack line used. Also add 175kPa (25psi) for friction loss in the standpipe. Also calculate friction loss of supply lines.	<ul style="list-style-type: none"> • Make friction and height loss calculations for discharge lines, standpipe system and working lines on fire floor • Set and maintain calculated supply pressure/volume 				
10. Communications					
Communications established with fire ground command and monitored	<ul style="list-style-type: none"> • Operator maintains effective radio communications with IC 				
PASS/FAIL					