

# City of Winter Park Fire-Rescue Standard Operating Guideline

# 220.02

**Title: Procedures for the Maintenance  
and Operation of Vehicle 2204, 1993  
Sutphen Mini-Tower**

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**Purpose:** To establish a procedure to outline the regular maintenance and operations of Vehicle #2204 (Sutphen Mini-Tower).

**Scope:** This policy will outline what maintenance is to be performed by Department personnel and what is to be referred to the garage personnel. In addition, this SOP will cover those operational considerations of this apparatus with regards to testing, training and fire / rescue operations.

## **General:**

### **220.02.01. Description**

Vehicle 2204 is a 1993 Sutphen "Mini-Tower" manufactured by the Sutphen Corporation in Columbus, Ohio. It was officially placed in service on December 20, 1993 at 08:00. It is currently assigned to Station 62 and is used as the Department's reserve Truck.

### **220.02.02. Specifications**

1. Engine - Detroit Diesel 8V92TA
  - a. OIL - SAE 40wt / 25 Quarts
  - b. ANTI-FREEZE / 76 Quarts
  - c. POWER STEERING FLUID - Dextron 2 ATF / 8 Pints
  - d. FUEL TANK - Diesel / 65 Gallons
2. Transmission - Allison HT-740D
  - a. FLUID - Dextron 2 ATF / 32 Quarts
3. Chassis - Sutphen Corporation
  - a. Front Axle - Rockwell / 90 wt. varies with axle
  - b. Rear Axle - Rockwell / 90 wt. 36 Pints
  - c. Tires - Front / Goodyear 315/80R 22.5 Rear / Goodyear 12R22.5

4. Pump - Hale 1500 GPM Single Stage
  - a. Relief Valve Control
  - b. Detroit Diesel Engine Water Governor Control
  - c. 500 Gallon water tank
  
5. Aerial Ladder - Sutphen Corporation
  - a. Length - 75+ feet / 4 Section
  - b. Hydraulic Tank / Dextron II / 65 Gallon
  - c. Leveling System (Jacks) / Dextron II / 7 Pints
  
6. Measurements
  - a. Overall Length = 37'5" Bumper to tip of ladder
  - b. Angle of Approach = 13'.05"
  - c. Angle of Departure = 9'.75"
  - d. Overall Height = 10' 9" to the top of the ladder at the tip
  - e. Cab Height while tilted = 12' 10"
  - f. Wheelbase = 210"
  - g. Width = 96"

**220.02.03. Fire Department Performed Maintenance**

Daily Check List Items:

- a. Visual Inspection / Around / Over / Under Vehicle
  
- b. Check all liquid levels on chassis: engine, transmission, coolant, pump oil, power steering and all other liquid levels.  
NOTE - If engine was running within the previous (5) minutes of the engine oil being checked it should be allowed to sit and drain into the oil pan for a proper check.
  
- c. Check belts for wear, tension and condition.
  
- d. Visually check fuel level tank gauge and condition of tank for any damage.
  
- e. Examine the Dry Type Air Cleaner gauge located on the dash. When the air restriction gauge is in the RED, or Closed, it is time to change the filter. This operation should be referred to the garage.

- f. Tires and Wheels - Check and maintain correct air inflation pressures per tire sidewall instructions (weekly). Rims should be inspected for damage. These are ALUMINUM RIMS and can be dented, bent or damaged by driving over obstacles in the road. Lug nuts should be TORQUED at regular intervals by the garage. NO IMPACT WRENCHES ARE TO BE USED ON THE ALUMINUM RIMS. The staff at the garage should be reminded of this each time a tire is dealt with or at times of preventative maintenance visits.
- g. Automatic Transmission - Check shift linkage to make sure the gear selector makes the proper changes in the transmission pattern.
- h. To properly check the transmission fluid level the following should be performed in order:
  - 1. Stop Engine
  - 2. Set Parking Brake
  - 3. Place Transmission in NEUTRAL
  - 4. Engine should be at NORMAL OPERATING TEMPERATURE
  - 5. Engine RPM should be at IDLE  
Dipstick will show an ADD or FULL indication.  
FLUID SHOULD ONLY BE ADDED BY CITY MAINTENANCE PERSONNEL.
- i. Fire Pump - Check overall operation of fire pump and primer pump oil level.
- j. Electrical System - Check all lights and gauges.
- k. Check mirrors.
- l. Visually Check Water Tank Level.
- m. Examine all other equipment as required.
- n. Run auxiliary generator to normal operating temperature (weekly).  
Check fuel level daily.

See Sutphen Operators Manual for other daily and weekly checklists covering the pump and aerial operations.

- o. Washing of Apparatus - Painted surfaces may be washed as normal. Truck may be placed on the waxing rotation to maintain appearance. Avoid waxing close to the reflective striping or lettering to prevent wax build-up on the edges of the letters. **DO NOT WAX STAINLESS STEEL BODY SECTIONS.** A special product is available for the maintenance of the stainless steel. In addition, only use clean water to rinse-off the Aluminum Rims. **DO NOT SPRAY COOL WATER ON RIMS OR CHASSIS COMPONENTS THAT ARE HOT.** Allow the truck to cool prior to rinsing.

NOTE: It will be to the operator's discretion to set the ladder on a daily check. However, the operation of the pump and the aerial ladder will be checked during the weekly performed on MONDAY.

#### **220.02.04. Operations**

1. Set-up for Aerial Operations
  - a. If you have the option, set the truck up about 20 feet from the building. Leave a minimum of (2) feet on each side of the truck for stabilizers.
  - b. Set the parking brake and place the transmission in NEUTRAL. Activate the PTO switch located on the switch console. This will activate the PTO for all aerial operations. It should be noted that at any time the driver feels that the aerial device will be needed on the scene that the PTO should be activated prior to engaging the Pump Drive and prior to leaving the cab area to go to the pump panel. The PTO is only to be engaged while the truck transmission is in NEUTRAL and the engine is at IDLE SPEED. A red light on the dash will indicate when the PTO is engaged.
  - c. Be sure that a minimum of 90 PSI is in the trucks air system.
  - d. Once PTO is engaged the truck transmission should remain in the NEUTRAL position unless the FIRE PUMP is needed. To engage the FIRE PUMP while the PTO is in operation, place the FIRE PUMP transfer switch in PUMP and place the transmission in DRIVE. This will continue the operation of the PTO and engage the FIRE PUMP.

## Outside the Vehicle

- e. Place the wheel chocks in front and behind the rear wheels.
- f. Set the ground plates for the stabilizers on each side of the truck. THE LADDER MAY NOT BE PLACED INTO OPERATION WITHOUT THE USE OF THE STABILIZERS AND THE STABILIZERS MUST HAVE THE PLATES PLACED PRIOR TO SETTING.
- g. Move panel switch labeled "AUX. ENGINE CONTROL" to "Aerial Operations" and activate "High Speed" switch to achieve the 90-PSI in the hydraulic system needed to properly set the stabilizers. THE STABILIZERS MUST BE SET AT "HIGH SPEED" or 1400 RPM. Activate the switch labeled "UPPER POWER". This will provide power to the rotation lights and flood lights on the ladder
- h. Once the Stabilizers are set, the ladder may be placed into operation. The operator must utilize the slide-out step any time the ladder is being operated. This may prevent electrical shock should the ladder come in contact with any energized electrical lines.
- i. The operator of the ladder must remain conscious of the location of the ladder with regards to the surroundings. Items to be considered should be:  
Power Lines, Stationary Objects such as trees and buildings, the Cab of the truck, when the ladder is operated below 30 degrees and rotated near the front of the vehicle, etc.
- j. Once the stabilizers are set the operator should return the "AUX. ENGINE CONTROL" switch to the "Pump Operations" for all fire pump controls. At this point the RPM of the engine may be controlled by either the electronic controller on the side of the gauge panel or the manual throttle located on the panel itself. It should be noted that the manual "VERNIER THROTTLE" will not operate when the Aux. Engine Control switch is in the AERIAL position or when the Detroit Diesel / RPM control device is in the ON position.

## Raise / Lower of Ladder

- a. The first operation, when utilizing the ladder from its resting place, is to RAISE it up to a point then ROTATE then EXTEND. The opposite should be followed when returning the ladder to its cradle.

- b. Raise the ladder by pushing the center lever, located at the control box, outward. Lower the ladder by pulling the lever, inward.
- c. NORMAL IDLE should be used when beginning any movement with the ladder. The HIGH IDLE can be activated after the movement has begun and should be turned OFF prior to the completion of the movement. This procedure will serve to prevent the jerking motion that causes stress to the ladder and the vehicle itself.
- d. When positioning the ladder for a rescue of a victim from an elevated opening, the ladder should be brought to the victim from ABOVE. Never direct the ladder at the opening from below, the victim may panic and jump for the ladder prior to a firefighter being in position for the rescue.
- e. When operating the elevated waterway, the system should be monitored by utilizing both the FLOW METER and PRESSURE GAUGE located near the Wheel-type control valve. Attempts should be made to keep the ladder itself stationary while flowing water. Although movements of the ladder are capable, it is easier and more desirable to control the waterway nozzle from either the ground or ladder tip mounted "joy-stick" controller.

#### Rotation

- a. The ladder is capable of rotating 360 degrees either to the left or right. All rotation operations should be performed at IDLE SPEED!
- b. While rotating the ladder the operator must bring the rotation to a complete STOP before changing the direction of the rotation. There is a relief-valve built into the hydraulic system to control this operation to reduce the SHOCK. In no way should this be an operational practice.

#### Auxiliary Power

- a. The Auxiliary Power switch is located on the pump panel. Auxiliary power is used in the event of hydraulic pump failure or in case the truck engine fails. The electric motor is operated by pulling the switch out. All ladder functions can be operated with Auxiliary Power.

## Returning the Ladder to Ready Position

- a. If the waterway was utilized, all drains and valves should be OPENED prior to RETRACTING the ladder. This will allow the water in the system to drain and not cause any undue strain on the waterway seals.
- b. The ladder should always be RETRACTED first, then ROTATED into position, then LOWERED into the cradle. The ladder alignment lights will indicate when proper rotation is achieved.
- c. Remove the Wheel Chocks. Failure to do this could result in the wheel chocks being wedged under the tires making them unremovable.
- d. The stabilizer release switch should be moved when the stabilizers are ready to be retracted. Stabilizers should be retracted at IDLE SPEED. Stabilizer pads should be replaced carefully so as not to damage any body parts.
- e. Once all components are replaced, move to the cab and place the FIRE PUMP out of gear, if used. Wait until the Speedometer reaches "0" after taking transmission out of gear. Switch PTO, OFF and observe that the RED pilot light is OUT.
- f. Prior to leaving the scene, the Driver should make an inspection trip around the vehicle to see that all equipment is secure.
- g. The truck should not be driven with the UPPER POWER switch left in the ON position. This switch could allow for unnecessary lights to be left on that could blind other drivers.

## 2. Set Up for Pump Operations ONLY

This apparatus operates much the same as any other fire pump this Department utilizes. Each operator must become familiar with those items that are particular to this unit. Items are listed in this section as a reminder, not to act as a pump operator manual for this vehicle.

- a. This unit is equipped with a "Detroit Diesel" electronic engine control device. Should you select to utilize this throttle during pumping operations it must be turned on at the pump panel after the pump is engaged. This device allows for the electronic control of the RPMs of the engine either manually or automatically when the PSI position is selected.

- b. Be reminded that the manual (vernier) throttle will not operate if the electronic throttle is in the ON position or if the Aux. Engine Control is in the "Aerial" position.
- c. This unit is equipped with an air-assisted water control valve (keystone valve) that controls water flow from the front suction to the pump. This valve is not equipped with an air bleeder; therefore, the truck will operate with the drain closest to the pump left in the OPEN position. This will allow the air to bleed out when the hydrant is charged from the FRONT suction. The operator must remember to go to the right side of the truck and CLOSE this bleeder after the operation has begun.
- d. The valve located on the right side discharge, #2, is designed as a "slow-close" valve. Additional pressure is required to close this valve over any other on the truck.

### 3. Cab Tilting

#### TO RAISE CAB

- a. Secure or remove all loose objects from inside the cab.
- b. Make sure all objects on the front bumper are removed or otherwise stowed.
- c. Make sure all cab doors are closed, all personnel are in the clear and there is sufficient overhead clearance to raise the cab. It should be noted that the cab has sufficient clearance to tilt while sitting in its' bay. It requires 12' 10" to fully tilt the cab.
- d. Raise Cab by activating the switch located in the compartment near the control panel. When the cab is fully tilted, the safety bar will drop into place.

#### TO LOWER THE CAB

- a. Raise Cab to MAXIMUM point
- b. Make sure all tools, spray cans, drop lights, etc. are removed from under the cab and engine area.
- c. Make sure that all personnel are clear from the cab area.

- d. Have a second person release the safety bar and drop the cab about 1" by pushing the switch marked DOWN.
- e. Lower the cab until the lock can be heard closing at the rear of the cab.

**WARNING: Failure to perform any of these actions during the raising or lowering of the cab could result in serious injury or death or damage to the vehicle.**

#### 4. Operations of the "Jacobs Engine Brake"

The Jacobs Engine Brake is coupled to the engine exhaust valve train. When actuated, it prevents power strokes from occurring and the engine works as a retarding force on the vehicle.

It is controlled by a panel-mounted switch. With the control switch "ON", the engine brake will function whenever foot pressure is off the throttle. Depressing the throttle will deactivate the engine brake.

With this Detroit Diesel type engine, the brake has a two position switch which allows either the right bank or left bank of valves to be used for braking. This switch has a "HI - LO" position and a separate position for "ON - OFF" when the braking effect is not desired.

For safety reasons the Department policy for operating the Jacobs Engine Brake on any apparatus will be to the drivers discretion as to use the "HI or LO" mode. The unit will be turned OFF during all wet road conditions. If the unit is left ON, skidding may occur on any slippery surface.

#### 5. Operational Questions

All operational questions for this vehicle shall be routed through the chain-of-command to the Battalion Chief assigned to apparatus.

A copy of the Operational Manual from the Sutphen Corporation is located in the Battalion Chief's office and is available at any time to all personnel.