



## **MONTGOMERY COUNTY FIRE AND RESCUE SERVICE**

### **Operator's Guide to Fire Apparatus Out of Service Criteria**

#### **Table of Contents**

Driving and Crew Areas, Apparatus Body, and Compartmentation .....	3
Chassis, Axles, Steering and Suspension Systems, Driveline, Wheels, and Tires .....	4
Engine Systems and Exhaust.....	5
Engine Cooling System .....	5
Transmission and Clutch .....	6
Low-Voltage, Line Voltage Electrical Systems, and Warning Devices.....	6
Air Brake Systems .....	7
Hydraulic Brake Systems .....	8
Fire Pump System .....	8
Aerial Device Systems.....	9
Inspections.....	10
Definitions .....	11



## MONTGOMERY COUNTY FIRE AND RESCUE SERVICE

### Operator's Guide to Fire Apparatus Out of Service Criteria

## Driving and Crew Areas, Apparatus Body, and Compartmentation

The following defects and deficiencies of the driving and crew areas, the apparatus body, and the compartmentation reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- Body mounting that is defective
- Cab mounting that is defective
- Seat belts that are torn or have melted webbing, missing or broken buckles, or loose mountings. Due to the extreme safety-related consequences of a defective seat belt, and the fact that one defective seat belt (unless it is the driver's seat belt) does not render a piece of apparatus unusable, the authority having jurisdiction shall take any seating position with a defective seat belt out of service. (All assigned riding positions must have operable seat belts.)
- Cracked or broken windshield that obstructs the driver's/operator's view
- Missing or broken rearview mirrors that obstruct the driver's/operator's view
- Windshield wipers that are missing or inoperable
- Steering wheel that has a deficiency affecting the drivability of the vehicle
- Oil pressure, engine, and/or transmission temperatures that can not be monitored or verified
- Speedometer that is inoperable
- Air gauge or audio low air warning device that has failed or is inoperable when air pressure < 60 psi (vehicles with air brakes)
- Door latches that are defective
- Defrosters that are inoperable
- Foot throttle that is inoperable



## **MONTGOMERY COUNTY FIRE AND RESCUE SERVICE**

### **Operator's Guide to Fire Apparatus Out of Service Criteria**

## **Chassis, Axles, Steering and Suspension Systems, Driveline, Wheels, and Tires**

The following defects and deficiencies of the chassis, axles, steering and suspension systems, driveline, wheels, and tires reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- Tires that have cuts in the sidewall that penetrate to the cord
- Tires that have a tread depth of 4 /32 in. (3.2 mm) or less on any steering axle or 2 /32 in. (1.6 mm) or less on any non-steering axle at any two adjacent major tread grooves anywhere on the tire
- Any tire that is flat or has a detectable or audible leak
- On dual wheel tires: tires that are touching sidewall to sidewall when properly inflated
- Suspension components that are defective
- Wheel studs missing or loose wheel lugs
- Wheels that are cracked, bent, and/or broken that affect drivability
- Axle flanges that have Class 3 leakage
- An axle with a hub seal that has any Class 3 leakage or an empty reservoir
- Steering components that are defective affecting the vehicle handling
- A steering component that has Class 3 leakage
- Driveline components that are defective



## **MONTGOMERY COUNTY FIRE AND RESCUE SERVICE**

### **Operator's Guide to Fire Apparatus Out of Service Criteria**

#### **Engine Systems and Exhaust**

The following defects and deficiencies of the engine systems reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- Air filter restriction indicator that shows maximum restriction after resetting
- Engine system that has significant leakage of oil
- Engine that is overheating
- Oil that contains coolant
- Oil that is diluted with fuel
- A fuel system component that has Class 2 leakage of fuel
- Fuel tank, mountings, or straps that are defective
- Fuel cap is missing or does not seal to prevent spillage
- Stop-engine light that fails to turn off after engine is started
- Exhaust components are broken or hanging
- Exhaust components are that leaking causing exhaust fumes to enter the cab or patient compartment

#### **Engine Cooling System**

The following defects and deficiencies of the engine cooling system reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- Cooling system component that has Class 3 leakage
- Coolant that contains oil
- Radiator that is loose
- Cooling fan that is loose or cracked



## **MONTGOMERY COUNTY FIRE AND RESCUE SERVICE**

### **Operator's Guide to Fire Apparatus Out of Service Criteria**

#### **Transmission and Clutch**

The following defects and deficiencies of the transmission and clutch reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- Automatic transmission that overheats
- Automatic transmission that has a "Do not shift" light on
- Transmission fluid that contains engine coolant
- Transmission components that have Class 3 leakage of transmission oil

#### **Low-Voltage, Line Voltage Electrical Systems, and Warning Devices**

The following defects and deficiencies of the low voltage electrical system and the line voltage electrical system reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- Charging system that fails to maintain 12-volts
- Grounding and bonding of the line voltage electrical system that is defective
- Insufficient DOT lighting to clearly mark the vehicle
- Insufficient warning lighting to clearly indicate emergency response
- Turn-signal is inoperable
- There is not any operable audible DOT warning devices (at least either the electric horn or the air horn, if so equipped, must be operable)
- There are not any operable audible emergency warning devices (at least the electronic siren, or the mechanical siren, if so equipped, must be operable)



## MONTGOMERY COUNTY FIRE AND RESCUE SERVICE

### Operator's Guide to Fire Apparatus Out of Service Criteria

## Braking Systems

### Air Brake Systems

The following defects and deficiencies of the air brake system reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service. Use the prescribed test procedure for a commercial driver's license to assist with determining out of service condition.

- Service brakes that have an air pressure drop of more than 2 psi (13.8 kPa) in 1 minute for single fire apparatus or more than 3 psi (20.7 kPa) in 1 minute for combination fire apparatus, with the engine stopped and the service brakes released
- Leak-down rate (time) of the applied side of the air brake that is more than 3 psi (20.7 kPa) in 1 minute for single fire apparatus or more than 4 psi (27.6 kPa) in 1 minute for combination fire apparatus, with the engine stopped and the service brakes applied
- Braking system components that are defective
- Braking operation that is ineffective
- Parking brake operation that is ineffective
- Air compressor that fails to build air pressure. The time to build air pressure from 50 psi to 90 psi should not exceed 3 minutes
- Air compressor that fails to maintain 80–90 psi (552–621kPa) pressure in the system with the service brakes applied and the engine at idle, or air compressor that fails to fill the air system to the air compressor governor cutout pressure with the service and parking brakes released
  - The cut-out pressure should not exceed 135 psi
  - The cut-in pressure should not be less than 80 psi
- Antilock braking system (ABS) warning indicator that is activated upon checking chassis operator's manual to determine the indicator light's meaning. (The warning indicator generally indicates that ABS is inoperable and the vehicle should be driven as such.)



## MONTGOMERY COUNTY FIRE AND RESCUE SERVICE

### Operator's Guide to Fire Apparatus Out of Service Criteria

#### Hydraulic Brake Systems

The following defects and deficiencies of the hydraulic brake system reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- Brake system components that have Class 2 leakage of brake fluid
- Friction surfaces, brake shoes, or disc brake pads that have grease or oil on them
- Braking operation that is ineffective
- Parking brake operation that is ineffective
- Brake warning light that is activated or brake pedal that falls away or drifts toward the flooring when brake pressure is applied
- Antilock braking system (ABS) warning indicator that is activated upon checking chassis operator's manual to determine the indicator light's meaning. (The warning indicator generally indicates that ABS is inoperable and the vehicle should be driven as such.)

#### Fire Pump System

The following defects and deficiencies of the fire pump system reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- Pump that will not engage
- Pressure control system that is not operational
- Pump transmission components that have Class 3 leakage of fluid
- Pump panel throttle that is defective
- Master gauges inoperable
- Discharge relief valve not operable
- Primer motor not operable
- Tank-to-pump valve leaks
- Water leak in continuous stream



## **MONTGOMERY COUNTY FIRE AND RESCUE SERVICE**

### **Operator's Guide to Fire Apparatus Out of Service Criteria**

#### **Aerial Device Systems**

The following defects and deficiencies of the aerial device and its systems reduce the operational safety and performance of the fire apparatus and shall be considered when placing the apparatus out of service:

- Power takeoff (PTO) that will not engage
- Stabilizer system that is defective
- Aerial device that is defective
- Hydraulic system components that are defective
- Cable sheaves that are defective
- Cables that are broken or frayed
- Aerial device that is structurally deformed
- Torque box structure or fasteners that are defective
- Turntable fasteners that are defective or missing
- Class 3 leakage from aerial components





## **MONTGOMERY COUNTY FIRE AND RESCUE SERVICE**

### **Operator's Guide to Fire Apparatus Out of Service Criteria**

#### **Inspections**

All inspections shall be conducted in accordance with the manufacturer's recommended procedures.

It shall be the responsibility of the authority having jurisdiction to develop and implement a schedule of service and maintenance for the fire apparatus, systems, and components described in this document, based on manufacturer's recommendations, local experience, and operating conditions.

Inspections shall be performed at least as frequently as the manufacturer's recommended intervals and when the fire apparatus or any component is suspected or reported to have defects or deficiencies.

All defects or deficiencies found during an inspection shall be repaired or corrected by a qualified person.

It shall be the responsibility of the authority having jurisdiction to develop written criteria for when the apparatus is to be taken out of service. The presence of defects and deficiencies that reduce the operational safety and performance of the apparatus below the level established in the 49 CFR, part 390, "Federal Motor Carrier Safety Regulations"; applicable federal, state, and local regulations; applicable nationally recognized standards; manufacturers' recommendations; and guidelines established by the fire department or its designated service and maintenance organization shall be considered when placing the apparatus out of service.

The apparatus shall be returned to service only after defects and deficiencies have been corrected.



## MONTGOMERY COUNTY FIRE AND RESCUE SERVICE

### Operator's Guide to Fire Apparatus Out of Service Criteria

## Definitions

**Adjust.** To maintain or regulate, within prescribed limits, by setting the operating characteristics to specified parameters.

**Alignment.** To adjust components to bring about optimum or desired performance.

**Authority Having Jurisdiction.** The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure.

**Calibrate.** To correlate the reading of an instrument or system of measurement with a standard.

**Collector Rings.** A means of transmitting electrical power to the aerial device turntable from the main power supply; usually, concentric rings made of brass that are contacted by brushes to make the transfer to the specific electrical functions.

**Component.** A constituent part of a mechanical or electrical device.

**Defect.** A discontinuity in a part or a failure to function that interferes with the service or reliability for which the part was intended.

**Defective.** Having a defect, or faulty, namely loose, broken, or missing.

**Deformation.** Abnormal wear, defects, cracks or fractures, warpage, and deviations from the original condition that would affect safe and correct operation.

**Documentation.** The process of gathering, classifying, and storing information.

**Failure.** A cessation of proper functioning or performance.

**Fire Apparatus.** A vehicle used for fire suppression or support by a fire department, fire brigade, or other agency responsible for fire protection.

**Combination Fire Apparatus.** A vehicle consisting of a pulling tractor and trailer.

**Single Fire Apparatus.** A vehicle on a single chassis frame.

**Frame.** The basic structural system that transfers the weight of the fire apparatus to the suspension system.

**Inspect.** To determine the condition or operation of a component(s) by comparing its physical, mechanical, and/or electrical characteristics with established standards, recommendations, and requirements through examination by sight, sound, or feel.

**Interlock.** A device or arrangement by means of which the functioning of one part is controlled by the functioning of another.



## MONTGOMERY COUNTY FIRE AND RESCUE SERVICE

### Operator's Guide to Fire Apparatus Out of Service Criteria

**Ironing.** Damage in the form of wear or indentations caused to the bottom of the aerial device base rail material by misalignment or malfunction of the rollers.

**Leakage.** The escape of a fluid from its intended containment, generally at a connection. The three classes of leakage are defined.

**Leakage, Class 1.** Seepage of fluid, as indicated by wetness or discoloration, not great enough to form drops.

**Leakage, Class 2.** Leakage of fluid great enough to form drops, but not enough to cause drops to fall from the item being inspected.

**Leakage, Class 3.** Leakage of fluid great enough to cause drops to fall from the item being inspected.

**Maintenance.** The act of servicing a fire apparatus or a component within the time frame prescribed by the authority having jurisdiction, based on manufacturer's recommendations, local experience, and operating conditions in order to keep the vehicle and its components in proper operating condition.

**Preventive Maintenance.** The act or work of keeping something in proper condition by performing necessary preventive actions, in a routine manner, to prevent failure or breakdown.

**Manufacturer's Recommendation (Specification).** Any requirement or suggestion a fire apparatus builder or component producer makes in regard to care and maintenance of its product(s).

**Modification.** An alteration or adjustment to any component that is a deviation from the original specifications or design of the fire apparatus.

**Operator Alert Device.** Any device, whether visual, audible, or both, installed in the driving compartment or at an operator's panel, to alert the operator to either a pending failure, an occurring failure, or a situation that requires his or her immediate attention.

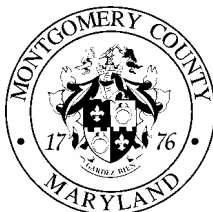
**Optical Source.** Any single, independently mounted, light-emitting component in a lighting system.

**Overhaul.** To inspect, identify deficiencies, and make necessary repairs to return a component to operational condition.

**Power Train.** The parts of a fire apparatus that transmit power from the engine to the wheels, including the transmission, split shaft power takeoff, midship pump transmission, drive shaft(s), clutch, differential(s), and axles.

**Powered Equipment Rack.** A power-operated device that is intended to provide storage of hard suction hoses, ground ladders, or other equipment, generally in a location above apparatus compartments.

**Proper.** As recommended by the manufacturer.



## MONTGOMERY COUNTY FIRE AND RESCUE SERVICE

### Operator's Guide to Fire Apparatus Out of Service Criteria

**Qualified Person.** A person who, by possession of a recognized degree, certificate, professional standing, or skill, and who, by knowledge, training, and experience, has demonstrated the ability to deal with problems relating to a particular subject matter, work, or project.

**Repair.** To restore to sound condition after failure or damage.

**Replace.** To remove an unserviceable item and install a serviceable counterpart in its place.

**Severe Service.** Those conditions that apply to the rigorous, harsh, and unique applications of fire apparatus, including but not limited to local operating and driving conditions, frequency of use, and manufacturer's severe service (duty) parameters.

**Shall.** Indicates a mandatory requirement.

**Should.** Indicates a recommendation or that which is advised but not required.

**Steering Axle.** Any axle designed such that the wheels have the ability to turn the vehicle.

**Test.** To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

**Operational Test.** A test to determine the operational readiness of a component on a fire apparatus by observing the actual operation of the component.