



TRUCK / TRACTOR / TRAILER AIR BRAKES

General Air Brake Maintenance and Tolerances

Brake and Wheel End Education

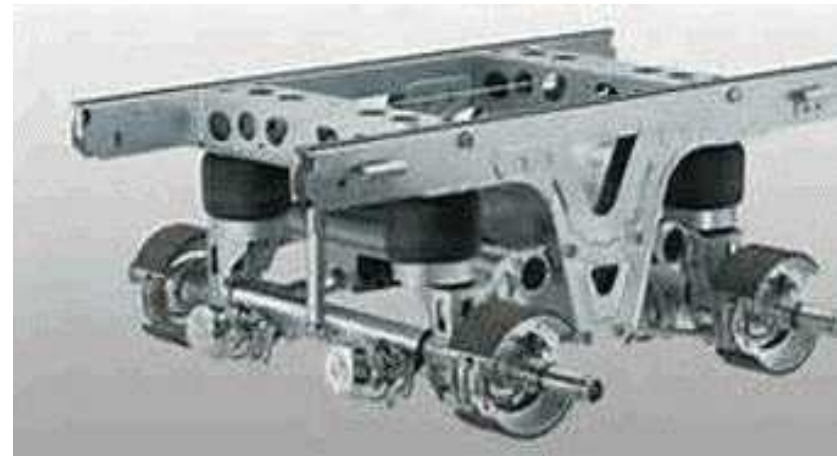
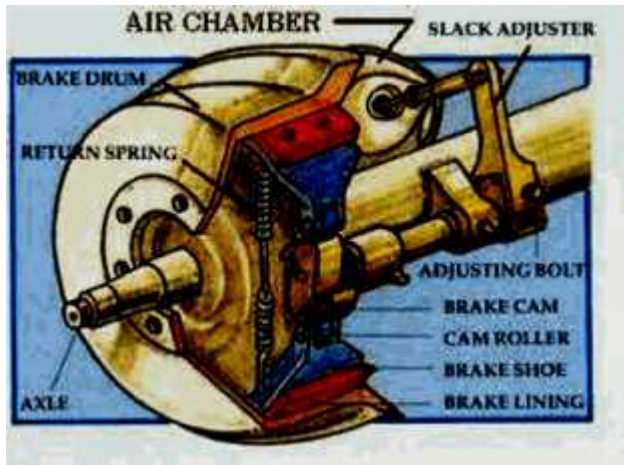
Randy Price, Advanced Brake Instructor, ASE Master Certified

As a result of the changes to Federal Motor Carrier Safety Regulation 49CFR, Part 393.47 on August 15, 2005 this article provides valuable information for reference and the inspection of mechanical components of an air brake system. The new regulations provide for the integrity of the mechanical components. These general specifications are for the mechanical components of the Truck, Tractor and Trailer air brake systems. The limits and procedures were researched through many service, maintenance, operator and specific manufacturer manuals and can be used as general guidance, training and awareness for maintenance and inspection personnel. They are not meant to be all-inclusive. Mechanics and service personnel must consult the specific manufacturer service manual for the vehicle and system being repaired or rebuilt for specifications, limits and proper procedures.



Commercial trucks drivers, from time to time, are stopped by the Department of Transportation (DOT) and asked to perform an air brake test to assure maximum safety of the braking system. The purpose of the inspection is to make sure the brakes do not leak, that the slack adjusters are adjusted properly and that the brakes are balanced in the front and back.

Air Brake System Overview



SLACK ADJUSTER: AUTOMATIC AND MANUAL

- Manual Slack: Service / Adjust every 8,000 miles or monthly
- Automatic Slack: Service / Check (Not Adjust), every 25,000 miles or 90 days
- Free Stroke: 3/8" to 5/8" at clevis area.
- Cam Shaft to Slack / Play: .020" MAX
- Check all clevis pins / yokes for free movement and lubricate every 25,000 miles or 90 days
- "S" Camshaft endplay: .005" - .045"
- "S" Camshaft Backlash / Play Limits: .094" MAX
- "S" Camshaft and Bushing Play: .030" MAX



Automatic Slack Adjusters



Manual Slack Adjusters

BRAKE DRUM

- Diameter wear Limits – Stamped on Drum .120" MAX
 - (Example: 16 1/2" drum / 16.620" MAX wear)
- Drum mounting face rounding over limits: .030" MAX
- Drum run out / out of round limits:
 - Steer Axle: 015" MAX
 - Drive Axle & Trailer Axle: .020" MAX
- Drum bell mouth / taper limits: .010" MAX



AIR DISC ROTORS

- Rotor lateral run out / wobble: .020" MAX
- Rotor Thickness Variation: .005" MAX
- Rotor radial run out: .035" MAX
- Rotor minimum thickness is stamped on each rotor
- Clearance between lining & rotor:
 - Meritor system: .024" - .035" cold between caliper and outboard pad
 - Bendix system: .024" - .043" cold between caliper and inboard pad



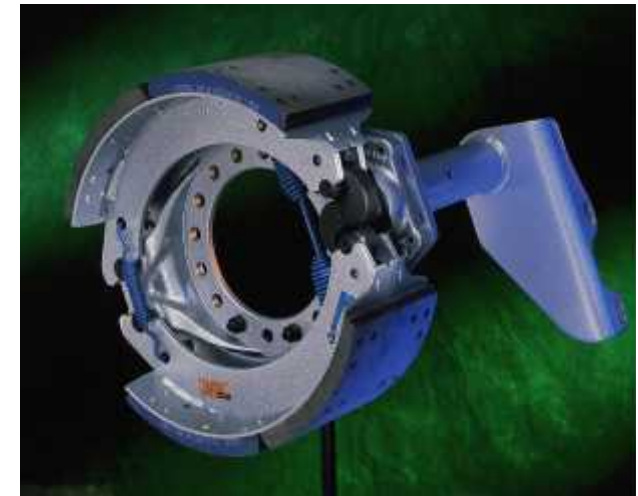
AIR BRAKE CHAMBERS

- Inspect chambers at every brake reline or at least once a year
- Chambers should be replaced in pairs to keep good brake balance on axle
- Never mix match long stroke and standard chambers
- Keep all seal plugs and vents in proper position
- Check torque on mounting bolts



SHOES / LINING / MOUNTING

- Brake shoe anchor pins / bushings on brake spider: .030" MAX
- Brake shoe to drum clearance:
 - New Shoes: .025" MAX
 - Worn Shoes: .015" MAX
- Always use new brake shoe hardware: Springs, rollers, anchor pins and bushings
- Always replace "S" Camshaft bushings at each reline
- Replace all wheel seals at each reline
- Check condition of all wheel bearings
- Adjust wheel bearings to proper torque / end play tolerance
- Check condition of all wheels before mounting
- Always torque wheels to proper specifications (Steel vs. Aluminum)



Advance Brake Toolbox is a Navistar® Parts Education brake training program.

Brake system specifications are located at the Code of Federal Regulations web site

<http://www.gpo.gov/fdsys/pkg/CFR-2000-title49-vol4/xml/CFR-2000-title49-vol4-part393.xml>