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The Passport to a Rewarding Automotive Career

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Modern Automotive Technology Chapter 72

Brake System Diagnosis And Repair

North Montco Technical Career Center

Learning Objectives

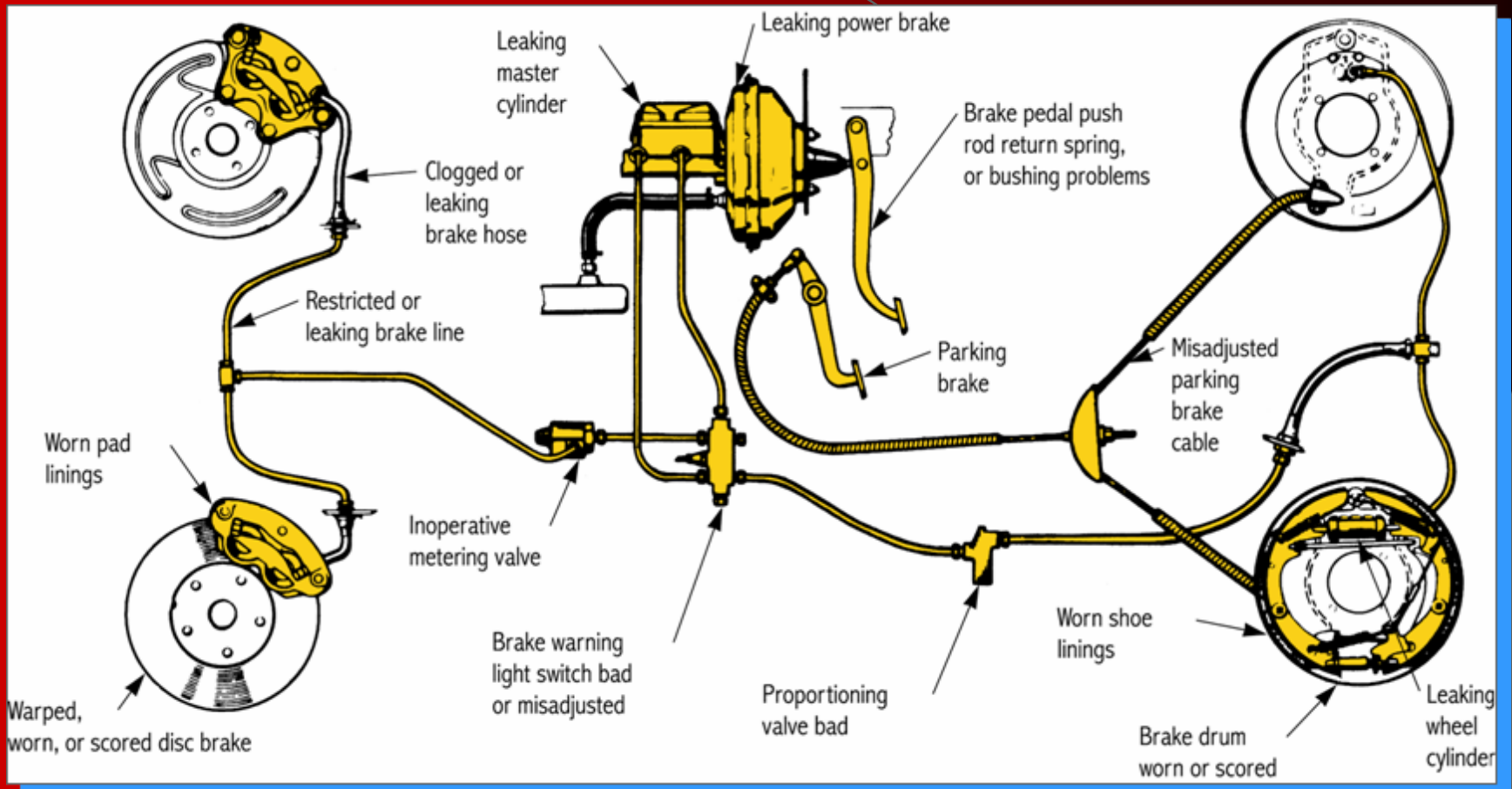
- Diagnose common brake system problems.
- Inspect and maintain a brake system.
- Describe basic procedures for servicing a master cylinder and a brake booster.
- Explain how to service a disc brake assembly.
- Explain how to service a drum brake assembly.
- Describe the procedures for both manual and pressure bleeding of a brake system.
- Cite the safety rules that should be followed when servicing brake systems.

Chapter 72

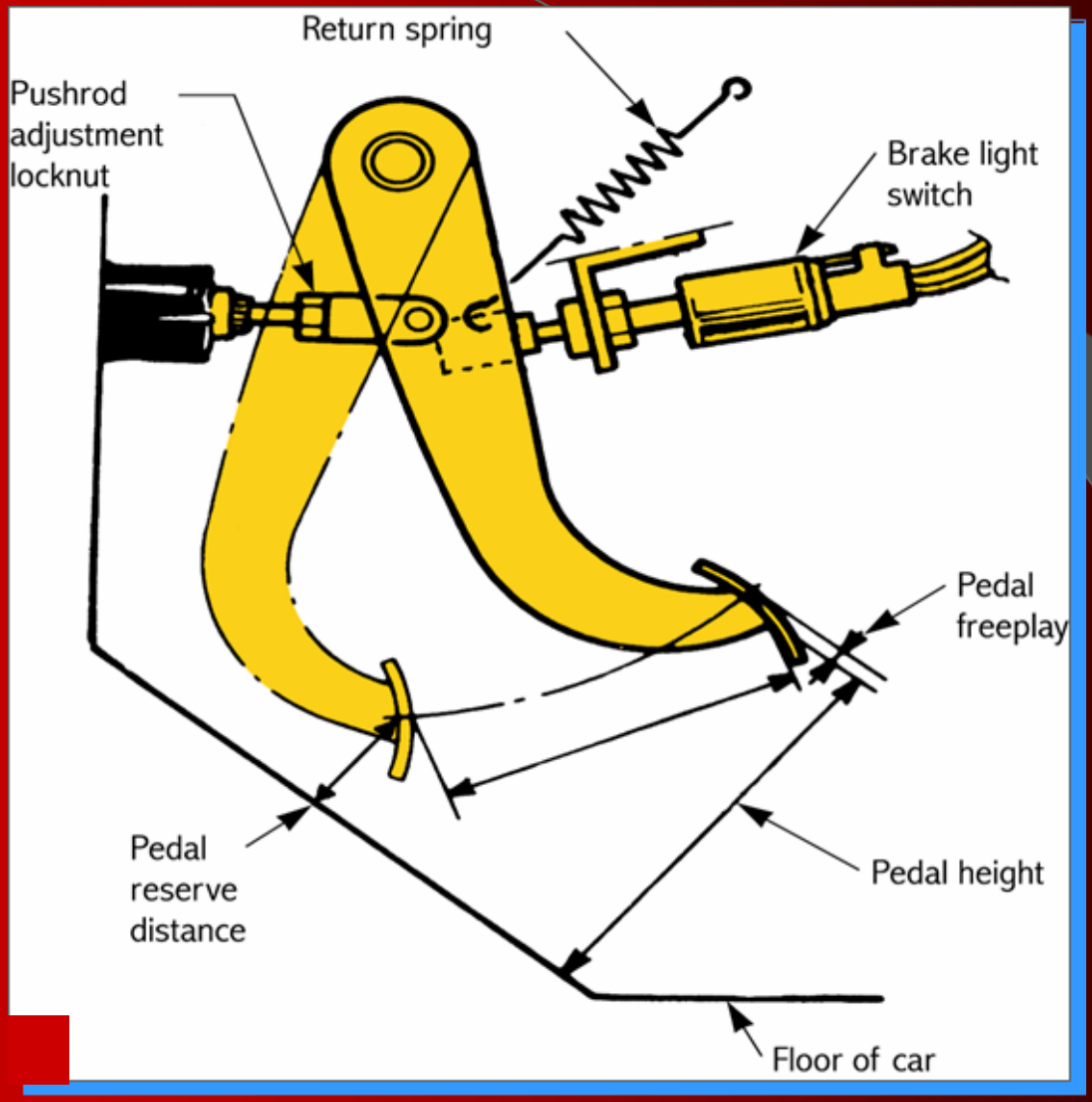
1. Brake Pedal Free-Play is needed to prevent brake drag and overheating.

2. Excessive Brake Pedal Effort is a noticeable increases the amount of pressure needed to apply brakes and stop vehicle.

Brake System Problems



Brake Pedal Free-Play



Excessive Pedal Effort

- Noticeable increase in the amount of foot pressure needed to apply the brakes
- Possible causes:
  - seized wheel cylinder or caliper piston
  - collapsed brake hose or crimped line
  - faulty master cylinder
  - contaminated linings
  - disconnected brake booster vacuum line or defective booster

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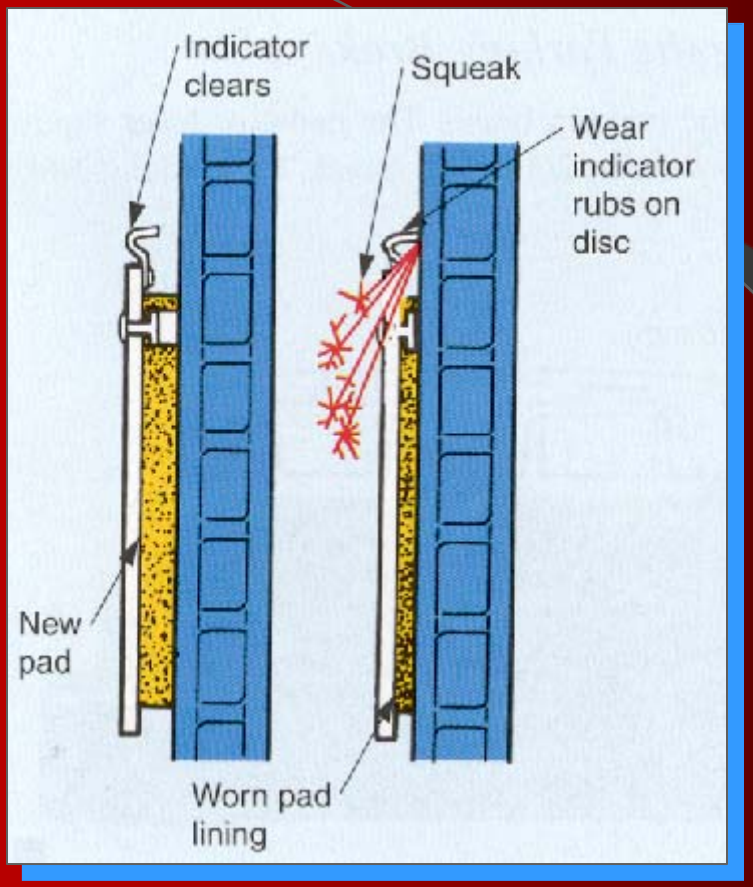
3. Dropping Brake Pedal (Fading) is a symptom where brake pedal slowly moves all the way to the floor when steady pressure is applied to it.

4. Brake Shoe Lining must not be worn thinner than about 1/16″ (2/32”, 1.5 mm).

Dropping Brake Pedal

- Pedal slowly moves all the way to the floor when steady pressure is applied to it
- Pumping usually restores pedal height momentarily
- Possible causes:
  - internal leak in the master cylinder
  - external fluid leak in any component

Disc Brake Inspection



Inspect brake pad linings for thickness, must not be less than 1/16″ (2/32”, 1.5 mm).

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5. A Spongy Brake Pedal is a condition in which brakes apply but pedal does not feel solid; it will travel farther to the floor before full braking action occurs.

6. Grabbing is a condition in which brakes apply too quickly, with only light brake pedal application.

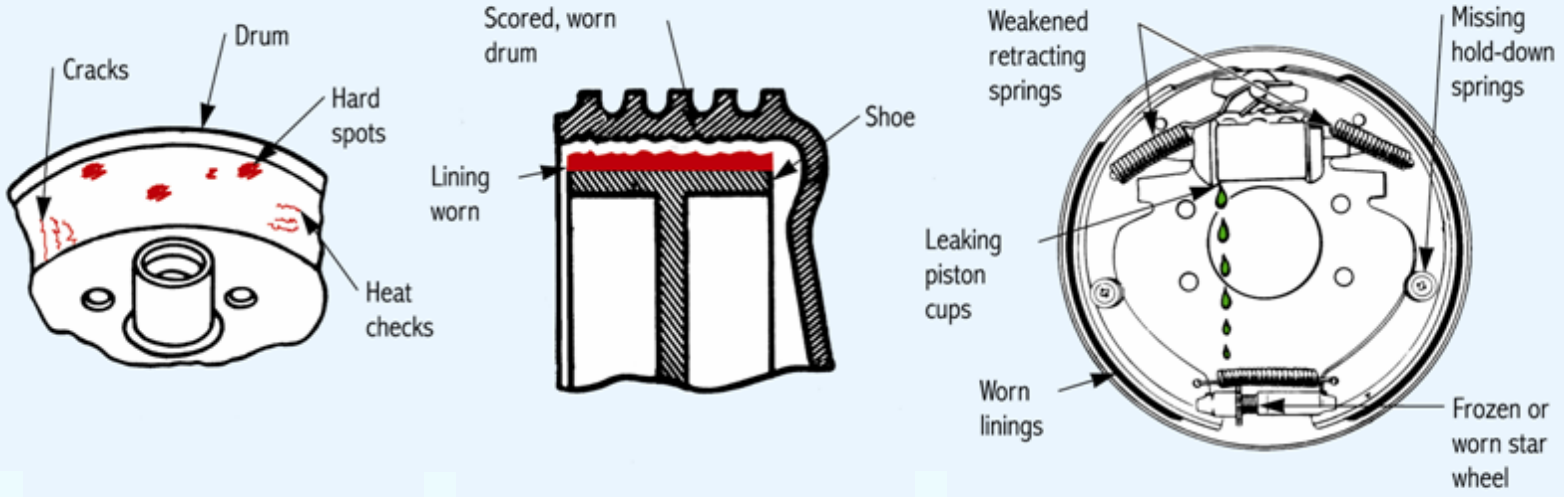
Spongy Brake Pedal

- Brakes will apply, but the pedal does not feel solid
- Possible causes:
  - air in the brake system
  - faulty residual check valve in the master cylinder
  - maladjusted brake shoes

Grabbing Brakes

- Brakes apply too quickly, even with light brake pedal application
- Possible causes:
  - malfunctioning brake booster
  - brake fluid or grease on the linings
  - worn brake linings
  - faulty metering valve
  - mechanical problem in the wheel brake assembly

Causes of Grabbbing



Check the drum for cracks or heat damage

A badly scored drum must be machined

Check for weak springs & leaking wheel cylinders

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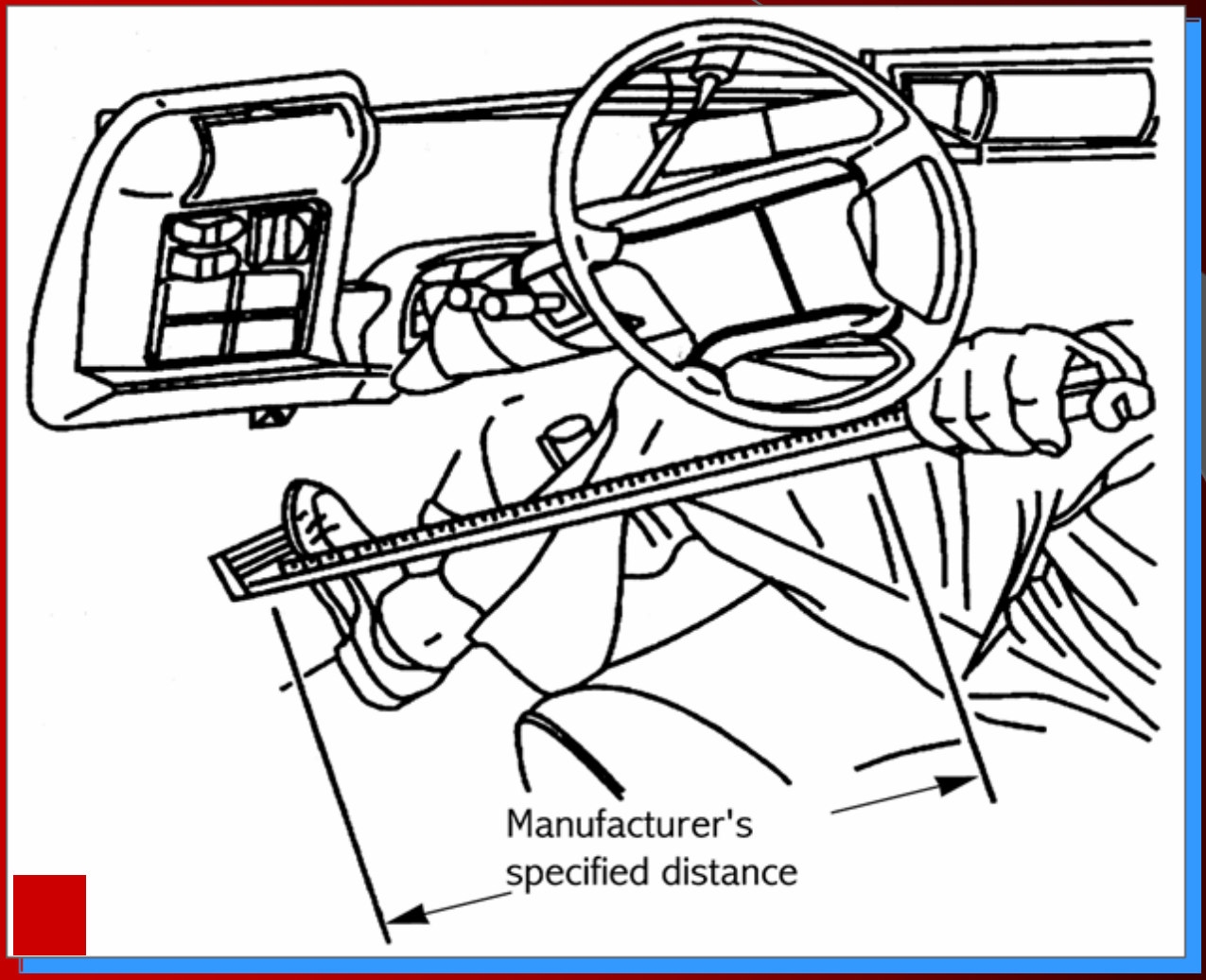
7. Brake Pedal Height is the distance from pedal to floor with the pedal at rest.

8. Pulling Brakes causes a vehicle to veer right or left when braking.

Brake Pedal Height



Pulling Brakes

- Vehicle veers to the right or left when the brakes are applied
- Possible causes:
  - seized caliper or wheel cylinder piston
  - grease or fluid-coated lining
  - leaking cylinder
  - faulty automatic adjuster
  - brake lining dust in a drum brake assembly

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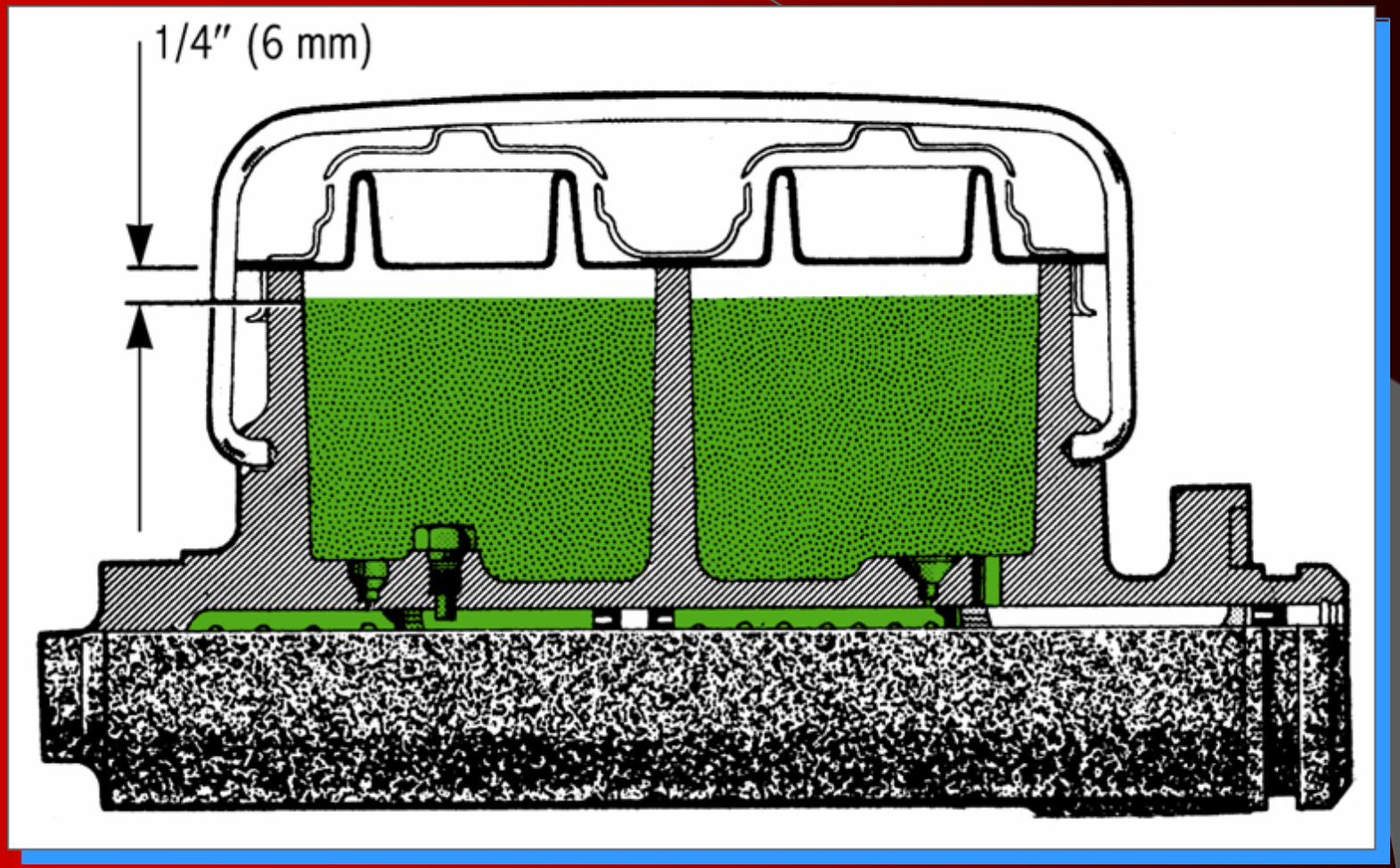
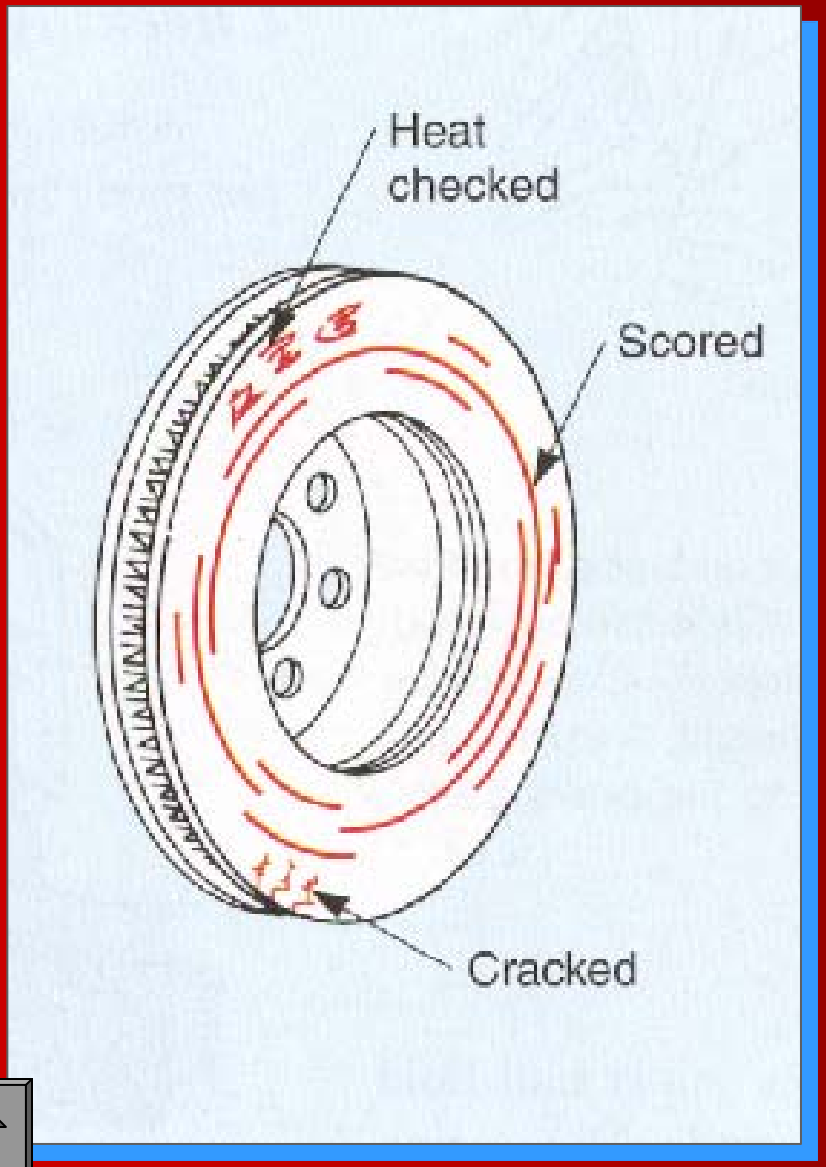
9. Brake Fluid Level should be 1/4″ from top of reservoir.

10. Brake Pedal Vibration is usually caused by an out-of-round brake drum or warped disc.

Checking Brake Fluid

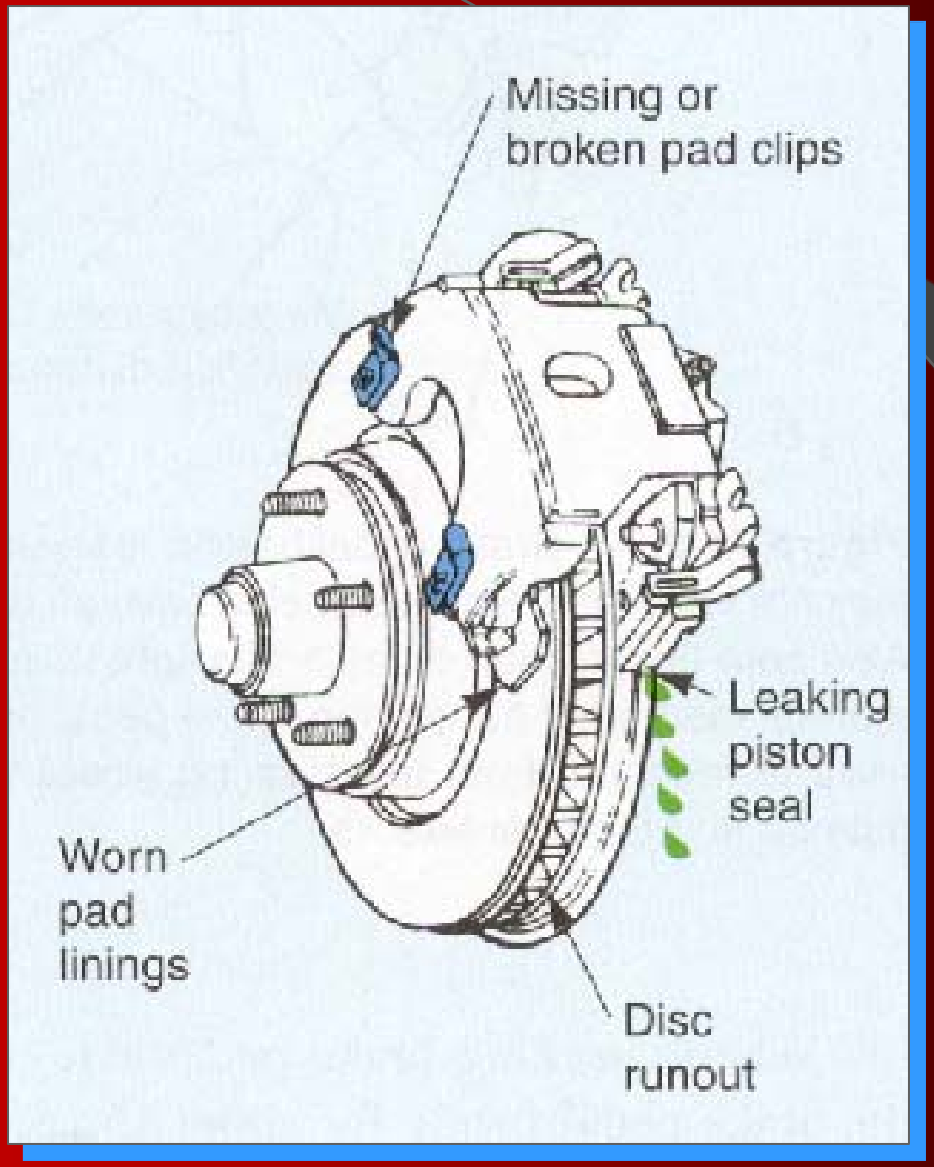


Disc Brake Inspection

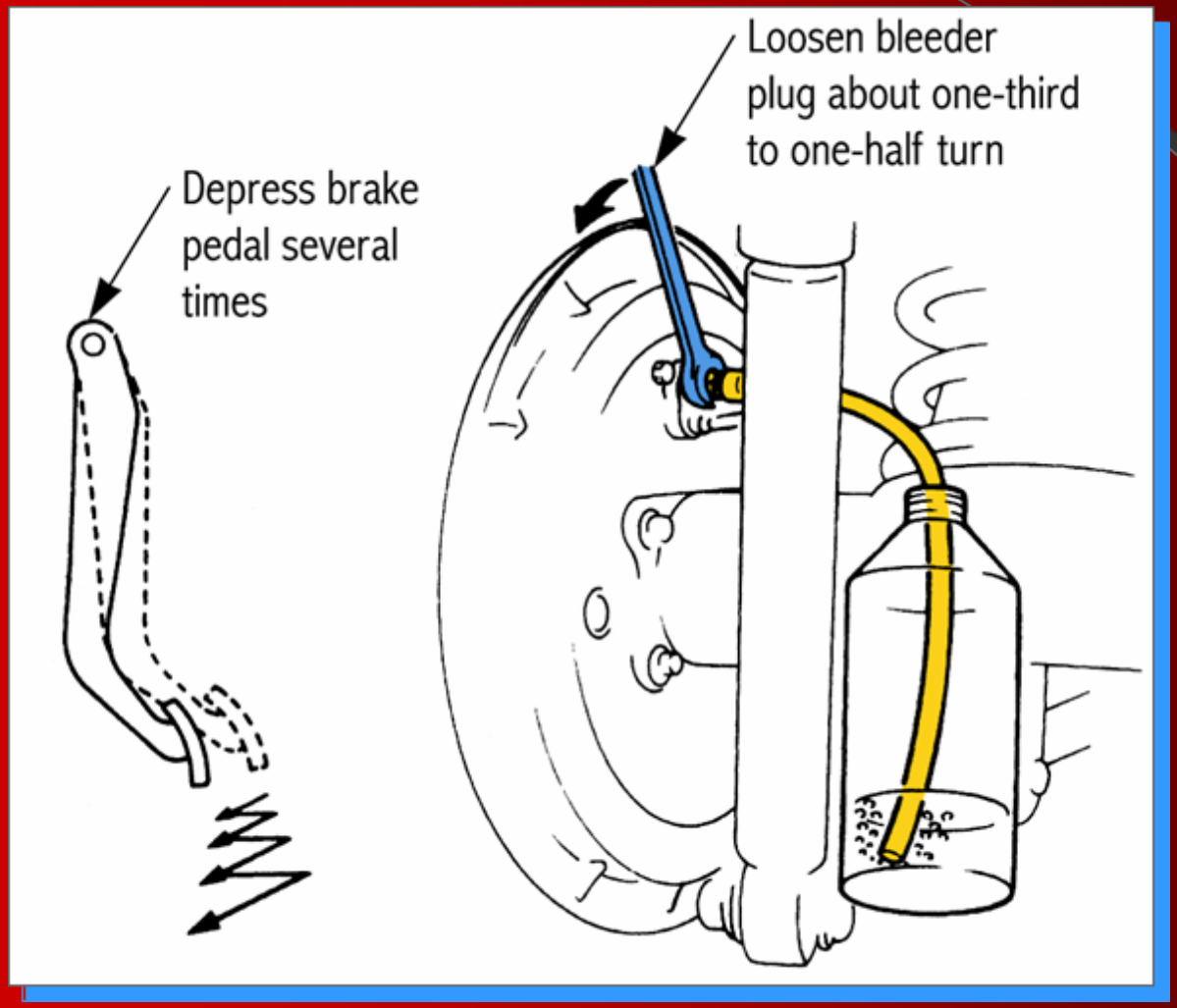


Inspect rotors: scoring, cracks, out-of-round, and/or heat damage can cause brake pedal vibration

Disc Brake Inspection

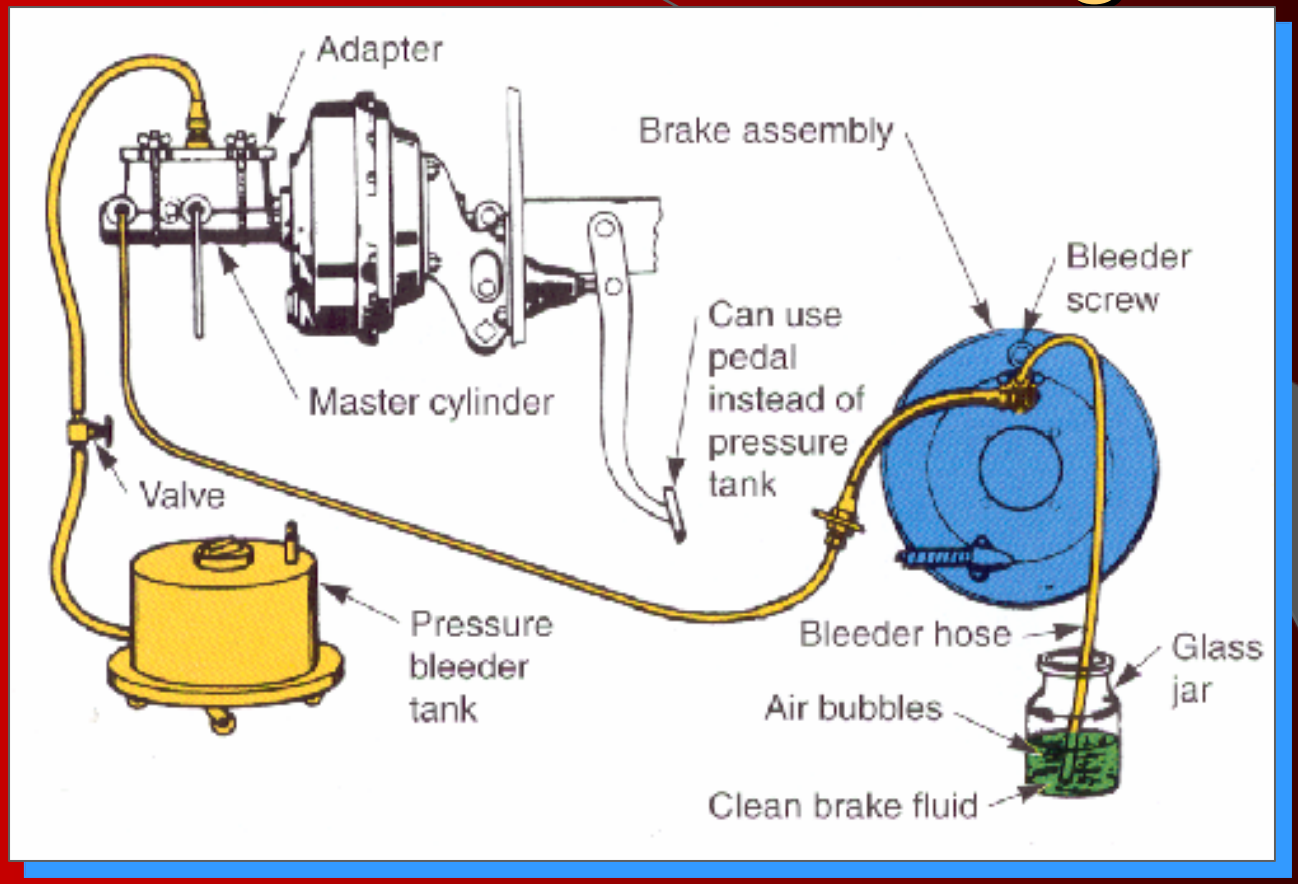


Bleeding Brakes



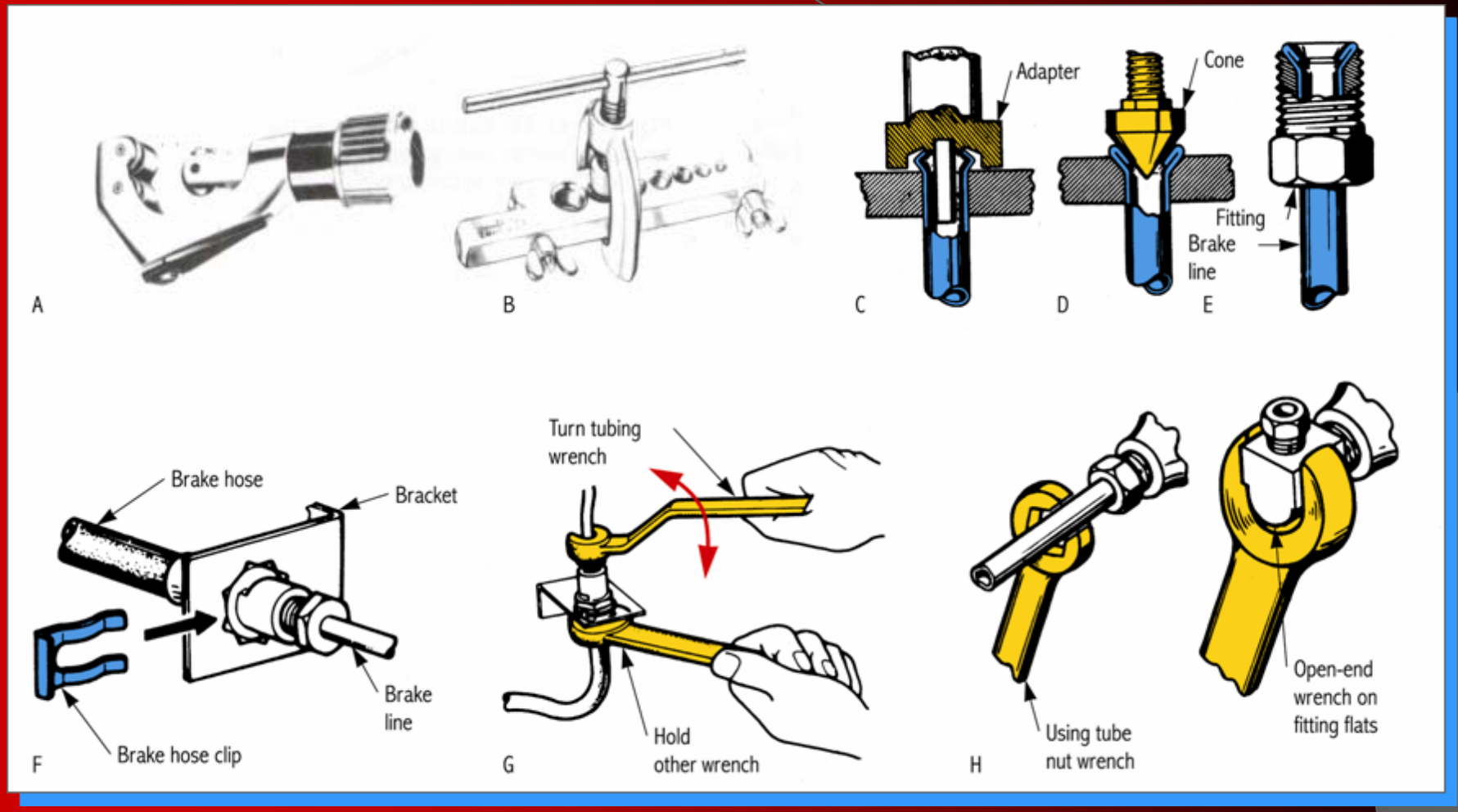
Bleeding brakes removes air from the brake system

Pressure Bleeding



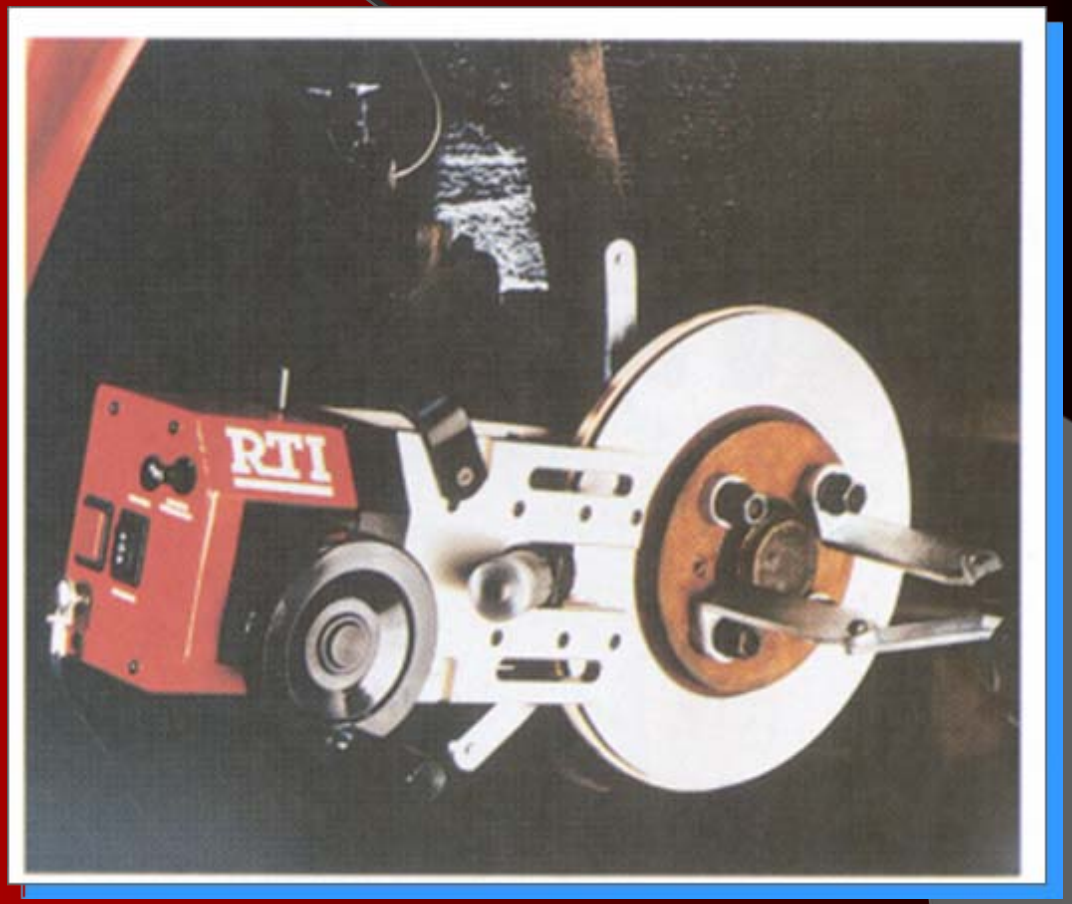
Uses a pressure bleeder tank, which contains brake fluid under pressure

Double Flaring a Brake Line

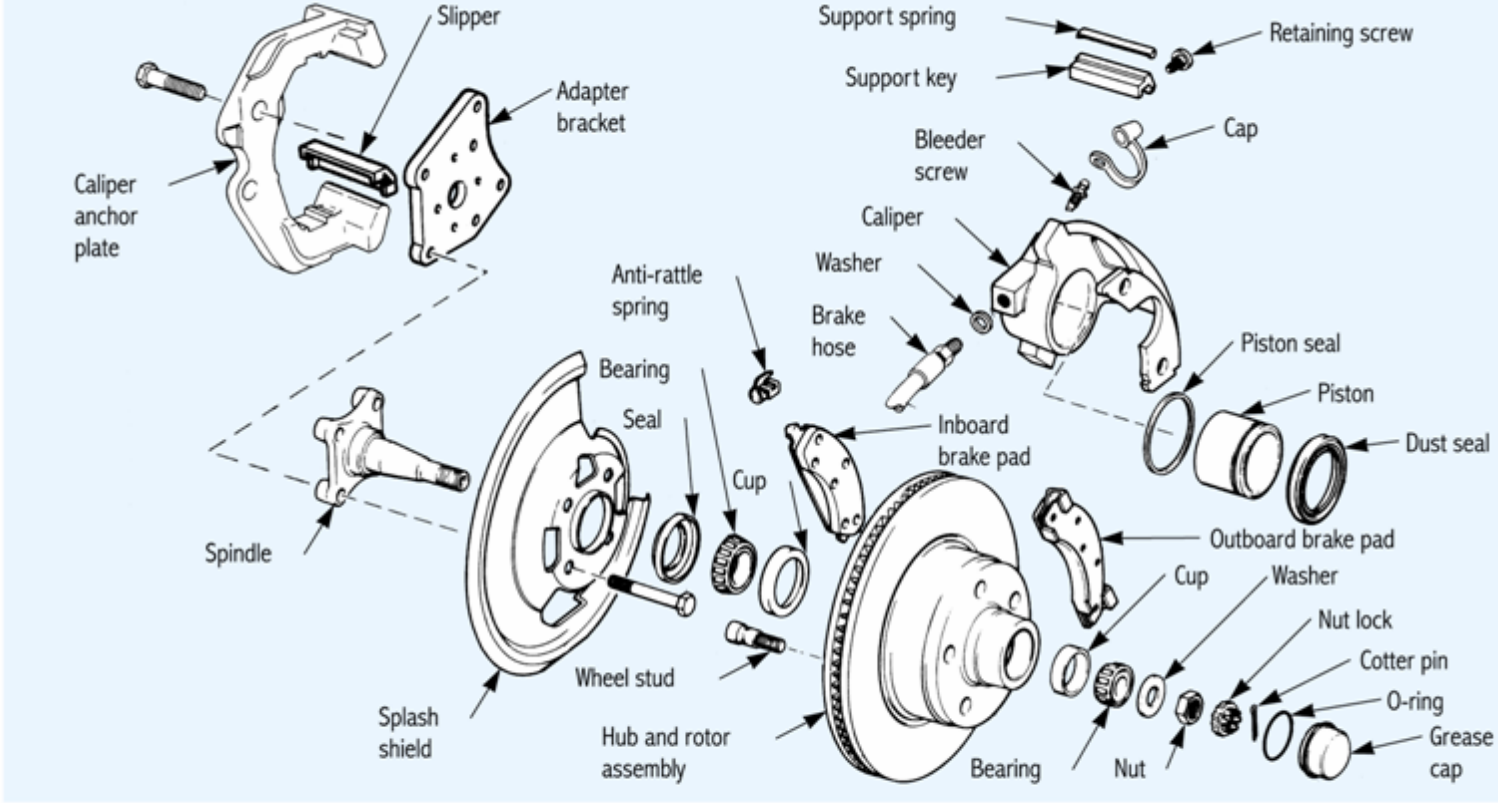


On-Car Brake Lathe

Lathe assembly has controls for feeding cutters into the disc surface

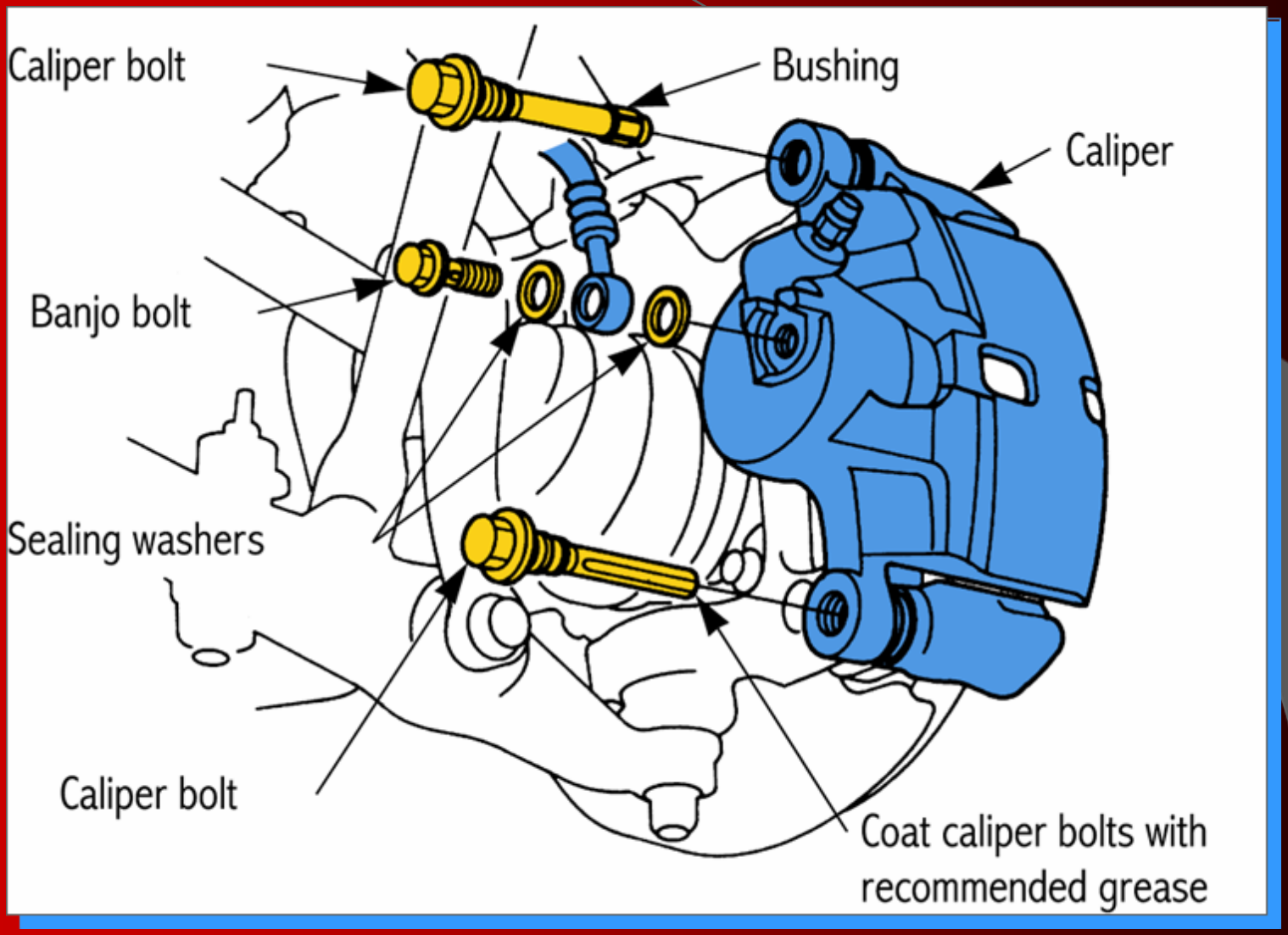


Disc Brake Reassembly

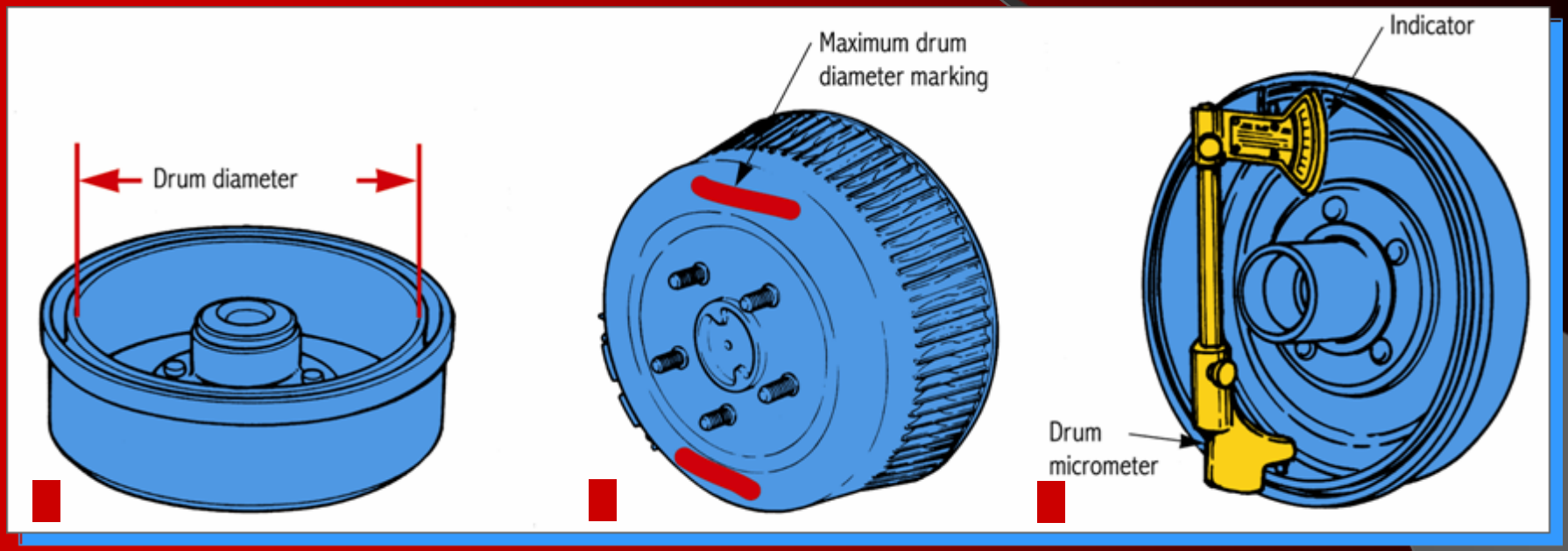


Disc brake components

Disc Brake Reassembly



Measuring Brake Drum Diameter

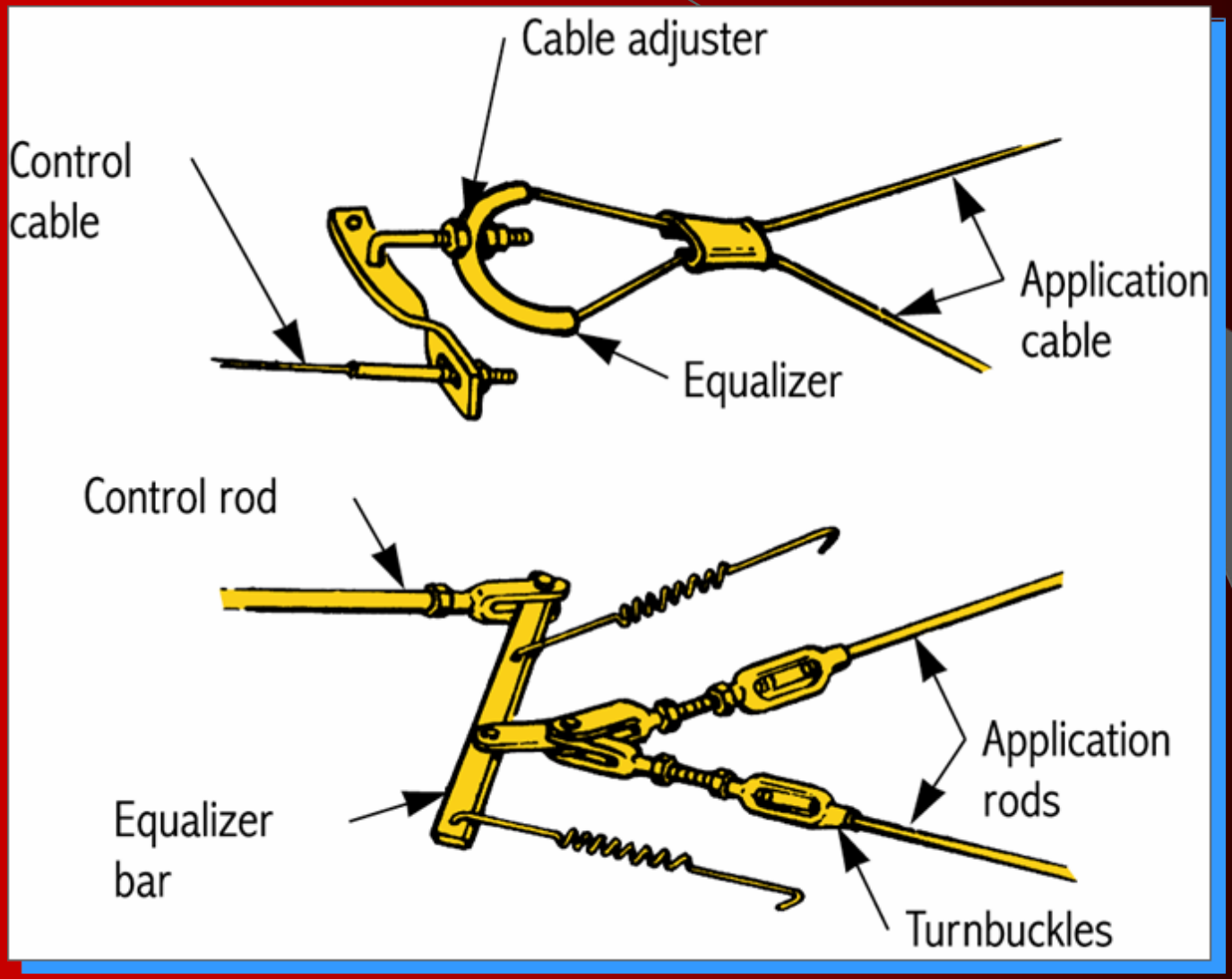


Typically, a drum should not be machined more than 0.060” (1.5 mm) oversize

Drum diameter is often stamped on the drum

Use a drum micrometer to measure the diameter

Parking Brake Cables



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