OBJECTIVES

• Describe the parts and operation of disc brakes.
• Describe the construction of disc brake pads.
• Discuss the brake pad assembly methods and brake lining composition.
• Describe the difference between fixed caliper and floating or sliding caliper.

DISC BRAKES

• Parts and Operation
  ▪ Piston(s) squeeze friction material (pads) on both sides of rotating disc (rotor)
  ▪ Used on front wheels of late-model vehicles
  ▪ Used on rear wheels of increasing number of automobiles
DISC BRAKES

- Adopted because supply greater stopping power than drum brakes with less likelihood of fade

DISC BRAKE PADS

- Brake Pad Assembly
  - Block of friction material attached to stamped steel backing plate
  - Some pad backing plates have tabs that bend over caliper to hold pad in place
  - Others have tabs with holes in them
    - Pin slips through holes and fastens to caliper body to hold pads

- Still others have retainer spring that locks pad to caliper piston
- Lining material can be one of a number of products
- Can be fastened to backing plate in several ways
DISC BRAKE PADS

- Brake Pad Assembly
  - Edges of lining material usually perpendicular to rotor surface
  - A few larger pads have tapered edges to help combat vibration and noise

DISC BRAKE PADS

- Pad Assembly Methods
  - Riveted linings
    - Brake block attached to backing plate with metal rivets

DISC BRAKE PADS

- Pad Assembly Methods
  - Bonded linings
    - Glue brake block directly to shoe pad backing plate
DISC BRAKE PADS

• Pad Assembly Methods
  - Mold-bonded linings
    - Combines advantages of bonding with mechanical strength of riveting

DISC BRAKE PADS

• Brake Lining Composition
  - Ingredients mixed and molded into shape of finished product
  - Fibers in material only thing holding mixture together

DISC BRAKE PADS

• Brake Lining Composition
  - Large press forces ingredients together to form brake block, which becomes brake lining
DISC BRAKE PADS

• Brake Lining Composition
  • Semimetallic friction material
    • Uses metal rather than asbestos in its formulation

DISC BRAKE PADS

• Brake Lining Composition
  • Nonasbestos friction material
    • Use synthetic material such as aramid fibers instead of steel
DISC BRAKE PADS

- Brake Lining Composition
  - Carbon fiber friction material
    - Newest and most expensive of the lining materials

DISC BRAKE PADS

- Brake Lining Composition
  - Ceramic friction material
    - Most pads today are ceramic and use little, if any steel

CALIPER DESIGNS

- Fixed Caliper Design
  - Body manufactured in two halves
  - Uses two, four, or six pistons to apply brake pads
  - Caliper rigidly mounted to suspension
  - When brakes applied, pistons extend from caliper bores and apply brake pads with equal force from both sides of rotor
CALIPER DESIGNS

• No part of caliper body moves when brakes applied
• Floating and Sliding Caliper Design
  • Used in front brakes of most vehicles
  • Caliper free to move within limited range on anchor plate solidly mounted to vehicle suspension

• Floating Caliper Operation
  • Body of floating caliper does not make direct contact with anchor plate
  • Body supported by bushings and/or O-rings
    • Allow it to “float” or slide on metal guide pins attached to anchor plate
CALIPER DESIGNS

• Floating Caliper Operation
  • Depend on proper lubrication of pins, sleeves, bushings, and O-rings for smooth operation
  • Special high-temperature brake grease must be used

• Sliding Calipers
  • Body of sliding caliper mounts in direct metal-to-metal contact with anchor plate
  • Calipers move on ways cast and machined into caliper body and anchor plate
  • Retaining clips and design of caliper prevent body from coming out of ways

• Depend on good lubrication of ways for proper operation
<table>
<thead>
<tr>
<th>SUMMARY</th>
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<tbody>
<tr>
<td><strong>Piston(s) squeeze friction material (pads) on both sides of rotating disc (rotor)</strong></td>
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<td><strong>Fixed caliper design is body manufactured in two halves</strong></td>
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