

Introduction to Aerial Apparatus Inspection and Maintenance

Prepared by A-shift # 3

Cpt Adams
Lt Taylor
Sgt Scarborough
Sgt Ford

Introduction to Apparatus Inspection and Maintenance

Objectives

- Perform routine test, inspections, and servicing functions on the systems and components specified in the following list, given a fire department vehicle and its manufacturer's specifications, so that the operational status of the vehicle is verified.

- Battery (ies)
- Braking system
- Coolant System
- Electrical System
- Fuel
- Hydraulic Oil
- Oil
- Tires
- Steering System
- Belts
- Tools, appliances, and equipment

- Document the routine tests, inspections, and servicing functions, given maintenance and inspection forms, so that all items are checked for proper operation and deficiencies are reported

- Perform the routine tests, inspections and servicing functions specified in the following list in addition to the previous list, given a fire department aerial apparatus, so that the operational readiness of the aerial apparatus is verified

- Cable Systems (if applicable)
- Aerial device hydraulic systems
- Slides and rollers
- Stabilizing systems
- Aerial device safety systems
- Breathing air systems
- Communication systems

Time Frame

3 hours or as needed

Level of Instruction

Application and Hands on

Materials Needed

Handouts

Daily vehicle check sheets

Weekly vehicle check sheets

Information sheet

Instructions to the instructor

Should have an aerial apparatus available

Adapt to your departments SOP's

References

IFSTA/ Aerial Apparatus Driver/Operator/ First Edition

NFPA 1002

Course Goals

To train driver operator on the proper checks for an aerial apparatus

Differentiate between maintenance and repair:

Maintenance – keeping apparatus in a state of readiness

Repair – to restore or replace that which has become inoperable, damaged or worn.

The purpose of preventive maintenance is to try to eliminate unexpected and catastrophic failures that could threaten life and property and lengthen life of apparatus

A systematic maintenance program

Every fire department should have SOP's for systematic apparatus maintenance programs.

Those SOP's should dictate;

- Which item the drivers are responsible for checking and which conditions they are allowed to correct on their own.
- How maintenance and inspection results should be documented and transmitted to the proper person or department.

Maintenance and Inspection forms serve many functions;

- Warranty claims
- Accident review boards
- Purchasing new equipment

Cleanliness

Many people look at apparatus cleanliness only from the standpoint of public relations

The public sees a piece of fire apparatus as a unit of protection in which it has invested many thousand dollars

A clean engine and functional parts permit proper inspection, thus ensuring efficient operation

Care should be taken not to strip all necessary lubrication from apparatus when washing and cleaning

Apparatus Inspection

The driver should follow a systematic procedure for inspecting the apparatus, one particular method is the walk around.

Approaching the vehicle

- Look for problems that are readily apparent by simply looking at the vehicle.
 - Look beneath the vehicle for leaking fluids
 - Ensure proper ventilation

Left and Right, Front Side Inspection

- Door should close tightly, door latch should work, window glass in place and operable.
- If equipped with saddle tanks check for apparent leaks or cracks.

Condition of the tire and wheel

- Visual
 - Lug nuts
 - Cracks
- Look for defects involving
 - Springs
 - Spring hangers
 - Shackles
 - U-bolts
 - Shock absorber
 - Proper tire inflation
 - Valve stem condition
 - Tire condition
 - Uneven wear

Front Inspection

- Obvious body damage
- Windshield
- Wiper Blades and arms
- All lights Emergency and non- emergency
- Audible warning devices
- Extra equipment
- Pump intakes
- Pump discharges
- Hydraulic rescue tool systems
- Electric cord reels
- Front stabilizers (if equipped)

Right Front Side of Vehicle

- Same as the left side of vehicle

Right/ Left – Rear Side Inspection

- Obvious body damage
- Same principles listed on check front tires and wheels
- Mud flaps
- Snow chains
- Compartment doors
- Open all doors and check equipment in them
- Booster reel
- Stored hose
- Booster tank
- High-Rise bundles of hose
- Stabilizer pads present and in place
- Stabilizer

Rear Inspection

- All running and warning lights
- Equipment stored in rear compartments
- Compartment doors
- Check hose loads
- Hose bed covers
- Ground ladders and pike poles

- Hydrant Wrench and Gate Valve

In cab Inspection

Once the outside inspection is complete the driver should enter the cab and begin a mechanical check of the apparatus

- Adjust the seat and mirrors
- All electrical switches should be in the off position
- Seatbelts
- Check tilt/telescoping steering wheel
- Start according to manufactures recommendations
- Allow time to warm up if not on an emergency run

Once the vehicle is running check gauges in cab

- Speedometer
- Tachometer
- Oil pressure
- Fuel gauge
- Ammeter/ voltmeter
- Air pressure
- Coolant temperature
- Electrical equipment switches
- High beam headlights
- Heating and air condition controls
- Radio controls
- Audible warning device controls
- Controls for computer equipment
- Windshield wiper
- Window defroster
- Automatic chains
- Interior cab lights
- Auxiliary brakes

Load Sequencer

Turns on various lights at specified intervals

Load Monitor

“watches” the system for added electrical loads

Load Shedding

Shuts down less important equipment when excessive load occurs

Steering system

- Check for proper adjustment and reaction
- No more than 10 degrees play in either direction
- NFPA 1901
- The standard requires air pressure to build to a sufficient level to allow operation within 60 seconds of starting
- Should be equipped with air protection valve that prevents the air horns from being operated when pressure is below 80 psi.

Engine Compartment Inspection

Acceptable to perform these checks before or after engine run-up except for transmission fluid

- Proper operation of cab lift motors and pumps
- CAUTION Make sure adequate vertical clearance and that all loose equipment in cab is removed or secured before cab is tilted
 - Engine oil
 - Air filter
 - Emergency shut down
 - Exhaust system
 - Cooling fan
 - Radiator coolant
 - Washer fluids
 - Battery condition
 - Transmission fluid level
 - Power steering fluid
 - Brake fluid
 - Air system
 - Belts

- Electrical wiring
- Leaks

Aerial Device Inspection

Visual Inspection

- Check level of the hydraulic fluid
- Inspect the stabilizers
 - Fluid leakage
 - Damaged hoses
 - Warning lights
 - Locking pins
 - Stabilizer pads
- Inspect turntable assembly
- Inspect lower control pedestal
- Inspect the platform control console
- Inspect aerial device communication system
- Status/ operation of breathing air supply system
- Inspect the aerial device extension / retraction system
- Inspect the elevation / lifting cylinders
- Inspect various sections of the aerial device
- Inspect the elevating platform assembly
- Inspect ladder rungs
- Inspect aerial waterway systems
- Inspect any equipment that is attached to the end of the aerial device fly section

Operational Inspection

Serves two purposes

- Ensures the device is in proper working condition
- Serves as a review for the driver/operator

Park the apparatus in suitable location for operation

Transfer power from the drive train to the aerial device hydraulic system

- Once lowered check for signs of physical damage or leaking
- Check for any indicator lights appropriate

Raise and extend the aerial device

- Fully elevate and extend the device
- Look for jerky motion
- Unusual noises
- Unusual bending or twisting
- If equipped with a platform operation should be conducted from both control stations

Rotate aerial device

- Should move in a complete circle with no jerking as it spins
- Listen for unusual sounds
- Watch for leaking fluids

Test operation of auxiliary equipment

- Video equipment
- Generators
- Flood lights

Stow the aerial device and stabilizers

- Make sure all equipment stows properly
- No hydraulic fluid leaks
- All indicator lights go out

Prepare and send all appropriate Documents

Closing;

Fire apparatus must always be ready to respond. Regardless of whether the truck responds to a call once an hour or once a month, it must be ready to perform in the manner that it was designed. In order to ensure this, certain preventive maintenance functions must be performed on a regular basis. Performing routine maintenance checks can prevent most apparatus or equipment failures.

