Adjustment

Most manual slack adjusters have a spring-loaded locking sleeve that must be pressed in and held so the adjusting bolt can be turned.

Depending upon the orientation of the slack adjuster, you may need to turn the adjusting bolt clockwise or counter-clockwise. There are two indicators to watch for to ensure that you’re tightening and not loosening the slack adjustment.

With a wrench of the proper size, usually a \( \frac{9}{16} \) inch, depress the locking sleeve and turn the adjusting bolt while watching the end of the camshaft. The camshaft will rotate slightly as the bolt is being turned. If you’re turning in the right direction, the cam will rotate in the same direction that it would if the brakes were being applied, as shown by the arrow on the cam end in the diagram below.

If the pushrod goes into the chamber, this indicates that the previous slack adjustment was done incorrectly.

If the slack adjuster is pulling the pushrod out of the chamber when you turn the adjusting bolt, stop. The adjusting bolt is being turned in the wrong direction.

The pushrod and the slack adjuster arm should never move in or out while turning the adjusting bolt.

If the pushrod goes into the chamber, this indicates that the previous slack adjustment was done incorrectly.

Once you know the proper direction, continue turning until solid resistance is met. This indicates that the brake linings have contacted the brake drum.

If the brake has no dust shields, or if you can see the brake shoes and linings through an inspection slot, you can visually verify that the linings have contacted the drum.

Backing off the adjusting bolt about \( \frac{1}{3} \) of a turn should establish correct running clearance between the lining and drum. Be sure the locking sleeve re-engages the bolt so that the adjustment will not back off.
It’s common, especially on tandem axle units, for the adjusting bolts on one axle to adjust in one direction, while the other axle requires an opposite turn. It’s not uncommon to find that the brakes on one or the other axle have been mistakenly backed off, creating a serious safety hazard.

After adjusting, verify that there’s enough clearance by re-measuring the free stroke.

**S-cam brakes — automatic slack adjuster**

All commercial trucks and trailers with air brakes have been manufactured with automatic slack adjusters since 1996. Automatic slack adjusters adjust themselves during normal brake applications made in day-to-day driving.

Automatic slack adjusters are able to maintain brake stroke more reliably than manual slack adjusters. But, automatic slack adjusters must still be checked as part of a pre-trip inspection.

Once properly installed, automatic slack adjusters shouldn’t need manual adjustment. If an automatic slack adjuster strokes beyond the maximum allowed, this usually indicates that there are other brake problems that need to be repaired by a qualified brake service mechanic.

Manual adjustment of automatic slack adjusters is dangerous because it gives a false sense of security about the effectiveness of the braking system. A manual adjustment may temporarily shorten the stroke, but the automatic slack will soon re-set to its designed stroke.

Repeated manual adjustment can cause undue wear on the internal components of the slack adjuster and possibly lead to early failure.

Manufacturers generally recommend that automatic slack adjusters be checked by a mechanic at every chassis lubrication interval, every 40,000 km, or every three months, whichever comes first.

The National Safety Code of Canada as well as American and Mexican laws require a daily check of brake adjustment as part of a pre-trip inspection. As well, in certain mountainous areas of North America, signs are posted requiring trucks to stop and check brakes before proceeding down long grades. These brake checks are required regardless of whether manual or automatic slack adjusters are used.

If a pushrod stroke is excessive during one of these checks, the automatic slack adjuster has either failed, been incorrectly installed, or there is a problem within the foundation brake.

**Checking and adjusting automatic slack adjusters**

Most manufacturers of automatic slack adjusters specify that pushrod stroke be checked by making a 90 to 100 p.s.i. (620 to 690 kPa) application. If you have no application pressure gauge, turn the engine off and pump the reservoir pressure down to between 90 and 100 p.s.i. (620 to 690 kPa) — then make a full application.
Pushrod strokes with automatic slack adjusters are usually slightly longer than with well-adjusted manual slack adjusters. With a typical Type 30 clamp type air chamber and an automatic slack adjuster, the brakes need repair if pushrod measurements are:

- more than ¾ of an inch (20 mm) using the pry method of free stroke measurement, or
- more than two inches (50 mm) using the brake application — applied stroke method.

If a pushrod stroke is excessive, the automatic slack adjuster has either failed, been incorrectly installed, or there is a problem within the foundation brake.

THE FOLLOWING ARE EMERGENCY PROCEDURES ONLY. A REPAIR OR REPLACEMENT MUST BE MADE AS SOON AS POSSIBLE.

Be sure that the vehicle is safely parked with the wheels blocked. The air system should be at full pressure and the spring parking brakes released.

If you make an emergency adjustment of an automatic slack adjuster, be sure to record it on your daily post-trip inspection report. After adjusting, verify that there is sufficient clearance by re-measuring the free stroke.

**Slack adjusters with hexagonal adjusting bolts**

If the slack adjuster has a hexagonal (six-sided) adjusting bolt, the brakes may be set up by turning the adjusting bolt in a **clockwise** direction until the lining contacts the drum. Backing off the adjusting bolt by ½ a turn should restore running clearance. Backing off may take considerable force and you may hear or feel ratcheting. This is normal.
Slack adjusters with square adjusting bolts

If the slack adjuster has a square adjusting bolt located at the bottom end of the body, don’t try adjusting until a spring-loaded pawl that meshes with internal teeth is disengaged. These units have a ¾ inch hexagonal (hex) cap located on the slack adjuster body. Some of these hex caps are equipped with a round “button” that can be pried up approximately 1/32 of an inch (.75 mm) and held, using a screwdriver. On units that don’t have the button, the hex cap, spring and pawl must be removed. With the spring and pawl disengaged, you can do the adjustment.

These brakes must be set up with a counter-clockwise turn until the lining contacts the drum. Turning the adjusting bolt ½ a turn clockwise will restore running clearance. Release the button or re-install the spring and pawl if you removed them.

Air brake adjustment myths

There’s some misinformation about air brakes that you may hear. These myths could be dangerous, if you believe them.

Myth #1:
Brake adjustment can be checked from the cab by making a full brake application and checking for an initial pressure drop of between 8 to 12 p.s.i. (55.2 to 82.8 kPa). The assumption is that as the brake chambers stroke further and further, that more air volume will be required, and this should show up on the reservoir gauges.

Fact #1:
Modern trucks have very large air reservoirs, and even if all the brakes had excess pushrod travel, the pressure drop would not reach the 8 to 12 p.s.i. (55.2 to 82.8 kPa) range. Also, most truck reservoir gauges don’t have fine enough markings to accurately estimate such pressure changes.

Myth #2:
A 90-degree angle between the centre of the slack adjuster arm and the chamber pushrod with the brakes applied is a good indication that the brake is adjusted correctly.

Fact #2:
The 90-degree angle is more dependent on the length of the chamber pushrod than on brake adjustment. Also, to prevent interference between the slack adjuster and suspension parts, some manufacturers will vary the angle up to plus or minus 10 degrees.
Myth #3:
A clockwise turn of the adjusting bolt on a manual slack adjuster will set up the brakes.

Fact #3:
Depending on the orientation of the slack adjuster on the brake assembly, the correct direction to set up the brakes may be clockwise, or counterclockwise. On vehicles with tandem axles, it’s common to find that one axle sets up with a clockwise turn, while the other requires a reverse direction.

Myth #4:
As long as the parking brake control valve is open and the trailer supply valve is open (charged), spring brakes are off and slack adjustment can be checked.

Fact #4:
Some parking brake control valves and trailer supply valves will remain in the open position with as little as 20 p.s.i. (138 kPa) system air pressure. Yet the spring brakes may be partially or fully applied. For this reason, make sure system air pressure is at least 90 to 100 p.s.i. (620 to 690 kPa) and all parking brakes are released before checking brake adjustment.

Myth #5:
Replacing automatic slack adjusters with manual slack adjusters better ensures that the brakes are kept properly adjusted.

Fact #5:
Automatic slack adjusters, as the name implies, automatically adjust for brake wear as the brakes are used. Manual slack adjusters don’t adjust for brake wear until they are manually adjusted. A Transport Canada study showed that vehicles with manual slack adjusters were put out-of-service at a rate 150 per cent higher than those with automatic slack adjusters, because there’s a higher probability that a brake with a manual slack adjuster would be out of adjustment.

Under Yukon Commercial Vehicle Safety and Enforcement rules, it’s illegal to retrofit manual slack adjusters on a vehicle manufactured with automatic slack adjusters.

Review questions

1. Why’s it so critical to check slack adjustment?
2. Who’s ultimately responsible for the brakes on a vehicle?
3. What are the dangers of operating a vehicle where the pushrod travel is barely within tolerance when the brake drums are cold?
4. What items should you carry to measure and adjust slack adjusters?
5. What’s the first thing you should do when preparing to measure slack adjustment?
6. How much pressure should you apply to the foot valve when measuring slack adjustment using the applied stroke method?
7. How do you know you’re turning the adjusting bolt in the correct direction when adjusting a slack adjuster?
8. What’s an advantage of automatic slack adjusters?