New Hampshire Department of Safety
Division of Fire Standards and Training & Emergency Medical Services

DRIVER / OPERATOR – ALL VEHICLES

2017 EDITION

CURRICULUM GUIDE

COURSE SIZE-UP

Description	The Driver/Operator-All Vehicles course is designed to provide emergency medical services providers and firefighters with the fundamental knowledge and skills required to drive and operate modern emergency vehicles safely and efficiently. Topics covered include vehicle terminology, design and construction, driving skills, emergency response considerations and skills, and basic maintenance considerations and skills. Additionally, the course includes the National Traffic Incident Management Responder Training program.
Goal	To provide emergency vehicle driver/operators with the fundamental knowledge and skills required to drive, operate, and maintain emergency vehicles safely and efficiently.
NFPA Standard Referenced	NFPA 1002: Standard for Fire Apparatus Driver/Operator Professional Qualifications, 2017 edition
Textbook Referenced	IFSTA Pumping and Aerial Apparatus Driver/Operator Handbook, Third edition
Additional References	● New Hampshire Commercial Driver's License (CDL) Manual ● Federal Motor Carrier Safety Regulations ● NFPA 1451: Standard for a Fire and Emergency Service Vehicle Operations Training Program, 2018 edition ● NFPA 1500: Standard on Fire Department Occupational Safety, Health, and Wellness Program, 2018 edition ● NFPA 1901: Standard for Automotive Fire Apparatus, 2016 edition ● NFPA 1911: Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles, 2017 edition
Prerequisite	Valid Driver's License
Enrollment	● Minimum: 8 Students ● Maximum: 16 Students
Timeline	Total Time Required for Delivery: 24 Hours • Module 1: Understanding Emergency Vehicles: 4 Hours • Module 2: Maintaining Emergency Vehicles: 4 Hours • Module 3: Driving & Operating Emergency Vehicles: 4 Hours • Module 4: Skill Drills: 8 Hours • Traffic Incident Management (TIMs): 4 Hours

COURSE OUTLINE

Module 1: Understanding Emergency Vehicles (4 Hours)

- Activity DOAV 1-1: Emergency Vehicle Types
- Discussion DOAV 1-2: Introduction to Emergency Vehicle Design & Construction
- Activity DOAV 1-3: Emergency Vehicle Design & Construction Breakout Stations

Module 2: Maintaining Emergency Vehicles (4 Hours)

- Activity DOAV 2-1: What is Maintenance?
- Discussion DOAV 2-2: Introduction to Emergency Vehicle Checks
- Activity 2-3: Emergency Vehicle Checks Breakout Stations

Module 3: Driving & Operating Emergency Vehicles (4 Hours)

- Activity DOAV 3-1: Emergency Vehicle Driver/Operator Attributes
- Activity DOAV 3-2: Basic Driving Knowledge
- Activity DOAV 3-3: Emergency Response Knowledge

Traffic Incident Management (4 Hours)

Module 4: Skill Drills (8 Hours)

- Evolution DOAV 4-1: Emergency Vehicle Checks
- Discussion DOAV 4-2: Roles & Responsibilities
- Evolution DOAV 4-3: Basic Driving Skills
- Evolution DOAV 4-4: Emergency Response
- Evolution DOAV 4-5: CDL Maneuvering Skills
- Evolution DOAV 4-6: NFPA Maneuvering Skills

MODULE 1 SIZE-UP

Goal	To provide emergency vehicle driver/operators with an understanding of how modern emergency vehicles differ from passenger vehicles and light trucks.
Objectives	At the conclusion of Module 1, students will be able to: 1. Describe the types of emergency vehicles and have an understanding of the applicable industry standards. 2. Describe the challenges of driving and operating emergency vehicles based on vehicle design. 3. Recognize vehicle components and explain their functions.
NFPA Standard Reference	NFPA 1002: Standard for Fire Apparatus Driver/Operator Professional Qualifications, 2017 edition
Textbook Reference	IFSTA Pumping and Aerial Apparatus Driver/Operator Handbook, Third edition ● Chapter 1 ● Chapter 3: ➢ *Page 93 (Beginning with Starting, Idling, and Shutting Down Apparatus) to Page 98 (Stopping at the end of the Axle/Weight Distribution Section)* ➢ *Page 108 (Beginning with ABS) to Page 112*
Additional References	● New Hampshire Commercial Driver's License (CDL) Manual ● NFPA 1901: Standard for Automotive Fire Apparatus, 2016 edition
Prerequisite	None
Instructor / Student Ratio	● 1 Lead Instructor ● 2 Instructors ● 16 Students
Timeline	Total Time Required for Delivery: 4 Hours ● Activity 1-1: Emergency Vehicle Types ● Discussion 1-2: Introduction to Emergency Vehicle Design & Construction ● Activity 1-3: Emergency Vehicle Design & Construction Breakout Stations

Module 1 Outline

Activity 1-1: Emergency Vehicle Types

Discussion 1-2: Introduction to Emergency Vehicle Design & Construction

Activity 1-3: Emergency Vehicle Design & Construction Breakout Stations

MODULE 1 SET-UP & DELIVERY CONSIDERATIONS

Set-Up

1. Arrange the activity space with tables & chairs to provide for four separate small group work areas, and place the easel stand within view of the dry erase board.

Delivery

1. Divide the class into four groups of four students.

2. Explain the activity:
   - *Students will have 10 minutes to work as a group to answer the questions that will be placed on the easel stand.*
   - *Each group should make a list of their answers.*
   - *At the end of the 10-minute work period, the instructional staff will facilitate a discussion based on each group's answers.*

3. Place the Activity 1-1 Poster Board on the easel stand and provide the groups with 10 minutes to work.

4. At the conclusion of the 10-minute work period, the instructional staff will facilitate a discussion by:
   - *Asking the first group to list one emergency vehicle type and one vehicle challenge.*
   - *A photo of the emergency vehicle type will be taped to the dry erase board.*
   - *The vehicle challenge will be written on the dry erase board.*
   - *The instructional staff will provide a brief description of the vehicle type and challenge.*
   - *The second group will then follow the same format, followed by the third, and then fourth.*
   - *Each group will continue to provide a vehicle type and challenge, one each at a time, until each group's list has been exhausted.*

When each group's list has been exhausted, the instructional staff will ensure that each vehicle type and each vehicle challenge on the Activity 1-1 Reference Charts have been listed and described.

	Driver / Operator – All Vehicles **Activity 1-1** **Emergency Vehicle Types**	
Objective	At the conclusion of Activity 1-1, students will be able to: 1. Describe the types of emergency vehicles and have an understanding of the applicable industry standards. 2. Describe the challenges of driving and operating emergency vehicles based on vehicle design.	
Delivery Format	Group Activity	
Resources Required	● Easel Stand & Activity 1-1 Poster Board ● Large Dry Erase Board & Markers ● Tape & Apparatus Photos	
Instructor / Student Ratio	● 1 Lead Instructor ● 2 Instructors ● 16 Students	

DOAV Activity 1-1 Reference Chart

Prompts

Prompt 1
Make a list of the different types of emergency vehicles.

Prompt 2
Make a list of the purpose specific fixed systems found on the various types of vehicles. *Example: Fire pump*

Prompt 3
Make a list of the challenges / differences in driving emergency vehicles based on their design and construction as compared to a standard passenger car, SUV, or pick-up truck. *Note: There are challenges / differences that pertain to all types of emergency vehicles and challenges / differences that pertain only to specific types of vehicles.*

	DOAV Activity 1-1 Reference Chart **Apparatus Types**	

Staff / Command Cars, SUVs, Pick-Up. Trucks
Ambulances *Type I / Type II / Type III*
Pumper Fire Apparatus
Initial Attack Fire Apparatus *Mini-Pumper / Midi-Pumper*
Mobile Water Supply Fire Apparatus *Tankers / Tenders*
Aerial Fire Apparatus *Aerial Ladder – Tractor Drawn Aerial Ladder (TDA) – Elevating Platform*
Quint Fire Apparatus
Special Service Fire Apparatus *Rescues – Command Posts – Air / Light / Rehab Units*
Mobile Foam Fire Apparatus
Wildland Fire Apparatus
Aircraft Rescue & Fire Fighting Apparatus (ARFF)
Trailers
Personally Owned Vehicles (POVs)

DOAV Activity 1-1 Reference Chart

Fixed Systems

Aerial Device
Auxiliary Suppression Systems (Dry Chemical, CO2, etc.)
Breathing Air Support Systems
Communications Systems
Cot Loading Systems
Cranes
Fire Pumps / Foam Systems
Generators
Hose Beds / Racks (Powered)
Hydraulic Rescue Tools (Permanently Mounted Power Units)
Inverters
Ladder Racks
Light Towers / Scene Lighting (Permanently Mounted)
Portable Tank Racks
Oxygen Cylinder Lifts
Oxygen Delivery Systems
Suction Systems (Medical)
Winches

DOAV Activity 1-1 Reference Chart

Challenges / Differences

They are Higher / Longer / Wider
They are Less Maneuverable *Larger Profile – Steering / Turning – Tail Swing – Backing – Parking / Positioning*
They Weigh More *Weight Distribution – High Center of Gravity – Water Surge*
The Perspective from the Driver's Seat may be Different
They may have Decreased Visibility
They may Accelerate Differently
They are More Difficult to Stop, and Braking May Feel Different
They may have Components which could be different or unfamiliar
They may have Safety Systems which could be different or unfamiliar
They may have Fixed Systems or Equipment which could be different or unfamiliar
They are operated under Emergency Conditions which is very different than normal driving conditions
There may be a lack of Design / Engineering *Older Apparatus – Non-Purpose Built / Home-made Apparatus*
They required Knowledge and Skills beyond those required to drive passenger cars and trucks
They required the Driver to Maintain a High Level of Proficiency

	Driver / Operator – All Vehicles **Discussion 1-2** **Emergency Vehicle Design & Construction**	
Objective	At the conclusion of the Introduction to Emergency Vehicle Design & Construction Discussion, students will be able to: 3. Recognize vehicle components and explain their functions.	
Delivery Format	Instructor Led Discussion	
Resources Required	• Easel Stand & Emergency Vehicle Design & Construction Poster Boards • Large Dry Erase Board & Markers	
Instructor / Student Ratio	• 1 Lead Instructor • 2 Instructors • 16 Students	

DOAV Activity 1-2 Reference Chart

Poster Board 1: Introduction

Overall Apparatus Design Changes:

- Move away from home-built apparatus
- Fully enclosed cabs
    - NFPA 1500 prohibits riding on the exterior of apparatus & strongly discourages riding on the exterior of Wildland apparatus

DOAV Activity 1-2 Reference Chart

Poster Board 2: Cabs

Photos of apparatus w/ cabs highlighted; bodies grayed out

Custom vs. Commercial

Conventional vs. Cab-over / Cab-forward

DOAV Activity 1-2 Reference Chart

Poster Board 3: Frame

Frame Rails

Cross members

DOAV Activity 1-2 Reference Chart

Poster Board 4: Engine

Engine Cooling System

- Engine: Creates Power
- Cooling system

Turbocharger

DOAV Activity 1-2 Reference Chart

Poster Board 5: Exhaust

Exhaust System / Emissions Controls

- Ward No-Smoke system
- Diesel Particulate Filter (DPF)
- Selective Catalytic Reduction (SCR) / Diesel Exhaust Fluid (DEF)
- Idling
    - Avoid low RPMs
    - Causes rapid build-up of excess carbon in DPF
- Regen Inhibit Switch
    - Prevents Regen when vehicle is parked where high exhaust temperatures could/will cause harm/damage
    - Prevents Regen when apparatus is in pump, aerial ops, etc.

Exhaust System / Emissions Controls

- Ward No-Smoke system
- Diesel Particulate Filter (DPF)
- Selective Catalytic Reduction (SCR) / Diesel Exhaust Fluid (DEF)
- Idling
    - Avoid low RPMs
    - Causes rapid build-up of excess carbon in DPF
- Regen Inhibit Switch
    - Prevents Regen when vehicle is parked where high exhaust temperatures could/will cause harm/damage
    - Prevents Regen when apparatus is in pump, aerial ops, etc.

DOAV Activity 1-2 Reference Chart

Poster Board 6: Transmission / Driveline

Transmission: Regulates the power and transmits it to the driveline

DOAV Activity 1-2 Reference Chart

Poster Board 7: Axles

DOAV Activity 1-2 Reference Chart

Poster Board 8: Wheels & Tires

DOAV Activity 1-2 Reference Chart

Poster Board 9: Suspension / Steering

DOAV Activity 1-2 Reference Chart

Poster Board 10: Electrical

Electrical System

- Batteries
- Alternator
- Wiring
- Fuses / Circuit Breakers
- Load Managers: Prevent electrical system overload
- Multi-Plex

DOAV Activity 1-2 Reference Chart

Poster Board 11: Brakes

DOAV Activity 1-2 Reference Chart

Poster Board 12: Safety Systems

	Driver / Operator – All Vehicles **Activity 1-3** **Emergency Vehicle Design & Construction** **Breakout Stations**	
Objective	At the conclusion of Activity 1-3, students will be able to: 3. Recognize vehicle components and explain their functions.	
Delivery Format	Group Activity	
Resources Required		
Instructor / Student Ratio	1 Lead Instructor Station 1: Driveline / Suspension / Steering (Instructor Led) ● 1 Instructor ● 4 Students Station 2: Safety Systems & Features (Student Led) ● 4 Students Station 3: Brakes (Instructor Led) ● 1 Instructor ● 4 Students Station 2: Vehicle Dimensions & Weight (Student Led) ● 4 Students	

DOAV Activity 1-3 Reference Chart

Station 1: Driveline / Suspension / Steering

Demonstration & Discussion Points

1) Driveline

- Driveshaft
- Axles:
  - ⇒ Steer
  - ⇒ Drive:
    - Differential
    - Differential Lock
    - Inter-Axle Lock

2) Suspension

- Purpose:
  - ⇒ Keeps tires in contact with the ground
  - ⇒ Minimizes stress on vehicle components
  - ⇒ Increases ride quality
- Types:
  - ⇒ Coil Spring / Struts
  - ⇒ Leaf Springs / Shock Absorbers
  - ⇒ Rubber Block
  - ⇒ Air
  - ⇒ Hydraulic (Liquid Spring)
  - ⇒ Independent

3) Steering

- Steering Column
- Power Steering Pump / Fluid Reservoir
- Steering Box(s)
- Pitman Arm
- Drag Link
- Steering Arm
- Tie Rods

DOAV Activity 1-3 Reference Chart

Station 2: Safety Features & Systems Prompts

Prompt 1
Explain the purpose and function of the following systems that may be found on a modern emergency vehicle: • **TPMS** • **ABS** • **ATC** • **RSC** • **ESC** • **VDR**

Prompt 2
What components / systems may be found on the exterior of emergency vehicles to increase the safety of the crew and public?

Prompt 3
What components / systems may be found in the cabs and crew compartments of modern emergency vehicles to increase safety of the crew?

Prompt 4
What components / systems may be found in the patient compartment of modern ambulances to increase safety of the crew and patient?

DOAV Activity 1-3 Reference Chart

Station 2: Safety Features & Systems

Discussion Points

Prompt 1
Explain the purpose and function of the following systems that may be found on a modern emergency vehicle: • **TPMS** • **ABS** • **ATC** • **RSC** • **ESC** • **VDR**

TPMS: Tire Pressure Monitoring System
May be a special cap placed on the valve stem of each tire. May be a special sensor within each tire that sends a signal to a digital display on the dashboard.

ABS: Antilock Brakes
Utilize wheel-speed sensors and a computer. When the computer detects that wheels are slipping / losing traction, the system automatically reduces brake pressure to prevent the wheels from locking up. Drivers should maintain firm, steady pressure on the brake pedal during an ABS activation.

ATC: Automatic Traction Control
Uses the ABS system. Reduces engine torque and applies the brakes to wheels that are spinning.

RSC: Roll Stability Control

Uses the ABS system and lateral accelerometers.

When the system senses excessive lateral forces, engine torque is reduced, and the brakes are applied to slow the vehicle and maintain stability.

ESC: Electronic Stability Control

Uses the ABS system, lateral accelerometers, and steering sensors.

When the system senses excessive lateral forces, engine torque is reduced, and the brakes are applied to slow the vehicle, maintain stability, and keep the vehicle oriented in the direction of steering input.

VDR: Vehicle Data Recorder

Required by NFPA 1901.

DOAV Activity 1-3 Reference Chart

Station 2: Safety Features & Systems

Discussion Points

Prompt 2
What components / systems may be found on the exterior of emergency vehicles to increase the safety of the crew and public?

Handrails
Access Steps / Ladders
Non-Slip Surfaces & Walkways
Walkway Safe to Step Markings
Reflective Striping & Trim
Scene / Work Lighting
Audible & Visual Warning Devices
Traffic Preemption Systems
Back-Up Alarms
Rear / Side-Vision Cameras
Wheel Chocks
Tire Chains
Tool Restraints / Brackets
Hose Bed Covers / Hose Restraints

DOAV Activity 1-3 Reference Chart

Station 2: Safety Features & Systems

Discussion Points

Prompt 3
What components / systems may be found in the cabs and crew compartments of modern emergency vehicles to increase safety of the crew?

Seat Belts
Seat Belt Monitoring Systems
Supplemental Restraint Systems
Information Screens / Compartment Ajar Warning Indicators
Reflective Striping & Trim
Work Lighting
Equipment Brackets / Restraints / Cabinets
Clean Cab Designs

	DOAV Activity 1-3 Reference Chart **Station 2: Safety Features & Systems** **Discussion Points**	

Prompt 4
What components / systems may be found in the patient compartment of modern ambulances to increase safety of the crew and patient?

Seat Belts / Harnesses / Position & Design of Seating
Supplemental Restraint Systems
Cot Restraints
Cot Lifting Systems
Equipment Brackets / Restraints / Cabinets

DOAV Activity 1-3 Reference Chart

Station 3: Brakes

Demonstration & Discussion Points

1) Actuating Types & Components

- **Hydraulic:**
- **Air:**
  - ⇒ **Start here…**
  - ⇒ **Protection Valve**
- **Air Over Hydraulic**

2) Foundation Brakes

- **Drum**
- **Disc**

3) Auxiliary Brakes

- **Purpose:**
  - ⇒ **Reduce wear on the service brakes**
  - ⇒ **Reduce the chance of brake fade**
  - ⇒ **Required by NFPA 1901 on vehicles over 36,000 pounds**
- **Types:**
  - ⇒ **Engine / Compression**
    - **When activated, no fuel is injected into the cylinder**
    - **With no fuel being fed into the heated air to force the piston down, the exhaust valve opens and dispels the air, which slows the engine**
  - ⇒ **Exhaust**
    - **Restricts the flow of exhaust which slows the engine**
  - ⇒ **Transmission Retarder**
    - **Chamber at the rear of the automatic transmission containing a rotor with vanes**
    - **When the retarder activates, fluid is redirected into the chamber, which slows down the spinning rotor, which slows the driveshaft**
  - ⇒ **Driveline Retarder**
    - **A ring of electric coils surrounds the driveshaft**
    - **When activated, the electric coils produce a magnetic field around the driveshaft which slows it down**

Protection valve shuts off nonessential items (i.e. air horns) when air pressure drops below 80 psi

All auxiliary brakes activate when the throttle is released

DOAV Activity 1-3 Reference Chart

Station 4: Vehicle Dimensions & Weight

Prompts

Prompt 1
What vehicle dimensions should the Driver/Operator know?

Prompt 2
What do the following terms mean and how do they relate to driving an emergency vehicle? • **Wheelbase** • **Turning Radius** • **Cramp Angle** • **Angle of Approach** • **Angle of Departure** • **Breakover Angle** • **Trail Over** • **Tail Swing**

Prompt 3
What do the following terms mean and how do they relate to driving an emergency vehicle? • **Curb Weight** • **Cargo Weight** • **Actual Vehicle Weight** • **GVWR** • **AWR** • **CVWR**

Prompt 4
What does Center of Gravity mean?

Prompt 5
What should the Driver/Operator know about weight distribution?

DOAV Activity 1-3 Reference Chart

Station 4: Vehicle Dimensions & Weight

Discussion Points

Prompt 1
What vehicle dimensions should the Driver/Operator know?

Height Maximum allowable in NH is 13 feet, 6 inches
Width Maximum allowable in NH is 8 feet, 6 inches (102 inches) Common Cab Widths: 96 inches, 98 inches, 100 inches
Length Maximum allowable in NH is 45 feet for a straight truck

DOAV Activity 1-3 Reference Chart

Station 4: Vehicle Dimensions & Weight

Discussion Points

Prompt 2
What do the following terms mean and how do they relate to driving an emergency vehicle? • **Wheelbase** • **Turning Radius** • **Cramp Angle** • **Angle of Approach** • **Angle of Departure** • **Breakover Angle** • **Trail Over** • **Tail Swing**

Wheelbase
The horizontal distance between the center of the front wheels and the center of the rear wheels. In a tandem rear axle vehicle, the center of the front wheels and the center point of the axle group.

Turning Radius
The radius of the tightest circular turn that the vehicle can make.

Cramp Angle
A measurement of the maximum angle that a steer wheel can turn.

Angle of Approach

The angle former by level group and a line from the point where the front tires touch the ground to the lowest projection at the front of the apparatus.

Angle of Departure

The angle formed by level ground and a line from the point where the rear tires touch the ground to the lowest projection at the rear of the apparatus.

Breakover Angle

The angle formed by level ground and a line from the point where the rear tires touch the ground to the bottom of the frame at the wheelbase midpoint.

Trail Over

The difference between the track of the front tires and the rear tires when a vehicle is traveling through a curve or turn.

Tail Swing

The movement of the rear portion of the vehicle (front the rear wheels to the farthest rear point on the vehicle) that moves in the opposite direction from the direction the vehicle is turning.

DOAV Activity 1-3 Reference Chart

Station 4: Vehicle Dimensions & Weight

Discussion Points

Prompt 3
What do the following terms mean and how do they relate to driving an emergency vehicle? • **Curb Weight** • **Cargo Weight** • **Actual Vehicle Weight** • **GVWR** • **AWR** • **CVWR**

Curb Weight
The weight of the vehicle without any equipment or people.

Cargo Weight
The weight of equipment, water, etc.

Actual Vehicle Weight
The actual weight with all equipment, cargo, people, etc. Also known as the in-service weight.

GVWR: Gross Vehicle Weight Rating
The maximum allowable operating weight of a vehicle based on the manufacturer's design and engineering. The GVWR takes into consideration the weight of the vehicle and cargo. The GVWR is required to be marked on the vehicle, typically in the area of the driver (door jamb, rear cab wall, etc.).

AWR: Axle Weight Rating

The maximum allowable weight that can be carried on a single axle.

The AWRs are required to be marked on the vehicle, typically on the same label as the GVWR.

GCWR: Gross Combined Weight Rating

The maximum allowable weight of a truck and trailer.

DOAV Activity 1-3 Reference Chart

Station 4: Vehicle Dimensions & Weight

Discussion Points

Prompt 4
What does Center of Gravity mean?

Center of Gravity
The point at which the vehicle's weight is evenly dispersed and all sides are in balance.

Prompt 5
What should the Driver/Operator know about weight distribution?

Weight Distribution
The maximum allowable side to side weight difference per NFPA 1901 is 7%.

MODULE 2 SIZE-UP

Goal	To provide emergency vehicle driver/operators with an understanding of how to maintain modern emergency vehicles.
Objectives	At the conclusion of Module 2, students will be able to: 1. Describe the components and importance of a preventative maintenance program. 2. List and explain the steps to conduct an in-service check of an emergency vehicle. 3. Recognize deficiencies that would place an emergency vehicle out of service.
NFPA Standard Reference	NFPA 1002: Standard for Fire Apparatus Driver/Operator Professional Qualifications, 2017 edition
Textbook Reference	IFSTA Pumping and Aerial Apparatus Driver/Operator Handbook, Third edition ● Chapter 2: ● *Pages 29 to 68*
Additional References	● New Hampshire Commercial Driver's License (CDL) Manual ● NFPA 1901: Standard for Automotive Fire Apparatus, 2016 edition ● NFPA 1911: Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles, 2017 edition
Prerequisite	Completion of Module 1
Instructor / Student Ratio	● 1 Lead Instructor ● 2 Instructors ● 16 Students
Timeline	Total Time Required for Delivery: 4 Hours ● **Activity 2-1:** What is Maintenance? ● **Discussion 2-2:** Introduction to Emergency Vehicle Checks ● **Activity 2-3:** Emergency Vehicle Checks Breakout Stations

Module 2 Outline

Module 2: Maintaining Emergency Vehicles (4 Hours)

- Activity DOAV 2-1: What is Maintenance?
- Discussion DOAV 2-2: Introduction to Emergency Vehicle Checks
- Activity 2-3: Emergency Vehicle Checks Breakout Stations

Module 2 Set-Up & Delivery Considerations

Notes:

- The procedure for conducting brake checks will be demonstrated using an actual emergency vehicle

	Driver / Operator – All Vehicles **Activity 2-1** **What is Maintenance?**	
Objective	At the conclusion of Activity 2-1, students will be able to: 1. Describe the components and importance of a preventative maintenance program.	
Delivery Format	Group Activity	
Resources Required	● Easel Stand & Activity 2-1 Poster Boards ● Large Dry Erase Board & Markers	
Instructor / Student Ratio	● 1 Lead Instructor ● 2 Instructors ● 16 Students	

	DOAV Activity 2-1 Reference Chart **Maintenance** **Prompts**	

Prompt 1
What is Maintenance?

Prompt 2
What are the components of an emergency vehicle preventative maintenance program?

DOAV Activity 2-1 Reference Chart

Maintenance

Discussion Points

Prompt 1
What is Maintenance?

Maintenance (IFSTA)
Keeping equipment or apparatus in a state of usefulness or readiness.

Preventative Maintenance (NFPA 1911)
The act or work of keeping something in proper condition by performing necessary preventative actions in a routine manner to prevent failure or breakdown.

DOAV Activity 2-1 Reference Chart

Maintenance

Discussion Points

Prompt 2
What are the components of an emergency vehicle preventative maintenance program?

Cleaning
Fueling
Routine Checks
PM Services Fluids & Filters Replaced Lubrication Alignment Torquing Fasteners Replacing Windshield Wipers, Tires, Belts & Hoses, Batteries, etc.
Performance Testing Pump Tests Foam Systems Tests Aerial Tests Electrical System Tests Breathing Air Systems Tests Annual Weight Verification
Documentation

	Driver / Operator – All Vehicles **Discussion 2-2** **Introduction to Emergency Vehicle Checks**	
Objective	At the conclusion of Discussion 2-2, students will be able to: 2. List and explain the steps to conduct an in-service check of an emergency vehicle. 3. Recognize deficiencies that would place an emergency vehicle out of service.	
Delivery Format	Instructor Led Discussion	
Resources Required	● Easel Stands ● Emergency Vehicle Checks Discussion Poster Boards	
Instructor / Student Ratio	● 1 Lead Instructor ● 2 Instructors ● 16 Students	

DOAV Activity 2-2 Reference Chart

Poster Board 1: Introduction

DOAV Activity 2-2 Reference Chart

Poster Board 2: Guiding Documents

What Guides Emergency Vehicle Maintenance & Repair?

- NFPA Standards (1911)
- Federal Motor Carrier Safety Regulations
- Manufacturer's Recommendations
- Department Policies & Procedures

DOAV Activity 2-2 Reference Chart

Poster Board 3: When to Check

When to Check

- Pre-Use
- In-Use
- After-Use

DOAV Activity 2-2 Reference Chart

Poster Board 4: How to Check

CDL Pre-Trip 7 Step Method

- Vehicle Overview
- Check Engine Compartment
- Start Engine / Check Cab
- Stop Engine / Check Lights
- Walkaround Check
- Check Lights
- Start Engine

NHFA 8 Step Emergency Vehicle Check

1) Vehicle Overview
2) Engine Compartment Check
3) Cab Check
4) Exterior Check
5) Brake Check
6) Drive Vehicle
7) Fixed Systems Check
8) Inventory Check

DOAV Activity 2-2 Reference Chart

Poster Board 5: OOS

Out of Service Criteria / Policies & Procedures for Taking a Vehicle Out of Service

DOAV Activity 2-2 Reference Chart

Poster Board 6: Repair

DOAV Activity 2-2 Reference Chart

Poster Board 7: Documentation

	Driver / Operator – All Vehicles **Activity 2-3** **Emergency Vehicle Checks Breakout Stations**	
Objective	At the conclusion of Activity 2-3, students will be able to: 2. List and explain the steps to conduct an in-service check of an emergency vehicle. 3. Recognize deficiencies that would place an emergency vehicle out of service.	
Delivery Format	Group Activity	
Resources Required		
Instructor / Student Ratio	1 Lead Instructor Station 1: Engine Compartment (Instructor Led) ● 1 Instructor ● 4 Students Station 2: Cab (Student Led) ● 4 Students Station 3: Brakes (Instructor Led) ● 1 Instructor ● 4 Students Station 2: Exterior (Student Led) ● 4 Students	

DOAV Activity 2-3 Reference Chart

Station 1: Engine Compartment

Discussion Points

Notes:

- The procedure for conducting a check of the engine compartment will be demonstrated using an actual emergency vehicle
- Brake component checks are listed on the Emergency Vehicle Check Reference Chart but have been omitted from this station as they are covered in Breakout Station 3: Brakes
- Wheel & Tire component checks are listed on the Emergency Vehicle Check Reference Chart but have been omitted from this station as they are covered in Breakout Station 4: Exterior Check

DOAV Activity 2-3 Reference Chart

Station 1: Engine Compartment

Demonstration Points

(2) Engine Compartment
Engine Off – Parking Brake Set – Chocks Set
Verify Adequate Clearance **- Open Hood / Tilt Cab -** ***Verify Safety Support is in Place***
Check for Obvious Fluid Leaks
Check Engine Oil Level / Condition (Cold)
Check Radiator
Check Coolant Level / Condition (Cold)
Check Condition of Hoses
Check Condition of Belts *Alternator / Water Pump / Power Steering*
Check Batteries *Condition / Connections / Mounting / Water Level or Charge Status Indicator*
Check Electrical Wiring
Check Exhaust System Components
Check Frame Rails & Cross Members
Check Front Suspension Components *Springs / Hangers / U-Bolts / Shackles*
Check Front Axle
Check Steering Components *Steering Column / Steering Box / Pitman Arm / Drag Link / Knuckles / Steering Arm / Tie Rods*
Check Power Steering Fluid
Check Front Tires *Tread / Sidewalls / Pressure*
Check Front Wheels / Lug Nuts / Hubs
Check Windshield Washer Fluid
Start Engine **– Check Transmission Fluid Level / Condition (Hot) –** ***Shut Off Engine***
Close Hood / Lower Cab

DOAV Activity 2-3 Reference Chart

Station 2: Cab

Prompts

Prompt 1
What is the function / purpose and normal reading of each gauge?

Prompt 2
What is the function / purpose of each indicator?

Prompt 3
When the ignition is first turned on, which indicator light should illuminate momentarily and then turn off?

Prompt 4
How should the driver/operator adjust the following? • **Seat** • **Steering Wheel** • **Mirrors**

Prompt 5
What is the driver/operator looking for when checking the steering?

Dashboard Labeling:

1. Coolant Temperature (180 to 220)
2. Oil Pressure (25 to 80 psi)
3. Transmission Fluid Temperature (180 to 200)
4. Air Pressure (110 to 130 psi)
5. Turbo Pressure
6. Voltmeter (12 to 14 volts)
7. Air Filter Minder
8. Fuel Level
9. DEF Level
10. ATC Indicator Light
11. Low Air Pressure Indicator Light
12. Low Voltage Indicator Light
13. Multi-Plex Error Indicator Light
14. Check Engine Indicator Light
15. Stop Engine Indicator Light
16. Service Required Indicator Light
17. Emissions Malfunction Indicator Light
18. Tractor Control System Indicator Light
19. Tire Pressure Indicator Light
20. High Idle Indicator Light
21. Low Coolant Indicator Light
22. High Coolant Temperature Indicator Light
23. Low Oil Pressure Indicator Light
24. Cab Door Open Indicator Light
25. Wait to Start Indicator Light
26. High Transmission Temperature Indicator Light
27. Check Transmission Indicator Light
28. ABS Indicator Light
29. Water in Fuel Indicator Light
30. Low DEF Indicator Light
31. SRS Indicator Light
32. DPF Indicator Light
33. High Exhaust Temperature Indicator Light

DOAV Activity 2-3 Reference Chart

Station 3: Brakes

Demonstration Points

Hydraulic Brakes

Air Brakes

- Components
  - Compressor
  - Air Lines
  - Air Drier
  - Tanks
  - Air Chambers
  - Slack Adjustors
  - Drums / Shoes
  - Discs / Pads
- In-Cab Check

DOAV Activity 2-3 Reference Chart

Station 3: Brakes

Demonstration Points - Hydraulic

(2) Engine Compartment
Engine Off – Parking Brake Set – Chocks Set
Check Brake Fluid Level / Condition
Check Brake Lines
Check Drums / Shoes or Rotors & Calipers / Pads

(5) Brake Check: Hydraulic
Engine Off – Parking Brake Set – Chocks Set
Pump Brake Pedal 3 Times
Press Brake Pedal & Hold for 5 Seconds *Pedal Should Not Move*

DOAV Activity 2-3 Reference Chart

Station 3: Brakes

Demonstration Points - Air

(2) Engine Compartment
Engine Off – Parking Brake Set – Chocks Set
Check Air Compressor / Belt
Check Air Lines
Check Air Chambers
Check Drums / Shoes / Slack Adjustors or Rotors & Calipers / Pads
Check Air Drier

(5) Brake Check: Air
Engine Off – Parking Brake Set – Chocks Set
Start with Air System Fully Charged
Release Parking Brake
Test Air Leakage Rate – Static *Air Pressure should drop No More than 2 PSI in 1 minute*
Test Air Leakage Rate – Service Brakes Applied *Air Pressure should drop No More than 3 PSI in 1 minute*
Check Low Air Pressure Alarms *Visual & Audible – Both MUST Activate before air pressure drops below 60 PSI*
Verify that Parking Brake Applies
Start Engine
Verify Rate of Air Pressure Build-Up *Engine at Operating RPMs – Air Pressure MUST build from 85 PSI to 100 PSI within 45 seconds*
Verify Compressor Cut-In Pressure *Compressor should start at approximately 90 to 100 PSI*
Verify Compressor Cut-Out Pressure *Compressor should stop at approximately 120 to 130 PSI*
Check Service Brake Operation *FMCSR / NFPA: 10,000 lbs + : Must stop within 35 ft at 20 mph*
Check Parking Brake Operation *Should hold vehicle on 20% grade / steepest in AHJ*

DOAV Activity 2-3 Reference Chart

Station 4: Exterior

Prompts

Prompt 1
What should the driver/operator be looking for when checking the Frame?

Prompt 2
What should the driver/operator be looking for when checking the Fuel Tank and Fuel Fill?

Prompt 3
What should the driver/operator be looking for when checking Exhaust components?

Prompt 4
What should the driver/operator be looking for when checking the Driveshaft and Differential?

Prompt 5
What should the driver/operator be looking for when checking the Rear Suspension components?

Prompt 6
What should the driver/operator be looking for when checking Wheels & Tires? • **Hubs?** • **How is the correct tire pressure determined?** • **What is the minimum allowable tire tread depth?**

Prompt 7
What should the driver/operator be looking for when checking Lights?

Reasons for Checking Tire Pressures:

- Incorrect tire pressure can lead to:
    - Increased Braking Distance
    - Creates less responsive steering
    - Increased tire wear
    - Poor fuel economy
    - Underinflation causes the sidewalls to flex which increases heat; high heat can lead to blowout and tread separation

MODULE 3 SIZE-UP

Description	
Goal	To provide emergency vehicle driver/operators with an understanding of the principles and practices for driving emergency vehicles in non-emergency and emergency conditions and situations.
Objectives	At the conclusion of Module 3, students will be able to: 1. Understand the personal attributes of an emergency vehicle driver/operator 2. Understand the vehicle dynamics and handling characteristics of emergency vehicles, including safe driving skills. 3. Understand emergency response considerations.
NFPA Standard Reference	NFPA 1002: Standard for Fire Apparatus Driver/Operator Professional Qualifications, 2017 edition

Textbook Reference	IFSTA Pumping and Aerial Apparatus Driver/Operator Handbook, Third edition
	● Chapter 3:
	  ▯ *Page 79 to Page 93*
	  ▯ *Page 98 (Starting with Driving Downhill) to Page 108 (Stopping before the start of the ABS Section)*
	  ▯ *Page 113 to Page 116*
	  ▯ *Page 118 to Page 131*
	● Chapter 3:
	  ▯ *Page 149 (Starting at Special Positioning Situations) to Page 155*
	● Chapter 16:
	  ▯ *Page 574 to Page 580*

Additional References	● New Hampshire Commercial Driver's License (CDL) Manual ● NFPA 1901: Standard for Automotive Fire Apparatus, 2016 edition ● NFPA 1911: Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles, 2017 edition
Prerequisite	Completion of Modules 1 & 2
Enrollment	Maximum: 16 Students
Timeline	Total Time Required for Delivery: 4 Hours ● Activity 3-1: Emergency Vehicle Driver/Operator Attributes ● Activity 3-2: Basic Driving Knowledge ● Activity 3-3: Emergency Response Knowledge
Staffing	● 1 Lead Instructor ● 1 Instructor

Module 3 Outline

Module 3: Driving & Operating Emergency Vehicles (4 Hours)

- Activity DOAV 3-1: Emergency Vehicle Driver/Operator Attributes
- Activity DOAV 3-2: Basic Driving Knowledge
- Activity DOAV 3-3: Emergency Response Knowledge

Module 3 Set-Up & Delivery Considerations

	Driver / Operator – All Vehicles **Activity 3-1** **Emergency Vehicle Driver/Operator Attributes**	
Objective	At the conclusion of Activity 3-1, students will be able to: 4. Describe the attributes of an emergency vehicle driver/operator.	
Delivery Format	Group Activity	
Resources Required	• Easel Stand & Activity 3-1 Poster Boards • Large Dry Erase Board & Markers • Tape & Apparatus Photos	
Instructor / Student Ratio	• 1 Lead Instructor • 2 Instructors • 16 Students	

	DOAV Activity 3-1 Reference Chart **Driver/Operator Attributes** **Prompt**	

Prompt 1
What are the attributes of a good Driver/Operator?

DOAV Activity 3-1 Reference Chart

Driver/Operator Attributes

Discussion Points

Prompt 1
What are the attributes of a good Driver/Operator?

Knowledgeable
Laws / Regulations / Policies / Procedures
Vehicles / Fixed Systems / Equipment
Area / Community / Response District
NFPA 1002 Requirements
Proficient
Driving Skill
Operation of Fixed Systems & Equipment Carried on the Vehicle
NFPA 1002 Requirements
Qualified
Licenses (CDL?)
Certified (DOAV, DOP, DOA, etc.)
Approved (Department Check-Off procedures for specific vehicles)
Positive Attitude
Safety Oriented
Patient / Able to Control Emotions & Adrenaline Self-Motivated / Prepared
Dependable / Trustworthy
Good Communicator
Knows Capabilities & Limitations
Able to Maintain Situational Awareness / Looks at the Big Picture

Fit for Duty

In-Shape

Healthy
Physically / Mentally

Medically Cleared
Annual Physical / DOT Medical Card / NFPA 1582 Physical

Well-Rested
Awake for 18 Hours is the equivalent of a BAC of 0.08
Awake for 24 Hours is the equivalent of a BAC of 0.10

Sober
Medication (Over the Counter & Prescription) / Alcohol

IAFC Zero Tolerance Policy: No operations for at least 8 hours after consuming alcohol

CDL Manual Examples:
Starting with a BAC of 0.24 at Midnight
BAC of 0.16 at 0600
BAC of 0.05 at 1200

	Driver / Operator – All Vehicles **Activity 3-2** **Basic Driving Knowledge**	
Objective	At the conclusion of Activity 3-2, students will be able to: 1. Understand the vehicle dynamics and handling characteristics of emergency vehicles, including safe driving skills.	
Delivery Format	Group Activity	
Resources Required	• Easel Stand & Activity 3-2 Poster Boards • Noisemakers	
Instructor / Student Ratio	• 1 Lead Instructor • 1 Instructor • 16 Students	

DOAV Activity 3-2 Reference Chart

Basic Driving Knowledge

Question 1

Question 1
What should the Driver/Operator always do before entering the cab?

Question 1 Answer
Circle Safety Check

DOAV Activity 3-2 Reference Chart

Basic Driving Knowledge

Question 2

Question

What should the Driver/Operator do to safely enter and exit the cab of the vehicle?

Answer

- **Maintain 3 Points of Contact**
- **Use Hand Holds / Handrails**
- **Avoid using the Steering Wheel if possible**
- **Consider Exiting Backwards**

Activity 3-2 Reference Chart

Question 3

Question

Part 1:

What should the Driver / Operator do upon entering the cab?

Part 2:

What should the Driver / Operator do when starting the vehicle?

Answer

Part 1:

- **Adjust cab features**
  - **Seat**
  - **Steering Wheel**
  - **Mirrors**
- **Fasten Seat Belt / Confirm Crew has Fastened Seat Belts**

Part 2:

- **Turn Batteries On & Pause**
- **Turn Ignition On & Pause**
- **Allow Vehicle to Go Through Prove-Out Cycle**
- **Start Vehicle**

Activity 3-2 Reference Chart

Question 4

Question

How should the Driver / Operator hold the steering wheel to maintain the most control of the vehicle?

Answer

- **Use 2 Hands**
- **Place Hands at the 9 & 3 Position to Avoid Air Bags**

Follow-Up

- Discuss hazards of only having one hand on the wheel & palming
- Avoid turning the wheels when the vehicle is stationary
- Push-Pull steering technique will be demonstrated on the driving days

Activity 3-2 Reference Chart

Question 5

Question

What should the Driver / Operator do to safely & efficiently accelerate the vehicle?

Answer

- **Push the throttle gently**
- **Avoid excessive pitch**
- **Remember weight transfer**

Activity 3-2 Reference Chart

Question 6

Question

Where should the Driver / Operator position the vehicle in the travel lane of a road of average width?

Answer

- **Center of the lane**

Activity 3-2 Reference Chart

Question 7

Question

Where should the Driver / Operator position the vehicle in the travel lane of a road of a narrow road?

Answer

- **Closer to the center line**
- **Avoid the soft shoulder**

Follow-Up

- How does wind effect vehicle position?
- Watch for road surfaces that won't support the weight of the apparatus
- Should we drive through standing water on the roadway?
    - Most new custom apparatus have the air intake low in a wheel well

Activity 3-2 Reference Chart

Question 8

Question

Part 1:

Where should the Driver/Operator be looking when driving?

Part 2:

Where should the Driver / Operator NOT be looking when driving?

Answer

Part 1:

- **Ahead of the vehicle: 12-15 seconds**
- **To the sides**
- **To the rear (mirrors)**
- **Gauges**

Part 2:

- **Maps / Resource Books**
- **MDTs / Computers**
- **Cell Phones**

Activity 3-2 Reference Chart

Question 9

Question

What should the Driver/Operator do to safely and efficiently brake the vehicle?

Answer

- **Press the brake gently**
- **Avoid excessive pitch**
- **Remember weight transfer**
- **Gradually trail off the brakes as the vehicle is just about to come to a stop**

Activity 3-2 Reference Chart

Question 10

Question

What are the 3 components / distances that make up Total Stopping Distance?

Answer

- **Perception Distance**
- **Reaction Distance**
- **Braking Distance**

Answer:

- Perception Distance
  - The distance the vehicle travels between the time your eyes see a stimulus and the brain recognizes that there is a need to stop
  - ¾ seconds is the average for a healthy driver
- Reaction Distance
  - The distance the vehicle travels between the time your brain recognizes the need to stop and your foot depresses the brake pedal
  - ¾ second is the average for a healthy driver
- Braking Distance
  - The distance it takes for the brakes to stop the vehicle
  - Depends on condition of the brakes, condition of the tires, pavement conditions, etc.
  - Air brakes may only be 65% efficient:
    - Lag time due to air
    - Tire composition
    - Brake fade.

Example:

- Vehicle traveling at 55 mph
  - Perception Distance = 60 feet
  - Reaction Distance = 60 feet
  - Braking Distance = 390 feet
  - Total Stopping Distance = 510 feet
    Football field is 360 feet long

Mass / Momentum: As the mass increases the momentum increases

Activity 3-2 Reference Chart

Question 11

Question

Where should the Driver/Operator position the vehicle to safely and efficiently travel through a corner or make a turn?

Answer

- **Delayed entry / late steering**
- **Avoid Early Entry / Early Steering**
- **Be mindful of trail-over**
- **Be mindful of centrifugal force**
- **Remember weight transfer**
- **Brake in a straight line: 90% of braking should be done before turning. Tires have some braking action.**

Activity 3-2 Reference Chart

Question 12

Question

What safety practices should be followed to safely back the vehicle?

Answer

- **Use spotters**
- **Stay in contact / communication**
  - **- Hand signals**
  - **- Hand Lights at Night**
  - **- Radio**
  - **- Stay in line with the mirror**
- **Don’t back too fast: spotter should not have to run!**
- **If you can’t see the spotter, stop!**
- **If the spotter must move out of the driver’s line of sight, signal the driver to stop**
- **Use of back-up cameras**

Activity 3-2 Reference Chart

Question 13

Question

What should the driver/operator do when encountering decreased visibility while driving?

Answer

- **Reduce speed**
- **Increase following distance**
- **Dim cab lights if possible**

Activity 3-2 Reference Chart

Question 14

Question

What should the driver/operator do when encountering slippery road conditions?

Answer

- **Rain / Wet Leaves / Ice / Snow**
- **Reduce speed**
- **Increase following distance**
- **Correct use of Auxiliary brakes**
- **Correct use of 4wd**
- **Correct use of tire chains**

    - Why do we shut auxiliary brakes off?
- Adverse weather may require 3-5 times more distance to stop
    - Dry Pavement: 59 ft. braking distance
    - Wet Pavement: 75 ft.
    - Snow covered pavement: 137 ft.
    - Ice covered pavement: 174 ft.

Activity 3-2 Reference Chart

Question 15

Question

What should the driver/operator do when a loss of traction occurs?

Answer

●

Answer:

- Stay off the brakes
- Ease off the throttle
- Steer in the direction you want the vehicle to go
- Skids
  - Acceleration Skid
  - Locked wheel skid

Activity 3-2 Reference Chart

Question 16

Question

What should the driver/operator do if the vehicle leaves the roadway?

Answer

- **Stay off the brakes**
- **Ease off the throttle**
- **Let the vehicle coast to a stop**
- **DO NOT oversteer**

Activity 3-2 Reference Chart

Question 17

Question

What should the driver/operator do in the event of brake failure?

Answer

- **Downshift**
- **Apply emergency brake**
- **Allow vehicle to coast to a stop**
- **ID escape routes**

Activity 3-2 Reference Chart

Question 18

Question

What should the driver/operator do in the event of tire failure?

Answer

●

Answer:

- DO NOT brake!
- Accelerate to maintain control
- Once control is reestablished, allow the vehicle to coast to a stop
- Identify escape routes

Activity 3-2 Reference Chart

Question 19

Question

What should the driver/operator do if a hazard is encountered while driving that could cause a collision?

Answer

●

Answer:

- Look for escape routes
- Steer away from a collision
- Accelerate away from a collision
- Brake
    - ABS: Stomp & Stay

Activity 3-2 Reference Chart

Question 20

Question

Part 1:

What should the Driver/Operator do if a hazard is unavoidable, and a collision will occur?

Part 2:

What should the Driver/Operator do after the collision has occured?

Answer

Part 1:

- **Ahead of the vehicle: 12-15 seconds**
- **To the sides**
- **To the rear (mirrors)**
- **Gauges**

Part 2:

- **Maps / Resource Books**
- **MDTs / Computers**
- **Cell Phones**

Part 1: What should the Driver/Operator do if a hazard is unavoidable and a collision will occur?

Answer:

- Steer to avoid a direct impact

Part 2: What should the Driver/Operator do after the collision has occurred?

Answer:

- Call for help
- Secure the scene / preserve evidence
- Treat injuries

- Document
- Drug & alcohol testing?
- Need to have an SOP in place before it happens

	Driver / Operator – All Vehicles **Activity 3-3** **Emergency Response Knowledge**	
Objective	2.	
Resources Required		
Delivery Format	Group Activity	

	DOAV Activity 3-3 Reference Chart **Station 1: Pre-Response** **Set-Up & Prompt**	

Scenario Prompt

You have been dispatched to a call:

- **What things should you think about before starting the response?**
- **What things should you do before starting the response?**

DOAV Activity 3-3 Reference Chart

Station 1: Pre-Response

Discussion Points

Considerations

- Call Type
  - Hot Response
  - Cold Response
- Location
- Time of Day
- Road / Traffic Conditions
- Weather Conditions
- Unusual Circumstances

Actions

- Circle Safety Check
- Start vehicle as early as possible (If station equipped with exhaust removal system)
- Don PPE (if required & as needed) prior to entering vehicle
- Fasten Seat Belt
- Confirm Crew is dressed / seated / belted
- Check mirrors, gauges, instruments
- Confirm address and response route

DOAV Activity 3-3 Reference Chart

Station 2: Speed & Space Management

Set-Up & Prompt

Scenario Prompt

You are responding to a report of a building fire. What do you need to consider and do in regard of speed and space management while responding?

DOAV Activity 3-3 Reference Chart

Station 2: Speed & Space Management

Discussion Points

Discussion Points:

- Speed / Following Distance
  - Leave extra room
  - How effective are the sirens & air horns?
    - Can easily overdrive the siren
    - By the time people hear the sirens & horns they have no time to react
  - NH RSA reference speed
- Visual Habits
  - Aim High in Steering
  - Get the Big Picture
  - Scan
    - Ahead & to the Sides
      - Intersections
      - Shoulders
      - Stopped / Slow Traffic
      - Driveways / Parked Cars
      - Hazards
    - To the Rear (Mirrors)
    - Gauges & Instruments / Indicators
  - Leave an Out
  - Increase Following Distance
  - Make Sure Others Can See You
- Maneuvering Around Traffic
  - Avoid passing on the right
  - Going into the opposite direction of travel
    - Slow down!
    - NH RSA requires use of lights AND sirens

DOAV Activity 3-3 Reference Chart

Station 3: Intersection Management – Stop Signs

Set-Up & Prompt

Scenario Prompt

You are responding to a report of smoke in the building. What do you need to be thinking / doing?

DOAV Activity 3-3 Reference Chart

Station 3: Intersection Management – Stop Signs

Discussion Points

Considerations

- NH RSA / NFPA Standards
- Account for all lanes of traffic
- Siren Use: change tone / pitch prior to entering intersection
- Limited visibility (Fog, snow, buildings, etc) slow down & use extra caution

Notes:

- Intersections are common locations for collisions
- Sirens lose their effectiveness after 50 mph
- Use short bursts of air horns

DOAV Activity 3-3 Reference Chart

Station 4: Intersection Management – Traffic Signals

Set-Up & Prompt

Scenario Prompt

You are responding to an EMS call. What do you need to be thinking / doing?

DOAV Activity 3-3 Reference Chart

Station 4: Intersection Management – Traffic Signals

Discussion Points

Considerations

- NH RSA / NFPA Standards

DOAV Activity 3-3 Reference Chart

Station 5: Railroad Crossings

Set-Up & Prompt

Scenario Prompt

You are responding to confirmed structure fire. What do you need to be thinking / doing?

DOAV Activity 3-3 Reference Chart

Station 5: Railroad Crossings

Discussion Points

Discussion

- Yield to the train

DOAV Activity 3-3 Reference Chart

Station 6: Multiple Responding Units – Same Direction

Set-Up & Prompt

Scenario Prompt

Both companies are responding to a Delta level EMS call. What do both Driver/Operators need to be thinking / doing?

DOAV Activity 3-3 Reference Chart

Station 6: Multiple Responding Units – Same Direction

Discussion Points

Discussion

- Following distance
  - Not too close
  - Not too far: traffic will see the first vehicle but not the second and try to cut in
- Siren use: vary the tone / pitch

DOAV Activity 3-3 Reference Chart

Station 7: Multiple Responding Units – Opposite Directions

Set-Up & Prompt

Scenario Prompt

Both companies are responding to a kitchen fire. What do both Driver/Operators need to be thinking / doing?

DOAV Activity 3-3 Reference Chart

Station 7: Multiple Responding Units – Opposite Directions

Discussion Points

Discussion

- Preemption system use
- Radio communications
- Try to be mindful of where other companies are / are coming from

DOAV Activity 3-3 Reference Chart

Station 8: Stopped School Bus

Set-Up & Prompt

Scenario Prompt

You are responding to a motor vehicle collision with entrapment. What do you need to be thinking / doing?

DOAV Activity 3-3 Reference Chart

Station 8: Stopped School Bus

Discussion Points

Discussion

- NH RSA
- NFPA Standards
- Expect the kids and bus driver to do the unexpected

DOAV Activity 3-3 Reference Chart

Station 9: Ambulance Operations

Set-Up & Prompt

Scenario Prompt

You have responded to an EMS call. Treatment has been started and it has been determined that the patient will be transported to the hospital.

- **What should you consider before starting the transport?**
- **What should do before starting the transport?**
- **What should you do while en-route to the hospital?**

DOAV Activity 3-3 Reference Chart

Station 9: Ambulance Operations

Discussion Points

Discussion

- Response Mode: Hot vs. Cold
  - Does every transport need to be hot?
- Secure Patient:
  - All straps including the shoulder straps
  - Car seats / specialized devices for pediatric patients
- Secure Providers
- Complete procedures before leaving if possible
- Secure Equipment:
  - Cardiac monitor
  - 1st-In Bag
  - Drug Box
    - Obtain medications that might be used during the transport before leaving

DOAV Activity 3-3 Reference Chart

Station 10: Limited Access Roadway Response

Set-Up & Prompt

Scenario Prompt

You have been dispatched to a motor vehicle collision:

- **What should you consider before starting the response?**
- **What should do while responding?**

DOAV Activity 3-3 Reference Chart

Station 10: Limited Access Roadway Response

Discussion Points

Audible warning devices are not effective
Avoid the use of crossovers

MODULE 4 SIZE-UP

Goal	To provide emergency vehicle driver/operators with an opportunity to drive emergency vehicles under routine and simulated non-emergency conditions in a controlled and supervised environment to develop abilities and confidence.
Objectives	At the conclusion of Module 4, students will be able to: 1. Demonstrate the ability to perform and document an Emergency Vehicle Check. 2. List and describe the roles and responsibilities of the driver and crew while operating an emergency vehicle. 3. Explain vehicle dynamics considerations. Demonstrate an understanding of and ability to perform basic driving skills while driving an emergency vehicle. 4. Demonstrate the ability to drive an emergency vehicle under simulated emergency response conditions. 5. Explain the requirements of the CDL Basic Skills Control Test and demonstrate an ability to perform the skills required to complete the test while driving an emergency vehicle. 6. Demonstrate the ability to complete NFPA 1002 maneuvering exercises while driving an emergency vehicle.
NFPA Standard Reference	NFPA 1002: Standard for Fire Apparatus Driver/Operator Professional Qualifications, 2017 edition
Textbook Reference	None
Additional References	● New Hampshire Commercial Driver's License (CDL) Manual ● NFPA 1901: Standard for Automotive Fire Apparatus, 2016 edition ● NFPA 1911: Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles, 2017 edition
Prerequisite	Completion of Modules 1, 2, 3, & TIMs
Instructor / Student Ratio	● 1 Lead Instructor ● 3 Instructors ● 8 Students
Timeline	Total Time Required for Delivery: 8 Hours ● **Evolution 4-1:** Emergency Vehicle Checks ● **Discussion 4-2:** Roles & Responsibilities ● **Evolution 4-3:** Basic Driving Skills ● **Evolution 4-4:** Emergency Response ● **Evolution 4-5:** CDL Maneuvering Skills ● **Evolution 4-6:** NFPA Maneuvering Skills

Module 4 Outline

Module 4: Skill Drills (8 Hours)

- Evolution DOAV 4-1: Emergency Vehicle Checks
- Discussion DOAV 4-2: Roles & Responsibilities
- Evolution DOAV 4-3: Basic Driving Skills
- Evolution DOAV 4-4: Emergency Response
- Evolution DOAV 4-5: CDL Maneuvering Skills
- Evolution DOAV 4-6: NFPA Maneuvering Skills

Module 4 Set-Up & Delivery Considerations

	Driver / Operator – All Vehicles **Evolution 4-1** **Vehicle Checks**	
Objective	At the conclusion of Evolution 4-1, students will be able to: 1. Demonstrate the ability to perform and document an Emergency Vehicle Check.	
Delivery Format	Skills Evolution	
Resources Required		
Instructor / Student Ratio	● 1 Lead Instructor ● 3 Instructors ● 8 Students	

	Driver / Operator – All Vehicles **Discussion 4-2** **Roles & Responsibilities**	
Objective	At the conclusion of Discussion 4-2, students will be able to: 2. List and describe the roles and responsibilities of the driver and crew while operating an emergency vehicle.	
Delivery Format	Instructor Led Discussion / Demonstration	
Resources Required		
Instructor / Student Ratio	● 1 Lead Instructor ● 2 Instructors ● 16 Students	

DOAV Discussion 4-2 Reference Chart

Roles & Responsibilities

Driver

- **Ensure that All Vehicle Occupants are Seated & Belted**
- **Drive & Operate the Vehicle**
- **Prevent / Minimize Distractions**

Officer

- **Ensure that All Vehicle Occupants are Seated & Belted**
- **Prevent / Minimize Distractions**
  - *Limit Conversation to Response & Operations*
- **Operate the Audible Warning Devices**
- **Operate the Radios / Communicate**
- **Navigate**
- **Scan for / Communicate Hazards**

Crew

- **Ensure that All Vehicle Occupants are Seated & Belted**
- **Prevent / Minimize Distractions**
  - *Limit Conversation to Response & Operations*
- **Scan for / Communicate Hazards**

	Driver / Operator – All Vehicles **Evolution 4-3** **Basic Driving Skills**	
Objective	At the conclusion of Evolution 4-3, students will be able to: 3. Explain vehicle dynamics considerations. Demonstrate an understanding of and ability to perform basic driving skills while driving an emergency vehicle.	
Delivery Format	Skills Evolution	
Resources Required		
Instructor / Student Ratio	● 1 Lead Instructor ● 3 Instructors ● 8 Students	

DOAV Evolution 4-3 Reference Chart

Part 1A: Vehicle Positioning Discussion

Discussion Point: Lane Positioning

Roads of Average Width: Center of the Lane

Narrow Roads: Closer To / On the Center Line

Discussion Point: Corner Positioning

Applies to both curves/corners as well as intersections/turns.

Early Steering / Turning Too Soon:

- Also known as Earl Apex.
- Places the vehicle too close to the inside of the curve/corner.
- Increases the risk of placing the vehicle too close to the edge of the roadway/soft shoulder.
- Increases the risk of hitting curbs, signs, other vehicles, etc.
- Poor vehicle handling/energy management technique that leads to excessive lateral forces that can cause vehicle rollover.
- Does not give the driver room to react to, or maneuver around/away from obstacles or obstructions.

Late Steering:

- Also known as Late Apex.
- Places the vehicle closer to the outside of the curve/corner.
- Decreases the risk of placing the vehicle too close to the edge of the roadway/soft shoulder.
- Decreases the risk of hitting curbs, signs, other vehicles, etc.
- Good vehicle handling/energy management technique that minimizes lateral forces and maintains vehicle stability.
- Gives the driver room to react to, or maneuver around/away from obstacles or obstructions.

Discussion Point: Vehicle Design

Conventional Cab:

- **Lane Positioning:** Driver's seat is often positioned inward from the side of the vehicle; feels more similar to cars and SUVs/light trucks making it easier to judge lane position.
- **Corner Positioning:** Driver is seated behind the front axle; feels more similar to cars and SUVs/light trucks making it easier to judge when to start turning.

Cab-Forward / Cab-Over:

- **Lane Positioning:** Driver's seat is positioned farther outward placing the driver closer to the edge of the vehicle making the driver feel as though they are over the centerline of the road.
- **Corner Positioning:** Driver is seated ahead the front axle making the driver feel that they have traveled too far into the corner when they are in the correct position to turn. Drivers must remember that they must drive into the corner slightly farther with this type of cab before they start to turn.

Discussion Point: Where to Look

Drivers must remember to scan, and to look ahead of the vehicle paying attention to the next corner or objective.

During the cone course evolutions, looking at the cones directly in front of the vehicle will place the vehicle in a position that will hit cones.

DOAV Evolution 4-3 Reference Chart

Part 1B: Vehicle Positioning Demonstration

Demonstration: Early Steering / Early Apex

The Early Steering / Early Apex Demonstration is conducted in a Stop-Motion format.

An instructor gathers the students in the center of the demonstration corner to explain the demonstration while a second instructor performs the demonstration. There are four stops with specific discussion points for each stop.

Stop 1: The driver has started to turn (steering input) prior to reaching the corner.

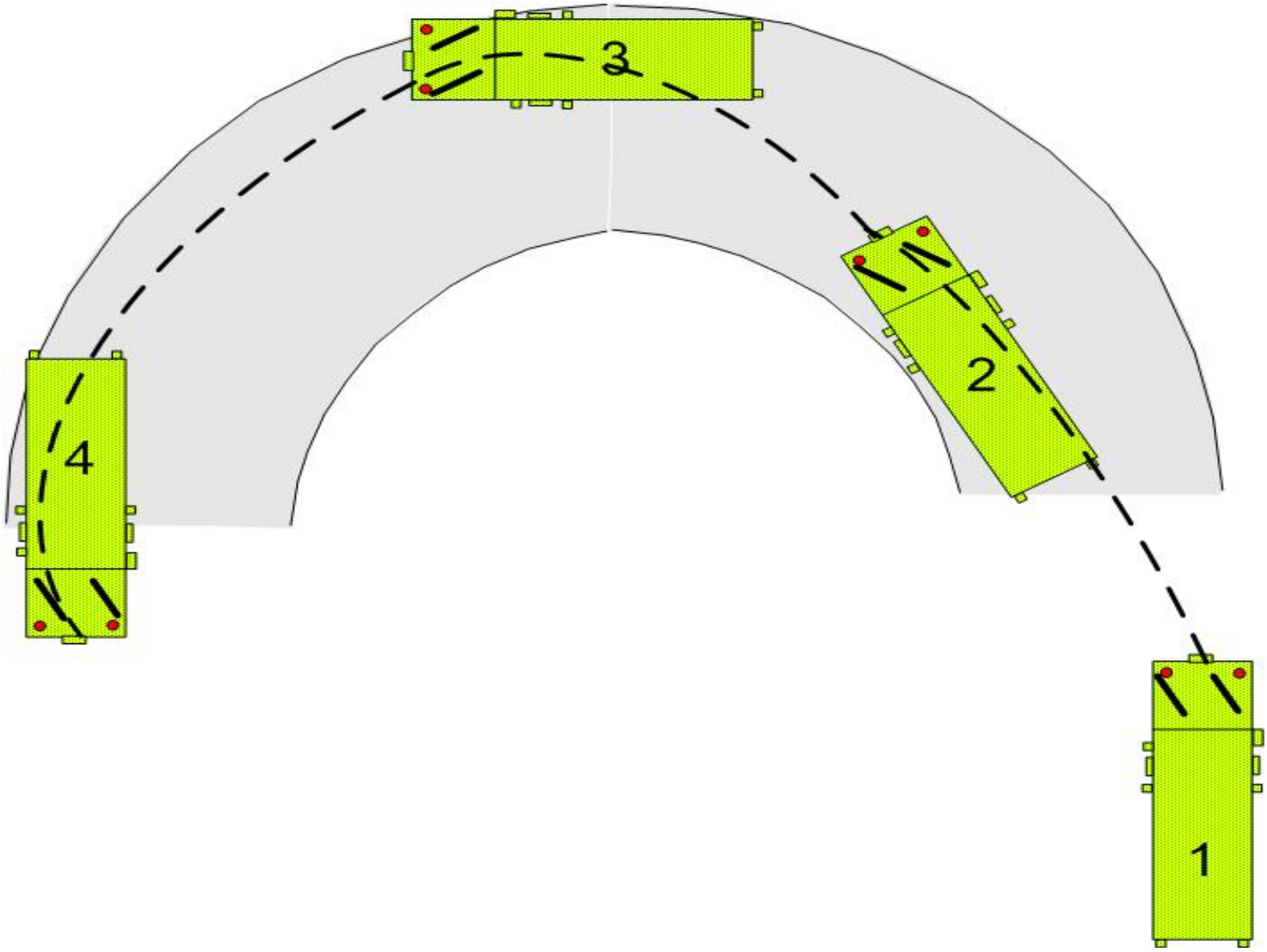
Stop 2: The early steering input places the vehicle on the inside of the corner and too close to the cones.

Note: The instructor driving should purposely place the vehicle in a position that will strike cones on the inside of the corner for emphasis.

Stop 3: As the vehicle continues into the corner it travels to the outside of the corner; in doing so the vehicle travel through the entire footprint of the corner and there is no extra room to maneuver in the event of an obstacle or obstruction. It should also be explained that the front wheels are not facing in the same direction as the driver's line of sight.

Stop 4: As the vehicle exits the corner it is on the outside of the corner and again too close to the edge of the roadway. While the body of the vehicle is in line with the exit of the corner, there is still significant steering input applied and the front wheels are not pointing in the direction of travel. The driver needs to rapidly remove steering input which does not maintain the stability of the vehicle. The driver cannot accelerate until the wheels are back straight which is past the exit of the corner.

The Early Steering / Early Apex Demonstration should be first be conducted with a Conventional Cab vehicle and then repeated with a Cab-Forward / Cab-Over vehicle. The instructor explaining the demonstration should point out the difference in view/perspective from the driver's seat for both vehicles.


3
2
4
1

DOAV Evolution 4-3 Reference Chart

Part 1B: Vehicle Positioning Demonstration

Demonstration: Late Steering / Late Apex

The Late Steering / Late Apex Demonstration is initially conducted in a Stop-Motion format.

An instructor gathers the students in the center of the demonstration corner to explain the demonstration while a second instructor performs the demonstration. There are three stops with specific discussion points for each stop.

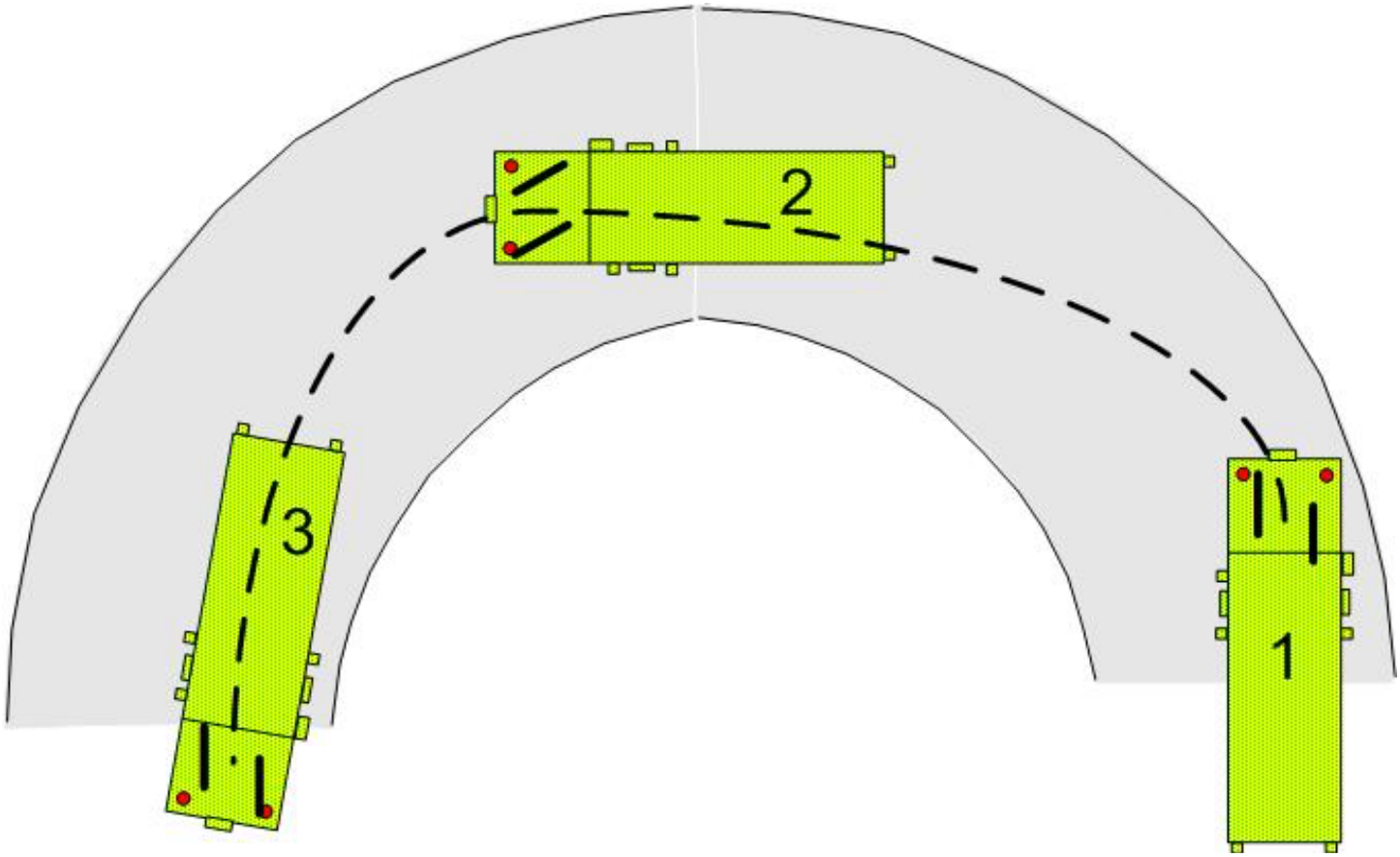
Stop 1: The driver maintains a straight line approaching the corner, enters with the vehicle on the outside of the corner, and travels straight into the corner without any steering input. The driver only starts to turn after entering the corner, at approximately the second cone.

Stop 2: The late steering input places the vehicle in the center of the travel lane, away from the edge of the roadway/soft shoulder. The driver has room to maneuver in the event of an obstacle or obstruction.

Stop 3: As the vehicle continues into the corner it remains centered in the travel lane and the front wheels are more in line with the direction of travel. The overall travel path through the corner has required less steering input which has reduced the lateral forces on the vehicle. As the vehicle nears the exit of the corner the driver can begin to accelerate. Late Steering enables a more efficient travel path through the corner which saves time as compared to Early Steering. Time savings on emergency response come from more efficient driving techniques, not from faster vehicle speeds.

The Early Steering / Early Apex Demonstration should be first be conducted with a Conventional Cab vehicle and then repeated with a Cab-Forward / Cab-Over vehicle. The instructor explaining the demonstration should point out the difference in view/perspective from the driver's seat for both vehicles.

After the Stop-Motion demonstration, the demonstration is conducted a second time in a continuous format. Vehicle speed should be approximately 20 to 25 mph.


2
3
1

DOAV Evolution 4-3 Reference Chart

Part 1C: Vehicle Positioning Skills

Cone Course Orientation
Start here…

	DOAV Evolution 4-3 Reference Chart **Part 2A: Push-Pull Steering Discussion**	

Discussion Point: Steering with One Hand
Start here…

Discussion Point: Push-Pull Steering
Start here…

DOAV Evolution 4-3 Reference Chart

Part 2B: Push-Pull Steering Skills

DOAV Evolution 4-3 Reference Chart

Part 3A: Acceleration & Braking Discussion

Discussion Point

Energy:

- Potential
- Kinetic

Greater mass = greater energy

Inertia: The resistance of an object to any change in it's motion

Momentum:

- The "power" of a moving object – how much force does it carry
- The product of mass (a measure of how much matter in an object) & velocity (how fast something moves in a particular direction)

Mass Doubled – Kinetic energy doubled if speed stays the same

Speed doubled, kinetic energy increases 4x

Speed tripled, kinetic energy increases 9x

Friction / Centrifugal Force

Vehicle Motion

- Pitch
- Roll
- Yaw

Ways to manage energy while the vehicle is in motion:

1. Vehicle Handling
2. Braking
3. Skidding
4. Crashing

The purpose of the driving skills taught are to maintain control of the vehicle through maximum stability and traction

DOAV Evolution 4-3 Reference Chart

Part 3B: Acceleration & Braking Skills

State of New Hampshire Department of Safety
Division of Fire Standards & Training and Emergency Medical Services

Driver / Operator – All Vehicles Certification Exam (2017 edition)

Skill Sheet DOAV-2
Basic Driving Skills
NFPA 1002-2017: 4.3.1

Candidate Number: _____ Date: _____

1st Attempt / Retest Pass / Fail

Vehicle Used: _____

Evaluator: _____

	Points Possible	Points Earned
Completes a 360° Vehicle Safety Check.	1	
Enters cab safely. Adjusts driver's seat, steering wheel, and mirrors.	1	
Fastens seat belt.	1	
Confirms that the vehicle is safe to move (crew seated and belted; equipment in cab secure).	1	
Correctly performs all maneuvers on the predetermined route.	1	
Maintains: • A safe following distance. • Control of the vehicle while accelerating and braking. • Control of the vehicle while cornering and turning. • Reasonable speed for prevailing conditions (Roadway, weather, traffic)	1	
Maintains an awareness of vehicle gauges, instruments, and indicators.	1	
Operates vehicle in accordance with all applicable laws, policies, and procedures.	1	
	8	

Critical Criteria:

____ Fails to correctly complete 8 steps

Document all reasons for not awarding points in the space below:

	Driver / Operator – All Vehicles **Evolution 4-4** **Emergency Response Skills**	
Objective	At the conclusion of Evolution 4-4, students will be able to: 4. Demonstrate the ability to drive an emergency vehicle under simulated emergency response conditions.	
Delivery Format	Skills Evolution	
Resources Required		
Instructor / Student Ratio	● 1 Lead Instructor ● 3 Instructors ● 8 Students	

DOAV Evolution 4-3 Reference Chart

Evolution Orientation

DOAV Evolution 4-3 Reference Chart

Height Restriction

DOAV Evolution 4-3 Reference Chart

Weight Restriction

To Be Developed

DOAV Evolution 4-3 Reference Chart

Intersection: Stop Sign

DOAV Evolution 4-3 Reference Chart

Intersection: Traffic Light with Preemption

DOAV Evolution 4-3 Reference Chart

School Bus

To Be Developed

DOAV Evolution 4-3 Reference Chart

Railroad Crossing

DOAV Evolution 4-3 Reference Chart

Emergency Evasive Maneuver / Stop

State of New Hampshire Department of Safety
Division of Fire Standards & Training and Emergency Medical Services

Driver / Operator – All Vehicles Certification Exam (2017 edition)

Skill Sheet DOAV-6
Restricted Horizontal & Vertical Clearances
NFPA 1002-2017: 4.3.5

Candidate Number: _____ Date: _____

1st Attempt / Retest Pass / Fail

Vehicle Used: _____

Evaluator: _____

	Points Possible	Points Earned
Horizontal Clearance		
Drives the vehicle through the diminishing clearance lane and stops at the designated mark without striking any cones.	1	
Verifies that a safety observer is in place prior to backing the vehicle.	1	
Backs the vehicle through the diminishing clearance lane and stops at the designated mark without striking any cones.	1	
Immediately stops the vehicle if the safety observer moves out of view.	1	
Vertical Clearance		
Determines if the vehicle will safely fit under the simulated vertical height restriction. • If YES: Drives into the designated area. • If NO: Informs the evaluator that there is not sufficient clearance for forward travel.	1	
Verifies that a safety observer is in place prior to backing the vehicle.	1	
Backs the vehicle to the designated starting point.	1	
Immediately stops the vehicle if the safety observer moves out of view.	1	
	8	

Critical Criteria:

____ Fails to correctly complete 8 steps

Document all reasons for not awarding points in the space below:

State of New Hampshire Department of Safety
Division of Fire Standards & Training and Emergency Medical Services

Driver / Operator – All Vehicles Certification Exam (2017 edition)

Skill Sheet DOAV-7
Defensive Driving Skills
NFPA 1002-2017: 4.3.6

Candidate Number: _____ Date: _____

1st Attempt / Retest Pass / Fail

Vehicle Used: _____

Evaluator: _____

	Points Possible	Points Earned
Identifies an imminent hazardous condition or situation that may / will result in a collision.	1	
Takes appropriate action to avoid a collision (evasive maneuvering, emergency braking, acceleration, etc.)	1	
Maintains: • Control of the vehicle while accelerating or braking. • Control of the vehicle while cornering or turning. • Distance away from the object to prevent a collision.	1	
Operates the vehicle in accordance with all applicable laws, policies, and procedures.	1	
	4	

Critical Criteria:

____ Fails to correctly complete 4 steps

Document all reasons for not awarding points in the space below:

State of New Hampshire Department of Safety
Division of Fire Standards & Training and Emergency Medical Services

Driver / Operator – All Vehicles Certification Exam (2017 edition)

Skill Sheet DOAV-9
Emergency Response Initiation
NFPA 1002-2017: 4.4.1

Candidate Number: _____ Date: _____

1st Attempt / Retest Pass / Fail

Vehicle Used: _____

Evaluator: _____

	Points Possible	Points Earned
Receives an emergency call; obtains pertinent information.	1	
Completes a 360° Vehicle Safety Check.	1	
Enters cab safely. Adjusts driver's seat, steering wheel, and mirrors.	1	
Fastens seat belt.	1	
Confirms that the vehicle is safe to respond (crew seated and belted; equipment in cab secure).	1	
	5	

Critical Criteria:

____ Fails to correctly complete 5 steps

Document all reasons for not awarding points in the space below:

State of New Hampshire Department of Safety
Division of Fire Standards & Training and Emergency Medical Services

Driver / Operator – All Vehicles Certification Exam (2017 edition)

Skill Sheet DOAV-10
Telephone Procedures
NFPA 1002-2017: 4.4.2

Candidate Number: _____ Date: _____

1st Attempt / Retest Pass / Fail

Evaluator: _____

	Points Possible	Points Earned
Answers telephone promptly; identifies self and department / agency.	1	
Obtains the following information from the caller: • Nature of the emergency / request for service • Location • Caller's name • Call-back telephone number	1	
Records necessary information.	1	
Provides appropriate follow-up information to the caller (safety information, instructions to evacuate the structure, instructions to call 911, etc.).	1	
	4	

Critical Criteria:

____ Fails to correctly complete 4 steps

Document all reasons for not awarding points in the space below:

State of New Hampshire Department of Safety
Division of Fire Standards & Training and Emergency Medical Services

Driver / Operator – All Vehicles Certification Exam (2017 edition)

Skill Sheet DOAV-10
Radio Procedures
NFPA 1002-2017: 4.4.3

Candidate Number: _____ Date: _____

1st Attempt / Retest Pass / Fail

Evaluator: _____

	Points Possible	Points Earned
Verifies the absence of other radio traffic prior to transmitting.	1	
Holds radio microphone 1-2 inches away from mouth.	1	
Identifies who the message is directed to, identifies self/unit, and waits for a response.	1	
Transmits a message that is clear, concise, and accurate.	1	
Speaks calmly, clearly, distinctly, and at an appropriate speed.	1	
Acknowledges that the message has been received.	1	
Corrects any inaccurate information/messages.	1	
	7	

Critical Criteria:

____ Fails to correctly complete 7 steps

Document all reasons for not awarding points in the space below:

	Driver / Operator – All Vehicles **Evolution 4-5** **CDL Maneuvering Skills**	
Objective	At the conclusion of Evolution 4-5, students will be able to: 5. Explain the requirements of the CDL Basic Skills Control Test and demonstrate an ability to perform the skills required to complete the test while driving an emergency vehicle.	
Delivery Format	Skills Evolution	
Resources Required		
Instructor / Student Ratio	● 1 Lead Instructor ● 3 Instructors ● 8 Students	

DOAV Evolution 4-5 Reference Chart

Evolution Orientation

DOAV Evolution 4-5 Reference Chart

Station 1: Straight Line Backing

Set-Up

DOAV Evolution 4-5 Reference Chart

Station 1: Straight Line Backing

Procedure

1. The D/O drives the vehicle through the lane stopping past the last cones.
2. The D/O backs the vehicle through the lane stopping with the forwardmost portion of the vehicle just past the last cones.
3. The D/O drives through the lane and proceeds to the next station.

Warning!

A Safety Observer MUST be used when the vehicle is backing.

Notes
No portion of the vehicle should extend over the boundary lines of the lane.

DOAV Evolution 4-5 Reference Chart

Station 2: Offset Backing

Set-Up

DOAV Evolution 4-5 Reference Chart

Station 2: Offset Backing

Procedure

1. The D/O drives the vehicle through the left lane stopping far enough past the lane to facilitate maneuvering into the right lane.
2. The D/O backs the vehicle into the right offset lane stopping with the forwardmost portion of the vehicle just past the last cones.
3. The D/O drives out of the right offset lane and proceeds to the next station.

Warning!

A Safety Observer MUST be used when the vehicle is backing.

Notes
No portion of the vehicle should extend over the boundary lines of the lanes.

DOAV Evolution 4-5 Reference Chart

Station 3: Alley Dock

Set-Up

DOAV Evolution 4-5 Reference Chart

Station 3: Alley Dock

Procedure

1. The D/O drives the vehicle into the marked lane.
2. The D/O drives past the alley and positions the vehicle parallel to the outer border of the lane.
3. The D/O backs the vehicle into the alley stopping with the rearmost portion of the vehicle within three feet of the rear of the alley.
4. The D/O drives the vehicle out of the alley, into the lane, and to the next station.

Warning!

A Safety Observer MUST be used when the vehicle is backing.

Notes
No portion of the vehicle should extend over the boundary lines of the lane or alley.

State of New Hampshire Department of Safety
Division of Fire Standards & Training and Emergency Medical Services

Driver / Operator – All Vehicles Certification Exam (2017 edition)

Skill Sheet DOAV-3
Restricted Clearance Backing (Alley Dock)
NFPA 1002-2017: 4.3.2

Candidate Number: _____ Date: _____

1st Attempt / Retest Pass / Fail

Vehicle Used: _____

Evaluator: _____

	Points Possible	Points Earned
Drivers forward into the lane and passes the dock.	1	
Verifies that a safety observer is in place prior to backing the vehicle.	1	
Backs the vehicle into the dock without striking any cones.	1	
Immediately stops the vehicle if the safety observer moves out of view.	1	
	4	

Critical Criteria:

____ Fails to correctly complete 4 steps

Document all reasons for not awarding points in the space below:

DOAV Evolution 4-5 Reference Chart

Station 4: Parallel Parking

Set-Up

DOAV Evolution 4-5 Reference Chart

Station 4: Parallel Parking

Procedure

1. The D/O drives the vehicle in a straight line past the parking space with the vehicle parallel to the space.
2. The D/O backs into the space without crossing the front, side, or rear boundaries.
3. The D/O backs the vehicle to change direction.
4. The D/O drives the vehicle out of the space and proceeds to the next station.

Warning!

A Safety Observer MUST be used when the vehicle is backing.

Notes
No portion of the vehicle should extend over the boundary lines of the space.
The entire vehicle must be positioned within the space.

	Driver / Operator – All Vehicles **Evolution 4-6** **NFPA Maneuvering Skills**	
Objective	At the conclusion of Discussion 4-2, students will be able to: 6. Demonstrate the ability to complete NFPA 1002 maneuvering exercises while driving an emergency vehicle.	
Delivery Format	Skills Evolution	
Resources Required		
Instructor / Student Ratio	● 1 Lead Instructor ● 3 Instructors ● 8 Students	

DOAV Evolution 4-6 Reference Chart

Evolution Orientation

DOAV Evolution 4-6 Reference Chart

Station 1: Confined Space Turnaround

Set-Up

DOAV Evolution 4-6 Reference Chart

Station 1: Confined Space Turnaround Procedure

1. The D/O drives the vehicle into the box through the opening marked by the two lime green cones.
2. The D/O maneuvers the vehicle towards the right side of the box, proceeding towards the far side of the box, and turning towards the left side of the box to position the vehicle in a location that will facilitate backing to change direction.
3. The D/O backs the vehicle to change direction.
4. The D/O drives the vehicle out of the box through the opening marked by the two lime green cones.

Warning!

A Safety Observer MUST be used when the vehicle is backing.

Notes

No portion of the vehicle should extend over the boundary lines of the box.

There is no limitation on the number of times the D/O can maneuver the vehicle to complete the 180° change of direction in the box.

State of New Hampshire Department of Safety
Division of Fire Standards & Training and Emergency Medical Services

Driver / Operator – All Vehicles Certification Exam (2017 edition)

Skill Sheet DOAV-5
Confined Space Turnaround
NFPA 1002-2017: 4.3.4

Candidate Number: _____ Date: _____

1st Attempt / Retest Pass / Fail

Vehicle Used: _____

Evaluator: _____

	Points Possible	Points Earned
Drives into the confined space via the designated opening without striking any cones.	1	
Turns the vehicle 180° within the confined space without positioning the vehicle over the boundary line formed by the cones and without striking any cones.	1	
Verifies that a safety observer is in place prior to backing the vehicle.	1	
Immediately stops the vehicle if the safety observer moves out of view.	1	
Drives out of the confined space via the designated opening without striking any cones.	1	
	5	

Critical Criteria:

____ Fails to correctly complete 5 steps

Document all reasons for not awarding points in the space below:

DOAV Evolution 4-6 Reference Chart

Station 2: Serpentine

Set-Up

DOAV Evolution 4-6 Reference Chart

Station 2: Serpentine

Procedure

1. The D/O drives the vehicle in a straight line to the left of the cones and stops just beyond the last cone.
2. The D/O backs the vehicle to the Left of Cone 1, to the Right of Cone 2, and to the Left of Cone 3. The vehicle should be backed far enough past Cone 3 to center the vehicle on the row of cones and facilitate driving forward through the row.
3. The D/O drives the vehicle forward to the Right of Cone 3, to the Left of Cone 2, and to the Right of Cone 1.

Warning!

A Safety Observer MUST be used when the vehicle is backing.

Notes
A Safety Observer MUST be used when the vehicle is backing.

State of New Hampshire Department of Safety
Division of Fire Standards & Training and Emergency Medical Services

Driver / Operator – All Vehicles Certification Exam (2017 edition)

Skill Sheet DOAV-4
Roadway Obstructions (Serpentine)
NFPA 1002-2017: 4.3.3

Candidate Number: _____ Date: _____

1st Attempt / Retest Pass / Fail

Vehicle Used: _____

Evaluator: _____

	Points Possible	Points Earned
Drives the vehicle in a straight line along the left side of the cones without striking any cones.	1	
Verifies that a safety observer is in place prior to backing the vehicle.	1	
Backs the vehicle to the Left of Cone 1, to the Right of Cone 2, and to the Left of Cone 3 without striking any cones.	1	
Immediately stops the vehicle if the safety observer moves out of view.	1	
Drives the vehicle forward to the Right of Cone 3, to the Left of Cone 2, and to the Right of Cone 1 without striking any cones.	1	
	5	

Critical Criteria:

____ Fails to correctly complete 5 steps

Document all reasons for not awarding points in the space below:

DOAV Evolution 4-6 Reference Chart

Station 3: Diminishing Clearance

Set-Up

DOAV Evolution 4-6 Reference Chart

Station 3: Diminishing Clearance Procedure

1. The D/O drives the vehicle in a straight line into the diminishing clearance lane.
2. The D/O drives through the lane and continues to the finish line of cones placed beyond the lane stopping as close to the cones as possible.
3. The D/O backs the vehicle through the diminishing clearance lane stopping far enough past the lane to facilitate driving forward to the next station.

Warning!

A Safety Observer MUST be used when the vehicle is backing.

Notes
No portion of the vehicle should extend past the finish line. The last cones in the diminishing clearance lane will need to be removed for apparatus with 100” cabs.

Explain that center lane narrows
Explain ocular fixation

State of New Hampshire Department of Safety
Division of Fire Standards & Training and Emergency Medical Services

Driver / Operator – All Vehicles Certification Exam (2017 edition)

Skill Sheet DOAV-6
Restricted Horizontal & Vertical Clearances
NFPA 1002-2017: 4.3.5

Candidate Number: _____ Date: _____

1st Attempt / Retest Pass / Fail

Vehicle Used: _____

Evaluator: _____

	Points Possible	Points Earned
Horizontal Clearance		
Drives the vehicle through the diminishing clearance lane and stops at the designated mark without striking any cones.	1	
Verifies that a safety observer is in place prior to backing the vehicle.	1	
Backs the vehicle through the diminishing clearance lane and stops at the designated mark without striking any cones.	1	
Immediately stops the vehicle if the safety observer moves out of view.	1	
Vertical Clearance		
Determines if the vehicle will safely fit under the simulated vertical height restriction. • If YES: Drives into the designated area. • If NO: Informs the evaluator that there is not sufficient clearance for forward travel.	1	
Verifies that a safety observer is in place prior to backing the vehicle.	1	
Backs the vehicle to the designated starting point.	1	
Immediately stops the vehicle if the safety observer moves out of view.	1	
	8	

Critical Criteria:

____ Fails to correctly complete 8 steps

Document all reasons for not awarding points in the space below: