

SAN DIEGO FIRE RESCUE DEPARTMENT



PIERCE SERVICE AERIAL LADDER TASK BOOK

TRAINEE NAME: _____
(PRINT)

The San Diego Fire-Rescue Department Training and Education Division has developed this Task Book to provide a training format and certification of the minimum skill level needed to successfully operate this apparatus as the driver and equipment operator. Each Task Book lists the job performance requirements for the specific certification in a format that allows a candidate to be trained and evaluated during the training sessions. To achieve certification, the applicant must successfully complete **ALL** task and job performance requirements listed in this Task Book.

Before a certification can be issued, successful job performance of all sections must be observed and recorded by a qualified and approved trainer.

These job performance requirements serve as general guidelines. As such, they are not intended to replace specific sequences of apparatus or equipment operation that may be outlined by manufacturer specifications. Training shall follow department standard operating procedures. **IF** you are unsure about the safe operating principles and limitations of the specific make of your apparatus, refer to the manufacturer operation manual. When a conflict with department procedures and manufacturer specifications occur, manufacturer procedures will govern the task. **Err on the side of safety.** Trainers should have manufacturer specifications and department standard operational guidelines available. Should additional assistance be required, contact the Driver Training Officer at the Training and Education Division for assistance. **DO NOT** contact the manufacturer directly.

There is a six month time restriction from beginning a certification to the time of completion. If a trainee does not complete the certification in the six month time limit, they must start the entire process over. The Training and Education Division must receive the completed Task Book no later than thirty (30) days after completion of training.

Instructions:

- Trainer:
1. Must be an Engineer or higher, certified on the apparatus and possess a current license with appropriate endorsement(s), before conducting any training.
 2. Ensure that all information, dates, and hours are recorded accurately in this Task Book.
- Trainee:
1. Must have a current applicable license or permit, with appropriate endorsement(s), in their possession and show it to the trainer at **each** training session.
Note: Drivers must follow all restrictions on their license. Example: a 64 restriction (automatic transmission only) cannot drive a manual transmission apparatus.
 2. Check to see that the trainer is certified for the apparatus you will be utilizing.
 3. Complete driver's license information on the certification page(s).
 4. When all Task Book information has been documented, obtain required signatures and forward the completed Task Book to the Training and Education Division.

The Training and Education Division will review this Task Book to determine that all the information is complete and correct. The certification information form will be removed, filed at Training, and the Task Book will be returned to the trainee for future reference.

A CLASS "B" LICENSE IS REQUIRED TO DRIVE THIS APPARATUS.

PIERCE SERVICE AERIAL LADDER
CERTIFICATION

THE SECTION BELOW MUST BE COMPLETED IN ITS ENTIRETY BEFORE AN APPARATUS
CERTIFICATION WILL BE ISSUED.

Apparatus No: _____ @ Station: _____ Return certification to Station #: _____
Name (Print): _____ ID#: _____
Rank: _____ Station: _____ Division: _____ Battalion: _____
CDL#: _____ Exp: ____ / ____ / ____ Physical: ____ / ____ / ____ Exp: ____ / ____ / ____
Class: _____ Endorsement(s): _____ Restriction(s): _____

This trainee has satisfactorily completed a twenty two (22) hour training course in the operation of this vehicle, demonstrating the requisite knowledge and skills to safely and effectively operate this classification of apparatus. Training time may be **NOT** be reduced even if trainee is previously certified on other apparatus. Total training hours required for certification will depend upon the trainee's skill level and **NOT** the minimum hourly requirement. Training time shall never be less than the minimum requirements.

Training shall be limited to a **maximum** of six (6) hours per shift. Trainee **may not** OCA until certified.

Dates of Training From: _____ / _____ / _____ To: _____ / _____ / _____
Month Day Year Month Day Year

Trainee Signature: _____

* Trainer: _____
Print Name Signature

* Supervisor: _____
Print Name Signature

* Battalion Chief: _____
Print Name Signature

* Your signature certifies that the above person has completed the certification program detailed in this booklet. This individual has completed the minimum number of training hours and demonstrated a driving and operating ability that is consistent with all department standards and procedures.

<p>TRAINING DIVISION USE ONLY</p> <p>Driver Training Officer Signature: _____</p> <p>Training Chief Signature: _____</p>
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TRAINING RECORD – PIERCE SERVICE AERIAL LADDER

DATE	TIME	HRS	APP #	TASK	STA#	SUPERVISOR NAME
	FROM:					PRINT:
	TO:					SIGN:
	FROM:					PRINT:
	TO:					SIGN:
	FROM:					PRINT:
	TO:					SIGN:
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	FROM:					PRINT:
	TO:					SIGN:
				Total hours		

Send a Driver Training Record (FD-902) along with this booklet if **additional** training is documented.

PIERCE SERVICE AERIAL LADDER

INSTRUCTIONS

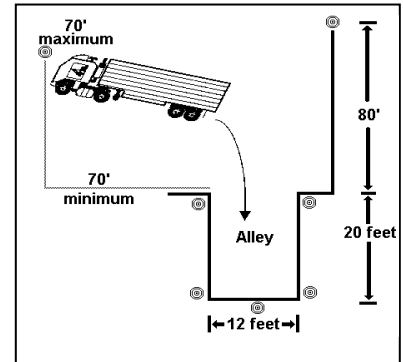
- A. The trainer will check (✓) off each box after successful completion of the performance requirements by the trainee.
- B. Sections with multiple boxes are to be initialed after each evolution is successfully completed.
* **Driving skills can be demonstrated during normal driving** after completion of required practice training and basic skill demonstration in an approved practice area.

EXAMPLE:

1. ***Alley Dock (Backing into station)(DMV)**

Dock the vehicle from a 90° angle in one movement, without touching any cones or stanchions, staying within all boundary lines, and stopping within one (1) foot of the dock or stop line. Pulling forward will result in a penalty.

JD	JD	JD
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- C. Trainee must complete a minimum of eight (8) hours of driving to include:
1. Normal street / traffic conditions
 2. Multiple turns and lane changes
 3. Freeways
 4. Up / down hills requiring shifting
 5. Railroad crossing
 6. Underpass / low clearance areas
 7. Unusual operating conditions for the vehicle and area being driven
 8. Semi-improved surface operation
 9. Maneuvers listed in the Driving Skills section

NOTE: Driving requirement(s) may be adjusted or eliminated if not in the available operation area.

- D. Trainee must complete a minimum of ten (10) hours of ladder operations demonstrating the requisite knowledge and skills to successfully and effectively perform all operational tasks. Four (4) hours of which **must** be using the ladder as a lifting device; the remaining (6) hours will be utilized for hose lays, hydraulics, and other aerial ladder drills.

- E. Trainee must complete a minimum of four (4) hours using all apparatus forms, performing apparatus maintenance, and operating and maintaining auxiliary equipment.

F. Resources:

1. Manufacturer's Maintenance and Operating Manuals
2. San Diego Fire-Rescue Department Policies and Procedures
3. California Vehicle Code and Department of Motor Vehicle Commercial Driver Handbook
4. City of San Diego Driver / Operator Manual
5. Off Road Training Manual
6. IFSTA Aircraft Rescue and Firefighting
7. Ervin Fire Fighting Apparatus and Procedures (3rd Edition)
8. SDFD apparatus specification sheet

TRAINEE MUST DEMONSTRATE AND ARTICULATE KNOWLEDGE OF THE FOLLOWING INFORMATION:

I. PREPARATION

- A. Read the apparatus operation manual and ancillary equipment manuals completely
- B. Articulate an understanding of all danger, warning, and caution notices stated in the apparatus operation manual

II. APPARATUS DESCRIPTION

- A. Manufacturer _____ F # of cylinders / CID _____ / _____
- B. Apparatus Type _____ G. Governed speed _____ RPM
- C. GVWR _____ H. Max Horsepower _____ @ _____ RPM
- D. Engine Manufacturer _____ I. Max Torque _____ lbs @ _____ RPM
- E. Engine Cycles / Type _____ J. Transmission Type _____

III. APPARATUS SPECIFICATIONS

- A. Height (clearance) _____ - Width _____ - Turning Diameter _____
- B. Length _____ - Chassis overhang - Front _____ - Rear _____
- C. Equipment overhang - Front _____ - Rear _____
- D. Tire pressure - Front _____ PSI - Rear _____ PSI
- E. Air brake can size – Front _____ - Rear _____
- F. Maximum stroke – Front _____ " - Rear _____ "
- G. Clevis pin measurement (+ or - 1/16") - Front brake cans _____ " - Rear brake cans _____ "

IV. VERIFICATION OF OPERATIONAL STATUS OF VEHICLE

- A. Checks that parking brake is set
- B. Performs Pre-trip inspection (FDM-7) using proper procedures
- C. Performs air brake system test and logs brake measurements
 LF _____ " LR _____ " LRT _____ " RF _____ " RR _____ " RRT _____ "
 1. Apparatus with Knorr front brakes are out of service if front calipers can not be moved (wiggled) when grasped with both hands and shaken
 2. Lack of ability to move a front brake caliper indicates the caliper is frozen shut
- D. Perform daily, weekly, and monthly assigned checks (FDM-8)
- E. Knowledge of all forms that apply to this apparatus
- F. Performs "Walk Around" prior to entering cab to drive
 - 1. Secures equipment
 - 2. Compartment doors closed
 - 3. Disconnects air and electrical cords
 - 4. Wheel blocks up and stowed
 - 5. Clear to proceed
- G. Adjusts seat and mirrors
- H. Checks that intercom and radios are operational and volume is correctly set

V. STARTING

- A. Fastens seatbelt
- B. Locates gauges, switches, and controls
- C. Battery switch on “**BOTH**” and / or master ignition switch “**ON**”
- D. Transmission in neutral
- E. Ignition to “**ON**” position
- F. Observe and note “**ALL**” auto checks
 1. Wait for them to finish, approximately ten (10) seconds before attempting to start engine
 2. Observes dash indicator light system test for indicator light problems
- G. Start engine
- H. If **No Start**
 1. Repeat steps B thru F
 2. Maximum crank time is 15 seconds, then rest for 15 seconds. Repeat 3 times.
 3. If still **no start**, then call for repair
- I. Run engine at low idle (600-800 RPM) for two minutes to lubricate engine and turbocharger
- J. Check gauges (at 1000 RPM)
 1. Oil pressure reading _____ PSI Normal reading should be _____ PSI
 2. Air pressure reading _____ PSI max Driving pressure range is _____ to _____ PSI
 3. Voltmeter reading _____ Volts Normal reading should be _____ Volts
 4. Ammeter reading _____ Amps Normal reading should be _____ Amps
 5. Engine temperature _____ °F Normal operating temperature should be _____ °F
 6. Transmission temperature _____ °F Normal operating temperature should be _____ °F
- WARNING - DO NOT** operate vehicle if gauge readings are outside of normal operating range, either high or low
- K. Check that Retarder / Jake Brake / Telma indicator light(s) and /or control switch(es) are “**ON**”

VI. AIR BRAKE SYSTEMS

- A. Describe operation of apparatus compressed air system
 1. Emergency brakes set automatically at _____ PSI
 2. Low air warning _____ PSI
 3. “Cut In” pressure _____ PSI
 4. “Cut Out” pressure _____ PSI
- B. Parking brakes
 1. Describe the operation and function of the spring brake system and front parking brake system
 2. Describe and demonstrates how to apply and release both front and rear parking brakes
 - a. Apply front brake only after applying rear brake system
 - b. Releasing rear brake system automatically releases front brake system

VII. DRIVING APPARATUS

- A. Checks that crew is seated and seat belts are fastened
- B. Foot on brake
- C. **PRESELECTS** appropriate gear for road, weather, and operating conditions
- D. Releases parking brake(s)
- F. Does not allow apparatus to roll back
- G. Acceleration
 - 1. Applies light accelerator pressure to begin movement
 - 2. Eases off accelerator as desired speed is reached
 - 3. Avoids full throttle acceleration from a stop
 - 4. Consistent, smooth, and controlled
- H. Braking
 - 1. Anticipates stops and roadway imperfections
 - 2. Slows down and brakes before roadway imperfections such as dips and drainage swales
 - 3. Correctly utilizes retarder system controls to slow vehicle
 - 4. Allows engine to act as a brake (down shift to achieve if necessary)
 - 5. Brakes into turn - Accelerates out of turn
 - 6. Leaves room to go around stopped vehicles or obstacles
 - 7. Consistent, smooth, and controlled
- I. Operates engine in proper power range
 - 1. Maintain engine RPM in the lower 1/3 of the engine's power range for current operating conditions, which include the designated roadway speed limit
- II. Operates vehicle with awareness of chassis length and chassis and equipment overhang
 - 1. Considers vehicle length when changing lanes
 - 2. Slows sufficiently at bumps and dips in roadway to prevent ladder lash in cradle and apparatus chassis from bottoming out on front suspension
 - 3. Correctly compensates for limited rear vision in apparatus mirror system
- III. Chooses correct lane for driving conditions
- IV. Follows all Fire Department Policies, Procedures, and California Vehicle Code regulations
- V. Turning
 - 1. Plans and adjusts for extended turning radius of vehicle
 - 2. Uses mirrors consistently during driving, maneuvering into and during turns, or for apparatus positioning to monitor for possible hazards
 - a. Correctly compensates for limited rear vision in apparatus mirror system
 - b. Awareness of all vehicles and obstacles in possible turning areas
 - c. Considers vehicle length when changing lanes

DRIVING APPARATUS (Continued)

- REMINDER** - The rear end moves significantly to the left or right during turns
LOOK IN THE APPROPRIATE MIRROR "PRIOR" to initiating and during any turn
- 3. Utilizes turn signals well in advance of maneuver(s) to alert others of intentions
- 4. Selects appropriate gear to slow and control apparatus before and during turns
- 5. Starts and completes turn in proper lane
- 6. Obeys speed signs on all roadway turns
- 7. Proper hand position on steering wheel
- 8. Does not let steering wheel slip through hands
- 9. Avoids turning steering wheel while stopped
- N. **DOES NOT** idle engine for long periods of time as damage to turbo and injectors will occur from poor engine lubrication
 - 1. When idling for long periods is required by operations, increase the idle level to a minimum of 900 RPM (High Idle) to cool and lubricate engine and turbocharger
 - 2. Detroit Series 60 engine - 20 minutes or more idle time

VIII. DRIVING CAUTIONS

- A. Understands and applies height and weight restrictions to operation of the apparatus
 - 1. High center of gravity
 - 2. Reduced braking ability due to heavy weight (_____ lbs GVWR)
- B. **NO** sharp turns at any speed above 10 mph
 - 1. Preselects appropriate gear to slow apparatus for driving conditions and turns
 - 2. Does not brake while turning except at low speeds
 - 3. Checks the speedometer **BEFORE** making any turn
 - a. **DO NOT** attempt to estimate the apparatus speed
 - 4. Remember, mass in motion will continue to move in the same direction
 - 5. When responding to emergencies, accelerate fast while straight, but downshift and brake before going into a turn or curve
- C. **NEVER** allows vehicle to coast in neutral
 - 1. **TRANSMISSION DAMAGE WILL OCCUR**
 - 2. **ENGINE BRAKING** is not available
 - 3. **POWER** is not available when needed
- D. Knows when / how to use the Inter Axle Differential Lock; also called a Power Divider Lock
 - 1. Describes function of inter axel differential lock
 - a. Use when in low tractions conditions (sand or mud) only, **NEVER** on any hard surface or when a material overlays a hard surface
 - b. **DO NOT** apply during aerial operations at any time

DRIVING CAUTIONS (Continued)

- 2. Never drive and / or turn on hard or improved roadway surfaces in differential lock mode, always return to the differential unlocked mode
- 3. Driving on hard surfaces with the differential lock engaged may break driveline components such as axles and will damage tires
- 4. Switch from unlocked operation to differential locked operation when the apparatus is stopped, or when traveling in a straight line at a speed of less than 12 mph with both wheels are spinning at the same RPM
 - a. **DO NOT** exceed 25 mph while in differential lock mode
- 5. Switch back to two wheel drive (2 WD) differential unlocked mode just before returning to any hard roadway surface
- 6. Demonstrates correct operation of differential lock (both engaging and disengaging)
 - a. **DO NOT** move apparatus

IX. BACKING

- A. When and how to back
- B. Proper use of emergency lights

BACKING (Continued)

- C. Utilization of crew
 1. Uses personnel to back apparatus at all times, including other responders, if necessary
 2. Ensures back-up horn control cable or signal button are used to assist in proper backing
 3. Stops immediately if backing personnel are lost from sight
 4. Backup warning cable or button is located _____
 5. Ensures crew utilizes all backup warning devices
- D. Communicates with the crew
 1. Removes communication headset to hear crew outside apparatus
 2. Ensures crew utilizes all backup warning devices
- E. Sets up backing maneuver by proper positioning
- F. Uses appropriate speed while backing
- G. Procedure when alone
- H. Turning radius when backing is _____ feet
- I. Avoids over steering while backing

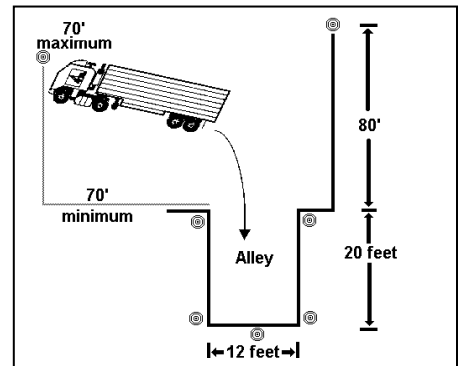
X. DRIVING SKILLS

A. Demonstrates the following driving skills / maneuvers:

* **Driving skills can be demonstrated during normal driving** after completion of required practice training and basic skill demonstration in an approved practice area(s).

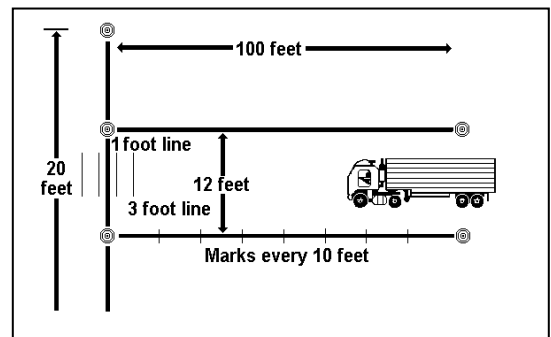
1. ***Alley Dock (Backing into station)(DMV)** - Dock the vehicle from a 90° angle in one movement, without touching any cones or stanchions, staying within all boundary lines, and stopping within one (1) foot of the dock or stop line. Pulling forward will result in a penalty.

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2. ***Forward Stop (Limit Line)(DMV)** - Drive down a 12 foot wide lane and stop when the driver estimates that the bumper is even with the stop line. Driver is allowed to make **one** stop only, to be within one (1) foot of the stop line.

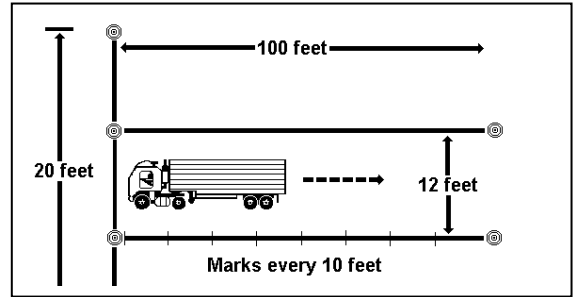
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DRIVING SKILLS (Continued)

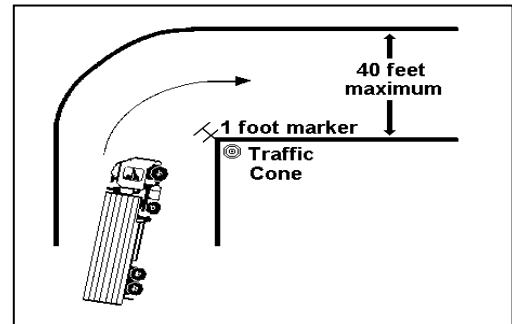
3. ***Straight Line Backing (DMV)** - May be combined with forward stop (Limit Line). Drive in reverse in a 12 foot wide lane without going outside the cones or boundary lines.

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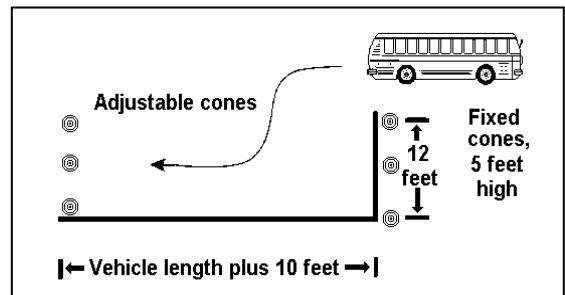
4. ***Measured Right Turn (DMV)** - Make a right turn around a corner with the back axles of the vehicle within one (1) foot of the designated cone, **without** striking it.

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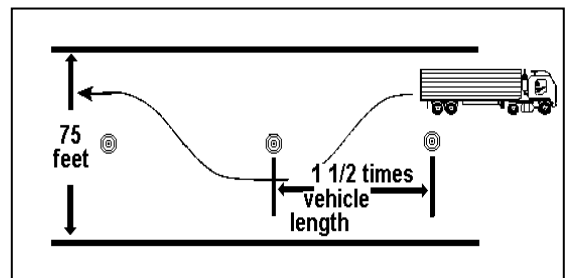
5. * **Parallel Parking (DMV)** - Park in a designated area without striking any cones or boundary lines.

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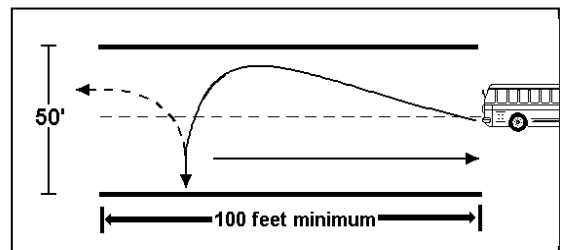
6. **Serpentine** - Maneuver vehicle both forward and in reverse around 3 cones in a serpentine manner without striking any cones and staying within the boundary lines.

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7. **Three-point U-turn** - Driver turns the vehicle 180 degrees, staying inside the cones or boundary lines. There is no limitation on the number of maneuvers used to accomplish this skill.

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XI. APPARATUS AUXILIARY AND SAFETY SYSTEMS

A. Load Manager

- 1. Purpose and function of Load Manager
- 2. Explains significance of each indicator light (colors) _____, _____
- 3. Normal operating position of the Load Manager switch along with the Master Light switch is that both switches are _____ (up / down)
- 4. Which systems are controlled by the Load Manager?
- 5. Order in which the Load Manager sheds systems
- 6. How and when the Load Manager can be bypassed
- 7. Possible consequences of bypassing the Load Manager
- 8. Proper way to reset the Load Manager

B. Antilock Braking System (ABS)

- 1. Describes ABS operation
- 2. ABS prevents wheel _____
- 3. Wheels effected _____
- 4. Utilizes normal brake pedal pressure during stops (DO NOT PUMP BRAKE PEDAL)
- 5. ABS warning light remains lit until _____ MPH (color) _____
- 6. Reports malfunction if warning light stays on (color) _____
- 7. Telma action during wheel lock up
- 8. ABS brake system operational technique

USE IN EMERGENCY SITUATIONS ONLY

STOMP - the brake pedal to the floorboard

STAY - on the brake pedal, do not let up

- a. Releasing the pedal resets the ABS computer, **INCREASING** the stopping distance

STEER - around the hazard(s)

- a. The vehicle will handle well with ABS system working

C. Automatic Traction Control (ATC)

- 1. Theory of operation
- 2. What does ATC do when wheel spin develops?
- 3. Locate the control switch
 - b. The switch label indicates _____
- 4. Normal control switch position _____ (up / down)
- 5. Explains why the green indicator light might illuminate
- 6. Explains what to do if the green indicator light remains illuminated

APPARATUS AUXILIARY AND SAFETY SYSTEMS (Continued)

- D. Emergency engine shut down – **TURN OFF IGNITION SWITCH**
1. **D**etroit **D**iesel **E**lectronic **C**ontrol (DDEC) unit on the Detroit series 60 engine will shut the engine down by turning the fuel off as in a normal shutdown procedure

XII. SECONDARY BRAKING DEVICES

A. Jake brake

1. Theory of operation and normal switch position
2. Proper use
3. Turns off when pumping
4. Procedure for wet conditions
- a. Switch position
 - b. Use / non - use of Jake Brake

B. Telma

1. Theory of operation and normal switch position
2. Telma will not work at speeds of less than _____ MPH
3. Proper use of control pedal or handle
4. Procedure for wet conditions
- a. Switch position
 - b. Use / non - use of retarder
5. During ABS, operation the Telma is _____

XIII. SHIFTING APPARATUS WITH AUTOMATIC TRANSMISSIONS

- A. Maintains engine speed in power range (1600 - 2100 RPM)
- WARNING - DO NOT LUG OR OVER SPEED THE ENGINE**
- B. Maintains and selects appropriate transmission gear for road, weather, and operating conditions to retain engine speed in power range
- a. The engine power range is the safest and most fuel efficient rpm to operate the engine
 - b. To reduce apparatus speeding incidents drive in the lowest possible gear that maintains the engine in the lower 1/3 of the engine power range at the posted speed limit
- C. Manually selects lower gear when engine lugs or transmission cycles between gears
1. Allison transmissions **WILL NOT** shift to a manually selected gear until the transmission is in the correct operating range, even if you incorrectly select a gear
- D. **DOES NOT** descend a hill in a gear higher than that required to ascend the hill
- E. Properly uses the MODE switch

XIV. CODE 3 POLICY

- | | |
|---|---|
| <input type="checkbox"/> A. Speed | <input type="checkbox"/> D. Passing |
| 1. The AVL system keeps tracks of apparatus speed, as well as location at all times | <input type="checkbox"/> E. Freeway |
| <input type="checkbox"/> B. Lights, siren, and opticom | <input type="checkbox"/> F. Railway crossings |
| <input type="checkbox"/> C. Intersection | <input type="checkbox"/> G. School bus |
| | <input type="checkbox"/> H. Describes sequence of code light activation |

XV. UNIMPROVED OR SEMI-IMPROVED SURFACE OPERATIONS

- A. **DO NOT** operate this class of apparatus off road at any time (unimproved surfaces include dirt, sand, loose soil or gravel, scrub, and grass)
- B. Remember the GVWR of this apparatus is _____ #
- C. Operation on **semi-improved** (other than fully engineered) surfaces **MUST** be done with extreme care as structural stability of surface and underlying soil is unknown
1. Soil or surfaces other than dedicated streets or highways have unknown load bearing capability
 - a. Gravel roadways or parking areas
 - b. Back country roads (private and fire), culverts, bridges
 - c. Paved surfaces other than dedicated streets
 - d. Private drive ways
 - e. Sidewalks
 - f. Parking structures
 - g. Adjacent to surfaces at the top of slopes
 - h. Adjacent to surfaces or slopes above soil held in position by retaining walls
 2. Improved or engineered surfaces are load rated at 500 PSI
 3. Apply this information to apparatus ladder stabilization situations as well
 - a. Review this task book's aerial stabilization section
- D. Carefully inspects the apparatus, tires, and under carriage for damage after operation on an unimproved or semi-improved surface
- E. Carefully inspects between dual tires to determine if rocks or other material is caught between the dual tires after all operations on any semi-improved surface

XVI. INCIDENT COMMUNICATIONS and PROCEDURES

- A. Demonstrate Knowledge and ability to:
1. Interpret dispatch information from a pager
2. Explains and properly demonstrates Fire Department radio operating policies and procedures
- a. Uses correct radio terminology

INCIDENT COMMUNICATIONS and PROCEDURES (Continued)

- 3. Explains and properly demonstrates Fire Department MDT / C policies and operating procedures
- 4. Read maps (SDFD & Thomas Brothers) and find locations

XVII. SECURING APPARATUS FROM DRIVING

- A. Curbs wheels when on incline
- B. Sets all parking brakes
- C. Transmission in neutral
- D. Checks the engine temperature (normal temp _____)
 - 1. For high temperature idle at _____ to _____ RPM until normal temperature achieved
 - 2. **DOES NOT** idle engine for long periods of time as damage to turbocharger and injectors will occur (Detroit 8v92 - 10 minutes or more; Detroit Series 60 - 20 minutes or more)
 - 3. When idling for long periods is required by any operation, increase the idle level to a minimum of 900 RPM (High Idle) to cool and lubricate the engine and turbocharger
 - 4. Normal engine idle speed is _____ RPM
- E. Control switches to “Off” (1) Ignition (2) Master (3) Battery (when equipped)
- F. Wheel block(s) down (manufacturer supplied wheel blocks only) or in station parking cradle
- G. Post trip vehicle inspection
 - 1. Air and fluid leaks
 - 2. Apparatus damage
 - 3. Equipment missing or damaged
 - 4. Resupply apparatus
 - 5. Clean apparatus
 - 6. Plug in air and / or electrical lines

XVIII. MAINTENANCE PROCEDURES

- A. Describes frequency and procedure to replace
 - 1. Coolant filter # _____ Coolant capacity _____ gallons % Mix _____
 - 2. Power steering fluid type _____
 - 3. Engine oil type _____ Oil filter # _____ Engine oil capacity _____ gallons
 - 4. Transmission oil type _____ Filter # _____ Oil capacity _____ gallons
 - 5. Fuel type _____ Fuel primary filter # _____ Secondary filter # _____
 - 6. Fuel capacity _____ gallons
 - 7. Differential oil type _____ Filter # _____ Oil capacity _____ gallons
 - 8. Front hub oil type _____ Weight _____ lbs
 - 9. Air filter # _____
 - 10. Front hub oil type _____ Weight _____ lbs

MAINTENANCE PROCEDURES (Continued)

B. Describe benefits of proper aerial device maintenance

- 1. Aerial hydraulic oil type _____ Hydraulic oil tank capacity _____ gallons
- 2. System capacity _____ gallons Total capacity _____ gallons Filter # _____

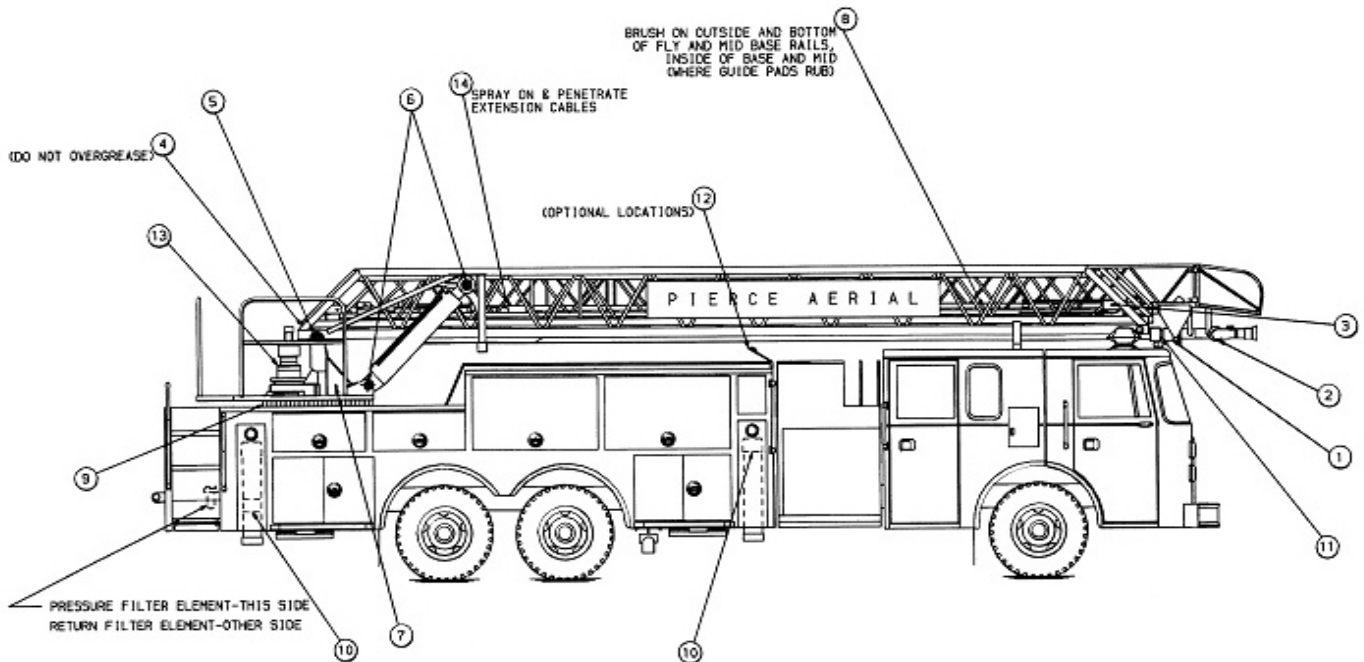
WARNING - Only fill hydraulic oil when aerial device is in the fully bedded & **retracted** position to ensure that all of the systems oil has drained back into the tank.

- 3. Cable, Guides, Pulleys, and Waterway maintenance (frequency _____)
- 4. Hydraulic pressure gage test pressure _____ psi (frequency _____)
- 5. Plumbed waterway ladders
 - a. **WIPE** waterway piping with a light coat of ATF to clean and lubricate waterway seals **AFTER EACH USE**

b. **LUBRICATE** waterway moving joints **AFTER EACH USE**

C. Performs Monthly and Quarterly Apparatus Maintenance checks (FDM forms)

- 1. Review maintenance manual for appropriate lubricants and chart of lubrication points



- 2. Clean and degrease apparatus
- 3. Inspect apparatus for leaks, defects, rust, cracked or chafing hoses, and repaint needs
- 4. Lubricate all wire rope
- 5. Lubricate all grease points (zerk fittings) and other moving joints
- 6. Lubricate Swing bearing
- 7. Lubricate Outriggers
- 8. Lubricate waterway seals and joints
- 9. Wipe down waterway with ATF
- 10. Perform Elevation (to 75 °), Rotation, and Extension maneuvers to distribute lubrication

MAINTENANCE PROCEDURES (Continued)

- 11. Clean excessive grease from all fittings and surfaces
- 12. Perform intake relief valve(s) test(s) and maintenance
- 13. Perform auxiliary equipment tests and maintenance
- 14. Perform Monthly Ladder System Tests
- 15. Perform Monthly EPU Operational Test
- D. Cab Tilt Procedure
 - 1. SAFETY considerations for cab tilt operation
 - a. Secures all loose materials in cab and close doors
 - b. Checks for apparatus equipment that may interfere with cab tilt and reposition it
 - c. Checks for overhead obstructions
 - 2. Engine ignition is _____ when cab is raised
 - 3. Demonstrates proper procedure for raising the cab
 - 4. After raising the cab, secures in position with safety support
 - 5. Lowering cab
 - a. Raises off safety support lock
 - b. Releases safety catch and stow support rod (if equipped)
 - c. Lowers cab
 - d. Ensures latches are secured (hold lowering toggle switch down until latches set and indicator light is “Off”)
- E Explains VOGEL Lubrication System and the Engineer duties relative to the system
 - 1. Daily, visually checks (observes) “AUTO LUBE” self check indicator on apparatus startup
 - a. Light should blink three (3) times indicating system “OK”
 - b. If light remains “ON”, there is a system fault
 - 1) Checks system grease level to see if system needs refill
 - 2) Reports all faults to the Repair Facility immediately
 - 3) System refill is only performed by the Repair Facility
 - 2. Visually checks auto lube operation at the system lube points looking for excess grease on the apparatus or the ground indicating possible broken lube lines or loose connections
 - 3. Monthly lubricates all grease points (zerk fittings) and other moving joints that are not part of the auto lubrication system
 - a. The system **DOES NOT** lube the drive shafts; this is a manual lubrication step
 - 4. During pre-trip brake and undercarriage inspection, checks the system hose lines and connections for looseness, kinks, or other damage
 - 5. **DOES NOT** store any equipment in the top well (where the auto lube unit is located) that in any way touches, or can possibly touch, the system wiring or lube hoses
 - 6. Reviews maintenance manual for appropriate lubricants and chart of lubrication points

MAINTENANCE PROCEDURES (Continued)

- G. Washing instructions
 1. Pierce maintenance manual section #4
 2. Avoid using high water pressure, hot wash solutions, abrasive detergents, or rough cleaning materials or motions
 3. Never wash in direct sunlight as the apparatus surface temperature may be too hot and gold leaf or other lettering may be damaged
 - a. Wax these areas only do not wash!
 4. Use only vehicle washing soap such as 3M car wash soap PN_39000 or equivalent
 5. Pre wet all surfaces before applying soap solution
 6. Use only soft materials and gentle cleaning motions to apply washing solution
 7. Rinse thoroughly before washing solution can dry
 8. Pressure wash **ONLY** the under side of the apparatus
 9. Dry all surfaces with a clean, soft, non-abrasive cloth or chamois
 10. Avoid daily washing as it damages paint, wash only when dirty, wipe down with damp chamois or cloth to remove dust or dirt between washings

- H. Towing instructions
 1. **NEVER** tow an automatic transmission equipped vehicle in neutral, remove the drive shaft to prevent transmission damage
 2. All towing operations and connections are the responsibility of the tow operator
 3. Chock vehicle tires while working on or around the vehicle
 4. Unload as much equipment as possible to reduce tow weight
 5. Drain apparatus water tank to reduce weight

- I. Describes checks to be performed after any maintenance at any repair facility
 1. Clean and refuel apparatus as necessary
 2. Perform a complete inventory
 3. Perform a complete pre-trip inspection
 4. Check tire pressure before moving the apparatus and after driving 25 miles
 5. Perform a complete post trip inspection immediately upon return to the station and immediately report any problems noted
 - a. Performs monthly Foam System tests

XIX. AERIAL DESCRIPTION

- A. Describe ladder system and ladder design type _____
- B. _____ Section Ladder Maximum personnel ON ladder without water flowing _____
- C. Maximum elevation _____ degrees Maximum extension _____ feet
- D. Maximum grade for side to side operation _____ % Front to back _____ %
- E. Maximum aerial stability is achieved by _____
- F. Maximum GPM flow _____ gallons @ _____ Degrees and _____ Feet Elevation

AERIAL DESCRIPTION (Continued)

- G. Outlets # and sizes _____ (if equipped)
- H. Supply Hose size _____ Length _____ ft.
- I. Set apparatus intake relief valve to _____ psi (if equipped)
- J. Outrigger system type _____ Outrigger width fully extended _____ ft.

XX. LADDER CAPACITIES

**WARNING - ALWAYS REFER TO APPARATUS LOAD CHART
DO NOT RELY ON MEMORY!**

REMEMBER to ADD UP the weight of Personnel, PPE, and Equipment operating on the ladder

- A. Standard Load capacity is determined with apparatus operating at:
 - 1. Level ground
 - 2. Maximum elevation
 - 3. Full extension
 - 4. No water flowing
 - 5. Maximum Ladder capacity throughout rotation is _____ lbs.
- B. Load capacity, water flowing, 45 - 75 degree elevation _____ #
- C. Load capacity, water flowing, 0 - 44 degree elevation _____ #
- D. Inclinometer used _____
- E. 100 % load capacity is allowed on grades up to _____ degrees or _____ % slope
- F. Load capacity drops to 50 % on grades exceeding _____ degrees or _____ % slope
- G. **DO NOT USE** ladder on grades exceeding _____ Degrees or _____ % slope
- H. Ladder capacity is reduced by **RUNG TILT**, Twisting of ladder from operation to the side while on a slope
 - 1. 100 % capacity zero (0) to _____ % rung tilt
 - 2. 50 % capacity _____ % to _____ % rung tilt
 - 3. **DO NOT USE** at rung tilts _____ % or greater
- I. Describe types of ladder loads and the effects on the ladder
 - 1. Dead (Static)
 - 2. Live (Dynamic)
 - 3. Impact / Shock
 - 4. Torsional
 - 5. Side
- J. Describe reasons for ladder failure and give example
 - 1. Overloading
 - 2. Impact loads
 - 3. Torsional loads
 - 4. Mechanical damage
 - 5. Human

XXI. HYDRAULICS

- A. Immediate Pump Pressure _____ PSI Ladder System Loss _____ PSI
- B. Fog nozzle - Nozzle Pressure _____ PSI
- C. Maximum pump pressure to the base of a pre-plumbed ladder with a fog nozzle _____ PSI

HYDRAULICS (Continued)

CALCULATE FOR ALL FOG NOZZLE SETTINGS @ MAXIMUM ELEVATION

- 1. GPM _____ PP at truck connection _____ PSI 4" FLR _____
2 1/2" FLR _____
- 2. GPM _____ PP at truck connection _____ PSI 4" FLR _____
2 1/2" FLR _____
- 3. GPM _____ PP at truck connection _____ PSI 4" FLR _____
2 1/2" FLR _____
- 4. GPM _____ PP at truck connection _____ PSI 4" FLR _____
2 1/2" FLR _____

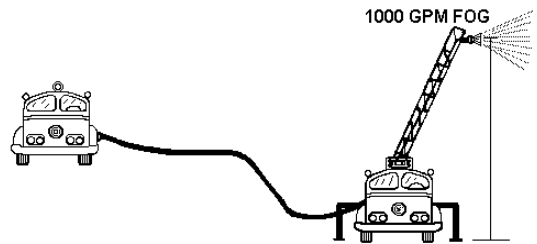
D. Straight tip Nozzle - Nozzle Pressure _____ PSI

E. Maximum pump pressure to the base of pre-plumbed ladder straight tip nozzle _____ PSI

CALCULATE FOR ALL STRAIGHT TIP NOZZLE SETTINGS @ MAXIMUM ELEVATION

- 1. 1 1/2" Tip - GPM _____ PP at truck connection _____ PSI 4"FLR _____
2 1/2" FLR _____
- 2. 1 3/4" Tip - GPM _____ PP at truck connection _____ PSI 4"FLR _____
2 1/2" FLR _____
- 3. 2" Tip - GPM _____ PP at truck connection _____ PSI 4" FLR _____
2 1/2" FLR _____

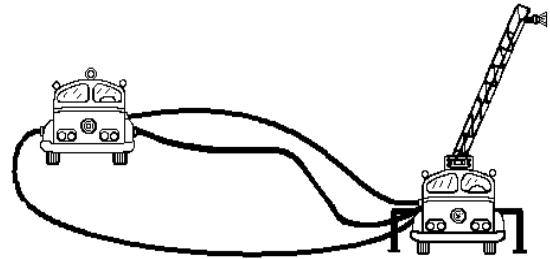
F Calculate the PP (Pump Pressure) for a 1000 GPM fog nozzle at 100' elevation. The supply line is 300' of 4" hose. **SHOW ALL YOUR WORK**



Pump Pressure = _____ PSI

HYDRAULICS (Continued)

G. Calculate the PP (Pump Pressure) for a 1 1/4" straight tip at 80' elevation. The supply lines are three (3) 100' lengths of 2 1/2" hose. **SHOW ALL YOUR WORK**



Pump Pressure = _____ PSI

XXII. LADDER SYSTEM OPERATION - CAB PROCEDURES

- | | |
|--|--|
| <ul style="list-style-type: none"> <input type="checkbox"/> A. Set parking brake(s) <ul style="list-style-type: none"> 1. Front and Rear <input type="checkbox"/> B. Apply Johnson bar (if equipped) <ul style="list-style-type: none"> 1. Locks' rear wheels only <input type="checkbox"/> C. Emergency Lights "ON" <input type="checkbox"/> D. Turn Opticom "OFF" <input type="checkbox"/> E. Turn Jake Brake "OFF" <input type="checkbox"/> F. Ladder power / Aerial switch "ON" <ul style="list-style-type: none"> 1. Light color _____ <input type="checkbox"/> Engage Ladder Power Take Off (PTO) <ul style="list-style-type: none"> 1. Light color _____ <input type="checkbox"/> H. Turn Hydro - Gen (generator) PTO "ON" <input type="checkbox"/> I. Shift Transmission to Neutral | <ul style="list-style-type: none"> <input type="checkbox"/> J. Verify Master switch "ON" (Releases ladder system locks) <input type="checkbox"/> K. Throttle switch to "ON" position <input type="checkbox"/> L. Turn up Radio Volume <input type="checkbox"/> M. Shift Radio Console to Remote <input type="checkbox"/> N. Take headset from Cab to pedestal for radio communication <input type="checkbox"/> O. Set wheel blocks on LEFT and RIGHT Front wheels <ul style="list-style-type: none"> 1. Forward and aft of wheel 2. Wheel blocks in complete alignment with tire (square to tread) 3. Collapsible wheel blocks MUST be LOCKED OPEN |
|--|--|

XXIII. AERIAL STABILIZATION

- A. **ALWAYS** be aware of road **CROWN** and **FALL LINE** of roadway
- B. **ALWAYS** ensure **ALL BRAKES** are correctly applied
- C. **ALWAYS** place wheel blocks tightly against wheels
 1. On front set of wheels **ALWAYS**
 2. Rear wheel set(s) if blocks are available or position dictates
- D. Engage jack / ladder selector switch to jack position
- E. **ALWAYS** ensures jack plates are down
 1. Place plate handles to inside to prevent tripping hazard
 2. Aerial devices, properly stabilized with stabilizer jack plates down apply a ground load of less than 75 PSI, the **MAXIMUM** allowable load under NFPA standards
 3. Aerial devices stabilized without stabilizer jack plates down apply a ground load of 154 PSI, which **EXCEEDS** the maximum allowable load under NFPA standards
 4. **SHORT JACKING** or **DYNAMIC FORCES** will increase loads on stabilizer plates above 75 PSI with potential loss of stability on the loaded side stabilizer plate; causing shifting or sinking of the plate and tipping apparatus to unsafe or collapse positions
 - a. This position shift will place additional load forces on the unstable aerial device and apparatus causing catastrophic failure
- F. Extends jack out - then down
 1. **NEVER SHORT JACK**
 2. **ALWAYS Low side first** (WHY) _____
 3. **HIGH side**
 4. Some apparatus may not allow stabilizer deployment if ladder or boom is out of cradle
 5. Deploy outriggers slightly **HIGHER** on ladder extension side of apparatus if **BELOW LEVEL** operation is considered
- G. Visually checks to see that stabilizing jacks and wheel blocks are down and set
- H. Levels Truck
 1. Stair step lifting procedure for jack operation
 2. Allows frame and aerial torque box to assume load by raising wheels off ground or taking the bulge out of the rear tires for correct stabilization per manufacturer specifications
 3. Maintain front tires on the ground at all times
 4. Extend jack length by _____
 5. Utilize level gages **SIDE TO SIDE TILT** and **FRONT TO BACK**
 - a. Green 100% load capacity (degrees tilt _____)
 - b. Yellow 50% load capacity (degrees tilt _____)
 - c. Red **UNSAFE DO NOT USE!** (degrees tilt _____)

AERIAL STABILIZATION (Continued)

6. Check interlock activated indicator lights are illuminated (color _____)
 - a. Some apparatus may not allow ladder operation if outriggers are not fully deployed and there is pressure on all stabilizer jacks

- I. **ENSURES** locking pins are in place on stabilizer jacks to prevent loss of stability if the stabilizer Jack drifts down
1. MINIMUM space above top of pin on stabilizer jack _____ Inches
 2. MINIMUM number of holes showing on outrigger _____

XXII. PEDESTAL CONTROLS

- | | |
|---|--|
| <input type="checkbox"/> A. Operating gauges | <input type="checkbox"/> H. Inclinator |
| <input type="checkbox"/> B. Engine start switch (if equipped) | <input type="checkbox"/> I. Ladder Load Chart(s) |
| <input type="checkbox"/> C. Intercom system | <input type="checkbox"/> J. Table level gage (if equipped) |
| <input type="checkbox"/> D. Radio | <input type="checkbox"/> K. Rung alignment indicator |
| <input type="checkbox"/> E. High idle switch | <input type="checkbox"/> L. Stop and lock controls |
| <input type="checkbox"/> F. Extension / elevation / rotation control levers | <input type="checkbox"/> M. Remote nozzle controls |
| <input type="checkbox"/> G. Ladder light switches | |

XXIII. SAFETY PROTOCOL

- WARNINGS:**
1. **Observe all manufacturer danger, warning, and caution notices**
 2. **Never exceed manufacturers recommended capacities**
 3. **Never short jack under any circumstances “RELOCATE THE TRUCK’S POSITION!” SHORT JACKING is a decision to SACRIFICE the truck to the incident and expose crew, bystanders, and the victims to be rescued to severe injury or death**
 4. **Personnel will not be “ON” or “CLIMB” the ladder Device in any position until the ladder is properly raised, extended, and rotated into position for use**
 5. **Personnel may ride in the basket on an aerial device with a personnel basket at the end of the ladder or extending device**
- A. **ALWAYS** put jack plates down with handles to inside to eliminate any trip hazard
- B. **ALWAYS** observe **ALL** moving apparatus, ladder jack, and ladder components when placing into or removing the ladder from operation to prevent injury to personnel or ladder damage
- C. Check for over head obstructions
- D. **DO NOT**, at any time, operate ladder close to, around or thru any wires or cables
1. Electricity both static and generated will arc to ladder causing injury and damage
 2. Smoke, rain, nozzle spray, runoff water, and cable deformation can contribute to arc potential

SAFETY PROTOCOL (Continued)

- E. Observes Ladder load limits!
 1. **DO NOT** rely on memory use load charts or tables
 2. Apply all loads perpendicular to ladder rungs (design strength) not laterally to ladder
 3. Tip loads are computed with the apparatus on level ground and waterway drained
 4. Maintain 10 foot separation, minimum, between personnel on the ladder
 5. The Inclinometer is the **KEY** device in determining load capacity
 6. Ladder pipe operations reduce load capacity to 50 % and that **MAY PROHIBIT** other uses
 7. Remember slope and tilt reduce load capacity significantly

- F. Understands ladder dynamic and static loads and demonstrates caution when moving ladder
 1. Avoid rapid and / or jerky movements with ladder controls. These actions cause twisting and other improper loads on the ladder, utilize slow smooth movements
 2. **ALWAYS** turn water flows **ON** and **OFF SLOWLY** to avoid **DYNAMIC** forces moving the ladder and causing damage or injury
 3. **ALWAYS** be aware that strong winds **WILL** effect the load capacity and stability of any aerial device. Winds over 30 MPH **REQUIRE** LOAD REDUCTION of 50 % and / or **DISCONTINUE** use of ladder
 4. The smaller the ladder elevation angle (closer to horizontal) the lower the load capability of the ladder is
 5. Shock loads such as a person jumping on to the ladder, impose stress several times greater than those loads involved when the load is gradually applied and may cause **IMMEDIATE** ladder failure

- G. **ALWAYS** engage all ladder locks and hydraulic lock valves **BEFORE** personnel mount and climb the ladder or the ladder is used in any other manner

- H. Grant permission to mount pedestal platform

- I. Grant permission to climb ladder
 1. Inspect personnel for PPE and SCBA, with aerial air system connector hose
 2. Inspect personnel for loose or unsecured objects that may fall or be dislodged, leave at ground level
 3. Inspect for ladder belt
 4. Brief personnel on manual ladder belt signals
 - a. One (1) tap ----- Move ladder to the **RIGHT**
 - b. Two (2) taps ----- Move ladder to the **LEFT**
 - c. Three (3) taps ---- **HELP** assistance or communication **REQUIRED**
 5. Ensures personnel perform ladder belt test prior to mounting and climbing ladder

- J. **ENSURES** use of life belt
 1. Leg locks are prohibited on an aerial ladder

- K. Maintains visual contact with personnel on ladder and top of ladder

SAFETY PROTOCOL (Continued)

- L. Monitor and verify fatigue level of personnel working on ladder at regular intervals (NOT TO EXCEED 30 minutes) and provide relief when necessary
- M. **ENSURE** no apparatus park **UNDER** or firefighters work **UNDER** a raised Aerial device
- N. **NEVER** power into or support ladder on a building or other surface
 1. Defeats the cantilever design of the ladder, its major strength
 2. Position a minimum of 12" above roof, wall or window sill
- O. **NEVER** utilize ladder as:
 1. A battering ram or tool to break objects, such as punching out windows
 - a. Windows may be broken by dropping the ladder tip into the window (allowed by NFPA)
 2. To support any portion of a structure
- P. **NEVER** scrape ladder on or along the surface of any objective (roof, wall, balcony, or window)
 1. Maintain clearance and keep movements slow, smooth and gentle
- Q. **NEVER** use ladder as an Anchor Point for any rigging system except the department approved system described in the using ladder as a lifting device section of this task book (Section XXXVI)
 1. **ALL other** Anchor Points **SHALL** only be attached to apparatus wheels or frame
- R. **NEVER** rappel from any aerial ladder as this produces uncontrollable loads on the ladder
- S. The outrigger **INTERLOCK OVER RIDE** switch **SHALL** be utilized only in emergencies to cradle the aerial ladder
 1. Utilizes jack system override to **UNSTICK** stabilizer beam or jack for retraction **ONLY**
 2. System may not be completely extended and interlock will prevent system operation
 3. Interlock prevents ladder retraction if an outrigger lifts off of ground
- T. Keep knees clear of tailboard when lowering stabilizing jacks to prevent injury
- U. Keep hands clear of yellow painted areas and **ALL** moving parts to prevent injury
- V. **ONLY a** Command Officer **MAY**, at their discretion in a life threatening emergency, override a safety protocol. **EXTREME CAUTION MUST BE USE AT THIS TIME**
 1. Any Aerial device used in any **NON APPROVED** manner or damaged in an accident **SHALL** be placed out of service and the Repair Facility notified
 2. The Truck may remain in service but the Aerial device is out of service until repaired, inspected and tested
- W. There is an extremely weak waterway / nozzle mounting connection on all preplumbed water way ladder installations at ladder tip where the nozzle is bolted to the waterway
 1. To prevent damage or breaking of the mounting connection when trying to place the ladder for ingress, egress, or rescue:
 - a. **ALWAYS** place the ladder in the rescue mode
 - b. Initially place the ladder tip a **Minimum** of four (4) ft away from buildings or obstacles lower than one and one half stories (15ft.)

SAFETY PROTOCOL (Continued)

- c. This is especially important as the nozzle tip is hidden by the ladder; and the operator can not correctly judge the distance the nozzle tip is from any object to see if it will hit the building or an obstacle
- d. To increase safety always turn the nozzle downward as far as possible so that it clears any objects close to the ladder tip

- X. Failure to properly lock waterway into the rescue or water tower positions will result in damage when the water way is charged due to the nozzle unit rapidly moving forward

XXIV. OPERATION OF AERIAL LADDER DEVICE FROM PEDESTAL

- A. Proper sequence for operation
 - 1. Rescue situation (Elevate- Rotate- Extend-Lower to objective or designated area for rescue)
 - 2. Ladder pipe operations (Elevate - Extend - Charge - Rotate slowly to position)
 - a. Utilize a firefighter on the ladder pipe **only as a last result.**
 - b. The firefighter may **climb the ladder only after the ladder is elevated and extended.**
- B. Operate pedestal controls with HIGH IDLE switch “ON”
- C. **DO NOT** operate the ladder if the Stabilizer Not Fully Extended Light is illuminated
 - 1. Indicates one or more stabilizer beams not fully extended
 - 2. High idle indicator light will not illuminate - **DO NOT** turn high idle “ON”
- D. Properly / Safely elevate to object or use position
 - 1. Keep elevation angle above 45 degrees whenever possible to reduce ladder loading
- E. Extends ladder using proper rung alignment
 - 1. Green alignment indicator light “ON” indicates that overlapping section rungs are aligned
 - 2. Light is “OFF” when rungs are “NOT” aligned
- F. Properly rotates ladder to operating position
- G. Properly lowers ladder to building or object (does not touch building or object)
 - 1. Utilize low idle when close to building or other objects to prevent damage to nozzle and waterway
- H. Utilizes and understands pedestal **INCLINOMETER, LOAD CHARTS, SAFETY GAGES, SAFETY INDICATOR LIGHTS, and WARNING BUZZER**
 - 1. A warning horn (buzzer) will occur each time the ladder is raised from the cradle
 - 2. The warning horn activates in addition to gage indications
 - 3. If warning horn does not activate at this time **EXTREME CAUTION MUST BE USED** when operating the ladder
 - a. Ladder is out of service, **Immediately** notify the repair facility if this condition occurs
 - 4. Low Level Load Gage (Stability Indicator) must be operated in the green range at all times
- I. Aerial evolutions are done **SLOWLY** and **SMOOTHLY** and Aerial device is **FEATHERED** to a stop at **ALL** times

XXV. APPARATUS OPERATIONAL POSITIONING

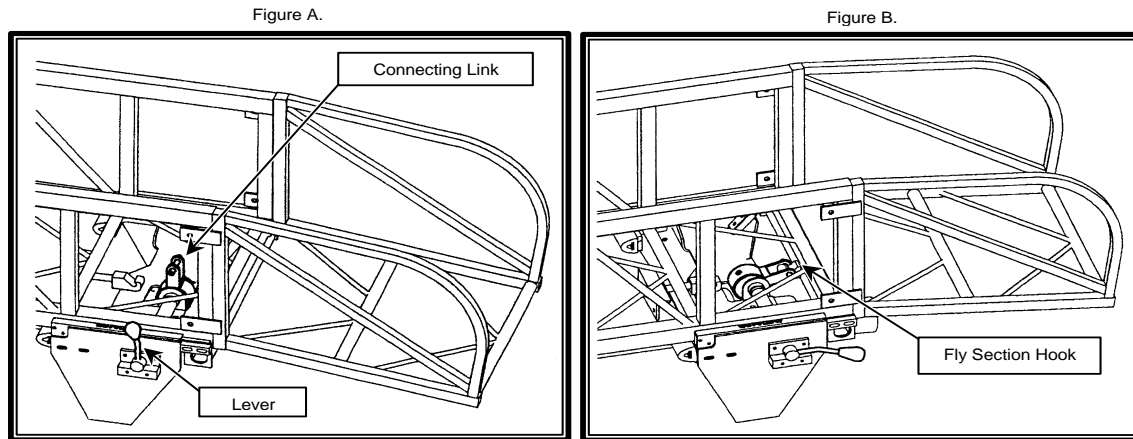
- NOTE - NEVER SHORT JACK**
- A. **NEVER** Position stabilizers on top of manholes or other ground equipment boxes
- B. **NEVER** Position stabilizers on top of Sidewalks or curbs
- C. **NEVER** Position stabilizers on top of unprepared surfaces; such as dirt, loose soil or gravel
 1. Parking lot surfaces are not engineered for loads; use extreme care when stabilizing and loading apparatus
- D. Describe and demonstrate the **SAFE ENVELOPE** of operation for this aerial device
- E. Describe and demonstrate **SCRUB** area or **TARGET** area for this apparatus Aerial device
 1. Locations that the Aerial device can reach under normal operating conditions
 2. Reachable locations vary depending on the apparatus position relative to the building or objective
- F. Positions apparatus to keep ladder extensions as close as possible to the center line of the apparatus and fall line of the roadway for maximum ladder reach and stability
 1. Off the rear (**BEST POSITION FOR SERVICE AERIAL LADDER OPERATION**)
 2. Off the front
 - a. Within 45 ° of center line of apparatus
 - b. **REMEMBER** the effects of **ROAD CROWN**
- G. General apparatus positioning
 1. Positions apparatus parallel to and in front of building for equipment and ground ladder utilization
 - a. Consider immediate use of the aerial device when operational conditions warrant
 - b. Factor in height and / or positioning of structure relative to access and incident
 - c. Anticipate changes in conditions and operations
 2. Maintain awareness of companies blocking access to ground ladders and reposition these units to prevent them from blocking access to ladders, equipment, or the incident (structure)
 3. Clear of overhead obstructions
 - a. Power lines
 - b. Building components
- H. Placements for Rescue
 1. Perpendicular to building
 2. Parallel to building
 3. Flush with sill of window or balcony railing
 4. Above roof line or object location for all other situations
- I. Placement for Ventilation _____
- J. Placement for Water tower operation _____
- K. Placement for below level operation _____

APPARATUS OPERATIONAL POSITIONING (Continued)

- L. Placement for operations on an incline
 1. Uphill
 2. Downhill
 3. Side hill
 4. Best _____
- M. Accurately and correctly places apparatus and ladder for
 1. Roof operations
 2. Windows
 3. Fire escapes and balconies
 4. Below Level position

XXVI. PINABLE WATERWAY NOZZLE POSITIONS

- A **RESCUE MODE (NORMAL POSITION)** - nozzle unit is attached to the aerial ladder middle section so that nozzle tip is behind top rungs of the fly ladder section
- B **WATER TOWER MODE** - nozzle is attached to the aerial ladder fly section (ladder tip) in front of the rungs, to provide room for clear operation



XXVII. POSITIONING PINABLE WATERWAY FOR USE AS A LADDER PIPE

- A. Reset water way lock from “RESCUE MODE” to “WATER TOWER MODE”
- B. With the aerial ladder in the fully retracted position rotate the CONTROL LEVER on the right side of the ladder to a vertical position (see Figure A)
- C. Rotate the connecting link over the hook located on the fly section cross bar (Figure B)
- D. Rotate the lever forward until in stops in a horizontal position and latches the bracket into position (see Figure B)
- E. **VERIFY** Connecting link is correctly attached to the fly ladder section hook

XXVIII. LADDER PIPE IMPLEMENTATION PROCEDURE

- WARNING - “NEVER ALLOW A FIRE FIGHTER TO RIDE THE LADDER UP”**

LADDER PIPE IMPLEMENTATION PROCEDURE (Continued)

- A. Identical controls are located at the turn table pedestal and the ladder tip to operate the nozzle
 1. Nozzle pattern is adjustable from straight stream to fog
 2. Nozzle tips are capable of vertical and horizontal movement
 3. Nozzles may be operated 45° either side of the ladder center line
- B. The **SAFEST** method of operating a ladder pipe is from the ladder pedestal
 1. Only send a firefighter up the ladder to operate the ladder pipe when there is no other way to deal with the operation
- C. Select variable nozzle setting or connect straight nozzle tip to be used
- D. Connect Supply line hose to intake or gate valve(s); use shut off butts on 2 1/2" lines
- E. Elevate aerial ladder to operating position
- F. Charge Supply line to shut off butts or gate valve
- G. Rotate ladder to operating position
- H. Charge ladder pipe; Open shut off butts or gate valves **SLOWLY**
- I. Operate automatic nozzle controls
 1. Turn "ON" nozzle master stream switch on the pedestal
- J. Have supply pump engineer provide immediate pump pressure
- K. Calculate correct pump pressure for the operation

XXIX. MANUAL LADDER PIPE IMPLEMENTATION PROCEDURES

- A. When a decision is made to have a fire fighter operate the ladder pipe, the following steps **MUST** be followed:
 1. Complete steps "C" thru "G" outlined above in Ladder pipe Implementation Procedures (Section XXVIII)
 2. Allow the Fire fighter to ascend the ladder and lock-in **ONLY** after the ladder is in operating position
 3. Advise firefighter the ladder pipe will be charged
 4. Charge ladder pipe; Open shut off butts or gate valves **SLOWLY!**
 5. Have supply pump engineer provide ImmEDIATE Pump pressure (IP _____ PSI)
 6. Calculate correct pump pressure for the operation

XXX. WATER TOWER OPERATIONS

- NOTE:** Ladder locks, ladder rotation lock, and water tower lock are not required due to apparatus ladder design

WATER TOWER OPERATIONS (Continued)

- A. Understands ladder dynamic and static loads and demonstrates caution when moving ladder
 - 1. **ALWAYS** turn water flows **“ON”** and **“OFF” SLOWLY** to avoid **DYNAMIC** forces moving the ladder and causing damage or injury
- B. Describe manufacturers rotation requirement for ladder _____
- C. Describe ladder safety systems
- D. Describes ladder hydraulic systems
- E. Describes ladder pressure gauge function
- F. Describes forces of ladder pipe on hydraulic system
- G. Describes ladder pipe nozzle reaction hazards
 - 1. Vertical deflection limits of nozzle _____
 - 2. Horizontal deflection limits of nozzle _____

XXXI. HOSE LAYS Trainee must produce effective fire fighting streams utilizing correct procedures and hydraulics

- | | |
|--|--|
| <input type="checkbox"/> A. Water Tower Straight Stream | <input type="checkbox"/> E. Flows & Sets Internal Intake Relief Valve |
| <input type="checkbox"/> B. Water Tower Fog | <input type="checkbox"/> F. Flows & Sets External Intake Relief Valve |
| <input type="checkbox"/> C. Built in 1 1/2" and 2 1/2' outlets | DO NOT ADJUST THE EXTERNAL RELIEF VALVE during fire fighting operations |
| <input type="checkbox"/> D. As a Stand pipe (remove nozzle) | 1. Monthly maintenance adjustment only |

XXXII. OPERATIONAL CONSIDERATIONS

- A. Ensures Fire Fighting Safety
 - 1. Engineer at operating aerial device or on pedestal **“IS”** the **ACCOUNTABILITY OFFICER** for this entry point
 - 2. Observes incident conditions and advises officer, assigned personnel and command of condition and situational changes
- B. Rescue priorities
 - 1. Most severely threatened
 - 2. Largest group
 - 3. Remaining victims in fire area
 - 4. Other exposed persons
- C. Rescue techniques
 - 1. Remove victim from fire or hazard
 - a. Begin at highest point (Top then Down)
 - b. Drop ladder to victim from above to prevent people from jumping on the ladder
 - 2. Remove fire or hazard from victim or area
 - 3. Ventilate structure

OPERATIONAL CONSIDERATIONS (Continued)

- D. Avoid impact and dynamic loads to aerial device when rescuing persons
 1. Approach victim location from above to prevent victim jumping on the ladder
 2. Carefully consider load capacities when assisting victims **ON TO** and **DOWN** the ladder
 3. Consider load distribution on ladder when rescuing victims
 - a. Multiple persons on the ladder

- E. General apparatus positioning
 1. First truck to the front of the incident
 2. Second truck to the rear of the incident
 3. Anticipate changes in conditions and operations
 4. Factor in height and / or positioning of structure
 5. Consider using the aerial device in place of ground ladders when operational conditions warrant

- F. Proper Engine Cooling - Maximum Temperature _____ °
- G. Emergency Cooling Procedures
 1. Check for obstructions
 2. Shed load
 3. Shutdown operations

XXXIII. INTAKE RELIEF VALVE PRE-PLUMBED WATERWAY

- A. Name / Type of relief valve(s) _____
- B. Locations of valve(s) _____
- C. Normal setting _____
- D. Properly sets ladder intake relief valve (s)
- E. Relief valve maintenance is to flow and adjust valve(s) _____

XXXIV. EXTERNAL PISTON RELIEF VALVE

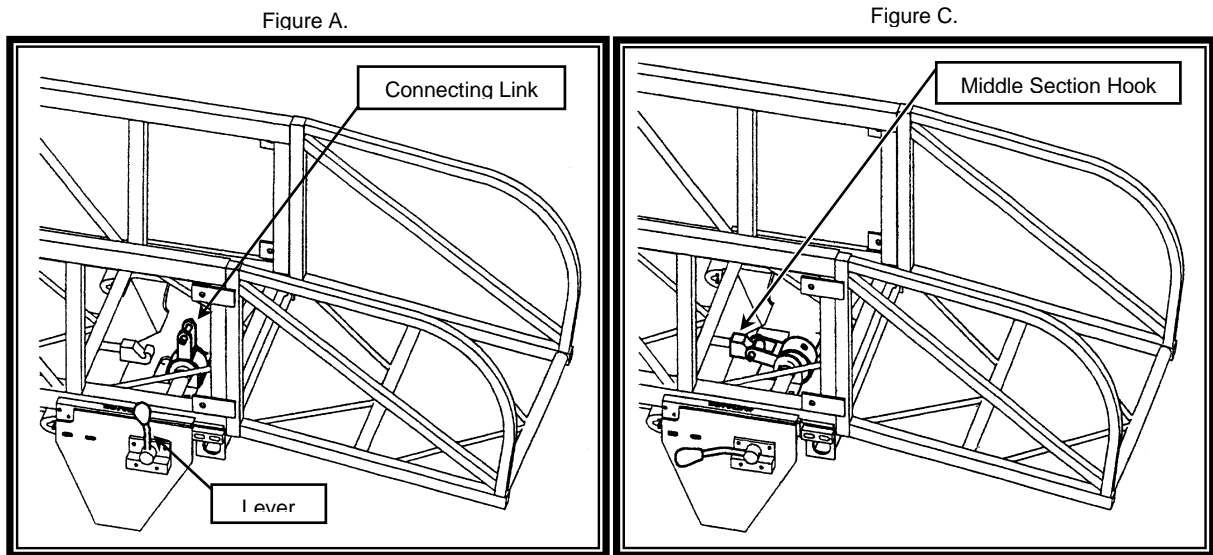
- A. SDFD policy is to set this valve to _____ PSI
- B. SDFD policy, flow and adjust valve _____
- C. Properly sets external intake relief valve
- D. Relief valve maintenance _____

XXXV. POSITIONING PINABLE WATERWAY FOR USE IN RESCUE OR FOR LIFTING

- A. **IMPORTANT!**
 1. **READ, UNDERSTAND, AND APPLY ALL MANUFACTURER DANGER, WARNING, AND CAUTION NOTICES CONCERNING LADDER OPERATION AND USE**
 2. **CALCULATE ALL LADDER LOADS USING THE LADDER LOAD CHART**

POSITIONING PINABLE WATERWAY FOR USE IN RESCUE OR FOR LIFTING (Continued)

- B. Verify pinable waterway positioned for rescue or ingress / egress operations
 1. Nozzle and waterway system attached to the Aerial Ladder Middle Section
 2. Reset water way lock from “WATER TOWER MODE” to “RESCUE MODE” if required
- C. With the aerial ladder in the fully retracted position, rotate the CONTROL LEVER on the right side of the ladder to a vertical position (see Figure A)
- D. Rotate the connecting link over the hook mounted in the middle section (Figure C)
- E. Rotate the control lever rearward until it stops in a horizontal position and latches the bracket into position (Figure C)
- F. **VERIFY** Connecting link is correctly attached to the ladder middle section hook

**XXXVI. USING LADDER AS A LIFTING DEVICE WITH THE LYFE PULLEY SYSTEM**

DANGER – Death or serious personal injury may occur if these procedures are not followed

- A. You must not operate this device unless:
 1. You have been trained
 2. You follow the safety and operating recommendations contained in the Pierce apparatus manual
 3. You follow SDFD policy
 4. Use only with NFPA approved rescue safety rope
 5. Use this pulley system only on ladders manufactured by Pierce Manufacturing Inc.
 6. You establish a safety area for rigging, loading and off loading of the rescuer(s) and victim(s) prior to rigging the ladder rope system, and attempting any rescue operation

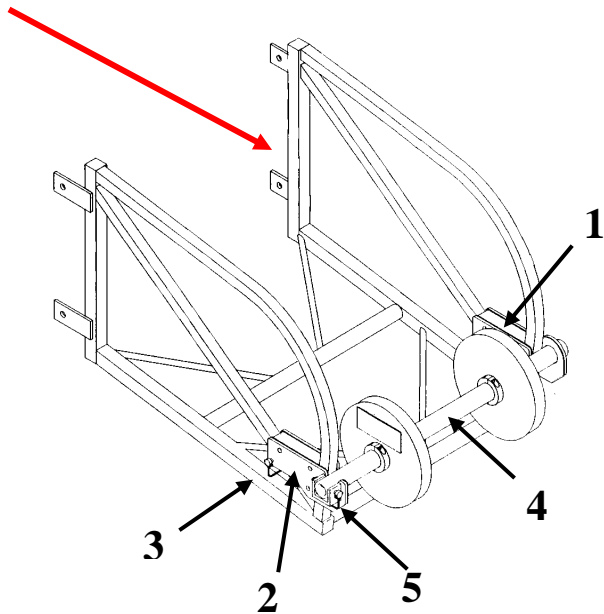
USING LADDER AS A LIFTING DEVICE WITH THE LYFE PULLEY SYSTEM (Continued)

- B. Install the Lyfe Pulley System on the portion of the ladder called the “EGRESS”

NOTE: This portion of the ladder is called the “EGRESS”

- C. Ensure the following information is understood and applied to all installations

1. Use Lyfe pulley system only when all pins and fasteners are properly installed
2. Use only original equipment fasteners
 - a. Never use substitute pins or fasteners
3. The left (# 1) and right (# 2) mounting brackets for the Lyfe pulley system on the egress are unique and they are not interchangeable
4. The pin (# 5) securing the shaft and pulley assembly must pass through both the right mounting bracket (# 2) and the Lyfe pulley shaft (# 4)




- D. MOUNTING BRACKET INSTALLATION STEPS

1. Install left mounting bracket (# 1) and right mounting bracket (# 2) on egress with two pins (# 3). Note: Mounting bracket pin on #1 side not shown
2. Slide shaft and pulley assembly (# 4) through hole in left mounting bracket (# 1)
3. Lower other end of shaft into right mounting bracket (# 2) and secure with pin (# 5)
4. The pin securing the shaft and pulley assembly must pass through both the right mounting bracket and the shaft.

- E. The system pulleys may be positioned (spaced) at any location along the mounting shaft bar
 1. To reposition pulleys, loosen pulley collar setscrews, relocate pulley, and retighten setscrews
 2. San Diego Fire-Rescue Department (SDFD) policy **REQUIRES** both pulleys be centered on the Lyfe pulley system mounting shaft to reduce torsional forces to the ladder

XXXVII. LYFE PULLEY USE GUIDELINES

DANGER REMINDERS

-  A. Before attempting the rigging and rescue operation, establish a safety area for rigging, loading, and off loading of rescuer(s) and victim(s)
- B. The capacity of the pulley system is 500 lbs. or the tip load of the ladder, whichever is less
- C. Do not allow the pulley system to come into contact with any objects (rocks, cliffs, walls, windows, victim, and rescuer)



XXXVIII. RIGGING AERIAL LADDER FOR A HIGH ANCHOR POINT

- ☐ A Properly install the cross bar and shaft and pulley assembly-to the end (Egress portion) of the ladder
 1. This rope system requires **BOTH** the cross bar and shaft and pulley assembly to complete the high anchor point system
 2. Shaft and pulley assembly with pulleys centered on the shaft
 3. Cross bar



- ☐ B Obtain and deploy the following rope rescue equipment to rig the aerial ladder pulley system
 1. Two (2) ½" x 300' static kernmantle ropes (400' ropes are being ordered for this evolution)
 2. Two (2) pulleys
 3. Six (6) steel carabiners
 4. Two (2) eight plates
 4. Four (4) 1" pieces of tubular webbing
 5. Two (2) prussic (Optional)

- ☐ C Begin by separating the above listed equipment into two areas
 1. Ladder tip area
 - a. Two (2) ½" x 300' static kernmantle ropes
 - b. Two (2) pulleys
 - c. Two (4) steel carabiners
 - d. Two (2) 1" pieces of tubular webbing to attach to the rescuer at the end of the rig
 2. Ladder base or pedestal area
 - a. Two (2) steel carabiners
 - b. Two (2) eight plates
 - c. Two (2) 1" pieces of tubular webbing for anchor points
 - d. Two (2) prussic (Optional)

- ☐ D Build the ladder rope system in two stages, making identical belay and haul systems
 1. Split the ladder tip equipment cache into two (2) identical smaller caches
 2. Tie a figure eight on a bight and clip it into the cross bar with a steel carabiner
 3. Attach one pulley and one carabiner to the rope and loop the rope up and over the Lyfe pulley, down to the base of the ladder. This is called the ladder rig
 4. Any load shall be attached to the pulley carabiner
 5. Rig the second line over the unused Lyfe system pulley wheel in an identical manner



RIGGING AERIAL LADDER FOR A HIGH ANCHOR POINT (Continued)

- E Complete the ladder rope system in two stages by building identical anchors for the belay and haul systems
 1. Split the ladder base equipment cache into two (2) identical smaller caches
 2. Tie a webbing anchor around the three-inch crossbeam at the base of the ladder
 3. Load an eight plate and attach it to the webbing with a carabiner.

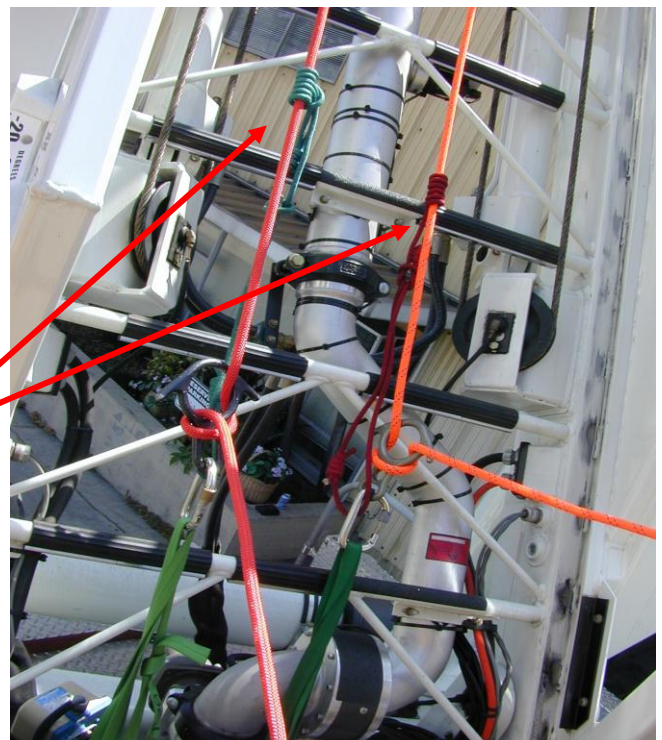


4. To complete the second system, rig the second line by duplicating the first rigging process
5. The complete high anchor point system has two identically rigged main (haul) line and belay line
6. **DO NOT** lock off the ropes to the eight plates at this time

6. A prussic may be added as a dead man safety to protect the rescuer should a lower/belay person become incapacitated

NOTE: These prussics must be tended to prevent them from setting whenever the rope is moving

7. Attachment of the ropes to the ladder base at the pedestal, allows the turntable to be rotated 360 degrees without a diagonal pull on the ladder or interference from stationary objects



RIGGING AERIAL LADDER FOR A HIGH ANCHOR POINT (Continued)

- E Use two (2) pieces of webbing to extend the body harness connections to the ladder rig pulleys, away from the rescuer's body, keeping hands, clothes, and tools out of the pulley system

- E Connect the stokes collection ring or eight plate directly to the two ladder rig carabineers.



XXXVIII. HIGH POINT ANCHOR SYSTEM OPERATION

- REMINDERS:**
 - 1. ALL steps of this rescue system's operation must be practiced in advance and fully understood by ALL crewmembers prior to beginning a rescue**
 - 2. The system's eight plates should NEVER be locked off when the ladder is in motion because any bind in the rope or another system component may harm the rescuer, victim, or the ladder**
 - 3. Depending on rescue needs the order of deployment may vary**

HIGH POINT ANCHOR SYSTEM OPERATION (Continued)

- A. Operation of the system requires three (3) personnel on the ladder pedestal
 1. An aerial ladder operator
 2. One belay person
 3. One main (haul) line person

Note: Both system lines are rigged the identically and either can be used as the main line or belay line



- B. It is important that the ladder operator **FULLY** understand the operation of the ladder and pulley system combination and how each ladder movement (raising, lowering, retracting, or extending) changes the upward or downward movement of the system ropes
 1. Watch both the top and bottom of the ladder for interference of ropes, webbing, carabiners, and pulleys with each other, the ladder, and any load(s)
- C. The raising / lowering operation is most effective when using the ladder at the highest angle possible
 1. This will allow for the most flexible use of the system to deploy the rescuer
 2. The operational steps include:
 - a. Rig both ladder systems as described
 - b. Attach rescuer/stokes to ladder rig carabineer as described
 - c. Retract the fly ladder to approximately six (6) feet of the fully retracted position, (ladder base) if not already there
 - 1) Full retraction may cause rope system entanglement with the ladder
 - d. Raise the ladder to the highest point without rope(s) contacting the ladder. Allow all ropes to pay out during this maneuver
 - e. Watch ropes and ladder components for contact with other objects
 - f. **DO NOT ATTEMPT** the rescue at this time

REMINDER: The eight plates should not be locked off when the ladder is in motion (rotation, extension, retraction, raising, or lowering)

- E. If the rescuer is not attached to the ladder rig before raising, than with the ladder fully elevated and properly retracted, rig the rescuer to the end of the ladder rig
- F. The rescue leader will then give the command for the two line tenders on the pedestal to put tension on the eight plates
- G. The rescue leader will then give the command for the ladder operator to raise the rescuer or stokes basket from the ground

HIGH POINT ANCHOR SYSTEM OPERATION (Continued)

- H. The ladder operator will now adjust the ladder position, under the guidance of the rescue leader, to place the rescuer into a position to reach the victim
 1. This process may require the ladder to be elevated, retracted, or extended to adjust the position of the rescuer to correctly arrive at the victim's location
 2. The ladder operator will perform all ladder movements slowly to prevent stress on any part of the system
- I. Reverse the above steps to raise the victim and the rescuer to safety
 1. **Remember the load limit of the ladder;** this may affect retrieval operations. With a 500-pound tip load limit, two rescuers or a rescuer and one victim may only be raised if within the ladder load limit.

**XXXIX. SUMMARY of HIGH POINT ANCHOR SAFETY PROTOCOLS**

- A. **READ, UNDERSTAND, AND APPLY** all manufacturer **Danger, Warning,** and **Caution** notices concerning ladder and Lyfe pulley system operation and use
- B. Properly **INSTALL BOTH** the Cross Bar and the shaft and pulley assembly to the end of the ladder
- I. **Know the load limit of the ladder and Lyfe Pulley System at all times**
 1. **Calculate all ladder loads using the Ladder Load Chart**
 2. **The allowable tip load may be lower depending on the ladder's load chart for the ladder elevation, side tilt, and operating angle**
 3. **The MAXIMUM CAPACITY of the Lyfe Pulley System is 500 lbs**
 4. **The retrieval operation for the rescuer and victim may have to be done one person at a time**

SUMMARY of HIGH POINT ANCHOR SAFETY PROTOCOLS (Continued)

- D. **DO NOT** allow the pulley system to come into contact with rocks, cliffs, walls, electric wires, windows, victim, the rescuer, or any other object
- F. **DO NOT** rappel from the ladder
- G. **NEVER** side load, impact load, or cause torsional loads to the ladder
- H. Refer to the SDFD Vertical Rescue Manual for additional information on rope rescue operations
1. Knots
 2. Harnesses
 3. Stokes rigging
 4. Anchor systems
 5. Rappel systems
 6. Mechanical advantage systems
- I. Truck crew responsibilities include:
1. Captain Ladder operation team leader
 2. Engineer Ladder operator
 3. Firefighter Rigger and main line operator
 4. Firefighter Rigger and belay line operator
- J. Rescue operations involving this rigging system may require more personnel than the available truck crew to perform the required operational steps
1. After the truck crew completes rigging the ladder rope system, the following personnel or equipment may be required to assist in rescue operations
 - a. Rescuer
 - b. Rigger
 - c. Safety observers
 - d. Tag line personnel
 - e. Medical personnel
 - f. Heavy Rescue personnel
 - g. Incident Command personnel
 - h. Law Enforcement personnel
 - i. Lifeguards
 - j. Relief personnel
 - k. 10. Additional apparatus

XXXX. AERIAL EVOLUTIONS

Trainee must perform the following evolutions utilizing appropriate procedures

- | | |
|--|--|
| <input type="checkbox"/> A. To roof | <input type="checkbox"/> D. Low angle rescue |
| <input type="checkbox"/> B. Window rescue | <input type="checkbox"/> E. Lifting and placing rescuer with rope system |
| <input type="checkbox"/> C. Fire escape and balcony rescue | <input type="checkbox"/> F. Water Tower |

XXXXI. EMERGENCY ENGINE COOLING

- A. Checks for obstructions
- B. Sheds load
- C. Reduce or discontinue operations
- D. Direct cooling operations with external cooling methods
1. Blowers
 2. Water misting

XXXXII. EMERGENCY POWER UNIT

- A. The Emergency Power Unit (EPU) is **ONLY** to be used to stow the ladder and outriggers in the event of a failure in the engine, transmission, or main hydraulic pump
 1. The EPU is not designed or intended to replace the main hydraulic system
 2. The EPU on the pierce apparatus is designed to run for up to thirty minutes, use caution to prevent overheating
 3. In the event of any system failure, the aerial is to **immediately** taken out of service, and the repair facility notified.

- B. To Operate the EPU
 1. Batteries and ignition must be on
 2. Aerial Master must be on (located on upper cab interior control panel)
 3. Open the valve for the operation wanted i.e. retract, rotate, lower the ladder or outriggers up and in
 - a. **This valve must be opened first so the EPU is not pressurizing a closed system**
 4. EPU toggle switch located on the rear stabilizer control panel or on the pedestal control panel
 - a. The switches must be held on during the EPU operation
 - b. This step requires two people to be performed safely
 5. Complete the operation by releasing the EPU toggle switch and close the selected valve.

- C. System bypass valves
 1. The system bypass valves are to be used when there is a failure in the electrical selection switch, located on the pedestal control panel, or a failure in the outrigger deployment sensor
 2. The system bypass valves may be used for ladder control **ONLY** when a command officer (BC or higher) has confirmed that the outriggers are fully extended and lowered
 3. System bypass valves operation
 - a. Ensure that you have hydraulic power
 - b. Ensure that you have fully extended and lowered all outriggers
 - d. For electrical selector malfunction
 - 1) Open the access door on the left side of the tailboard
 - 2) Pull red knob for desired operation
 - 3) Follow all department protocols for ladder operation

- D. For outrigger extension sensor failure
 1. Ensure that you have hydraulic power
 2. Receive approval from CHIEF OFFICER to continue operations
 3. Confirm outrigger extension, and deployment
 4. Open access panel door on pedestal
 5. Select appropriate red knob, pull knob for operation
 6. Use appropriate lever to complete operation
 7. Place apparatus out of service, notify repair facility

EMERGENCY POWER UNIT

- E. Describe and demonstrate EPU operation
 1. Emergency pump HP _____ Speed (RPM) _____ Pressure (PSI) _____
 2. Manual circuit selector
 3. Manual interlock override
 4. Pedestal outrigger and aerial operation interlock overrides
 5. Use EPU to rotate aerial device
- Performs emergency ladder operations using hydraulic pressure to retract and bed ladder
 1. Retract first
 2. Rotate
 3. Lower

XXXXIV. SECURING APPARATUS FROM AERIAL OPERATIONS

- A. Checks with officer for permission to shut down operations
- B. Notify supply engine to stop pumping and / or secure
- C. Close discharges and bleed down line pressures **BEFORE** retracting ladder
 1. Leave system drain **OPEN** on **ALL** preplumbed apparatus until ladder secured in cradle
- D. Ensure personnel on ladder are returned to ground
 1. **“DO NOT RETRACT WITH PERSONNEL ON THE LADDER”**
- E. Raise ladder from objective
- F. Verify ladder pipe nozzle tipped up to clear windshield when bedding ladder
- G. Lower ladder and secure in cradle
- H. Gently power ladder into cradle to prevent shifting while driving apparatus
 1. Until top rail of lower section begins to deflect outward
- I. Properly stow ladder pipe system
 1. Return ladder to rescue MODE position
 2. If straight tip is utilized on ladder pipe, stow in correct location and reinstall fog nozzle
- K. Determine engine temperature normal _____ °, idle to cool if necessary
- L. Performs walk around
 1. All equipment accounted for
 2. All equipment secured
 3. Compartment doors closed
 4. Wheel blocks up and stowed
 5. Clear to proceed

XXXXV. AUXILIARY EQUIPMENT

- A. Operates and maintains all fixed systems and equipment on the apparatus not specifically addressed in this standard
- B. Operates and maintains all auxiliary equipment assigned to this class apparatus
 1. **PERFORM** Monthly Electrical Equipment Maintenance Check

AUXILIARY EQUIPMENT (Continued)

- C. Hydro-Gen generator operations and specifications
1. Specifications
 - a. Type _____ manufacturer _____
 - b. Voltage _____ Amperage _____ Wattage _____
 2. Length of electric reel is _____ feet number of reels _____
 3. Location of main circuit panel _____
 4. Location of each circuit breaker for each light and receptacle
 5. On and off operating sequence for standard generator unit
 - a. Disconnect loads before starting or securing unit
 6. On and off operating sequence for PTO operated generator units
 - a. Aerial device all ready deployed
 - b. Generator operating need to deploy Aerial device
 - c. Transmission must be in _____
 - d. Disconnect loads prior to engaging or disengaging generator PTO and securing unit from operation
 - e. **DO NOT** engage Hydro-Gen generator PTO with High Idle “ON”
 - f. Restores all systems to correct standby positions
- D. Breathing air system operation and specifications
1. Breathing air system specifications
 - a. Type _____ Manufacturer _____
 - b. Tank capacity _____ Cu. ft. Pressure _____ - PSI
 - c. Operating pressure _____ PSI Number of outlets _____
 - d. Maximum useable air in system _____ Hours
 - e. Air filter _____ #
 2. Ensure personnel are equipped with SCBA units that have an aerial air system connector hose (pigtail)
 3. Operation
 - a. Turn on main cylinder valve
 - b. Set cylinder pressure reducing regulator to _____ PSI
 - c. Set ladder tip connection to _____ - PSI
 - d. Attach SCBA backpack air system connector
 4. **PURGE** the air system for (5) five seconds **AFTER** connecting the **SCBA** backpack air pig tail to the system by opening the face piece purge valve (turn red purge valve counter - clockwise)
 - a. **PURGE BEFORE EACH USE** and **BEFORE** donning the **SCBA** face piece
 5. **DO NOT** allow any single person to remain on the ladder or ladder air system for more than (30) thirty minutes without relief or verification of fatigue level
 - a. Check personnel fatigue level at regular intervals and provide appropriate relief
 6. System visual low air warning activates at _____ PSI at the pedestal
 7. System audible low air warnings activate at _____ PSI at ladder tip and at the pedestal
 - a. Describe operational procedures for action after warning initiated

