from the hub

7. Check the drum for damage or wear, and repair or replace as necessary. If a new drum is to be installed, be sure to remove the protective coating with a suitable degreaser.

New grease retainer seals should be installed whenever a wheel and hub is removed.

8. Position the brake drum to the hub and install the attaching screws, bolts, or bolts and nuts.

9. Position the hub and drum as an assembly on the axle and start the adjusting nut

10. Adjust the wheel bearing nut and then install the wheel bearing lock washer and locknut

11. Install a new rear axle oil seal, axle shaft and gasket, stud adapters, and attaching nuts

12. Install the wheel and tire as an assembly

13. Adjust the brake shoes and then remove the stand and lower the truck

BRAKE DRUM REFINISHING

Minor scores on a brake drum can be removed with fine emery cloth, provided the emery is thoroughly cleaned off the drum after the operation

A badly scored, rough, or cut-ofround drum should be ground or turned on a drum lathe Do not remove any more material from the drum than is necessary to provide a smooth surface for the brake shoe contact Brake drums up to and including 14 inches nominal diameter should not be machined to more than .060 inch beyond the original diameter

Brake drums larger than 14 inches nominal diameter should not be machined to more than .080 inch beyond the original diameter

If the diameter of the drum is less than .030 inch oversize after refinishing, install standard linings on the brake assemblies If the diameter is over 0.030 inch, install oversize or shimmed linings

BRAKE SHOE AND BAND RELINING

1. Remove the rivets and remove the old lining

2. Clean the shoe or band thoroughly with cleaning fluid, especially the rim surface Wipe the shoe or band dry and remove all burrs or rough spots from the shoe.

3. On service brake, check the inside diameter of the brake drum If the diameter is less than 0 030 inch oversize, install standard linings. If the diameter is 0 030–0 060 inch oversize, install oversize or shimmed linings

4. Position the new lining on the shoe or band and install new rivets, beginning with the rivet holes near the center of the shoe On some vehicles, the primary lining is shorter than the secondary lining. If this condition exists, position the shorter (primary) lining to line up with the heel end of the shoe Do not let brake fluid oil or grease touch the brake lining. If a brake lining kit is used to replace the worn linings, install all the parts supplied in the kit.

5. Check the clearance between the lining and shoe rim The lining must seat snugly against the rim with not more than 0 005 inch separation midway between any two rivets If only the linings are replaced on duo-servo single anchor brakes with fixed anchor pins, the brake linings must be cam ground 0.010 inch at the ends after the linings are riveted to the brake shoe

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PLAINTIFF'S EXHIBIT

FD-825

3 CLEANING AND INSPECTION

FRONT DISC BRAKES

1. Remove the wheel and tire, brake shoe retainers, and the shoe and linings as outlined in Part 12-03.

2. Make three thickness measurements with a micrometer across the middle section of the shoe and lining Take one reading at each side and one in the center. If the assembly has worn to a thickness of 0 210 inch (Shoe and lining together) at any one of the three measuring locations, or if the lining shows evidence of brake fluid or oil contamination that is causing a brake pull, Replace all (4) shoe and lining assemblies

3. Check caliper to spindle attaching bolt torque Torque them to specification if required

4. To check rotor runout, first eliminate the wheel bearing end play by tightening the adjusting nut After tightening the nut, check to see that the rotor can still be rotated

5. Clamp a dial indicator to the spindle so that the stylus contacts the rotor at a point approximately 1 inch from the outer edge. Rotate the rotor and take an indicator reading If the reading exceeds 0 010 inch total lateral runout on the indicator, replace or resurface the disc brake rotor. The following requirements must be met when resurfacing disc brake rotors (Fig. 2).

Rotunda Disc Brake Attachment FRE-2249-2 is the only approved tool to be used to refinish the disc brake rotors The step-by-step resurfacing procedure provided with the tool must be adhered to

A maximum of 0 020 inch material may be machined equally off each surface (A and B) maintaining a 0 940 inch minimum thickness

The finished braking surfaces of the rotor must be flat and parallel within 0 001 inch, lateral runout must not exceed 0 003 inch total indicator reading, and the surface finish of the braking surfaces are to be 15-80 micro inches

When the runout check is finished, be sure to adjust the bearings as outlined in Group 3, in order to prevent bearing failure.

6. Check the rotor for scoring Minor scores can be removed with a fine emery cloth If the rotor is excessively scored, refinish it as outlined in step 5 or replace the rotor if required

7. Visually check the caliper. If it is cracked or if any leakage is evident, it should be replaced Any leakage around the dust boot indicates the need for removal and disassembly

8. Check brake hoses for signs of cracking, leaks, or abrasion Replace if necessary

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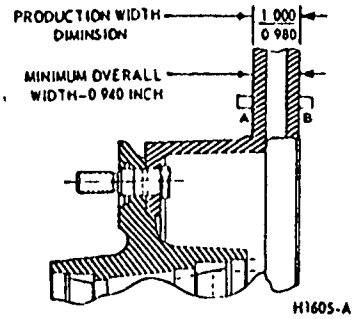


FIG. 2—Disc Brake Rotor Service Limits

BRAKE CYLINDER

1. Clean all brake cylinder parts in clean isopropyl alcohol Inspect all parts for wear or damage Check the cylinder bore for rust, scores, or other damage Be sure that the bleeder screw passage is clean and open Replace all parts that are worn or damaged

2. If dirt is found in any part of the hydraulic system, flush the entire system with clean isopropyl alcohol

MASTER CYLINDER

1. Clean all master cylinder parts in clean isopropyl alcohol, and inspect the parts for wear or damage, replacing them as required When a master cylinder repair kit is used, install all of the parts supplied in the kit.

2. Check the ports and vents in the master cylinder to make sure that all are open and free of foreign matter

3. On a single brake system master cylinder, check to see if the spring valve (riveted to the front end of the piston) is loose or has moved so that the piston ports are open, replace the piston

4. Inspect the cylinder walls for scores or rust, and recondition them if necessary. Hone the cylinder walls no more than necessary (0.003 inch maximum), either to remove scores and rust, or to obtain a smooth wall surface. Remove any burrs or loose metal that may have resulted from the honing operation, and clean the cylinder with clean isopropyl

BRAKE DRUMS AND LININGS

1. After removing one front wheel and drum and one rear wheel and drum from the vehicle, inspect the drums and brake shoe linings for wear or damage that would affect brake operation Do not let brake fluid, oil or grease touch the drum or linings.

2. A brake shoe should be relined when the lining face is worn to within 1/32 inch of any rivet head, or when the lining has been soaked with brake fluid, oil or grease. If a worn lining is not replaced, the brake drum may become severely damaged Always replace the primary and secondary brake shoe lining assemblies on both front or both rear brake assemblies at the same time.

3. Before relining a brake shoe, inspect the shoe for distortion, cracks, or looseness between the rim and web. If one of these conditions exists, replace the shoe. Do not attempt to repair a damaged brake shoe.

4. If the drum and linings are in good condition, install the wheel and drum The condition of the drums and linings of the opposite wheel will usually be about the same as that found at the wheel that was removed.

5. Add enough of the specified brake fluid to the master cylinder reservoir to bring the level to within 1/4 inch of the top of the filler neck

6. Check to be sure that the parking brake handle is fully released before making any brake adjustment

7. Check the front brake anchor pin nut with a wrench (on brake assemblies with an adjustable anchor pin) If the bolt is loose, torque it to 80–100 ft–lbs

BRAKE BOOSTER

1. After disassembly, immerse all metal parts in a suitable cleaning solvent and dry them with compressed air. Use only isopropyl alcohol on rubber parts or parts containing rubber. After the parts have been thoroughly cleaned and rinsed in cleaning solvent, the metal parts which come in contact with hydraulic brake fluid should be rewashed in clean isopropyl alcohol before assembly. Use an air hose to blow dirt and cleaning fluid from the recesses and internal passages When overhauling a power booster, use all parts furnished in the repair kit. Discard all old rubber parts.

2. Inspect all other parts for damage or excessive wear Replace damaged or excessively worn parts If the inside of the booster body is rusted or corroded, polish it with steel wool or fine emery cloth On piston type booster, replace the body shell when scored. Inspect the master cylinder bore for signs of scoring, rust, pitting or etching Any of these conditions will require replacement of the cylinder.

CAM–TYPE AIR BRAKES

1. Inspect the camshaft bushings and replace if worn or damaged

2. Check the anchor pins and shoe–to–cam rollers for wear or damage, and replace, if required

3. Check thickness of the brake lining at the center of the shoe, and replace, if necessary

4. Clean, inspect, and replace worn or damaged parts Coat the anchor pins and cam lobes with Lubriplate before installing the shoes

4 SPECIAL TOOLS

SPECIAL TOOLS

Ford Tool No	Description
Rotunda ARE 345	Fuel Pump Tester Gauge
Rotunda FRE 1431	Brake Drum Micrometer

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