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Inter Office

Ford Parts and Service Division

May 29, 1981

Mr. M. E. Hamburg

cc Mr. G. G. Clickard ✓
Mr. E. J. Riley

Subject: EPA/OSHA Asbestos Exposure Program for Brake Mechanics

Ref: 1. EPA letter of 4/27/81
2. A. B. M. Houston letter of 5/21/81

We have reviewed the EPA letter and attachments and also Mr. Houston's letter and offer the following comments:

1. The Training and Publications Dept. has published warnings in the brake section of the Car and Truck Shop Manuals regarding the health hazard of air blowing asbestos dust and recommended the use of proper equipment for dust removal. Copies of this information are attached for your use.
2. The Training and Publications Dept. has had no brake training programs in recent years because there has been no new technology on brake service requirements. Accordingly, we have not published training information on asbestos dangers and handling procedures.

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Attachments

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REMOVAL AND INSTALLATION

BRAKE DRUM

VEHICLES THRU 9000 SERIES

Use the following service procedures for both hydraulic and air brakes.

FRONT BRAKE DRUM

1. Raise the vehicle until the tire clears the floor and remove the wheel and tire from the hub. Loosen the brake shoe adjusting screw until the shoes no longer touch the brake drum. Remove the grease cap and the gasket (if equipped) from the hub.
2. On vehicles with 9,000 lb front axles and hydraulic brakes, remove the locknut, locking ring, dimpled washer and adjusting nut. On all other axles, remove the cotter pin, adjusting nut and flat washer from the spindle.
3. Remove the outer bearing cone and roller assembly. Pull the hub and drum assembly off the wheel spindle.
4. Remove the front wheel-to-hub retaining nuts (or rim and tire attaching nuts). Remove the wheel (or rim and tire) from the hub and drum.
5. Remove the brake drum retainers and attaching bolts, screws or bolts and nuts.
6. Remove the brake drum from the hub.
7. Check the drum for damage or wear, and repair or replace if necessary. If a new drum will be installed, be sure to remove the protective coating with degreaser.

Install new grease retainer seals whenever a wheel and hub is removed.

8. Place the brake drum to the hub and install the retainers and retaining bolts, screws, or bolts and nuts.
9. Install the hub and drum on the wheel spindle. Keep the hub centered on the spindle to prevent damage to the grease retainer or the spindle threads.
10. On vehicles with 9,000 lb front axles and hydraulic brakes install the outer bearing cone and roller assembly, and the bearing adjusting nut. On all other axles, install the outer bearing cone and roller and flat washer on the spindle. Install the adjusting nut.
11. Install the wheel and tire on the hub. Then install the clamps (if applicable) and the wheel stud nuts.
12. While rotating the wheel, tighten the adjusting nut to specification. Adjust wheel bearings as described in Group 11.
13. On vehicles with 9000 lb front axle and hydraulic brakes, install the dimpled washer with the dimple indexed in one of the holes in the adjusting nut. Install the locking ring lock nut and tighten to specification (refer to Group 11). Bend the locking ring over a flat of the lock nut.
14. Install the gasket (if equipped) and the grease cap, and tighten the wheel stud nuts to specification (refer to Group 11). Install the hub cap (if equipped), and adjust the brakes as described in this Part.

OVERHAUL

Removal of dust and dirt from brake assemblies should be done by using the Rotunda Brake Vacuum (340009) or equivalent or Rotunda brake parts washer (model 450016) or equivalent. Brake assembly dust and dirt should not be removed by either blowing off with an air gun or vacuuming with a standard industrial vacuum because a health hazard from breathing asbestos dust may develop. Also, any machining done on brake linings or pads should be done using properly exhaust ventilated equipment.

BRAKE DRUM REFINISHING

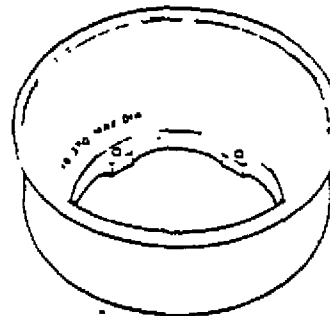
Minor scores on a brake drum can be removed with fine emery cloth, provided the emery is thoroughly cleaned off the drum after the operation.

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 out-of-round 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.

Each drum maximum braking surface diameter is shown on each brake drum (Fig. 10). Brake drums which exceed the maximum braking surface diameter shown on the brake drum, either through wear or refinishing, must be replaced.



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FIG. 10 Brake Drum Maximum Braking Surface Diameter Marking Location—Typical Medium—Heavy Truck Shown

On all medium and heavy trucks, the maximum braking surface diameter specification, which is shown on each brake drum, allows for 0.040-inch machining cut over the original nominal drum diameter, plus 0.030-inch additional wear before the drum must be replaced. After refinishing the brake surface runout must not exceed 0.070-inch total indicator reading, measured from the bearing cup.

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(complete axle set) on front wheels as required. The rubber caliper insulators and the plastic sleeves must be replaced when linings are replaced.

- 3 Visually check the caliper. If the caliper housing is leaking, it should be replaced. If a seal is leaking, the caliper must be disassembled and new seals installed. If a piston is seized in the bore, a new caliper housing is required.

Refer to Part 12-20 for disc brake rotor resurfacing procedure.

Service Precautions

- 1 Grease or any other foreign material must be kept off the lining surfaces of the rotor and external surfaces of the hub during service operations. In handling the rotor and caliper assemblies, avoid deformation of the brake rotor and nicking or scratching of brake linings.
- 2 If a caliper piston is removed for any reason, the piston seal must be replaced.
- 3 During removal and installation of a wheel assembly, exercise care not to interfere with the caliper splash shield or the bleeder screw fitting.
- 4 Front wheel bearing end play is critical and must be within specifications.
- 5 To avoid bending or damaging the rotor splash shield on full right or left wheel turns, be sure the vehicle is centered on the hoist before servicing any front end components.
- 6 Riding of the brake pedal (common on left-foot applications) must be avoided during vehicle operation.
- 7 The wheel and tire must be removed separately from the brake rotor, unlike drum brakes where the wheel, tire, and drum can be removed as a unit.
- 8 Do not attempt to clean or restore any oil or grease-soaked brake linings. When contaminated linings are found, they must be replaced in complete axle sets.
- 9 Always replace rubber caliper insulators and plastic sleeves when replacing linings. Do not lubricate the slide pins.
- 10 Caliper slide pins must be hand started into spindle before tightening. This is to insure that the large diameter of pin is through outer shoe holes to prevent binding or bending.

Drum Brakes

1. Remove the wheel from the drum, and remove the drum, Part 12-02.

Removal of dust and dirt from brake assemblies should be done by using the Rotunda brake vacuum (model 340009) or Rotunda brake parts washer (model 650016) or equivalent. Brake assembly dust and dirt should not be removed by blowing off with an air gun because a health

hazard from breathing asbestos dust may develop.

- 3 Inspect the brake shoes for excessive lining wear or shoe damage. If the lining is worn within 1/32 inch of the rivet heads or if the shoes are damaged, they must be replaced. Replace any lining that has been contaminated with oil, grease, or brake fluid. Replace lining in axle sets. Prior to replacement of lining, the drum diameter should be checked to determine that the brake drum braking surface diameter is within specification by using the Rotunda brake drum micrometer (model 100010) or equivalent. If the braking surface diameter exceeds specification, the drum must be replaced.
4. Check the condition of brake shoes, retracting springs, hold-down springs, and drum for signs of overheating. If the shoes have a slight blue coloring, indicating overheating, the retracting and hold-down springs should be replaced. Overheated springs lose their pull and could cause the new lining to wear prematurely, if not replaced. If the brake drums are heat spotted, indicating an overheated condition, they should be replaced.
5. Inspect all other brake parts, and replace any that are worn or damaged.
6. Inspect the brake drum and, if necessary, refinish. Refer to Rotunda Catalog Wheel Service, for a description of the various types of brake lathes available. The maximum inside braking surface diameter is shown on each brake drum (Fig. 21). If the maximum inside braking surface diameter shown on the drum is exceeded either by wear or refinishing, the drum must be replaced. Refer to Part 12-02 for refinishing.

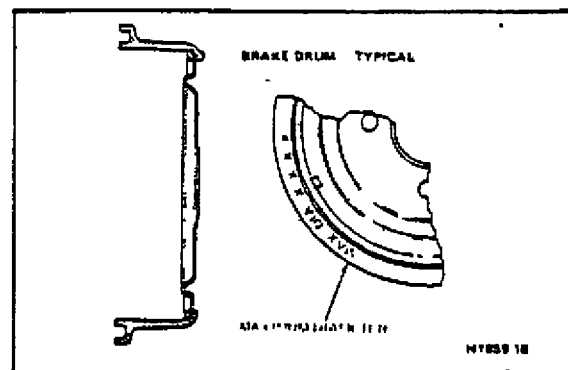


FIG. 21 Location of Brake Drum Maximum Inside Surface Markings

Brake Booster

Check the booster operation as noted under Power Brake Functional Test. If the brake booster is damaged or inoperative, replace it with a new booster. The brake booster is serviced only as an assembly, including the check valve.

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