



VEHICLE OPERATIONS

SAN FRANCISCO FIRE DEPARTMENT

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Vehicle Operations
May 2014

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FOREWORD

The goal of this manual is to establish standard operating practices as authorized by the Chief of Department and implemented by the Division of Training.

The purpose of this manual is to provide all members with the essential information necessary to fulfill the duties of their positions, and to provide a standard text whereby company officers can:

- Enforce standard drill guidelines authorized as a basis of operation for all companies
- Align company drills to standards as adopted by the Division of Training
- Maintain a high degree of proficiency, both personally and among their subordinates

All manuals shall be kept up to date so that all officers may use the material contained in the various manuals to meet the requirements of their responsibility.

Conditions will develop in fire fighting situations where standard methods of operation will not be applicable. Therefore, nothing contained in these manuals shall be interpreted as an obstacle to the experience, initiative, and ingenuity of officers in overcoming the complexities that exist under actual fire ground conditions.

To maintain the intent of standard guidelines and practices, no correction, modification, expansion, or other revision of this manual shall be made unless authorized by the Chief of Department. Suggestions for correction, modification or expansion of this manual shall be submitted to the Division of Training. Suggestions will be given due consideration, and if adopted, notice of their adoption and copies of the changes made will be made available to all members by the Division of Training.

Joanne Hayes-White
Chief of Department

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SECTION 1. DRIVER'S LICENSE INFORMATION

Members of the San Francisco Fire Department are required to have, and maintain, proper and valid State of California license classification for the particular vehicle they are operating. Members shall not operate personal vehicles while on duty without being in possession of a valid Class 'C' license.

Operating a vehicle when not in possession of a valid license, or a valid license classification, is a violation of the California Vehicle Code and, therefore, a violation of Department Rules and Regulations.

Members in the following ranks are required to maintain (at a minimum) a Class 'C' driver's license with Firefighter Endorsement:

- H-2 Firefighter
- H-3-Level III Firefighter/Paramedic
- H-4 Fire Inspector
- H-6 Fire Investigator
- H-10 Incident Support Specialist
- H-16 technical Training Specialist
- H-18 Community Services Coordinator

Members in other ranks must maintain (at a minimum) a Class 'C' license, but are not required to add the Firefighter Endorsement.

Members shall notify their immediate supervisors (officers) of any change in Driver's License status within 24-hours of that change. A change in Driver's License status includes suspension, revocation, classification change or renewal. Members shall forward the details of the license status change to the Office of the Deputy Chief of Operations, in General Form format, within twenty-four hours or upon reporting for next shift. Members shall include all information pertinent to their driver's license status change in the General Form. Members' supervisors (officers) must review and approve the General Form for completeness and accuracy. Supervisors (officers) must then meet with the member and review the Department's policy on licensing and apparatus operation relative to the license status change and must note same on the General Form to the Deputy Chief of Operations.

The Class C driver's license with Firefighter Endorsement is the minimum level of license that members must possess in order to operate Fire Department apparatus. Members may choose to maintain a higher class of licensure, such as a Commercial Class B or a Commercial Class A, or to add Endorsements, such as HazMat.

SECTION 1. DRIVER'S LICENSE INFORMATION

Maintenance of a higher classification of license must be done at the member's own expense.

The Department will reimburse only those members who are permanently assigned to the Bureau of Equipment and who must drive specialty equipment, such as the fuel truck or the tow truck, or members who are in other functional positions requiring specialty licensure as part of their regularly assigned duties. These members must maintain, at a minimum, a Commercial Class A license with HazMat and Firefighter Endorsement.

SECTION 2. DRIVER TRAINING

NEW MEMBER TRAINING

New driver training is in the form of lectures, demonstrations, and controlled environment hands-on driving instruction. California State Assembly Bill Number 1648 requires to meets or exceeds the standard outlined in NFPA 1002, chapter 4 (2008 version). This includes a classroom (cognitive) portion of at least 16 hours and a manipulative portion of least 14 hours of behind-the-wheel drivers training.

Upon graduation from the Fire Academy, probationary (PX) members will be in possession of a Class C license by reviewing and testing of current California Department of Motor Vehicles Commercial Drivers Handbook, California Department of Motor Vehicles Driver Handbook, San Francisco Fire Department Driver's Training Student Manual, and San Francisco Fire Department Vehicle Operation Manual which allows them to drive Department apparatus in NON-EMERGENCY situations, and under the supervision of the regular driver and the company officer.

Following graduation from the Fire Academy, driver training will continue under the supervision of the Field Training Officer (FTO). During the course of the twelve month probation, the new firefighter will be given opportunities to operate the apparatus in non-emergency situations only; such as returning from Alarms, inspections or driving the vehicle to drills or training. Such driver training shall be documented in the company journal.

When the FTO believes that the probationary firefighter is sufficiently prepared for certification as a driver, Pump Operator, or Aerial Operator, a General Form to that effect shall be submitted to the Division of Training by the Field Training Officer.

The components of training and testing include a Pre-trip Safety Inspection of the vehicle, a Knowledge and Skills Test, a practical Driving Test, and Driving Simulator Program.

Pre-Trip Safety Inspection

During the Pre-Trip Safety Inspection, the student will demonstrate the ability to conduct a pre-trip inspection, to determine if the vehicle is safe to drive.

SECTION 2. DRIVER TRAINING

Knowledge and Skills Test

- Knowledge of safe driving practices.
- Ability to place vehicle into operation, drive, and turn.
- Ability to use vehicle controls and emergency equipment.
- Ability to back and park the vehicle.

Driving Test

- Operation of the vehicle in traffic conditions on public roads.
- Turning the vehicle.
- Braking and slowing the vehicle.
- Backing the vehicle (with spotters).
- Parking the vehicle.

Driving Simulator Program



- Proper driving skills
- Steering exercises
- Awareness of surroundings
- Emergency responses
- Intersection analysis
- Multiple apparatus responses
- Learned responses to hazardous situations

Pre-Trip Inspection Sheet

Knowledge of the systems listed on this form will be presented at the Division of Training and further developed on the company level.

Pre-Trip Inspection										
DATE		TEST LOCATION		ETP CDL PRE-TRIP INSPECTION EVALUATION SCORE SHEET				RESULT		
VEHICLE LICENSE NO./TRAILER ID PLATE NO.		ROUTE NO.		EXAMINER'S SIGNATURE		EXAMINER CL NO.		Number of errors		
DRIVER'S SIGNATURE				DRIVER LICENSE NO.				<input type="checkbox"/> Passing <input type="checkbox"/> Unsatisfactory <input type="checkbox"/> Mechanical Postponement		
TYPE VEHICLE <input type="checkbox"/> CL A <input type="checkbox"/> CL B <input type="checkbox"/> PV Vehicle axes 2 3 Trailer axes 1 2 Air brakes Yes No (*) (*) If vehicle has no air brakes, put a line through these components.			PRE-DRIVE CHECKLIST 1. Turn signals F / B <input type="checkbox"/> 2. Brake lights <input type="checkbox"/> 3. Horn <input type="checkbox"/> 4. Emergency Flashers <input type="checkbox"/>		Engine Compartment Oil level 0 Coolant level 0 Power steering fluid/(belt) 0 Water pump (belt) 0 Alternator (belt) 0 Air compressor (belt) 0 Leaks/hoses 0		ALL VEHICLES <div style="display: flex; justify-content: space-between;"> <div> Clutch/gearshift 0 Temperature 0 Oil pressure 0 Ammeter/voltmeter 0 Air brake check (C-O-L-A) 0 Steering play 0 Parking brake/hydraulic 0 </div> <div> Mirrors, windshield 0 Wiper/washers 0 Lighting indicators (L-R-4-H) 0 Horn(s) 0 Heater/defroster 0 Safety belt/emerg (F-E-T) 0 </div> </div>			
TRUCK/TRACTOR <div style="display: flex; justify-content: space-between;"> <div> Front of Vehicle Lights 0 Steering box/hoses 0 Steering linkage 0 Front Suspension Spring/air 0 Spring mount 0 Shock absorber 0 Front Wheel Rims 0 Hub oil seal 0 Tires (I-C-D) 0 Lug nuts 0 Front Brake Slack adjuster 0 Brake chamber 0 Brake hoses/lines 0 Brake drum/linings 0 Driver/Fuel Area Door, mirror 0 Fuel tank/leaks 0 Battery box 0 Under Vehicle Drive shaft 0 Exhaust system 0 Frame 0 </div> <div> Rear Wheels F R Rims 0 0 Tires (I-C-D) 0 0 Axle seals 0 0 Lug nuts 0 0 Spacers 0 0 Rear Suspension Springs/air/torque 0 0 Spring mounts 0 0 Shock absorbers 0 0 Rear Brakes Slack adjuster 0 0 Brake chamber 0 0 Brake hoses/lines 0 0 Brake drum/linings 0 0 Rear of Vehicle Lights/reflectors 0 Doors/ties/lift 0 Splash guards 0 Coupling System Catwalk/Tongue storage area 0 Air/electric lines 0 Mounting bolts 0 Safety latch/locking jaws/ Safety devices 0 Platform (fifth wheel/pintle hook) 0 Release arm 0 Kingpin/apron/gap/Tongue/drawbar 0 Sliding 5th wheel locking pins/Sliding pintle 0 </div> </div>			TRAILER Trailer Front Air/electric connect 0 Header board 0 Lights/reflectors 0 Side of Trailer Landing gear 0 Frame, tandem release 0 Lights/reflectors 0 Doors/ties/lifts 0 Wheels F R Rims 0 0 Tires (I-C-D) 0 0 Axle seals 0 0 Lug nuts 0 0 Spacers 0 0 Suspension Springs/air/torque 0 0 Spring mounts 0 0 Brakes Slack adjuster 0 0 Brake chamber 0 0 Brake hoses/lines 0 0 Brake drum/linings 0 0 Rear of Trailer Lights/reflectors 0 Doors/ties/lift 0 Splash guards 0		BUS <div style="display: flex; justify-content: space-between;"> <div> Front of Vehicle Lights 0 Passenger Items Passenger entry/lift 0 Emergency exits 0 Seating 0 Drive/Entry Area Door(s), mirror 0 Front Brakes/Suspension Air leaks/level 0 Slack adjuster 0 Brake chamber 0 Brake hoses/lines 0 Brake drum/linings 0 Front Wheel Rims 0 Hub oil seal 0 Tires (I-C-D) 0 Lug nuts 0 Fuel Tank Area Fuel tank/leaks 0 </div> <div> Baggage Compartments Battery box 0 Doors secure 0 Rear Wheels F R Rims 0 0 Tires (I-C-D) 0 0 Axle seals 0 0 Lug nuts 0 0 Spacers 0 0 Rear Brakes/Suspension Air leaks/level 0 Slack adjuster 0 Brake chamber 0 Brake hoses/lines 0 Brake drum/linings 0 Rear of Vehicle Lights/reflectors 0 Splash guards 0 </div> </div>					
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Skills Development

To safely and effectively operate Department vehicles, new members will train and be tested on the following skills by DOT staff, prior to assignment to a field unit:

- Demonstrate safe control and maneuvering of the apparatus.
- Demonstrate proper placement and operation of the equipment on emergency and fire scenes.
- Demonstrate knowledge of applicable vehicle code regulations.
- Demonstrate knowledge of SFFD vehicle operation practices.
- Demonstrate knowledge of general apparatus care and maintenance.
- Demonstrate safe Code 3 Driver Simulator

SECTION 2. DRIVER TRAINING

Students will also demonstrate the following skills, in regards to operations of an Engine:

- Proper vehicle placement on the fireground
- Proper leading of hose
- Pump hookup to supplies
- Pump operations
- Development of fire streams

Students will also demonstrate the following skills, in regards to operations of an Aerial Ladder Truck:

- Proper vehicle placement on the fireground
- Proper placement of outriggers for stability
- Proper placement of Aerial Ladder to buildings
- Aerial Ladder operations
- Proper operation during use of Ladder pipe

A thorough understanding and working application of the material in this manual is essential to safely and effectively operate Department vehicles and apparatus.

SECTION 3. SAFE DRIVING PRACTICES

This chapter presents information relevant to safely controlling and driving the apparatus.

The best traffic safety device is a careful driver. Safe and careful driving practices are based on the following cardinal rules:

- CONCEDE the right-of-way to avoid a collision—never take the right-of-way by force.
- CONCENTRATE on the job of driving—distracted driving is dangerous driving.
- COURTESY to others, motorists and pedestrians—they are our primary responsibility.
- CONTROL the vehicle at all times—remain in control of the wheel and the apparatus.
- ANTICIPATE traffic situations and PRE-PLAN responses to those situations—know what you're going to do, before you need to do it.

**Officers, Drivers and Tillers
share responsibility for the safety and safe operation
of the apparatus and its occupants**

ATTITUDE

The apparatus operator must keep the vehicle under control at all times. A proper personal attitude is a key factor in doing so.

Apparatus operators cannot assume the right of way; they must always yield in the interest of safety. An apparatus involved in a collision while responding to a call, or even while under routine driving operations, can have costly, and potentially fatal, consequences.

A driver's attitude includes mental or emotional regard for him/herself, for others, for the apparatus and for surrounding conditions. Drivers with poor attitudes will tend to fault other motorists, pedestrians, civilians or driving conditions, instead of themselves.

SECTION 3. SAFE DRIVING PRACTICES

Faulty attitudes bear no relation to the skill of the driver. Faults which contribute to poor driver attitude can include:

- Overconfidence—taking the vehicle performance and mechanical tolerances for granted or counting on other people and motorists to do the “right thing.”
- Minimizing the seriousness of minor accidents—all accidents are serious and their causes should be analyzed and corrective action taken. Drivers must learn from their mistakes and apply what they’ve learned in future situations.
- Pride in past record—everyone should take pride in safety and maintaining a cautious approach to vehicle operations, but pride can blind a driver to dangers and lead to accidents.
- Faith in experience—experience is gained by doing, but also by learning. Every situation is different and every situation should be approached as if it were the driver’s first time behind the wheel.
- False ideas—relying on guesses, estimates, legends and fiction instead of truths. Verify everything before making a decision and taking action. Remember, the driver is ultimately responsible for the vehicle and its actions, regardless of what the passengers might be communicating.
- Self-righteousness—often causes a driver to “punish” others who, in his/her opinion, do something wrong in traffic.
- Impatience—taking needless chances, not exercising good judgment, and getting into tight situations, all in a vain attempt to save time.

A good driver is not overconfident, does not minimize the seriousness of accidents, does not let pride come before prudence, is pragmatic about driving experience, does not rely on guesswork to handle a driving situation, is not self-righteous to the exclusion of proper safety and is not impatient behind the wheel.

Attitudes are a learned response, and therefore, if faulty, can be changed.

Aggressive driving and ignoring safety precautions pose hazards to pedestrians, to other vehicles, and to fellow crew members

SPEED

Excessive speeding while operating an emergency vehicle is a very dangerous, and unacceptable, practice. The key to a rapid response is getting out of the station in a timely manner, not driving at excessive speeds. In San Francisco, distances are short, there are many intersections, and crowded traffic conditions. The potential gain in time savings is marginal, and does not justify the risk of speeding.

STOPPING DISTANCE

Total Stopping Distance of a vehicle is the sum of the Reaction Distance and the Braking Distance:

$$\text{TSD (Total Stopping Distance)} = \text{RD (Reaction Distance)} + \text{BD (Braking Distance)}$$

The Reaction Distance (RD) is the distance that the vehicle will travel, between the time that the driver realizes the need to brake, and when the brakes are actually applied. The Braking Distance (BD) is the distance that the vehicle will travel between the time that the brakes are applied, and the time when the vehicle actually comes to a complete stop. Remember that the vehicle will continue to move forward, even while slowing down during braking activities.

Braking and Stopping Distances

Speed	Reaction Distance (feet)	Braking Distance (feet)			Total Stopping Distance (feet)		
		Auto	Engine	Ladder Truck	Auto	Engine	Ladder Truck
10 mph	11		10	13		21	24
15 mph	17		22	29		39	46
20 mph	22	22	40	50	44	62	72
25 mph	28	31	64	80	59	92	108
30 mph	33	45	92	115	78	125	148
35 mph	39	58	125	160	97	164	199
40 mph	44	80	165	205	124	209	249
45 mph	50	103	210	260	153	260	310
50 mph	55	131	255	320	186	310	375
55 mph	61	165	310	390	226	371	451

As an example, for a vehicle travelling at 25 MPH, the driver's Reaction Distance is 28 feet. The Braking Distance is dependent on the size of the vehicle, the heavier the vehicle, the longer the Braking Distance. An Engine (heavy two-axle vehicle) travelling at 25 MPH will have a Braking Distance of 64 feet. The Total Stopping Distance for an Engine traveling at 25 MPH is:

$$\text{Total Stopping Distance} = \text{Reaction Distance} + \text{Braking Distance}$$

$$\text{Total Stopping Distance} = 28 + 64$$

$$\text{Total Stopping Distance} = 92 \text{ feet}$$

If the speed of the vehicle increases by only 10 miles per hour, to 35 MPH, the total stopping distance nearly doubles, to 164 feet. The effect of speed on braking capability

is graphically presented by this table. A driver's understanding that stopping distance increases exponentially with speed, is crucial to the safe operation of any vehicle.

Drivers should comply with the Basic Speed Rule: never exceed a speed which is reasonable and proper for the existing conditions, even when the law permits a speed higher than that at which you are driving. Safe, prudent driving speed varies with factors such as driver experience, vehicle condition, road and pavement condition, weather, and traffic congestion.

SKIDS

Most skids are caused by driving too fast for road conditions. A skid happens whenever a vehicle's tires lose their grip on the road. Excessive speed creates the potential for over-braking, which can lock up the vehicle's wheels and cause them to lose traction. Over steering—turning the wheels more sharply than the vehicle can safely turn—will also cause a skid.

The most common types of skids are rear-wheel-braking skids. These can occur when the rear drive wheels lock. Locked wheels have less traction than rolling wheels, so the rear wheels usually slide sideways in an attempt to “catch up” with the front wheels. In an Engine, this will cause the vehicle to slide sideways in a spin out. For a Ladder Truck (tractor trailer), a drive-wheel-skid can cause the trailer to push the tractor sideways, causing a jackknife.

To correct a rear drive-wheel-braking skid in an Engine or Truck:

Stop Braking—this will let the rear wheels roll and keep them from sliding further.

Turn into Skid—when the vehicle begins to slide sideways, the driver should turn in the direction of the skid.

Counter Steer—as the vehicle turns back on its course, it will have the tendency to keep turning. The driver must turn the steering wheel in the opposite direction, to counter the skidding and to bring the vehicle back on course.

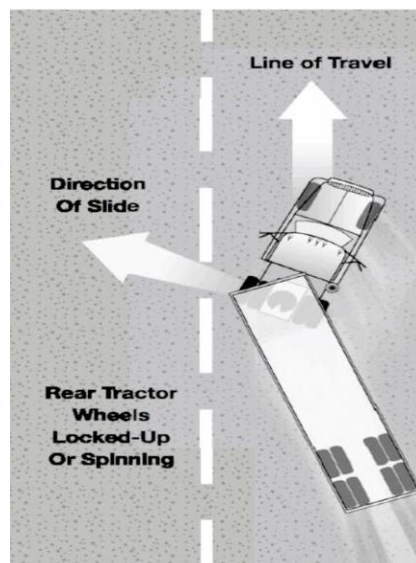
Avoiding conditions that lead to skidding is part of safe driving practices. These practices include:

- Don't drive faster than road conditions allow
- Anticipate conditions that might require braking or an evasive maneuver
- Don't use Auxiliary Braking Systems (retarder or Jake brake) when streets are wet
- Ensure proper tire pressures prior to vehicle operation (excessive tire pressure may cause tires to lose traction)

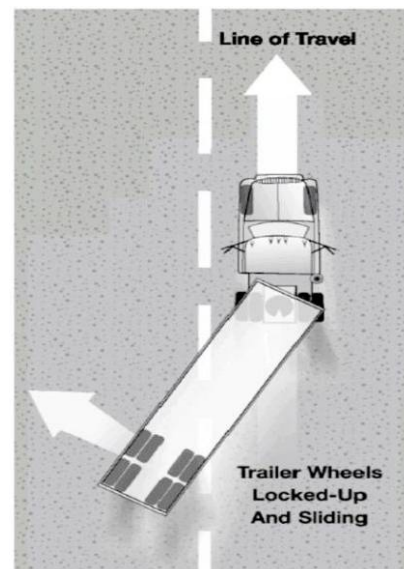
TRACTOR TRAILER JACKKNIFING

Jackknifing is a situation inherent to tractor-trailer vehicles (the Department's Ladder Trucks are tractor-trailers), where either the tractor or the trailer skids sideways due to poor road conditions, or due to improper braking or steering techniques. There are two kinds of jackknifing:

- **Tractor Jackknife**—where the rear of the tractor skids sideways and comes around
- **Trailer Jackknife**—where the rear of the trailer skids sideways and comes around



Tractor Jackknife



Trailer Jackknife

It is very difficult to correct a jackknife that has gone beyond a 15-degree angle of closure between the tractor and the trailer. In addition, the faster this critical 15-degree angle develops, the greater the force and severity of the jackknife. If recovery is started before a 15-degree angle is reached, control can be regained.

Rapid assessment and immediate application of corrective action are key to recovering from a jackknife.

If a **tractor jackknife** develops, immediately turn the front wheels towards the same direction to which the rear of the tractor is sliding, the procedure being similar to skid recovery in a passenger vehicle.

If a **trailer jackknife** develops, the cause is most often **locked trailer wheels**. When these wheels are locked, they have no directional power, and will be subject to an external side force, completely independent of other forces acting on the vehicle.

SECTION 3. SAFE DRIVING PRACTICES

Recovery from this type of jackknife calls for quickly getting all wheels rolling again, with careful steering to bring the tractor and trailer into line.

Sliding tires have no directional control. On Aerial Ladder Trucks, the brakes are adjusted so the braking systems on the tractor and on the trailer work in unison. Recovering from a trailer jackknife will take the combined skill and efforts of the driver and the tiller, working as a team, to align the vehicle and correct the skid.

In either situation, **avoid sudden deceleration** (taking foot off accelerator). Sudden deceleration can increase the skid, due to the sudden braking effect of the motor on the vehicle.

WEIGHT TRANSFER

Apparatus operators must be aware that the weight of tools and equipment carried on most fire apparatus will contribute to a skidding condition or possibly even cause a rollover due to weight transfer. Use only as much steering as is needed to keep weight transfer to a minimum. Steering should be smooth and continuous. Avoid excess speed in turns or harsh or abrupt steering action.

ADVERSE WEATHER



Wet weather makes roads slippery, which greatly increases the stopping distance. This is particularly true when there has not been rain for some time and there is a build-up of oil residue on the streets. A wet or foggy night, or the season's first sprinkle of rain, supplies the necessary moisture to make the streets slick after such a build-up. Apparatus operators must be aware of road conditions and adjust speed accordingly.

Under wet conditions, speed should be decreased gradually when braking, speed should be reduced when approaching curves, and sudden turns should be avoided.

Keep windshield wipers in good working condition. They are important safety devices. Driving without efficient wipers greatly increases the possibility of an accident.

Fog

Visibility is greatly decreased when driving in a fog. In dense fog, drive slowly! Drive with low beam headlights, which direct the light down to the road, rather than using high-beams, which direct the light out into the fog, where it will be reflected back at the driver. Avoid sudden stops, giving consideration for vehicles behind you. Signal stops by tapping on the brake pedal to make the brake lights blink. Never assume that there is a clear road ahead when driving in fog. Drive at a speed such that you can stop within the distance that you can see. When approaching the address or dispatch location of an incident while responding in fog or limited visibility conditions, slow the apparatus and have all members be alert to determine the actual location.

DEFENSIVE DRIVING

Anticipating other drivers' actions is an important element of defensive driving. The Vehicle Code does require private vehicles to pull to the right and remain at a standstill in response to emergency warning signals. Caution is essential when proceeding past stopped civilian vehicles. A driver may panic at the sound of a siren and move into traffic or suddenly stop. Newer vehicles are sound-tight and because of radios, closed windows or air conditioning, warning signals and sirens may not be heard by the driver. Never assume a driver will take the appropriate action. **Expect the unexpected.**

An intersection is a likely place for an accident involving an emergency vehicle to occur. Apparatus operators must use extreme caution at busy and blind intersections and slow the apparatus to a speed that allows a stop if necessary. In situations where all the lanes of traffic traveling in the same direction as the apparatus are blocked, the operator should move the apparatus into the opposing lane of traffic and proceed through the intersection at much reduced speed.

Important components of anticipating other drivers' actions include:

- 'Aim High'—steer with a safe path in mind, keeping eyes well ahead of travel.
- Scan conditions—do not fixate, keep eyes moving.
- Be prepared for sudden lane changes or even braking by civilian vehicles.
- Always have a plan for a safe passage (always have an "out").

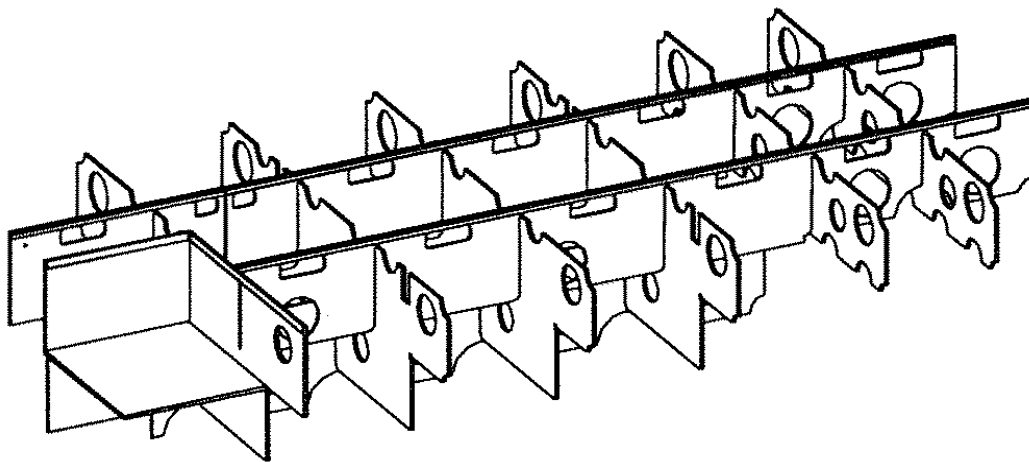
TANK SURGE

Every Engine in the SFFD fleet is equipped with a five hundred (500) gallon water tank. The water tank runs down the center axis of the apparatus and is baffled.

Baffles are partitions installed inside the water tank, to control the amount of water surge that results from the vehicle moving along a roadway. If a vehicle rounds a curve, the inertia of the water inside the tank will tend to surge toward the outside of the curve. In other words, as the vehicle is attempting to safely steer through a curve, the water will want to continue in a straight path of travel, pushing the vehicle toward the outside of the curve.

This surge of energy could cause the Engine to lose control or roll over, depending on the situation. Should the Engine begin to slow down suddenly or attempt a panic stop, the water will continue to move forward, creating a forward surge that will increase the stopping distance of the vehicle and possibly lead to loss of control. The movement of the water in the tank continues, even though the apparatus has stopped. In practice, this could mean an Engine involuntarily being pushed over a stop line and into oncoming traffic, even after the driver applied the brakes.

The schematic below shows a 500 U.S.-gallon water tank, typical of those found on the Department's triple-combination Engines, and the intricate baffling system that is built inside the tank.



The series of baffles inside the water tank are designed and placed to disrupt the movement of water by changing its direction of travel. These baffles are often staggered, so that the changing direction of the water creates a turbulent motion that results in the water absorbing most of its own energy.

Understanding the movement of water in the tank, and the potential for damage and injury that water surge can create, is a critical part of the safe driver's skill set.

When driving Engines, avoid sudden stops, accelerate and decelerate smoothly and avoid sharp turns at high rates of speed.

SECTION 4. STARTING AND DRIVING THE VEHICLE

SEAT BELTS

Seat belts are mandatory for all personnel on board a department apparatus, whenever the vehicle is in motion. This includes emergency and non-emergency driving situations.

Seat belts shall be properly placed and secured by the crew members before the apparatus is in motion, and shall remain secured and worn, until the destination has been reached.

Officers shall instruct all members in the proper use of seat belts and shall not permit an apparatus to be driven until all members have fastened their seat belts.



WARNING SYSTEMS

SFFD vehicles are equipped with a seat-belt-buzzer system. This warning system activates if all seat belts are not buckled in place, once the motor has started. This is an integral safety feature and members are prohibited from tampering with, circumventing or dismantling the system.

No member shall tamper with or in any way seek, investigate or analyze how to disarm, disable or disengage any buzzer or kill switch systems on any SFFD vehicles or apparatus.

PRIOR TO LEAVING THE STATION

- Know the route to the destination and verify with officer
- Ensure all occupants are properly seated with seat belts fastened. Apparatus shall not be placed in motion until all members are properly seated and secured by a seat belt
- Ensure all occupants are wearing headsets
- Select the proper battery bank (some apparatus)
- Make sure the gear shift is in neutral or park
- Do not engage the starter with the lights on. To do this could overload the alternator and cause damage to the electrical system

SECTION 4. STARTING AND DRIVING THE VEHICLE

- Engage the starter, listen for unusual noises
- Check the warning lights for oil and coolant
- Check the charging circuit to see if warning lights remain lit
- Observe all warning buzzers (low air, open compartment) and investigate/address prior to leaving the station
- Turn on emergency warning lights for a Code 3 response. Turn the lights on individually. DO NOT use master switch for all lights to come on at one time
- Get "OK" from officer to proceed
- Keep foot on brake, engage gearshift, release parking brake

AUTOMATIC TRANSMISSIONS

The apparatus should be started and driven in gears that meet the manufacturer's specifications



ACCELERATING

Accelerate the apparatus gradually. A sudden application of power may over-torque the drive train components, resulting in damage to the machinery. A slow, continual pressure on the accelerator will cause the transmission to shift as sufficient Engine speed is attained. This technique is preferable under normal driving conditions. When the pedal is fully depressed, the transmission will downshift or remain in a lower gear until close to the governed speed of the Engine. This will deliver the maximum acceleration allowed by the apparatus. This foot-to-the-floor technique should be used when necessary, but with concern for the overall wear on the vehicle.

Uphill

When climbing, and as the Engine speed decreases with the load, the torque or power also decreases, presenting the need to shift. Automatic transmissions downshift accordingly.

The operator may choose to shift to a lower gear to provide adequate driving power. A general rule of thumb is to drive an apparatus up a hill as fast as you would go down the same hill

Downhill

When driving downhill, select a lower gear before descending and remain in gear at all times. The Engine assists in braking, reducing wear on the brakes and making the apparatus easier to manage. Under dry road conditions, the retarder also assists in slowing the apparatus, reducing brake wear for emergency and final stops. Under slippery road conditions, turn off retarders as they reduce traction.

BRAKING

Braking should be done smoothly so that the apparatus will come to an even stop. Consider the weight of the apparatus and the total stopping distance required. An abrupt halt could result in injury to the crew or damage to the apparatus.

Air brakes use compressed air to activate the brakes.

The **service brake** system applies and releases the brake when using the brake pedal during normal operations.

The **parking brake** system applies and releases the parking brakes when the parking brake control is set. A pull/push mechanism is mounted on the dash, and is labeled "Parking Brake."

Some Aerial Ladder Trucks are equipped with a single braking system for both tractor and trailer. Older LTI/Spartan Aerial Trucks are equipped with two (2) separate parking brake systems, one for the tractor and one for the trailer. Both systems are to be set at ALL TIMES when the apparatus is parked, except when parking in the station. Only the tractor brake is required when in quarters.

**Vehicle operators must be familiar with the braking features
on their particular apparatus**

RETARDERS

The retarder is an auxiliary braking system designed to slow and assist in control of the vehicle when going downhill. The retarder is effective over a wide range of speeds. However, the lower the gear range position (1-2-3), the more effective the retarder.

WARNING: Do not use the retarder when roads are wet or hazardous. Retarder braking will occur only at the driving axle and could make vehicle control difficult. On vehicles equipped with a retarder control, place the switch to off until road conditions improve.

Observe the following additional precautions when driving a vehicle equipped with a retarder:

- Only apply and operate the retarder with your foot off the accelerator.
- Observe transmission and Engine temperature limits at all times.
- Select the lowest possible transmission range to effect retarder operation.
- In the event of overheating, decrease the vehicle speed to reduce retardation power requirements.
- Observe the retarder alert light to insure the vehicle control system is operating properly.

JAKE BRAKES

Some Department vehicles are equipped with an auxiliary braking system called a Jake Brake.

The Jake Brake is a vehicle slowing device, not a vehicle stopping device. It is not a substitute for the service braking system. The operation of the Jake Brake is fully automatic once it is turned on. The control for the Jake Brake is either one or two switches on the dashboard.

The Jake Brake relies on the free flow of oil for operation and is normally left on while driving during dry road conditions. A multi-position system is standard equipment. This feature allows you to select specific levels of retarding power by activating varying numbers of cylinders.

Two-Speed System: This is used on six-cylinder Mack and eight-cylinder Detroit Engines. A master switch indicates off, low, and high.

Three-Speed System: This system is used on Cummins in-line Engines. There are two switches. The master switch turns the Jake Brake on and off. The second switch controls the amount of retarding—low (1), medium (2), and high (3).



The Jake Brake is controlled by the throttle position. When you remove your foot completely from the throttle, the Jake Brake is automatically activated. When you reapply pressure to the throttle, the Jake Brake is deactivated instantly.

The Jake Brake will also remain activated after the brake pedal has been depressed, giving the combined power of both the Jake Brake and the service brakes. There is a pressure sensing device that deactivates the Jake Brake when the vehicle slows to about 10 MPH to prevent stalling the Engine.

WARNING: As with the retarder, turn the Jake Brake off during wet or icy road conditions.

SECTION 5. SFFD VEHICLE OPERATION PRACTICES

VEHICLE CODE REGULATIONS

Emergency vehicle operations in the San Francisco Fire Department are governed by the California State Motor Vehicle Code, the most applicable being Section 21055, 21056 and 17004.

Section 21055

“The driver of an authorized emergency vehicle is exempt from Chapter 2 (commencing with Section 21350), Chapter 3 (commencing with Section 21650), Chapter 4 (commencing with Section 21800), Chapter 5 (commencing with Section 21950), Chapter 6 (commencing with 22100), Chapter 7 (commencing with Section 22348), Chapter 8 (commencing with Section 22450), Chapter 9 (commencing with Section 22500), and Chapter 10 (commencing with Section 22650) of this division, and Article 3 (commencing with Section 38305) and Article 4 (commencing with Section 38312) of Chapter 5 of Division 16.5, under all of the following conditions:

(a) If the vehicle is being driven in response to an emergency call or while engaged in rescue operations or is being used in the immediate pursuit of an actual or suspected violator of the law or is responding to, but not returning from, a fire alarm, except that fire department vehicles are exempt whether directly responding to an emergency call or operated from one place to another as rendered desirable or necessary by reason of an emergency call and operated to the scene of the emergency or operated from one fire station to another or to some other location by reason of the emergency call.

(b) If the driver of the vehicle sounds a siren as may be reasonably necessary and the vehicle displays a lighted red lamp visible from the front as a warning to other drivers and pedestrians.

A siren shall not be sounded by an authorized emergency vehicle except when required under this section.”

Section 21056

“Section 21055 does not relieve the driver of a [an emergency] vehicle from the duty to drive with due regard for the safety of all persons using the highway, nor protect him from the consequences of an arbitrary exercise of the privileges granted in that section.”

Section 17004

“A public employee is not liable for civil damages on account of personal injury to, or death of, any person or damage to property, resulting from the operation, in the line of duty, of an authorized emergency vehicle, while responding to an emergency call or when in the immediate pursuit of an actual or suspected violator of the law, or when responding to but not upon returning from, a fire alarm or other emergency call.”

The effect of Vehicle Code sections 17004, 21055 and 21056 is; where the driver of an authorized emergency vehicle is engaged in a specified emergency function, he or she may violate certain rules of the road, such as speed and right of way laws, if he activates his red light and where necessary his siren in order to alert other users of the road to the situation. **Where the driver of an emergency vehicle fails to activate his red light, and where necessary his siren, he is not exempt from the rules of the road even though he may be engaged in a proper emergency function, and negligence may be based upon the violation of the rules of the road.**

A driver is always responsible for exercising due regard for the safety of others, even when operating under emergency conditions, with red lights and sirens activated. Drivers who disregard this responsibility can be found negligent for traffic violations

Drivers of SFFD apparatus are bound by the California State Vehicle Code and all of its sections and sub-sections. **This Code does not grant exemptions when operating the apparatus under normal driving circumstances.** Non-emergency driving privileges, when operating a fire apparatus, are the same as when operating any civilian vehicle.

Drivers who have been involved in an accident, while in uniform and on duty, and operating an authorized department vehicle during an emergency response, cannot be penalized by their civilian insurance company, when renewing their personal auto insurance. However, **it is the responsibility of the individual driver to contact his/her civilian insurance carrier within 30 days of the accident**, and to confirm that the accident occurred while driving an emergency vehicle.

All accidents are reported to the Department of Motor Vehicles, and the information is entered on the driver's record. A member may be inadvertently penalized if the insurance company becomes aware of his/her accident record, but is unaware that the accident occurred while the member was driving an emergency vehicle.

Therefore, on-duty drivers involved in accidents must notify their personal insurance companies to clarify the situation. If any difficulty is encountered resolving these issues,

the Department of Insurance has a customer complaint telephone number, 1-800-927-4357.

RESPONDING TO ALARMS

Engines, Trucks, Rescue Squads, Medic Units, Paramedic Captains, the HazMat Unit, hose tenders, and chief officers responding to box alarms, unit dispatches, or special calls are to respond Code 3, EMERGENCY RESPONSE, unless otherwise directed. A Code 3 response indicates the use of red lights and siren.

The Utility Unit, Fuel Unit, Arson Unit, Mobile Air Unit, Technical Services and other support vehicles are to respond Code 2 unless otherwise directed by the Incident Commander or the Department of Emergency Communications. A Code 2 response is to respond IMMEDIATELY, but non-emergency. DO NOT use red lights or siren on a Code 2 response.

Bureau of Equipment personnel may respond Code 3 at their discretion, based on the nature of the incident.

SPEED

Excess speed can result in, or cause, serious accidents or injuries. Drivers must have the vehicle under control at all times and give special attention to intersections. The key to a fast response is not driving at excessive speed; the key is getting out of the station quickly.

Whenever driving on surface (city) streets, the maximum speed for all Fire Department vehicles and apparatus is 35 MPH. The maximum speed shall only be used when driving conditions are most favorable. Speed on turns and corners shall not be faster than the conditions of the roadway, and centrifugal force on the apparatus, will allow.



Prior to proceeding through a red light intersection, apparatus must come to a complete stop. Whenever crossing against a red light, the maximum speed for all Fire

SECTION 5. SFFD VEHICLE OPERATION PRACTICES

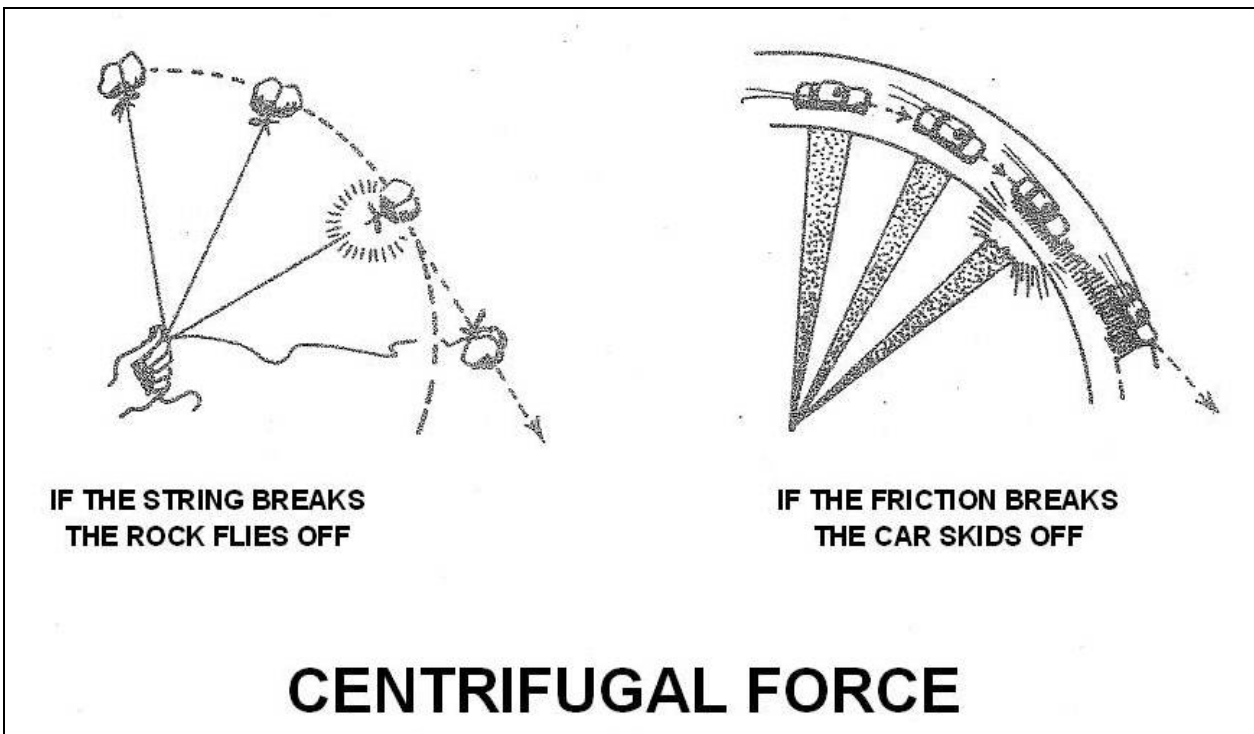
Department vehicles and apparatus responding to an emergency (lights and sirens) call is 15 MPH.

When it is necessary for an SFFD vehicle to respond or travel using a freeway, the California state maximum speed limit shall be observed.

URNS, CURVES AND SKIDS

The forces that act upon a vehicle while it is navigating through a turn or curve are called centrifugal forces. The effects of these forces vary with vehicle size, vehicle load, road conditions, curving angles and speed of the vehicle. Speed is the most deadly of these factors. As speed doubles, the centrifugal forces acting upon the vehicle increase four times ("squaring effect").

A driver's primary responsibility is to maintain control of his/her vehicle at all times; a skidding vehicle is an out-of-control vehicle.



Curves should always be approached at a speed which will not require braking while in the turn, and which will permit the application of power.

Tires do not have as much tendency to skid sideways while power is being applied to the drivetrain as they do when a turn is being made under coasting or braking activities.

Speed should be reduced before entering a turn. Good steering techniques are an essential component of making smooth and safe turns. Do not turn the steering wheel in a series of jerky movements. Skillful steering is done with a hand-over-hand technique.

The purpose of turn signals is to inform other drivers of intended actions. Turn signals shall be activated before starting to turn, not while turning. Signal in such a manner that it allows others to provide ample clearance for the maneuver. The California State Vehicle Code, Section 22108, requires that a driver signal continuously for 100 feet prior to reaching the actual turning point.

RIGHT-OF-WAY

Emergency vehicles, responding with red lights and siren, shall come to a **complete stop** at all stop signs, red lights, and arterial controlled intersections. After the emergency vehicle has gained control of the intersection, the driver may proceed through the intersection in a responsible and prudent manner.

**The speed of the emergency vehicle,
while crossing an intersection against the traffic signal,
shall be no more than fifteen (15) miles per hour**



Extra caution must be exercised when traversing multi-lane intersections

SECTION 5. SFFD VEHICLE OPERATION PRACTICES

While traversing intersections, the vehicle operator shall 'cover the brake' to assure an immediate stop if necessary.

At intersections, stop signs or other traffic areas, if the siren and emergency lights do not gain the right-of-way, it shall not be taken forcefully.

**Emergency Vehicle Operations do not
relieve a driver of responsibility for the safety of others**

SIRENS

Sirens produce a loud warning noise, designed to alert pedestrians and other drivers to the approach of the emergency apparatus. The siren is a piece of electronic equipment on the vehicle; it provides neither security nor protection. The siren does not automatically gain the right-of-way, it does not force other drivers to move out of the way of the emergency apparatus and it does not protect the emergency vehicle or its occupants from injury or harm.

Sirens do not prevent vehicle collisions

Sirens, and to the same extent, air horns, should only be sounded as is reasonably necessary to gain other drivers' attention. The siren must always be sounded a sufficient time before reaching an intersection, to allow civilian motorists the opportunity to react.

The Hi-Lo siren setting, also known as the "British Siren," is illegal for use in the United States and should never be used during emergency response by SFFD apparatus.

The reaction of civilian drivers to sirens and red lights is unpredictable, and obtaining the right-of-way requires patience on the part of, or direction from, the emergency apparatus driver, or the officer (using the public address system).

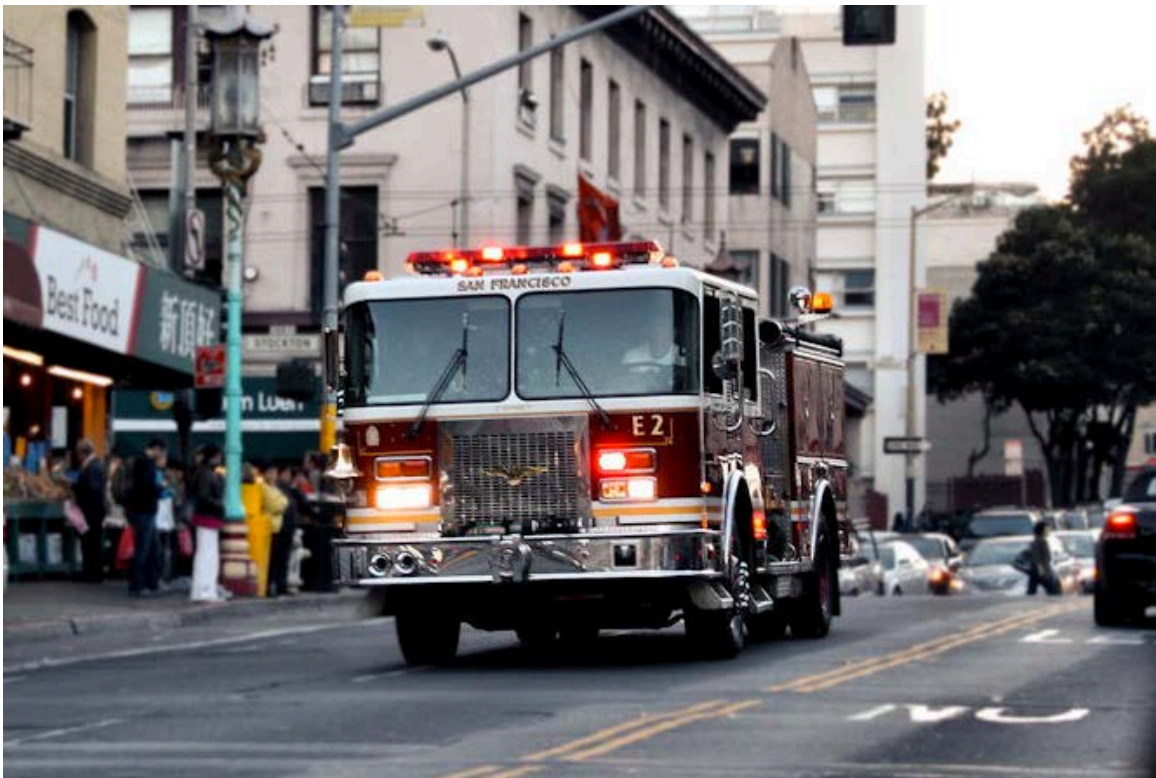
In extreme circumstances, such as traffic gridlock, it may be necessary to have members of the crew physically direct vehicles and motorists, to clear a route for the apparatus.

When consistent with safety, consideration should be given regarding the sounding of sirens and horns in the immediate vicinity of hospitals, schools, theaters, churches or other places of assembly, during the time that people are likely to be in attendance.

EMERGENCY LIGHTS

Headlights shall be on whenever the vehicle is in motion, day or night.

While responding to emergency dispatches, headlights, red lights, and other emergency warning lights shall be switched on at all hours of the day and night. When returning to quarters, red lights and all other emergency lights shall be switched off. When backing into quarters, headlights, red lights, and all other emergency warning lights shall be switched **ON** to alert traffic and to increase the visibility of the apparatus to oncoming drivers



'Alley Lights' shall not be switched on during Code 3 responses. Hand-held and/or mounted spot lights ("Snoopy Lights") shall not be turned on during Code 3 responses.

While responding to non-emergency dispatches, DO NOT use red lights, other emergency lights, or sirens. Observe all traffic regulations.

RESPONDING FROM MULTIPLE-COMPANY STATIONS

Common sense must prevail when responding to alarms from stations housing more than one company. The apparatus or vehicle prepared to leave first, should go first. Generally, Engines and rescue squads will proceed before Ladder Trucks.

However, in circumstances where two or more companies are leaving at the same time, if going to the right, the vehicle on the right shall proceed first, and, if going to the left, the vehicle on the left shall have the right of way.

In general, all SFFD vehicles responding from a multiple-company station shall take the same route to an alarm. While traveling on the same street, they shall do so in single file and no SFFD vehicle shall pass another while responding to, or returning from, an alarm, unless a vehicle is disabled, or unless communication has been established between the two apparatus drivers, and both understand and agree with the plan (to allow one vehicle to over-take, and pass, the other). An example would be to accomplish proper vehicle placement at the scene of an emergency response.

PRE-DETERMINED RESPONSE ROUTES

Drivers shall follow the pre-determined fire alarm response routes as closely as possible. Prevailing traffic conditions such as street closures, gridlock or construction, may force the driver to take a non-routine course to the alarm, but this should be the exception, not the rule. By keeping to the established, pre-determined routes of travel, drivers will minimize the possibility of an intersection accident between two Fire Department vehicles.

Officers and drivers must be alert for other responding companies, particularly at street intersections.

RESPONSE FROM LOCATIONS OTHER THAN COMPANY STATIONS

Officers and drivers must be particularly cautious when responding from locations other than quarters. It is their responsibility to anticipate the movement of companies coming from regular quarters and not to expect these companies to anticipate their movement.

RESPONSE ON ONE-WAY STREETS

Whether or not to respond against traffic on a one-way street is a decision left to the judgment of the officer and driver of the vehicle. If such a choice is made, extreme caution must be observed and any extended travel against traffic on one way streets should be avoided. **Wrong way travel on one way streets is permitted only when responding Code 3 to an emergency.**

BACKING

Accidents while backing are preventable. It is the policy of this Fire Department to position spotters (ground guides) to assist drivers and tillers during backing activities.



Spotters must be placed on either side of any Department Engine, Rescue Squad, Ladder Truck, and/or ambulance (when possible) when the vehicle is backing up, in order to guide the driver (and where applicable, the tiller) and to ensure that the area to the rear of the vehicle is clear of pedestrians and/or obstructions. Spotters must also be aware of their own personal safety and use caution when located on busy streets or in traffic.

Personnel placed to block traffic are NOT considered spotters

Engine

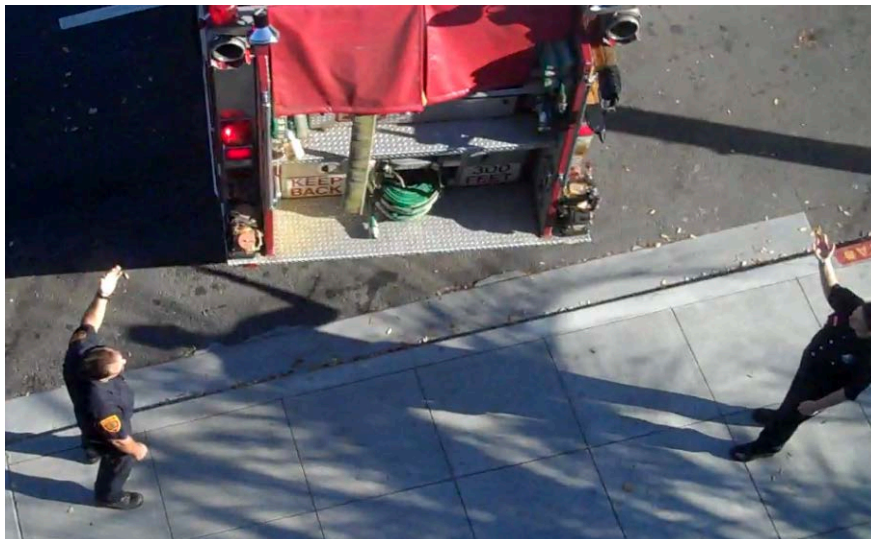
- Drivers must remove apparatus headsets prior to backing up, in order to hear audible warnings from the officer and spotters.
- The officer and spotters should position themselves so as to secure both visual and voice contact with the driver.

SECTION 5. SFFD VEHICLE OPERATION PRACTICES

- The officer should be positioned next to the driver's window, so as to maintain eye and voice contact with the driver.



- A second spotter should be placed at the left, rear corner of the vehicle, where the driver can readily see the spotter in his/her left side mirror (and the spotter can readily see the driver in the same mirror).
- The third spotter should be placed at the right, rear corner of the vehicle, where the driver can readily see the spotter in his/her right side mirror (and the spotter can readily see the driver in the same mirror).

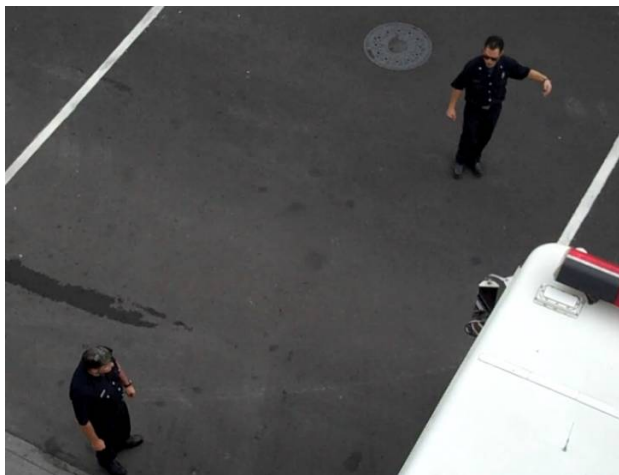


Aerial Ladder Truck

- The officer and spotters should position themselves so as to secure both visual and voice contact with both the driver and the tiller operator.



- The officer should be positioned next to the driver's window, so as to maintain eye and voice contact with the driver.
- A second spotter should be placed at the left, rear corner of the vehicle, where the driver can readily see the spotter in his/her left side mirror (and the spotter can readily see the driver in the same mirror) and the tiller can easily see the spotter by looking down to the left.



- The third spotter should be placed at the right, rear corner of the vehicle, where the driver can readily see the spotter in his/her right side mirror (and the spotter

SECTION 5. SFFD VEHICLE OPERATION PRACTICES

can readily see the driver in the same mirror) and the tiller can easily see the spotter by looking down to the right.



- Drivers and tillers must remove apparatus headsets prior to backing up in order to hear audible warnings from the officer and spotters.
- Drivers and tiller operators must communicate utilizing the buzzer system when engaged in backing operations.

Tractor drivers and tiller operators must use the buzzer system in order to indicate movement of the Truck prior to setting the vehicle in motion. Truck drivers and tiller operators must use the following buzzer system signal code:

Stop immediately	1 Blast
Move forward	2 Blasts
Move backwards	3 Blasts

Ambulance

- The spotter should be positioned at the rear of the vehicle, and should observe both sides of the apparatus when it is in reverse. The spotter should ensure the driver can readily visualize him/her in the side mirrors.
- When the paramedic is engaged in patient care and cannot leave the vehicle to act as a ground guide (spotter), extreme caution should be exercised by the driver of the ambulance when backing without a spotter.



When operating with any Department vehicle, spotters should communicate necessary action early and clearly to the drivers, so as to avoid accidents, collisions, damage or injuries.

**Backing operations should cease immediately
if the driver, or, in the case of a Ladder Truck, the tiller,
loses visual contact with any of the spotters**

PROPER PLACEMENT OF APPARATUS AT THE SCENE

Engines

Engine drivers should park so as not to interfere with the positioning of other Department vehicles. Particular attention must be given to the positioning of Engines in front of, or adjacent to, the fire building. Due consideration should always be given to the placement of Aerial Ladder Trucks. Every situation is different and the choice of placement is a judgment call by the officer assisted by an alert and experienced driver.

The following guidelines generally apply:

The **FIRST DUE ENGINE** will position just past the fire building, to facilitate hose leads and allow space for the first due Ladder Truck.

The **SECOND DUE ENGINE** will back in, drop supply lines and proceed to the nearest hydrant. This action should be performed while allowing access for a Ladder Truck to approach the fire building.

The **THIRD DUE ENGINE** will consider securing an alternate water supply for the first Engine, and, if a secondary supply is not needed, report to the Incident Commander.

Further instructions and procedures may be found in the PUMP OPERATIONS manual and should be used as a reference for this section (Engine)

Aerial Ladder Trucks

The driver and tiller must work together to obtain the best functional position for the apparatus. The driver and tiller shall remain with the apparatus until it is clear that the Aerial Ladder will not be utilized at the incident.

If the Aerial Ladder is to be used, the driver shall remain with the apparatus, and function as the Aerial operator. Every situation is different, but generally, the following guidelines shall apply:

The **FIRST DUE TRUCK** to arrive should be positioned at the front of the fire building whenever possible. This will depend on a variety of elements; such as the height and type of the fire building, any unusual laddering requirements, the width of the street, overhead wires or parallel-parked civilian vehicles.

The **SECOND DUE TRUCK** to arrive should take the other street front of the building (perpendicular to the 'fire street'). If the fire building is in the middle of the block, the second Truck should be positioned back from the building so as not to block other apparatus, and still be in a position to use the aerial if necessary.

Further instructions and procedures may be found in the TRUCK and LADDER manual and should be used as a reference for this section (Aerial Ladder Trucks)

STAGING AT GREATER ALARMS

At greater alarms, staging areas will be established. Staging is the method used to organize companies and equipment not immediately employed on the scene of an emergency, for rapid deployment at the order of the Incident Commander.

Often, more personnel are needed, not more apparatus. A staging area is generally established in a block adjoining, or near to, the incident site. The staging location is determined by the Incident Commander, and announced by radio, to assist in directing responding units. With a staging area



established, minimum personnel can maintain security for the unused apparatus.

The staging area officer will establish a layout that facilitates parking of multiple apparatus and allows for quick access to the incident scene. Generally, if a street is wide enough, diagonal parking with the front pointing out is preferred. If the street is narrow, in-line parking allowing enough room to pull out is appropriate. Officers of arriving apparatus should report in to, and follow the direction of, the Staging Officer.

The purpose of staging is availability for immediate response. It is the responsibility of the officer to keep the company intact and prepared for response with the necessary equipment.

CHOCK BLOCKS

Always use wheel chock blocks whenever parking any apparatus on a grade, on the scene of any emergency or when extending outriggers on a Ladder Truck. Chock blocks must be placed square and snug against the tires to be effective. Improperly placed chocks that are off even slightly may fail.

Engines and specialized apparatus are supplied with two chock blocks each. These chock blocks should be placed on the lower side of the rear wheels when the apparatus is parked on a slope.



SECTION 5. SFFD VEHICLE OPERATION PRACTICES

When parked on the flat, they should be placed one each side of the rear wheels.

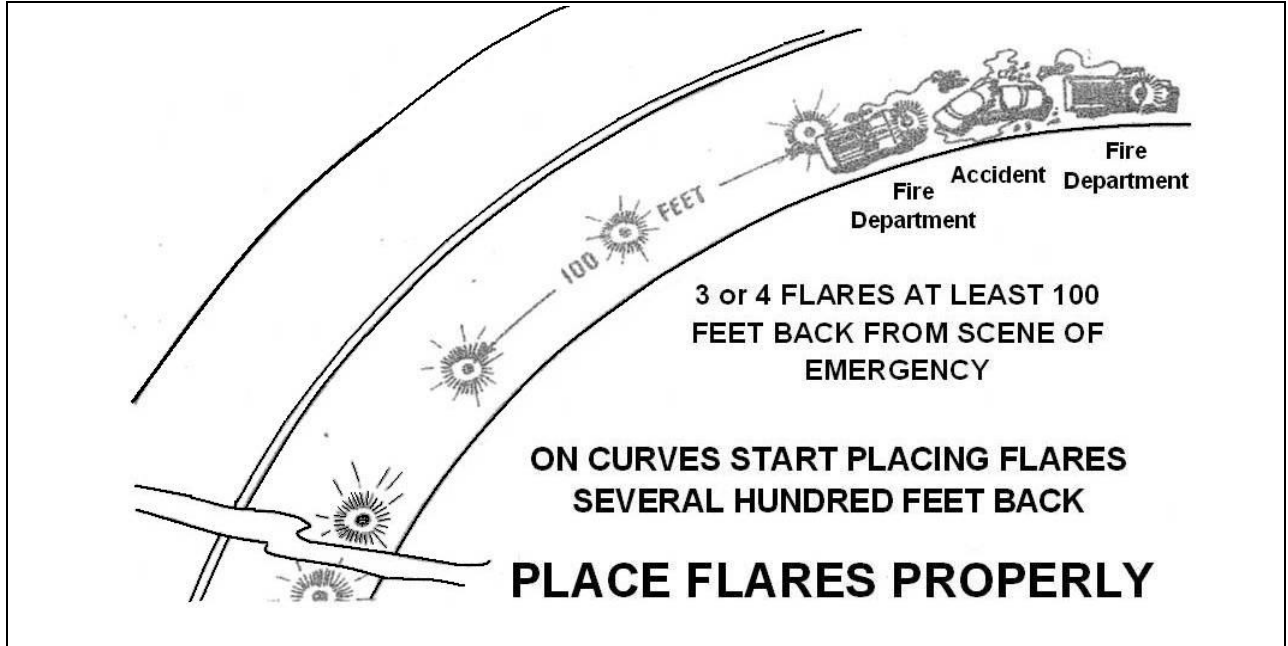


Ladder Trucks are provided with four chock blocks. NEVER put wheel chock blocks on the tires below the turntable when operating a Simon/LTI Aerial Ladder. When the outriggers are used, weight comes off these tires making them ineffective for chocking purposes. For Simon/LTI apparatus on a slope, position the chock blocks on the downhill side of the tractor front axle tires and the tiller tires. If the surface is level, put one wheel chock block on each side of the front tractor tires.

Do not forget the chock blocks are in place and try to drive away to the uphill side. Use a crew member to assist in retrieving the chock blocks.

USE OF FLARES

A series of flares should be placed from at least one hundred feet back from the emergency. If an entire street is blocked off, the flares should be placed across the intersections on both sides of the incident. If the emergency occurs on a curve, at night, or during times of heavy traffic flow, the flares should be spotted at an appropriate distance to assist scene safety. Proximity to potential flammable materials shall be avoided.



Proper procedure to ignite a flare

- Pull the tape up to release the cap of the flare.
- Twist the cap off the flare.
- Remove the tape from the cap to expose the scratch surface on the outside of the cap.
- Grasp the flare near its base and rub the scratch surface of the cap sharply against the flare head until ignition occurs.
- Always point the flare away from the face and body while igniting, and after ignition.
- After ignition, place the plastic cap on the non-ignited end of the flare. This will prevent the flare from rolling away after it is placed on the ground.
- Hold the flare for ten seconds and ensure proper ignition before placing it on the roadway
- Never wear latex gloves when lighting or handling flares

SECTION 6. DRIVING TRACTOR TRAILER LADDER TRUCKS

OPERATOR RESPONSIBILITIES

The responsibility of driving a tractor-trailer Ladder Truck safely and efficiently is shared equally by the driver and tiller operator (tiller). Driver and tiller must work as a team to coordinate their efforts, and to operate the vehicle properly.

The driver is the primary apparatus operator and has the following responsibilities:

- The safety of the public and of other vehicles while driving the vehicle.
- Knowledge of pre-determined response routes.
- Proper placement of apparatus during fire ground operations, including situating the tractor to facilitate removal of Ladders from the rear of the vehicle and to maximize the efficacy and operation of the Aerial Ladder.
- Proper care and maintenance of the tractor and a working knowledge of the tools and equipment carried on the apparatus.

The tiller has the following responsibilities:

- The safety of the public and of other vehicles while tillering the vehicle.
- Lateral control of the trailer during any and all vehicle operations.
- Proper placement of the trailer during fire ground operations, to facilitate removal of Ladders from the rear of the vehicle and to maximize the efficacy and operation of the Aerial Ladder.
- Proper care and maintenance of the trailer apparatus and of the Ladders, tools, and equipment carried on the trailer.

DRIVER-TILLER OPERATOR COMMUNICATION

Drivers and tillers who work together often will soon learn each other's operating techniques and, over time, will develop into an efficient and safe driver-tiller team. Truck officers must enforce adherence to good driving practices and strict observance of traffic laws.

It is equally important that company officers provide their relief drivers and tillers with driving practice, whenever possible, in order to maintain these members' driving skills and to learn the techniques of other drivers and tillers.

SECTION 6. DRIVING TRACTOR TRAILER LADDER TRUCKS

It is also good practice for the regular driver of the Truck to practice tillering, in order to become more familiar with joint driver/tiller responsibilities. Any combination of the driver/tiller personnel should be capable of handling the apparatus efficiently and effectively and of working together as a team.

Aerial Ladder Trucks are equipped with intercom system headsets. These headsets provide a means of communication between the tiller operator, driver, and crew. Essential information for clear messages includes:

- A verbal “OK” when leaving the station or from any parked situation, in addition to the buzzer
- A warning of observed hazards or obstacles by either the tractor driver or tiller operator
- A confirmation of unexpected right, left, or U-turns
- Directions regarding speed and direction prior to backing

These headsets perform other functions as well:

- Provide hearing protection
- Provide a means of monitoring the unit's Control channel
- Provide a means for the officer to prepare and direct the crew when responding to an incident
- Provide a means for the officer to transmit information over the Control Channel, to the Dispatch Center, or other responding units

Each Ladder Truck is provided with a buzzer button near the driver's seat and in the tiller's cab (usually on the floor by the left foot). Tractor drivers and tiller operators must use the buzzer system in order to indicate movement of the Truck prior to setting the vehicle in motion. Truck drivers and tiller operators shall use the following buzzer system signal code:

Stop immediately = 1 Blast

The **STOP** signal is intended primarily for use by the tiller operator to signal an emergency stop or a necessary stop during a backing operation.

Move forward = 2 Blasts

The **MOVE FORWARD** signal is primarily used by the tiller operator to signal that they are in proper position and that the tiller end of the Truck is ready to proceed forward. It is the company officer's responsibility to see that the crew is safely positioned on the apparatus with seat belts secured before directing the driver to proceed.

Move backwards = 3 Blasts

The **BACK-UP** signal signifies that a backing operation is necessary.

When given by the tiller operator, it signals a determination that the way is clear for backing and that the tiller operator is prepared to maneuver the trailer backward.

The driver must communicate with, and determine preparedness of, the tiller, prior to setting the vehicle in motion.

The driver and tiller operator may use the headset as an additional method of communication. However, even when using headsets, the driver and tiller must continue to use the buzzer system.

Aerial Ladder Trucks are equipped with a 'kill switch'. This safety device is a pedal that must be depressed in the tiller cab, before the motor will start. The driver will not be able to start the motor of the apparatus without the kill switch being depressed. This safety feature is designed to prevent a Ladder Truck from leaving the station, or other location, and proceeding through traffic without a tiller. As with any mechanical device, a kill switch can malfunction. Therefore, as an added precaution, the proper buzzer signal for FORWARD or BACK UP must be given by the tiller, and then acknowledged by the driver, via buzzer and intercom, before the apparatus is moved.

Drivers of Trucks can aid the tillers by clearly indicating their turns in advance of the actual maneuver. This is done by using the turn indicator well ahead of the legal requirements, so that the tiller can have ample time to anticipate the tractor's movement, and prepare to follow.

TRACTOR-TRAILER CONTROL WHEN LEAVING STATIONS

Prior to leaving the station, during emergency response or non-emergency activities, the driver's responsibilities include:

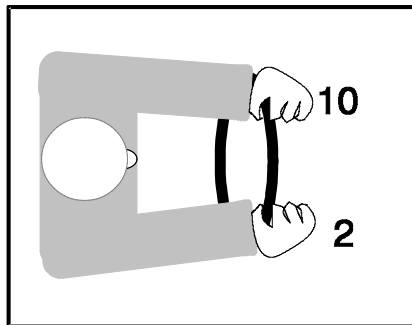
- Know the route to the destination. The driver and officer should confer and agree on the best route
- Confirm that all tools are secure and all compartment doors are closed
- Ensure the overhead (rollup) door is FULLY open and has reached its stops. Vehicles shall not proceed while a rollup door is still moving
- Ensure the front tractor tires are in line with the trailer, or will be turned into alignment as soon as the apparatus moves forward
- Ensure all personnel are properly seated, with seat belts and headsets, or hearing protection, on
- Receive the tiller's FORWARD signal to proceed
- Acknowledge the tiller's FORWARD signal

SECTION 6. DRIVING TRACTOR TRAILER LADDER TRUCKS

- Ensure hands are placed at the 10 and 2 o'clock positions on the steering wheel and be looking forward

Prior to leaving the station, during emergency response or non-emergency activities, the Tiller's responsibilities include:

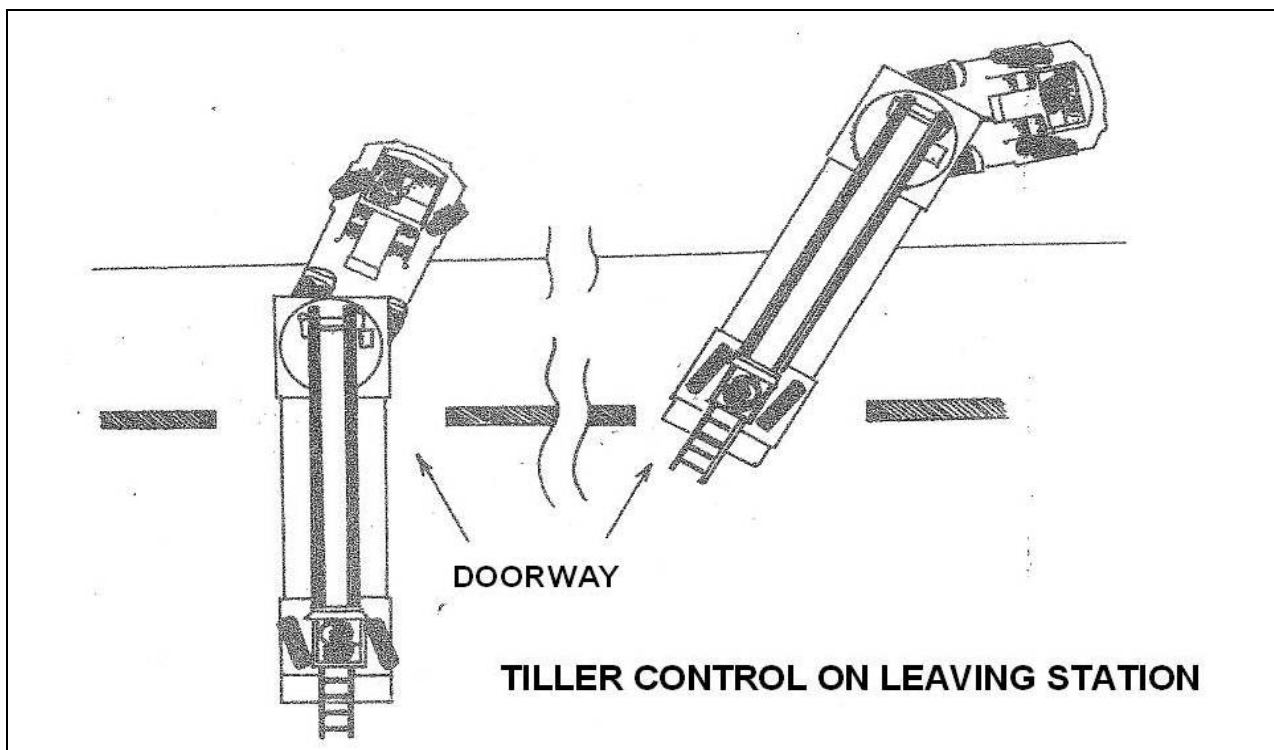
- Confirm all tools and Ladders are secure and all compartment doors closed
- Ensure the trailer tires are in line with the trailer, or will be turned into alignment, as soon as the apparatus moves forward
- Ensure the overhead door is FULLY opened and has reached its stops
- Be properly seated, with seat belt fastened and headset, or hearing protection, on
- Ensure hands are placed at the 10 and 2 o'clock positions (upper half of the steering wheel) on the steering wheel and be looking forward



- Signal the driver with 2 blasts on the “buzzer.” The tiller should never give the READY signal if the trailer is not properly secured or ready to move

The tiller must be wary of a Premature Door Closure. If this situation develops, the tiller should immediately signal the driver to STOP the tractor with a single (1) horn blast, followed by a voice-warning over the intercom system.

As the Truck leaves the station, the tiller must keep the trailer centered in the station doorway. It may be necessary for the tractor to make a sharp turn because of vehicle congestion in front of the station. The Driver should communicate this maneuver to the tiller, and then slowly proceed out of the station. If the driver is required to make a sharp right turn, it may be necessary to turn the tiller wheel slightly to the left to keep the trailer centered in the station doorway. In this maneuver, the right side of the trailer ahead of the tiller operator is the point where clearance must first be maintained. As the trailer wheels clear the doorway, the trailer will pivot and move the Ladder overhang toward the left side of the doorway. The tiller will then be required to steer to the right in order to keep the Ladder overhang centered in the doorway.



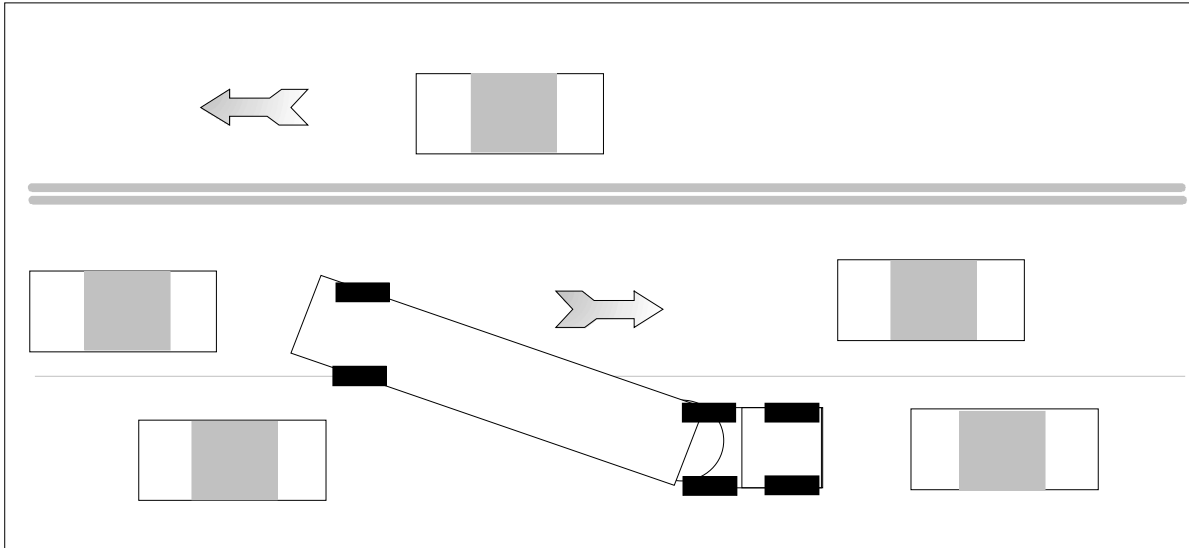
TRACTOR TRAILER CONTROL WHEN MOVING FORWARD

The Driver

- The driver has control of the speed and braking of the apparatus.
- The driver must constantly observe traffic conditions and hazards ahead of the tractor.
- The driver must constantly observe obstructions on both sides of the apparatus.
- The driver will maintain a dialogue with the tiller, regarding observed hazards and essential route information.
- When maneuvering, the driver must allow room for the trailer, not just the tractor.
- Using the mirrors to see the location of the trailer, the driver shall direct the tiller operator to alignment if necessary.

When the tractor and trailer are not in line, the width of the apparatus is greatly increased, which also increases the chance of being involved in an accident.

SECTION 6. DRIVING TRACTOR TRAILER LADDER TRUCKS



When traveling in a forward direction, under normal driving conditions, the tiller's primary task is to keep the trailer wheels parallel to the frame of the trailer, and in direct line with the tractor. The tiller must also remain aware of hazards and traffic conditions, and communicate any observations to the driver in the tractor. The tiller should constantly watch for obstructions on either side of the apparatus.

The tiller should avoid making sudden or sharp swing-outs, which might require a sharp counter swing-in, unless it is necessary to avoid an accident. Maneuvering the trailer should be done with smooth, calculated motions to avoid potential over-corrections or jackknives.

- When traveling in a forward direction, turning the tiller wheel counter-clockwise will cause the trailer wheels to turn to the left, and will move the rear of the trailer to the left.
- When traveling in a forward direction, turning the tiller wheel clockwise will cause the trailer wheels to turn to the right, and will move the rear of the trailer to the right.
- When the tractor and trailer are in line and traveling forward, little actual movement on the tiller wheel is necessary. The tiller need only control the side-to-side drift, similar to that which occurs when driving a passenger car forward.
- When making a turn, or when required to weave in and out of traffic on an emergency response, tiller should keep the trailer in line with the tractor as much as possible, turning the trailer wheels only enough to maintain adequate clearances.

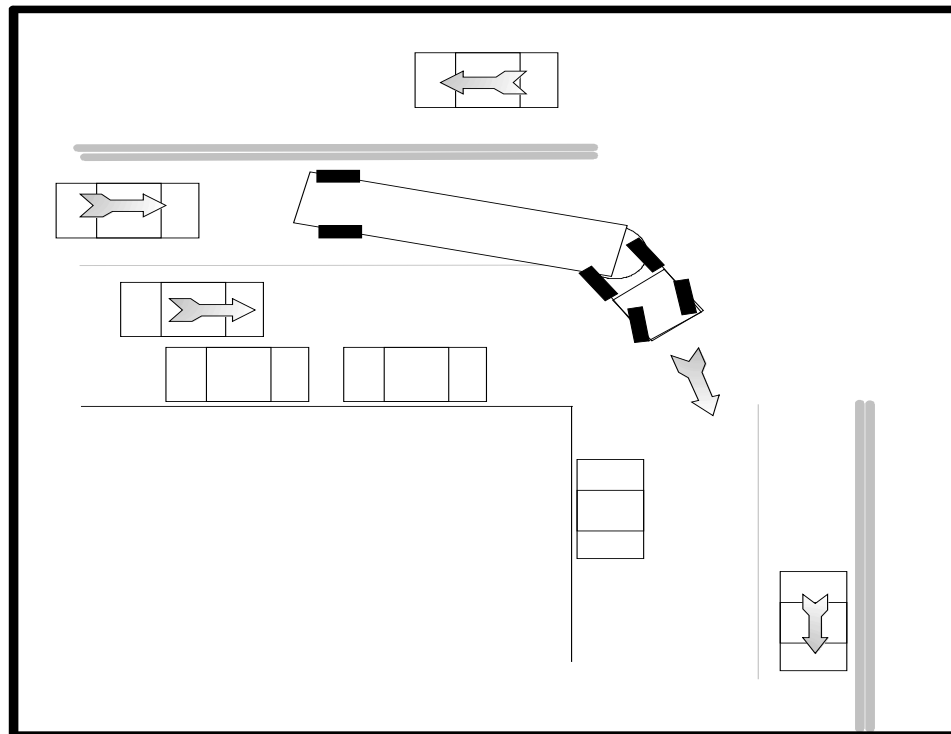
In situations where traffic is congested, by stopped or parked vehicles, or where narrow streets are involved, the tiller may need to turn the trailer wheels directly opposite to the

travel of the tractor wheels, in order to keep the trailer in alignment with the tractor and to maintain adequate clearance for the trailer and Ladder overhang. This particular maneuver must also be compensated by a smooth recovery turn of the trailer wheels to maintain proper tractor-trailer alignment.

TRACTOR TRAILER OPERATIONS THROUGH A 90-DEGREE TURN (CORNERING)

Particular care and alertness must be exercised by the driver and tiller operator during turns. If the intersection is clear, and the streets are wide, a right or left turn should not be difficult, if the driver steers the tractor **into a wide enough turn**.

If the traffic is heavy, or the streets are narrow, extra caution and good judgment must be used and the tiller must be constantly aware of vehicles on each side, and to the rear, of the apparatus. Even after starting into a turn, developments may occur which will require the tiller to maneuver the overhang of the trailer into the clear.

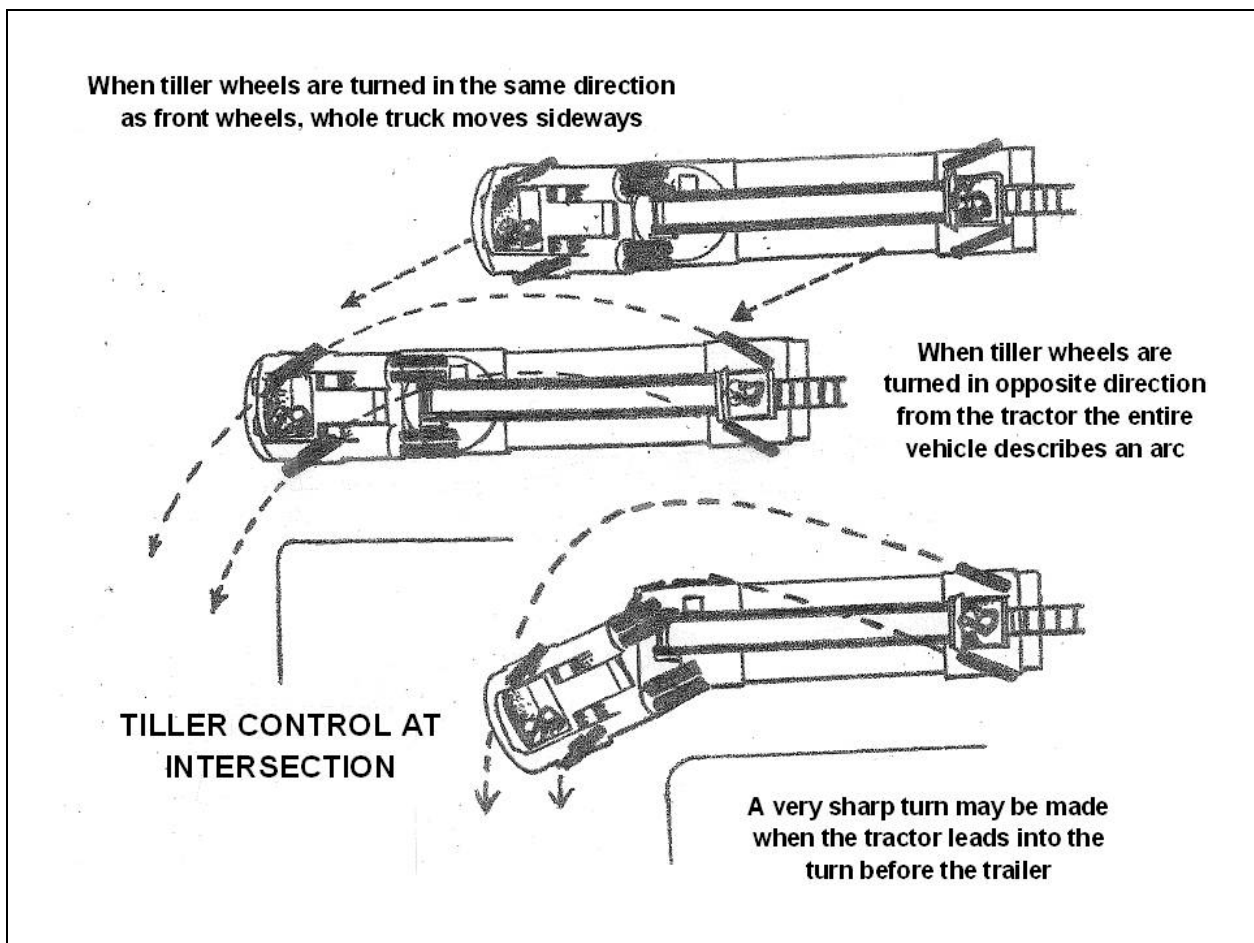


On most intersection turns, the trailer will track and follow the tractor without an excessive amount of tillering. When approaching a turn, the tiller operator should anticipate whether additional traffic lane space will be required to make the turn. If necessary, the tiller can partially block a lane of traffic by steering the trailer slightly into whichever lane it is necessary to keep clear.

SECTION 6. DRIVING TRACTOR TRAILER LADDER TRUCKS

When it is necessary to move out wide with the trailer, the tiller should start turning away from the corner at about the same time the front tractor wheels first enter the intersection. This maneuver will prevent overrunning of the inline position of the tractor and trailer, and will compensate for the centrifugal force of the turn.

If it is necessary for the driver to turn sharply at a point near the intersection curb, the tiller will need to turn the tiller wheel quickly in the opposite direction to avoid striking or overrunning the curb.



The tiller must constantly judge and maintain side clearance on any turn, sufficient to permit safe passage of the rear overhang of the trailer. If, at any time, the tiller is in doubt regarding safe clearance, the driver should be signaled immediately to STOP.

90° Turns (Forward)—Driver

- Inform the tiller that a 90° turn is coming up, and confirm acknowledgment from the tiller
- Use directional signals to indicate turning

- Inform the tiller if additional space will be required to negotiate the turn, and confirm acknowledgment from the tiller
- Use all mirrors, to observe the clearance on both sides of the tractor and trailer
- Go as deep into the intersection as possible before starting the turn
- Observe the travel of the trailer wheels with the inside mirror when squaring off the corner with the tractor
- When in doubt about safe clearance, immediately STOP
- Accelerate gradually and smoothly out of the corner, observing that the trailer has come back in line with the tractor
- Rapid tractor acceleration out of a turn should be avoided, as it shortens the reaction time for the tiller to make any corrections or maneuvers
- Remain in contact with the tiller throughout the maneuver

90° Turns (Forward)—Tiller

- Receive warning from driver that a 90° turn is coming up, and confirm receipt to the driver
- Determine whether additional lane space will be required to negotiate the turn
- If necessary, drift the trailer partially or fully into the lane opposite the turn
- Pay constant attention to clearance on both sides, and to the rear, of the trailer throughout the turn
- Start turning the tiller wheel away from the corner as the tractor wheels enter the intersection. The sharper the turn, the more turning will be necessary
- Hold the wheel steady at the 10 and 2 o'clock positions (upper half of the steering wheel) and be prepared to steer if it becomes necessary. Wide or unobstructed turns require little or no movement by the tiller
- Bring the trailer back in line with the tractor quickly and smoothly after negotiating the turn
- Do not “over tiller” on any turn
- When in doubt about safe clearances, signal to STOP using the buzzer and headset
- Remain in contact with the driver throughout the maneuver

MANEUVERING THE TRUCK BACKWARD

Maneuvering a Truck in reverse requires close coordination and instant communication between the driver and the tiller.

While backing the Ladder Truck, firefighters shall be stationed as spotters to warn the driver and tiller of any inadequate clearance or imminent dangers, or they may be

positioned to control traffic. However, firefighters positioned as traffic guides are not considered spotters for the apparatus during the backing maneuver.

During backing operations, the driver must control the movement of the apparatus at a slow and smooth speed. The driver must steer the tractor so that it tracks the trailer in proper alignment. The driver must be prepared to stop the apparatus immediately if a hazard develops. A jackknife could develop if close communication and coordination is not maintained between the driver and tiller.

Backing (reverse operations)—Driver

- Give the BACK UP signal using the buzzer (3 beeps) and receives confirmation from the tiller
- Wait for the officer, positioned at the driver's window, to signal that it is safe to proceed
- Place hands at the 10 and 2 o'clock positions (upper half of the wheel) on the steering wheel
- For straight backing, bring the wheels of the tractor in line with the trailer
- Watch for obstacles on both sides of the apparatus and be alert for warnings from the ground guides
- Watching the lead of the trailer, the tractor follows
 - To move the trailer to the right, rotate the steering wheel in a counter-clockwise direction (to the left). After the initial counter-clockwise move, rotate the steering wheel in a clockwise direction (to the right) as far as necessary to follow the trailer's lead
 - To move the trailer to the left, rotate the steering wheel in a clockwise direction (to the right). After the initial clockwise move, rotate the steering wheel in a counter-clockwise direction (to the left) as far as necessary to follow the trailer's lead
 - Hold or adjust that position as long as necessary, then bring the wheels back to center, to align the tractor and trailer when the maneuver is completed
 - Stop the vehicle when the tiller gives the STOP signal

Backing (reverse operation)—Tiller

- When ready, confirm the BACK UP signal using the "buzzer." Never give the signal unless ready to perform the maneuver
- Place hands at the 8 and 4 o'clock positions (lower half) on the tiller steering wheel, with thumbs pointing out
- Watch for obstacles on both sides of the apparatus, along the trailer and be alert for warnings from the ground guides

- Using outstretched thumbs as directional guides, turn the steering wheel as far as necessary for the trailer to move in its intended direction
- If the tractor or trailer moves in the wrong direction, signal STOP and communicate with the driver on the best way to bring the vehicle back in alignment
- Pay particular attention to the position of the tractor as well as to clearance on both sides and to the rear of the trailer
- Signal STOP when the apparatus is at the desired location
- The wheels of the tractor and trailer should be aligned when the backing operation is completed and the apparatus is stopped

When traveling in reverse, steering the wheels of a tractor trailer requires the opposite control from that used to steer the front wheels. If the tiller wheel is turned clockwise (to the right), the trailer travels sideways to the left. If the tiller wheel is turned counter-clockwise (to the left), the trailer will move to the right.

Remember, when engaged in backing maneuvers, place hands on the steering wheel with thumbs facing out, at the 8 and 4 o'clock positions (lower half of the steering wheel). The trailer will move in the direction of your thumbs, when you rotate the steering wheel in that direction.

Backing into Quarters

The complexities of backing a Truck into a company station will vary with the width of the street in front of the station, the set-back of the station apparatus doors, traffic conditions in front of the station and the physical width of the apparatus door.

All the rules and directives of reverse (backing) maneuvers apply. Good communication and smooth action between the driver and tiller are key to a successful backing maneuver.

- When approaching the station, the tractor should be driven about two-thirds to the opposite side of the street, to allow room for trailer swing in. The apparatus should be stopped when the rear of the trailer is several feet past the apparatus door to be entered
- As soon as the apparatus starts to back up, the tiller reverses the direction of the trailer wheels and steers into quarters
- The tiller must pay particular attention to the clearance on both sides and to the rear of the trailer, to avoid striking the apparatus door frame with the running board of the trailer or with the overhang of the Ladders
- As the Truck enters the apparatus doorway, the tiller must align the trailer with the center of the doorway

SECTION 6. DRIVING TRACTOR TRAILER LADDER TRUCKS

- The tiller may use fire station identifying marks or ceiling lights to determine proper alignment
- When parked, the trailer must be aligned with the tractor.



Drivers must back-up the tractor in the same arc that is used by the trailer, to prevent jackknifing. Drivers must pay particular attention to adequate clearance on either side of the tractor, and at the front of the trailer, as the apparatus enters the doorway. Drivers must properly align the tractor with the trailer as the apparatus is parked.

**Drivers must STOP all maneuvers when signaled by the officer, tiller or spotters.
Signals may be voice or hand commands**

Exhaust Extractors are designed to contain fumes and other smoke caused by the start-up of apparatus diesel motors, and to prevent the fumes from entering the station's living quarters. There is an Exhaust Extractor in every apparatus bay, one for each front-line response unit.

Once the apparatus is parked in the station the officer, or his/her designee, must place the Exhaust Extractor over the vehicle's exhaust pipe, and ensure that the magnet is properly affixed to the apparatus.

SECTION 7. MAINTENANCE AND INSPECTION PROCEDURES

Department vehicles must be regularly inspected, and properly maintained, to assure immediate response to alarms and to provide a safe environment for members, other drivers, pedestrians and others who may share the road. Responsibility for routine inspection is assigned to drivers and tillers. Company officers are responsible for monitoring the performance of these duties.

The Bureau of Equipment (BOE) coordinates the Vehicle Inspection Program. Every ninety (90) days, an apparatus undergoes a Class "A" inspection or Mobile Class "A" inspection by the mechanics at Central Shops. These inspections are required by law. A complete inspection is made of all system components, drivetrain, transmission, brakes and fuel system, and if necessary, repairs are made prior to returning the vehicle to service.

DAILY APPARATUS INSPECTION

The Daily Inspection/Pre-Trip Inspection routine begins with a visual overview of the apparatus, usually conducted by the drivers and, in the case of Ladder Trucks, tillers, when placing their personal equipment on the vehicle. Attention should be paid to anything unusual, or to equipment that was recently utilized.

Morning change of shift is the opportunity to gather information from the off-going crew about the apparatus and also to check the journal for notations. The minimum exchange should be an inquiry from the oncoming to off-going vehicle operator as to the status of the apparatus.

Following roll call and any update from the off-going crew, drivers and tillers shall begin the Daily Inspection. Generally, work on the vehicles should take two hours. This time frame is, of course, dependent on the amount of work required and any emergency responses, which may lengthen the time required to perform a thorough inspection and preparation of the apparatus.

SECTION 7. MAINTENANCE AND INSPECTION PROCEDURES

The Daily Vehicle Checklist is on HRMS, under the Daily Tab, Apparatus Checklist

Vehicle Inspection Form - Microsoft Internet Explorer provided by San Francisco Fire Department

San Francisco Fire Department
Personnel Scheduling and Planning

Firefighter.C

Apparatus Checklist Medical Checklist Narcotics

Employee Daily

E01 Daily Engine Inspection Checklist

Form Dt: 05/23/2012 Apparatus # 1145-567

Apparatus Change Cancel Apply Changes

Visual Overview

General Condition ☒ OK ☐ Needs Repair

Wipe Down (Daily) ☒ OK ☐ Needs Repair

Chassis/Body - Cleanliness ☒ OK ☐ Needs Repair

Chassis/Body - Damage ☒ OK ☐ Needs Repair

Leaks - Oil/Water/Hydraulic ☒ OK ☐ Needs Repair

Tires

Tread - Damage/Wear ☒ OK ☐ Needs Repair

Lug Nuts - Tight & Present ☒ OK ☐ Needs Repair

Proper Pressure ☒ OK ☐ Needs Repair

Engine

Crankcase Oil (prior to start) ☒ OK ☐ Needs Repair ☐ Added Oil Added (Qts)

Transmission Oil Level ☒ OK ☐ Needs Repair

Fan Belts - Worn/Loose ☒ OK ☐ Needs Repair

Battery - Connections Tight/Clean ☒ OK ☐ Needs Repair

Visual Overview

Begin the daily inspection with an overview of the apparatus and equipment. Note any obvious defects, damage or leaks.

Chassis—Cleanliness

Rinse road dirt from the tail and running boards regularly. Follow the company schedule for washing the apparatus. Wash the apparatus after close proximity to a fire or anytime there is noticeable dirt. Use cold water and a soft soap such as dishwashing soap. Do not use abrasives on painted surfaces while cleaning. Do not spray water or soap onto any electrical connections or switches.

Chassis—Damage

Check the apparatus for any damage to the body. Report any previously unreported damage to the officer.

Leaks—Oil—Water—Hydraulic

Inspect the underside of the apparatus. Investigate the source of any fluid found on drip pans or floor. Clean drip pans daily both for safety and to observe leaks.

Tires

The condition of the tires should be checked daily.

Tread—Damage—Wear

Inspect for cuts, breaks, and imbedded nails or glass. Observe the tread wear.

Lug Nuts—Present & Secure

Inspect the lug nuts of each wheel. Notice should be made that all lug nuts are present and secure.

Proper Pressure

Check for proper inflation using a tire pressure gauge. Proper pressures for apparatus are as follows:

- Front Tires
 - 100 PSI
 - Tread Depth 4/32"
- Rear Dual
 - 100 PSI
 - Tread Depth 2/32"
- Tiller Dual
 - 100 PSI
 - Tread Depth 4/32"

For other tire sizes not listed here, check the owner's manual or check with the BOE.

Crankcase Oil Level

Check crankcase oil on even ground for proper level. Add oil if indicated. Any oil added should be noted in the remarks section of the online Apparatus Daily Inspection Form.

Transmission Fluid Level

Check the transmission fluid level observing the recommended procedures for your apparatus. For apparatus with tilt cab accessibility to the transmission dipstick, perform this check during the weekly tilting of the cab scheduled by the company captain. If the transmission fluid level is low, inform your officer to notify BOE. Record any changes in the remarks section of the online Apparatus Daily Inspection Form.

Cooling System

The coolant level shall be checked. Add water if coolant level is low and notify BOE if the problem persists.

Fan and Alternator Belts

Visually inspect for wear. Test for correct tension by depressing the belt. For apparatus with tilt cabs, this check will be conducted during the weekly tilt. If the belts appear worn or loose, notify BOE.

Battery Connections

Make sure all battery connections are tight and clean. For apparatus with an onboard charger, the charger should be plugged in at ALL times when the apparatus is parked in the station to maintain battery charge.

Safety Belts/Straps

Verify that the seat belts or safety straps are in place and in good condition.

Mirrors

Adjust mirrors and check for cracks.

Start Apparatus

The apparatus should be started using the appropriate battery bank.

Cab Lights/Dash Lights

The lights referred to in this section are all interior cab lights including the dashboard. If any light is inoperative, the driver should notify the officer.

Fuel Level

Fuel tanks should be kept full. Tank content should not be allowed to go below the 3/4 mark on the fuel gauge. Any fuel added should be logged in the Company Journal and noted in the appropriate section of the online Apparatus Daily Inspection Form.

Oil Pressure

Observe the oil pressure at idle. Acceptable limits are outlined in the operation manual for each apparatus.

Charging Meter

If a vehicle is difficult to start, the problem might be a low battery. The charging meter can check the condition of the battery. This meter will also indicate if the system is charging while the apparatus is running and at what rate. If the charge is low, use the station charger (13.5–14.8 Volts).

Air System

Observe the dash gauge to assure that the required **90 pounds of air pressure** is in the air brake system. If the air pressure drops to a low point or the warning buzzer or light indicates low air pressure, the vehicle should be stopped and the source of the problem determined and corrected.

Temperature Gauge

While operating the vehicle during the daily check, the temperature gauge must be observed to assure that it is within the normal limits.

Head Lights/Turn Signals/Brake Lights/Warning Lights/Exterior Lights

All exterior lights of the apparatus must be checked. If any light is inoperative, the driver should notify the officer. It is very important that red lights and other emergency warning lights be kept operative.

Sirens and Horns

Check the operation of emergency response warning devices.

Test Air Brakes

Test the air brakes by moving the apparatus and applying the brakes firmly enough to correspond to the apparatus speed and road conditions.

MGM Safety Brake

Check the release and application of the MGM safety brake. (if vehicle is so equipped)

Trailer Brake

For Aerials, check the application and release of the trailer brake. (if vehicle is so equipped)

Hydraulic Brakes

Check the “feel” and effectiveness of the brakes. If the pedal has a spongy feel, it indicates the brake fluid level is low. Notify the BOE immediately if this situation develops.

<p>Drain the Air Brake System tanks according to manufacturer recommendations, If vehicle is equipped with a drain plug</p>
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Officers Belt / Portable Radios

Check the tool pouch and notify the officer if tools are missing or damaged. Inspect the flashlight; change batteries and bulb as needed. Replace the batteries on the portable radios as needed with fully charged batteries.

SCBA Equipment

Inspect the SCBAs. Make certain that the bottles are full. Assure that the units are clean, straps fully extended, and the units are ready for immediate use.

Ladders/Hose & Appliances

Check that all Ladders are present, secure, and in good condition. Follow the company schedule for cleaning Ladders. Check that all hose are present, clean, and properly loaded. Check that all nozzles, fittings, and hose appliances are present, in good condition, and in their proper place as listed on the company inventory.

Extinguishers (CO₂, Dry Chemical, and Water)

Check that all portable extinguishers are present and securely strapped. Check the water extinguisher gauge and fill with water and charge with air, if necessary. Request CO₂ and dry chemical replacements from the Bureau of Equipment.

Power Tools (Electric and Gas-Powered)

Give gas-operated tools an operational test. Wear hearing protection and eye protection if appropriate. Perform tests outside of station to minimize the effect of the noise and the fumes. Make necessary adjustments or replacements. Check fuel and fluid levels, fill if necessary. Check that all lights and cords are present, marked, and in good condition, ready to be used at an emergency incident. Mount tools securely on apparatus or in compartments.

Supplies and Hand Tools

Check condition and amount of “Visqueen,” roofing paper, nails, stapler, and staples

Pump Operations – Gauges/Controls

Verify apparatus has a prime. Check water tank level—fill if necessary. Observe for any pooling of water under apparatus (Identify and correct the source of any leaks or inform the company officer). Operate transfer valve (five times). Observe proper operation of gauges. Check action of gates and bleeders. Check the function of the Relief Control Valve.

Aerial/Boom/Outriggers

Deploy the outriggers. Ensure both sides deploy evenly. Place chock blocks (ALWAYS use auxiliary jacking plates). Raise and extend the Aerial. Rotate the turntable. Check for cleanliness and operation of micro-switches on the outriggers. (Clean with silicone spray and rags, if found to be stuck or otherwise inoperable)



PROCEDURES FOR REPAIRS

When reporting an item that requires attention by a mechanic, the officer in charge shall follow the procedures outlined below:

Emergency Requests

Emergency requests shall be made to the BOE at 558-3514 or 3514 on the Main Line. If the BOE is unavailable, notify the Department of Emergency Communications for emergency requests.

Routine Requests

Normal requests shall be made to the BOE at 558-3514 or 3514 on the Main Line, between 0800 and 0900 Monday through Friday (except holidays). Defer all non-emergency requests until the normal reporting hours.

Do NOT call the Central Repair Shop directly. All requests must go through the Bureau of Equipment. The BOE will make the determination as to whether the situation will be handled by the mobile mechanic in quarters or whether the apparatus will be sent to the Central Shops. Officers are responsible for putting the company out of service with Radio at 558-3268, or on the Main Line 3268, until repairs can be made.

SECTION 7. MAINTENANCE AND INSPECTION PROCEDURES

If the vehicle will be placed out of service for repair or changeover, the battalion chief shall be notified as well. The officer will document all pertinent facts in the company journal.

Minor Repair

Minor repair is defined as a repair or service that can be effected on the same day, and the apparatus returned to operation prior to the end of watch. If leaving the vehicle for minor repairs, remove all loose (non-compartment) equipment to lessen the chance of loss, damage, or theft. Remove apparatus headsets, all portable radios, and medical equipment.



Major Repair

Major Repair is defined as a repair or service which will keep the apparatus or vehicle out of service for more than one day. BOE will need to designate a vehicle for changeover. The crew will need to board a new (reserve) apparatus to remain in service, until the return of the “front line” vehicle. All hose and equipment shall be removed from the vehicle that is being left at Central Shops.

Body Damage

Unauthorized personnel shall not attempt to repair or straighten body damage to Department apparatus or vehicles, regardless of the manner of occurrence.

When body damage renders the apparatus or vehicle immobile, notify the BOE immediately. Only personnel of the BOE and the Central Shops are authorized to make body adjustments for mobility.

Pegs, holders or brackets that are permanently affixed to apparatus for holding tools, fittings, and other appliances, shall not be removed or relocated, permanently or temporarily, unless authorized by the Bureau of Equipment.

Changeover Rule

When a vehicle is being picked up at the Central Shops, or when a crew is changing into a Relief Piece, the vehicle shall be checked for fuel, oil, water, ability to pump, and/or proper Aerial function, by the driver (and tiller, if applicable), before loading any hose or equipment.

Test the radio and the Mobile Data Terminal when picking up a vehicle from Central Shops or when switching into a Relief Piece, before leaving the Repair Yard. Check the radio volume in Transmission Mode *and* in Receiving Mode. If the radio does not function properly, take the vehicle directly to the Radio Shop, at 901 Rankin Street, for repair.

Any deficiencies in the vehicle condition should be pointed out to Central Shops personnel, **prior to leaving the repair yard.**

Painting Apparatus and Vehicles

Firefighters may not paint, tag, tint, darken, deepen, or enrich over or on existing paint of the apparatus and equipment.

Stickers, decals or insignias may not be placed anywhere, or on any part of Fire Department vehicles or equipment, without written permission from the Chief of Department. Personalized company identification numbers and logos must be approved by the Chief of Department, in writing, before being applied to any Department vehicle or equipment.

The painting of motors, running gear, steel diamond plate, tools, fittings, appliances, and equipment holders is permitted, provided that only the paint issued for these purposes is used. Do not paint aluminum diamond plate. When painting, use care not to get paint on the body surfaces of the apparatus or vehicles.

POWER-WASHING OF EQUIPMENT

Power-washing or steam cleaning of SFFD vehicles and/or other equipment, such as generators or the HURST tool, is not permitted at any time. Electrical equipment is sensitive to moisture, and steam or power cleaning can cause short circuits. Steam or power-cleaning can also wash lubrication fluids and grease out of places where lubrication is vital for the proper functioning of the apparatus.

SECTION 7. MAINTENANCE AND INSPECTION PROCEDURES

Scrubbing with soap and water (from a garden hose) is appropriate for wheel wells and under the frame of apparatus. **DO NOT** use degreasing solvents anywhere in the Engine compartment. Use rags to clean in the Engine compartment. Major Engine cleaning, if necessary, will be done by the Central Shops during 'A'-level inspections.

FUEL

Fuel for SFFD vehicles can be obtained at the locations indicated on the table below. For any unusual leakage problems or questions, contact Support Services at 558-3253.

<u>Location</u>	<u>Address</u>	<u>Gasoline</u>	<u>Diesel</u>	<u>Natural Gas</u>
Station 2	1340 Powell Street		X	
Station 5	1301 Turk Street	X	X	
Station 6	135 Sanchez Street		X	
Station 7	2300 Folsom Street	X	X	
Station 8	36 Bluxome Street	X	X	
Station 9	2245 Jerrold Avenue	X	X	
Station 11	3880 26th Street		X	
Station 13	530 Sansome Street	X	X	
Station 14	561 26th Avenue		X	
Station 15	1000 Ocean Avenue		X	
Station 16	2251 Greenwich Street		X	
Station 18	1933 32nd Avenue	X	X	
Station 40	2155 18th Avenue		X	
Station 43	720 Moscow Street		X	
Station 44	1298 Girard Street		X	
Station 48	12th St. & D Streets	X	X	
Station 49	1415 Evans Street	X	X	
PG & E Plant	19 th & Shotwell Streets			X
Downtown Area	1 st & Folsom Streets			X
DPW Operations	2323 Cesar Chavez			X
SFIA Airport	692 McDonald Road			X

SECTION 8. ACCIDENT PROCEDURES AND INVESTIGATION

Policies and Procedures regarding Post-Accident situations can be found in the San Francisco Fire Department Vehicle Accident Policy