

$$[(A - B) / A] \times 100$$

The engine must be operating when power-assisted brakes are checked.

(d) *Brake hoses, master cylinder, tubes and tube assemblies.* Hydraulic brake hoses shall not be mounted so as to contact the vehicle body or chassis. Hoses shall not be cracked, chafed, or flattened. Brake tubes shall not be flattened or restricted. Brake hoses and tubes shall be attached or supported to prevent damage by vibration or abrasion. Master cylinder shall not show signs of leakage. Hose or tube protective rings or devices shall not be considered part of the hose or tubing.

(1) *Inspection procedure.* Examine visually brake master cylinder, hoses and tubes, including front brake hoses, through all wheel positions from full left turn to full right turn for conditions indicated.

[39 FR 26027, July 16, 1974, as amended at 40 FR 5160, Feb. 4, 1975]

**§ 570.56 Vacuum brake assist unit and vacuum brake system.**

The following requirements apply to vehicles with vacuum brake assist units and vacuum brake systems.

(a) *Vacuum brake assist unit integrity.* The vacuum brake assist unit shall demonstrate integrity as indicated by a decrease in pedal height when the engine is started and a constant 50-pound force is maintained on the pedal.

(1) *Inspection procedure.* Stop the engine and apply service brake several times to destroy vacuum in system. Depress the brake pedal with 50 pounds of force and while maintaining that force, start the engine. If the brake pedal does not move slightly under force when the engine starts, there is a malfunction in the power assist unit.

(b) *Low-vacuum indicator.* If the vehicle has a low-vacuum indicator, the indicator activation level shall not be less than 8 inches of mercury.

(1) *Inspection procedure.* Run the engine to evacuate the system fully. Shut off the engine and slowly reduce the vacuum in the system by moderate brake applications until the vehicle vacuum gauge reads 8 inches of mercury. Observe the functioning of the low-vacuum indicator.

(c) *Vacuum brake system integrity.* (1) The vacuum brake system shall demonstrate integrity by meeting the following requirements:

(i) The vacuum brake system shall provide vacuum reserve to permit one service brake application with a brake pedal force of 50 pounds after the engine is turned off without actuating the low vacuum indicator.

(ii) Trailer vacuum brakes shall operate in conjunction with the truck or truck tractor brake pedal.

(2) *Inspection procedure.* (i) Check the trailer vacuum system by coupling trailer(s) to truck or truck tractor and opening trailer shutoff valves. Start the engine and after allowing approximately 1 minute to build up the vacuum, apply and release the brake pedal. In the case of trailer brakes equipped with brake chamber rods, observe the chamber rod movement. Run the engine to re-establish maximum vacuum, then shut off the engine and apply the brakes with a 50-pound force on the brake pedal. Note the brake application and check for low-vacuum indicator activation.

(ii) For a combination vehicle equipped with breakaway protection and no reservoir on the towing vehicle supply line, close the supply line shutoff valve and disconnect the supply line. Apply a 50-pound force to the brake pedal on the towing vehicle and release. Trailer brakes should remain in the applied position.

(d) *Vacuum system hoses, tubes and connections.* Vacuum hoses, tubes and connections shall be in place and properly supported. Vacuum hoses shall not be collapsed, cracked or abraded.

(1) *Inspection procedure.* With the engine running, examine hoses and tubes for the conditions indicated and note broken or missing clamps.

**§ 570.57 Air brake system and air-over-hydraulic brake subsystem.**

The following requirements apply to vehicles with air brake and air-over-hydraulic brake systems. Trailer(s) must be coupled to a truck or truck-tractor for the purpose of this inspection, except as noted.

## § 570.57

## 49 CFR Ch. V (10–1–10 Edition)

(a) *Air brake system integrity.* The air brake system shall demonstrate integrity by meeting the following requirements:

(1) With the vehicle in a stationary position, compressed air reserve shall be sufficient to permit one full service brake application, after the engine is stopped and with the system fully charged, without lowering reservoir pressure more than 20 percent below the initial reading.

(2) The air brake system compressor shall increase the air pressure in the reservoir(s) from the level developed after the test prescribed in § 570.57(a)(1) to the initial pressure noted before the full brake application, with the engine running at the manufacturer's maximum recommended number of revolutions per minute with the compressor governor in the cut-off position, in not more than 30 seconds for vehicles manufactured prior to March 1, 1975. For vehicles, manufactured on or after March 1, 1975, the time allowed for air pressure buildup shall not exceed 45 seconds.

(3) The warning device (visual or audible) connected to the brake system air pressure source shall be activated when air pressure is lowered to an activating level that is not less than 50 psi. For vehicles manufactured to conform to Federal Motor Vehicle Safety Standard No. 121, the low-pressure indicator shall be activated when air pressure is lowered to an activating level that is not less than 60 psi.

(4) The governor cut-in pressure shall be not lower than 80 psi, and the cut-out pressure shall be not higher than 135 psi, unless other values are recommended by the vehicle manufacturer.

(5) Air brake pressure shall not drop more than 2 psi in 1 minute for single vehicles or more than 3 psi in 1 minute for combination vehicles, with the engine stopped and service brakes released. There may be an additional 1 psi drop per minute for each additional towed vehicle.

(6) With the reservoir(s) fully charged, air pressure shall not drop more than 3 psi in 1 minute for single vehicles or more than 4 psi in 1 minute for combination vehicles, with the engine stopped and service brakes fully

applied. There may be an additional 1 psi drop per minute for each additional towed vehicle.

(7) The compressor drive belt shall not be badly worn or frayed and belt-tension shall be sufficient to prevent slippage.

*Inspection procedure.* With the air system charged, open the drain cocks in the service and supply reservoir on the truck or truck-tractor. Note the pressure at which the visual or audible warning device connected to the low-pressure indicator is activated. Close the drain cocks, and, with the trailer(s) uncoupled, check air pressure buildup at the manufacturer's recommended engine speed. Observe the time required to raise the air pressure from 85 to 100 psi. Continue running the engine until the governor cuts out and note the pressure. Reduce engine speed to idle, couple the trailer(s), if applicable, and make a series of brake applications. Note the pressure at which the governor cuts in. Increased engine speed to fast idle and charge the system to its governed pressure. Stop the engine and record the pressure drop in psi per minute with brakes released and with brakes fully applied.

(b) *Air brake system hoses, tubes and connections.* Air system tubes, hoses and connections shall not be restricted, cracked or improperly supported, and the air hose shall not be abraded.

(1) *Inspection procedure.* Stop the engine and examine air hoses, tubes and connections visually for conditions specified.

(c) *Air-over-hydraulic brake subsystem integrity.* The air-over-hydraulic brake subsystem shall demonstrate integrity by meeting the following requirements:

(1) The air brake system compressor shall increase the air pressure in the reservoir(s) from the level developed after the test prescribed in § 570.57(a)(1) to the initial pressure noted before the full brake application, with the engine running at the manufacturer's recommended number of revolutions per minute and the compressor governor in the cut-out position, in not more than 30 seconds for vehicles manufactured prior to March 1, 1975. For vehicles manufactured on or after March 1, 1975, the time for air pressure build up shall not exceed 45 seconds.

(2) The warning device (visual or audible) connected to the brake system air pressure source shall be activated when the air pressure is lowered to not less than 50 psi.

(3) The governor cut-in pressure shall be not lower than 80 psi, and the cut-out pressure shall not be higher than 135 psi, unless other values are recommended by the vehicle manufacturer.

(4) Air brake pressure shall not drop more than 2 psi in 1 minute for single vehicles or more than 3 psi in 1 minute for combination vehicles, with the engine stopped and service brakes released. Allow a 1-psi drop per minute for each additional towed vehicle.

(5) With the reservoir(s) fully charged, air pressure shall not drop more than 3 psi in 1 minute for single vehicles or more than 4 psi in 1 minute for combination vehicles, with the engine stopped and service brakes fully applied. Allow a 1-psi pressure drop in 1 minute for each additional towed vehicle.

(6) The compressor drive belt shall not be badly worn or frayed and belt tension shall be sufficient to prevent slippage.

*Inspection procedure.* With the air system charged, open the drain cocks in the service and supply reservoir on the truck or truck-tractor. Note the pressure at which the visual or audible warning device connected to the low pressure indicator is activated. Close the drain cocks and, with the trailers uncoupled, check air pressure buildup at the manufacturer's recommended engine speed. Observe the time required to raise the air pressure from 85 to 100 psi. Continue running the engine until the governor cuts out and note the pressure. Reduce engine speed to idle, couple trailers, and make a series of brake applications. Note the pressure at which the governor cuts in. Increase engine speed to fast idle and charge the system to its governed pressure. Stop the engine and record the pressure drop in psi per minute with brakes released and with brakes fully applied.

(d) *Air-over-hydraulic brake subsystem hoses, master cylinder, tubes and connections.* System tubes, hoses and connections shall not be cracked or improp-

erly supported, the air and hydraulic hoses shall not be abraded and the master cylinder shall not show signs of leakage.

(1) *Inspection procedure.* Stop the engine and examine air and hydraulic brake hoses, brake master cylinder, tubes and connections visually for conditions specified.

[39 FR 26027, July 16, 1974, as amended at 40 FR 5160, Feb. 4, 1975; 41 FR 13924, Apr. 1, 1976]

#### § 570.58 Electric brake system.

(a) *Electric brake system integrity.* The average brake amperage value shall be not more than 20 percent above, and not less than 30 percent below, the brake manufacturer's maximum current rating. In progressing from zero to maximum, the ammeter indication shall show no fluctuation evidencing a short circuit or other interruption of current.

(1) *Inspection procedure.* Insert a low range (0 to 25 amperes for most 2- and 4-brake systems and 0 to 40 amperes for a 6-brake system) d.c. ammeter into the brake circuit between the controller and the brakes. With the controller in the "off" position, the ammeter should read zero. Gradually apply the controller to the "full on" position for a brief period (not to exceed 1 minute) and observe the maximum ammeter reading. Gradually return the controller to "full off" and observe return to zero amperes. Divide the maximum ammeter reading by the number of brakes and determine the brake amperage value.

(b) *Electric brake wiring condition.* Electric brake wiring shall not be frayed. Wiring clips or brackets shall not be broken or missing. Terminal connections shall be clean. Conductor wire gauge shall not be below the brake manufacturer's minimum recommendation.

(1) *Inspection procedure.* Examine visually for conditions specified.

#### § 570.59 Service brake system.

(a) *Service brake performance.* Compliance with any one of the following performance criteria will satisfy the requirements of this section. Verify that tire inflation pressure is within the limits recommended by the vehicle