



# Standard Guide for Scope of Performance of Emergency Medical Services Ambulance Operations<sup>1</sup>

This standard is issued under the fixed designation F 1517; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This guide covers minimum standards for the performance of emergency medical services (EMS) ambulance operators, including: operator qualifications, pre-run operation, and post-run aspects.

1.2 This guide shall promote the safe and efficient delivery of the ambulance, equipment, crew, passengers and patients, during all phases of the delivery of EMS involving the ambulance; at all times exercising the highest degree of care for the safety of the public. This guide may be applied to other EMS vehicles that do not necessarily provide patient transport.

1.3 This guide shall be used as the basis for training guides of the emergency medical services ambulance operator.

1.4 The values stated in SI units are to be regarded as the standard. The SI units given in parentheses are for information only.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

## 2. Referenced Documents

### 2.1 ASTM Standards:

F 1031 Practice for Training the Emergency Medical Technician (Basic)<sup>2</sup>

F 1177 Terminology Relating to Emergency Medical Services<sup>2</sup>

F 1230 Specification for Minimum Performance Requirements for Emergency Medical Service (EMS) Ground Vehicles<sup>3</sup>

F 1258 Practice for Emergency Medical Dispatch<sup>2</sup>

## 3. Terminology

### 3.1 Definitions:

3.1.1 The definitions given in Terminology F 1177 are applicable to this guide.

3.1.2 *ambulance*—See Terminology F 1177.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *ambulance operations*—the efficient delivery of the ambulance, equipment, crew, passengers and patients, during all phases of the delivery of EMS involving the ambulance at all times exercising the highest degree of care for the safety of the public.

3.2.2 *ambulance service provider*—as outlined in this guide, a person, company, corporation or political entity responsible for operation, maintenance, or policy making, or combination thereof, regarding emergency medical vehicle operations.

3.2.3 *bona fide occupational qualification (BFOQ)*—the skills and knowledge relevant to the performance of a specific task.

3.2.4 *departure check*—the visual check of the vehicle and surrounding area ensuring that equipment and supplies have been retrieved and properly stored and that all compartment doors are secured.

3.2.5 *egress check*—the visual check of the vehicle and surrounding area prior to operating the ambulance.

3.2.6 *emergency mode*—as defined by individual state statutes that refer to emergency vehicles, equipment, and operations.

3.2.7 *full check*—a comprehensive and systematic evaluation of the ambulance at specified intervals, including documentation of the inspection, any deficiencies found and their corrective actions.

3.2.8 *operator*—a person who operates or assists with the operation of an ambulance.

3.2.9 *post-run*—the managed return of the ambulance and operators to optimal pre-run readiness.

3.2.10 *pre-run*—all aspects of assuring response readiness.

3.2.11 *quick check*—an abbreviated version of the full check, focusing on the major operational functions of the vehicle.

## 4. Significance and Use

4.1 This guide provides minimum guidelines for safe and efficient ambulance operation.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 13.02.

<sup>3</sup> Discontinued; see 1996 *Annual Book of ASTM Standards*, Vol 13.01.

4.2 All ambulance operations and operators should follow this guide for the development of educational and training programs.

4.3 This guide is intended to promote safe and efficient ambulance operations and to reduce morbidity, mortality, and property loss associated with ambulance operations.

4.4 This guide is intended to assist those who are responsible for the development and implementation of policies and procedures for ambulance operations.

**5. Medical Fitness to Drive**

5.1 Because of the complex relationship of certain medical and mental impairments, a medical screening program shall be established by all EMS entities bestowing the privilege of ambulance driving.

5.2 The authorization of ambulance drivers must always be based on bona fide occupational qualifications (BFOQ) pursuant to the task of ambulance operation. The following considerations must be evaluated:

5.2.1 A medical exam of the applicant by a licensed M.D. or D.O. attesting that the history and physical reveals no evidence of any medical or physical condition which would prove detrimental to operating an ambulance.

5.2.2 Eye exam by a licensed ophthalmologist/optometrist to include:

- 5.2.2.1 Visual acuity,
- 5.2.2.2 Depth perception,
- 5.2.2.3 Peripheral vision,
- 5.2.2.4 Night blindness,
- 5.2.2.5 Color blindness, and
- 5.2.2.6 Amblyopia.

5.2.3 An examination of the medical history of the individual, designed to identify drivers who may be impaired by:

- 5.2.3.1 Loss of consciousness,
- 5.2.3.2 Cardiovascular disease,
- 5.2.3.3 Neurological/neurovascular disorder,
- 5.2.3.4 Mental illness,
- 5.2.3.5 Substance abuse/dependency,
- 5.2.3.6 Insulin-dependent diabetes, and
- 5.2.3.7 Rheumatic, arthritic, orthopedic, muscular, neuromuscular, or vascular disease that interferes with the ability to control and operate a motor vehicle safely.

5.2.4 The presence of a medical condition by itself may not constitute an impaired operator, but shall identify an area for consideration by the physician in making a determination of the medical fitness to operating an ambulance.

**6. Qualifications to Drive**

6.1 Authorization shall be based upon cognitive evaluation of the operator regarding laws, guidelines, and policies relating to ambulance operation during emergency and non-emergency modes.

6.1.1 The provider shall have a policy that addresses operator fatigue.

6.2 An ambulance driving evaluation by the provider covering warning device operation, passing, intersection approach precautions, turning, backing, and parking techniques during emergency and non-emergency modes.

6.3 A review of the state motor vehicle record for the previous three years with specific attention to traffic convictions concerning:

- 6.3.1 Speed,
- 6.3.2 Careless and imprudent driving,
- 6.3.3 Driving under the influence of alcohol or other mind-altering substances, and
- 6.3.4 Moving violations.

6.4 A review of motor vehicle accidents for the previous five years.

6.5 The operator shall possess a valid motor vehicle operators license, and any other certification required by state or local laws or regulations.

**7. Pre-Run**

7.1 The operator shall have knowledge of and shall comply with all applicable federal, state statutes, local ordinances, and regulations.

7.2 The operator shall have knowledge of the provider’s policies and procedures.

7.3 The operator shall have knowledge of roads, highways, and the locations of and accesses to major public facilities within the service area.

7.4 The provider shall have a process by which the operator is made aware of conditions that may affect traffic flow within the service area (street closures, construction, special events, and so forth).

7.5 The provider shall have a process by which the operator is made aware of present or forecasted environmental conditions affecting traffic flow within the service area (ice, snow, rain, and so forth).

7.6 Upon unit availability, the operator shall visually inspect the ambulance, and document the inspection in accordance with one of the methods as shown in Table 1. The vehicle shall be inspected for the following:

- 7.6.1 Apparent body or glass damage,
- 7.6.2 Proper function of emergency lights:
  - 7.6.2.1 Beacons or strobe,
  - 7.6.2.2 Light bar,
  - 7.6.2.3 Tunnel lights/flashers, and
  - 7.6.2.4 Other warning lights.
- 7.6.3 Vehicle operating lights:
  - 7.6.3.1 Headlights (high/low),
  - 7.6.3.2 Emergency flashers,
  - 7.6.3.3 Parking/running lights,
  - 7.6.3.4 Interior and exterior turn signal,
  - 7.6.3.5 Brake lights,
  - 7.6.3.6 Back up lights,
  - 7.6.3.7 Flood or scene lights,
  - 7.6.3.8 Dome lights: cab and patient compartment, and

**TABLE 1 Emergency Medical Services Ambulance Maintenance Guidelines for Checklist Completion**

Runs per Week	Full Check, h	Quick Check, h
0 to 1	every 96	every 24
2 to 3	every 72	every 24
4 to 7	every 48	every 24
8 to 50	every 24	every 12
50 +	every 24	every 8

- 7.6.3.9 Spotlights.
- 7.6.4 Damage, wear, and pressure in tires,
- 7.6.5 Damage, loose, or missing lugs on wheels,
- 7.6.6 Proper opening, closing, locking, and seals of entry and compartment doors,
- 7.6.7 Fluid levels:
  - 7.6.7.1 Automatic transmission,
  - 7.6.7.2 Battery,
  - 7.6.7.3 Brakes,
  - 7.6.7.4 Engine oil,
  - 7.6.7.5 Engine coolant,
  - 7.6.7.6 Power steering, and
  - 7.6.7.7 Windshield washer.
- 7.6.8 Fluid leakage on, around, or under the vehicle,
- 7.6.9 Wear, abrasion, rigidity or sponginess of radiator, fuel, heater, and other hoses,
- 7.6.10 Wear, abraded, or cracked engine drive or accessory belts,
- 7.6.11 Cleanliness of exterior, crew cab, and patient compartments,
- 7.6.12 Wear, abrasion, and proper function of operator, passenger, and patient restraint,
- 7.6.13 Indications and function of gages:
  - 7.6.13.1 Electrical charging system,
  - 7.6.13.2 Emergency brake,
  - 7.6.13.3 Fuel,
  - 7.6.13.4 Oil pressure,
  - 7.6.13.5 Tachometer, and
  - 7.6.13.6 Temperature.
- 7.6.14 Wear, abrasion, and proper function of windshield wipers,
- 7.6.15 Proper function and aim of windshield washer,
- 7.6.16 Proper function and clarity of two-way radio and other communication devices,
- 7.6.17 Damage, stability, and adjustment of outside and inside mirrors,
- 7.6.18 Proper function and clarity of emergency siren, public address, and other warning devices,
- 7.6.19 Proper adjustment of all seats,
- 7.6.20 Proper adjustment and function of steering wheel,
- 7.6.21 Charged and properly stored fire extinguishers,
- 7.6.22 Proper function of heating and air conditioning systems,
- 7.6.23 Proper inventory and condition of medical equipment and supplies, and
- 7.6.24 Level and alignment of chassis.
- 7.7 The quick check shall be constituted by:
  - 7.7.1 Visually checking for any fluid leakage on or around the ambulance,
  - 7.7.2 Conducting vehicle warmup,
  - 7.7.3 Checking fluid levels:
    - 7.7.3.1 Fuel,
    - 7.7.3.2 Engine oil,
    - 7.7.3.3 Power steering,
    - 7.7.3.4 Water/coolant level,
    - 7.7.3.5 Brake fluid,
    - 7.7.3.6 Transmission fluid,
    - 7.7.3.7 Windshield washer fluid, and

- 7.7.3.8 Battery water level.
- 7.7.4 Wear and tension of belts,
- 7.7.5 Wear and pressure of tires,
- 7.7.6 Emergency lights,
- 7.7.7 Function of lighting systems:
  - 7.7.7.1 Emergency lights,
  - 7.7.7.2 Running lights,
  - 7.7.7.3 Vehicle exterior, and
  - 7.7.7.4 Vehicle interior.
- 7.7.8 Proper function of horn and each siren position,
- 7.7.9 Vehicle cleanliness, and
- 7.7.10 Proper function of two-way radio and other communications equipment.

## 8. Operations

### 8.1 *Response Mode Management:*

8.1.1 The response mode of the ambulance shall be determined by dispatch protocol based on dispatch determinants as approved by the medical director. These determinants shall be consistent with Practice F 1258.

8.2 The operator shall, on the basis of known information, determine the best route to the scene and end destination.

8.3 Before beginning the response, the operator shall conduct a brief egress check consisting of the following:

- 8.3.1 Vehicle doors are securely closed and latched,
- 8.3.2 Vehicle hood is closed and securely latched,
- 8.3.3 Vehicle shore line is disconnected,
- 8.3.4 All equipment is secured,
- 8.3.5 Egress door is open, and
- 8.3.6 Patient stretcher is in place and secured.

### 8.4 *Operational Check Sequence:*

- 8.4.1 Ensure crew is on board and properly restrained,
- 8.4.2 Adjust the operator's seat,
- 8.4.3 Adjust mirrors,
- 8.4.4 Turn on battery(s),
- 8.4.5 Start the engine,
- 8.4.6 Review all gages,
- 8.4.7 Adjust environmental controls consistent with applicable needs,
- 8.4.8 Turn radio on and contact dispatch,
- 8.4.9 Adjust the tilt wheel,
- 8.4.10 Turn the headlights on,
- 8.4.11 Activate the emergency warning lights (if applicable),
- 8.4.12 Turn on power to siren/public address control system (if applicable),
- 8.4.13 Partially open the driver side window,
- 8.4.14 Evaluate brake pedal resistance,
- 8.4.15 Place the vehicle in gear,
- 8.4.16 Activate the siren (if applicable), and
- 8.4.17 Activate the turn signal (if applicable).

8.5 *Crew Roles*—The operator/crew member is responsible for:

- 8.5.1 Operating the ambulance in a safe and efficient manner, exercising the highest degree of care,
- 8.5.2 Safely passing other vehicles,
- 8.5.3 Utilizing eye sweep,
- 8.5.4 Maintaining a 3 to 4-s following distance, and

8.5.5 Maintaining the vehicle at a speed that is safe for conditions.

8.5.5.1 Under emergency response conditions the speed shall not exceed that which is safe for road or environmental conditions; in no case shall the speed exceed ten miles per hour over the posted speed limit.

8.5.5.2 Under non-emergency operations the operator shall comply with all local and state traffic laws.

8.5.6 Controlling the operation of the appropriate audible warning device for the current traffic conditions.

8.5.7 Utilizing the vehicle communication system,

8.5.8 Applying policies and procedures in the driving of the ambulance,

8.5.9 Initiating a constant rate of acceleration,

8.5.10 Using engine compression in stopping of the ambulance,

8.5.11 Maintaining smooth braking and cornering of the ambulance,

8.5.12 Assuring adequate stopping distance in traffic,

8.5.12.1 The operator shall stop the ambulance in traffic so the operator can see the bumper, both rear tires of the vehicle in front of the ambulance, and a minimum of five feet of the road surface in front of the ambulance.

8.5.13 Utilizing the 10-s lane change procedure,

8.5.14 Maintaining a rear and side space cushion,

8.5.15 Backing with a ground guide,

8.5.15.1 The operator is responsible for the safe backing of the ambulance. The operator shall never begin to back the ambulance before it has come to a complete stop. A person serving as a ground guide should be in place, eight to ten feet directly behind the left rear of the ambulance. Audio and visual communications should be established between the operator and the ground guide.

8.5.16 Understanding special transport procedures,

8.5.17 Undertaking special safety precautions with multiple personnel in the patient compartment,

8.5.18 Safely using and loading patient handling equipment,

8.5.19 Utilizing other crew members in the operation of the ambulance,

8.5.20 Accepting constructive criticism from other crew members, and

8.5.21 Utilizing safe procedures for operating in oncoming traffic lanes.

8.6 Controlled intersection management during emergency response mode:

8.6.1 300 ft (91.44 m) prior to the intersection the siren should be in the wail mode.

8.6.2 150 ft (45.72 m) prior to the intersection the operator shall active the yelp mode of the siren.

8.6.3 The operator's foot should be removed from the accelerator to cover the brake pedal and allow compression to slow the vehicle enabling the operator to start to apply the brake to bring the ambulance to a complete stop at the crosswalk line.

8.6.4 If the ambulance has an air-driven audible airhorn, give two short blasts on the airhorn.

8.6.5 Look to the left, look to the immediate front, look to the right, and then again to the left. The operator may then proceed through the intersection under ten miles per hour if traffic is stopped in all lanes to the left, in front of, and to the right of the ambulance. After the operator has made eye contact with all stopped vehicle drivers, the ambulance may proceed through the intersection exercising the highest degree of care.

8.6.6 Continue the siren yelp mode activation and proceed through the intersection exercising the highest degree of care.

8.6.7 When there are vacant lanes to the left or right, the operator must complete the previous steps of clearing each lane of traffic prior to crossing that lane.

8.6.8 The operator should anticipate that any vacant lane to his left or right may become occupied by another vehicle which did not see or hear the ambulance's warning systems.

8.6.9 The operator should be aware that other emergency vehicles may be approaching the same intersection that the operator has taken control of and the ambulance should not enter the intersection until the other vehicles have stopped or proceeded through the intersection.

8.6.10 The operator should avoid passing stopped vehicles on the right.

8.6.11 The operator should turn right at the intersection only after all vehicles have stopped and drivers on the right are aware of the ambulance.

8.6.12 The operator should anticipate that any vehicles in front may make an unexpected left turn in front of the ambulance after it has started to enter the intersection.

8.6.13 The operator must be aware of other hazards at the intersection, for example, pedestrians, road hazards, defective traffic control systems.

8.7 *Opposing Lane Usage*—The operator shall not enter an opposing traffic lane until it is safe to do so and all other on coming vehicles are aware of the ambulance's presence.

8.8 *Moving Against Traffic*—The operator shall not enter a one-way street against traffic until all opposing traffic is aware of the ambulance's presence and has yielded the right of way.

8.9 *Passing*:

8.9.1 *Stopped Vehicles*—The operator should exercise extreme caution when passing a stopped vehicle on either the left or right.

8.9.2 *School Buses (or Other Like Vehicles)*—The operator shall not pass a school bus when its stop sign and warning lights are activated unless the operator of the school bus signals that it is safe to pass. The ambulance should then proceed using the highest degree of care.

8.9.3 *Moving Vehicles*:

8.9.3.1 The operator shall exercise extreme caution when passing another vehicle in order to assure ample space to overtake and reenter the lane of traffic.

8.9.3.2 Passing on the right is generally not permitted, except when traffic flow is obstructed on the left and the right on multiple-lane highways. The operator may pass between the two lanes of traffic exercising the highest degree of caution.

8.10 *U-Turns*—The operator shall not make U-turns in traffic until all traffic has stopped. When doing so, all warning devices must be activated prior to executing the U-turn.

8.11 *Defensive Driving Techniques*—The operator is responsible for practicing defensive driving techniques under all conditions using the highest degree of care.

8.12 *Parking:*

8.12.1 The operator shall not park the ambulance so as to create a traffic hazard unless warning or other traffic control devices, or both, are being utilized.

8.12.2 *Emergency Scene:*

8.12.2.1 The operator is responsible for safely parking the ambulance at the scene to protect the ambulance, it's crew members, possible patients, and the scene.

8.12.2.2 The operator is responsible for setting the parking brake when the transmission is in the park position.

8.12.2.3 When there is a significant electrical load on the ambulance that is parked, if available the automatic idle advance should be activated.

8.12.2.4 When appropriate, the vehicle should be positioned so that the ambulance will not be required to back into traffic when leaving the scene.

8.13 *Scene Approach and Size-Up*—The operator is responsible for scene evaluation and for safely approaching the scene and overall evaluation of the scene.

8.14 *Multiple-Responding Units:*

8.14.1 The operator is responsible for maintaining a 300-ft (91.44-m) buffer zone between the ambulance and other emergency vehicles in front of the ambulance.

8.14.2 The ambulance and other responding unit(s) should never enter an intersection in tandem.

8.14.3 The operator shall not utilize a law enforcement escort.

8.14.4 The operator shall strongly discourage private, non-emergency vehicles from following the ambulance during transport.

8.15 *Environmental Modifying Factors*—The operator is responsible for keeping the ambulance out of a potentially hazardous scene until such scene has been declared safe by an appropriate authority.

8.16 *Vehicle Operation at Scene:*

8.16.1 *Warning Device Operation*—The operator is responsible for utilization of appropriate warning devices to protect the scene and the vehicle.

8.16.2 *Mechanical/Electrical System:*

8.16.2.1 The operator is responsible for monitoring the mechanical and electrical systems of the vehicle when on scene for an extended period of time.

8.16.2.2 The operator is responsible for monitoring the environmental systems of the vehicle when on scene for an extended period of time.

8.16.3 *Doors/Compartments*—The operator is responsible for ensuring that all vehicle doors are closed at all times except when loading and unloading the patient or equipment.

8.16.4 *Lights*—Scene lights/floodlights/high beams should not be directed in such a way as to blind oncoming traffic.

8.17 *Departing the Scene:*

8.17.1 *Departure Check:*

8.17.1.1 The operator is responsible for performing a quick visual walk-around check of the vehicle, checking for any obvious fluid leakage, open compartments, equipment left on scene before departing the scene.

8.17.1.2 The operator shall be advised by the senior medical technician as to the mode of operation of the ambulance during transport based on the condition of the patient.

## 9. Post Run

9.1 *Decontamination*—Any contamination of the ambulance, operator, equipment, or crew shall be managed in accordance with applicable standards.

9.2 *Resupply*—The operator shall ensure that disposables and other equipment are replaced as necessary to return the ambulance to pre-run status.

9.3 *Fuel:*

9.3.1 The operator shall ensure that the vehicle is replenished and maintained with fuel and other fluids as necessary to return the ambulance to pre-run status.

9.3.2 The operator shall ensure that the proper quality and type of fuel is used in the ambulance pursuant to the manufacturer's specifications.

9.4 *Documentation*—The operator shall ensure that all applicable documentation is completed in accordance with company policy.

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