SYMPTOM: Leaks

Tip: Determine when leakage occurs.

Static Leakage
- Check for air system contamination.
- Check for backfeed from spring brake valves, tractor protection valves and trailer (if connected).
- Inspect double check valve located between trailer control (hand valve) and brake valve. If this is the cause, leakage will occur when hand brake is applied and foot valve released.

Dynamic Leakage
- Check for air system contamination.
- Inspect double check valve located between trailer control (hand valve) and brake valve. If this is the cause, leakage will occur when hand brake is applied and foot valve released.
**Symptom:** Sensitive Brakes

**Tip:** Inspect foundation brakes

**Possible Causes**
- Incorrect slack adjuster arm length or chamber yoke connected to wrong hole in slack.
- Chamber/slack alignment binding momentarily.
- Inspect friction material.
- Inspect condition of foundation brake components.
- Cam rotation counter to wheel rotation.

**Tip:** Air system freeze-ups (freezes then breaks free)

**Possible Causes**
- Inspect relay valve, quick release valve, brake valve and air lines for proper operation.
- Inspect tire tread condition and determine type (standard or low profile).

**Tip:** Brake valve maintenance items

**Possible Causes**
- Plunger/treadle or pedal sticking:
  - Treadle or pedal hinge pin not lubricated.
  - Plunger and roller not lubricated.
  - Ensure proper treadle with roller.
  - Plunger coated in mounting plate.
  - Boot torn, dirt accumulated around plunger.
- Lubrication:
  - Too much (damages rubber spring and/or boot).
  - Too little - see plunger sticking,
  - Installation - body or mounting plate distortion due to uneven floor board or firewall mounting surface.

**Tip:** Inspect other air system components such as the LQ-4 or BP-1 for malfunction.
General Brake Air Valves

SYMPTOMS:

Leaks
Sensitive Brakes
Brakes Won't Apply Completely
Brakes Won't Release Completely

SYMPTOM: Brakes Won't Apply Completely

Tips

- Brakes not adjusted.
- Automatic slack adjuster malfunction (under adjusting).
- Air line or component freeze-up.
- Relay valve malfunction.
- Faulty foundation brake components.
- Pedal or treadle movement restricted floor board obstruction (tools, cans, gravel, debris).
- Improper chamber/slate adjuster alignment.
- Pushrod binding on chamber non-pressure plate.
- Pushrod too long/short.
- No air pressure in one brake circuit.
- Air lines misconnected to brake valve, relay valve, quick release valve or spring brake valve.
- Plunger/treadle or pedal sticking.

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3/17/2007
SYMPTOM: Brakes Won't Release Completely

Tips

- Parking brakes on, won't release.
- Condition of foundation brake components - springs, shoes, bushings (squeezed) or bent spider.
- Air lines pinched, improperly assembled into fittings or misconnected.
- Check brake valve stop button adjustment.
- System contamination - oil swelled.
- Relay valve - contamination - piston sticking.
- Quick release or ratio valve.
- Chamber/slack adjuster binding.
- Automatic slack adjuster malfunction - over-adjusting.
SYMPTOM: Leaks

Possible Causes

- SR-1 spring brake valve system is contaminated (corrosion, oil, carbon), causing feedback when the PP-1 is in the exhaust or out position.

Corrective Action

- Check brake system for corrosion, oil or carbon and take corrective action. Other possible causes of leakage include improper valve installation. Always carefully inspect (and clean if necessary) valves and fittings to prevent the entry of metal fitting chips. When installing fittings take care not to allow any excess Teflon tape or pipe dope to enter into the valve.
### SYMPTOM: Valve "Pops"

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure is too high.</td>
<td>Wrong PP-1 part number in use. Incorrect plunger spring B. (The rate of downstream pressure loss affects &quot;pop&quot; pressure - the greater the rate of loss the higher the pressure required to activate valve.)</td>
</tr>
<tr>
<td>Pressure is too low.</td>
<td>Wrong PP-1 part number in use. Incorrect plunger spring.</td>
</tr>
</tbody>
</table>
**SYMPTOM:** Bent Pushrod or Loose Push Plate
A bent pushrod or loose push plate indicates that the Chamber was not installed correctly causing improper alignment with the slack adjuster.

**Indications**
- The pushrod is too long or short.
- 90 degree angle between push rod and slack at 1 total chamber stroke.
- Keyholing non-pressure plate.

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3/17/2007
SYMPTOM: Clamp Ring Won't Fit

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<thead>
<tr>
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<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too loose and will not seal.</td>
<td>Vee configuration is distorted (by abusive use of mallet) or diaphragm incorrectly positioned between pressure and non-pressure plate.</td>
</tr>
<tr>
<td>Too tight and cannot install.</td>
<td>Diaphragm incorrectly positioned between pressure and non-pressure plate. You may be able to use the Vee configuration to seal - use mallet and tap evenly around clamp ring.</td>
</tr>
</tbody>
</table>

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ABS | Air Compressors | Air Dryers | General Brake Air Valves
Control Air Valves | Relay Air Valves | Chambers | Auto Slack Adjusters | Manual Slack Adjusters


3/17/2007
SYMPTOM: Leaks Around Clamp Ring

Possible Causes

- Clamp ring incorrectly installed.
- Clamp ring distorted.
- Clamp ring bolts over or undertorqued (tap evenly around clamp ring).

Air Compressor
Symptoms:
- Bent Pushrod or Loose Push Plate
- Clamp Ring Won't Fit
- Leaks Around Clamp Ring
- Weak Return Spring

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3/17/2007
SYMPTOM: Weak Return Spring

The following applies to the return spring for cam and slack adjuster only. Note that the standard return spring force, in pounds, is roughly equal to 1.5 times chamber size number (i.e. Type 30 chamber has approximately 45 pound return spring force at 0. stroke).

Possible Causes

- Broken return spring.
- Air slow to release.
- Weak foundation brake springs.
- Binding parts: Push rod, cam, cam bushings, rollers, anchor pins, rusty guides

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3/17/2007
SYMPTOM: Broken Linkage

Possible Causes
- Physical damage.
- Improper installation.

Corrective Action
- Repair or replace.
- Adjust so that there is a 90 degree angle between actuator push rod and the slack adjuster at 1/2 maximum actuator stroke.
### SYMPTOM: Over-adjusts

<table>
<thead>
<tr>
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<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition of foundation brake components.</td>
<td>Inspect the foundation brake components and repair or replace.</td>
</tr>
<tr>
<td>Improper installation.</td>
<td>Adjust so that there is a 90 degree angle between actuator push rod and the slack adjuster at 1/2 maximum actuator stroke.</td>
</tr>
</tbody>
</table>
### Automatic Slack Adjusters

#### SYMPTOMS:
- Broken Linkage
- Over-adjusts
- Under-adjusts
- Rusted to Cam

#### Possible Causes:
- Physical damage - broken linkage.
- Improper installation.

#### Corrective Action:
- Repair or replace.
- Adjust so that there is a 90 degree angle between actuator push rod and the slack adjuster at 1/2 maximum actuator stroke.

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**Control Air Valves** | **Relay Air Valves** | **Chambers** | **Auto Slack Adjusters** | **Manual Slack Adjusters**
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3/17/2007
SYMPTOM: Rusted To Cam

Corrective Action

» Make sure to lubricate regularly. Regular lubrication helps to prevent slack from rusting to the camshaft.