

CMV Brake Safety Symposium

Indianapolis Dec. 5-7 2006

Session IV – Straw-Man Exercise

Document #3

**Knowledge/Learning
Objectives & Outline**

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Driver Knowledge

General objective:

To ensure drivers have the knowledge and the ability to operate air brake equipped vehicles safely and in compliance with applicable vehicle safety regulations

“Need to know”

Estimated time needed to learn	High	Low
1. Air brake system operation		
a) Knows the basic function and operation of common air brake systems, components and safety features including:		
i) basic operating principles of the entire system		
ii) working knowledge of the general function and operation of:		
(1) foundation brakes		
(2) supply sub-systems and related components		
(3) service-brake sub-systems and related components		
(4) spring (parking/emergency) brake sub-systems and related components.		
(5) trailer brake sub-systems and related components.		
b) Recognizes the visual characteristics, external components		

Estimated time needed to learn	High	Low
2. Air brake system operating demands		
a) Knows air brake-equipped vehicle operating characteristics including:		
i) the effect of speed and weight on vehicle stopping requirements		
ii) the effect of brake adjustment on vehicle braking ability		
iii) tire skidding and the effects of anti-lock brake systems (ABS)		

Estimated time needed to learn	High	Low
3. Air brake system safety regulations		
a) Knows the applicable safety regulations related to air brake systems and is able to identify whether or not a vehicle is compliant		
i) Selected parts of FMVSS 121, 393.40 – 393.55, or equivalent regulations in other jurisdictions		

CMV Brake Safety Symposium – Indianapolis Dec. 5-7 2006

Session IV – Strawman Exercise

Estimated time needed to learn	High	Low
4. Air brake system compliance		
a) Knows and demonstrates safe driver conduct while performing a vehicle inspection.		
b) Identifies air brake system defects as defined in safety regulations, including:		
i) foundation brake component defects		
ii) brake chamber defects		
iii) brake drum and rotor defects		
iv) brake hose and tubing defects		
v) air tank defects		
vi) air compressor defects		
c) Knows and demonstrates methods for testing air brake system and component function to detect the presence of defects and determine compliance with safety regulations, including:		
i) low air pressure warning device		
ii) air pressure build-up time		
iii) air compressor governor settings		
iv) system for air loss rate		
v) tractor protection valve		
vi) automatic application function of the trailer brakes		
vii) vehicle parking brakes		
viii) air tank drain valves		
ix) anti-lock brake system (ABS)		
d) Knows the correct response to brake system safety and performance defects as prescribed by safety regulations.		

Estimated time needed to learn	High	Low
5. Air brake adjustment compliance		
a) Knows and demonstrates methods for inspecting brake adjustment to determine compliance with safety regulations.		
b) Knows the correct response to non-compliant air brake adjustment conditions.		

Technician (Inspector) Knowledge

General objective:

To ensure inspectors have the knowledge and the ability to determine when air brake equipped vehicles are safe and comply with applicable vehicle safety regulations

1. Air brake system operation

- a) Knows the operating principles, function and operation, and demonstrates correct methods for diagnosing, servicing and repairing of common air brake systems, components and safety features including:

(1) foundation brakes

- Air Disc Brakes
- S-Cam Brakes
- Wedge Brakes
- Brake Chambers
- Spring Brake Chambers
- Roto Chambers
- Stroke Indicator

(2) supply sub-systems and related components

- Air Dryer
- Pressure Protection Valve
- Trailer Water Separator
- Governor
- Reservoirs
- Double Check Valve
- Pressure Reducing Valve
- Air Dryer Module
- Dryer Reservoir Module
- Single Check Valve
- Double Check and Stop Light Switch
- In-line Air Filter
- Safety Valves
- Air Compressor
- Trailer Air Dryer
- Low Pressure Indicators

(3) service-brake sub-systems and related components

- Bobtail Ratio Valve
- Automatic Slack Adjuster
- Pressure Protection Valves
- Brake Proportioning Valve
- Control Valve
- Bobtail Proportioning Relay Valve
- Push-Pull Control Valve
- Treadle Valves
- Quick Release Valve
- Stop Lamp Switches
- Synchro Valve
- Relay Valves

Ratio Valve
Modulating Valve

(4) spring (parking/emergency) brake sub-systems and related components.

Dash Control Module
Tractor Protection Valve
Park Control Valve
Trailer Control Valve
Spring Brake Valve

(5) trailer brake sub-systems and related components.

Converter Dolly Systems
Relay Emergency Valve
Synchro Valve
Control Valve
Trailer Release Valve
Reservoir Control Valve
Relay Valve

(6) anti-lock brake systems and related components.

Controller
Diagnostic Unit
ABS/ATC Controller
Modulators
Wheel Speed Sensors

2. Air brake system safety regulations & compliance

- a) Knows all of the applicable safety regulations related to air brake systems in FMVSS 121, 393.40 – 393.55, 396 Appendix G, and equivalent regulations in other jurisdictions
- b) Knows and demonstrates methods for testing air brake system and component function to detect the presence of defects and determine compliance with safety regulations, including:
 - FMVSS 121, 393.40 – 393.55, 396 Appendix G, or equivalent regulations in other jurisdictions
- c) Knows the correct response to brake system safety and performance defects as prescribed by safety regulations.

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Session IV – Strawman Exercise

Enforcement Inspector

General objective:

To ensure inspectors have the knowledge and the ability to determine when air brake equipped vehicles are safe and comply with applicable vehicle safety regulations

(From Driver)

Estimated time needed to learn	High	Low
1. Air brake system operation		
a) Knows the basic function and operation of common air brake systems, components and safety features including:		
i) basic operating principles of the entire system		
ii) working knowledge of the general function and operation of:		
(1) foundation brakes		
(2) supply sub-systems and related components		
(3) service-brake sub-systems and related components		
(4) spring (parking/emergency) brake sub-systems and related components.		
(5) trailer brake sub-systems and related components.		
c) Recognizes the visual characteristics, external components		

Estimated time needed to learn	High	Low
2. Air brake system operating demands		
a) Knows air brake-equipped vehicle operating characteristics including:		
i) the effect of speed and weight on vehicle stopping requirements		
ii) the effect of brake adjustment on vehicle braking ability		
iii) tire skidding and the effects of anti-lock brake systems (ABS)		

Estimated time needed to learn	High	Low
3. Air brake system safety regulations		
a) Knows the applicable safety regulations related to air brake systems and is able to identify whether or not a vehicle is compliant		
i) Selected parts of FMVSS 121, 393.40 – 393.55, or equivalent regulations in other jurisdictions		

CMV Brake Safety Symposium – Indianapolis Dec. 5-7 2006

Session IV – Strawman Exercise

Estimated time needed to learn	High	Low
4. Air brake system compliance		
a) Knows and demonstrates safe driver conduct while performing a vehicle inspection.		
b) Identifies air brake system defects as defined in safety regulations, including:		
i) foundation brake component defects		
ii) brake chamber defects		
iii) brake drum and rotor defects		
iv) brake hose and tubing defects		
v) air tank defects		
vi) air compressor defects		
c) Knows and demonstrates methods for testing air brake system and component function to detect the presence of defects and determine compliance with safety regulations, including:		
i) low air pressure warning device		
ii) air pressure build-up time		
iii) air compressor governor settings		
iv) system for air loss rate		
v) tractor protection valve		
vi) automatic application function of the trailer brakes		
vii) vehicle parking brakes		
viii) air tank drain valves		
ix) anti-lock brake system (ABS)		
d) Knows the correct response to brake system safety and performance defects as prescribed by safety regulations.		

Estimated time needed to learn	High	Low
5. Air brake adjustment compliance		
a) Knows and demonstrates methods for inspecting brake adjustment to determine compliance with safety regulations.		
b) Knows the correct response to non-compliant air brake adjustment conditions.		