

Section 06-02: Brakes, Rear Drum
REMOVAL AND INSTALLATION

1997 Aerostar, Ranger Workshop Manual

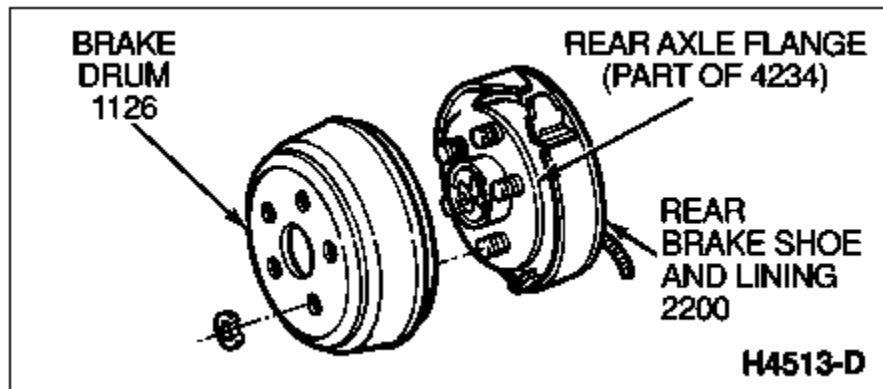
Lugnut Torque Requirement

NOTE: Torque specification is for nut and bolt threads free of dirt and rust. Do NOT use oil or grease on threads. Use only Ford recommended replacement fasteners.

Tighten lugnuts to 135 Nm (100 lb-ft).

Brake Drum

⚠ WARNING: DO NOT INHALE DUST FROM BRAKES OR ASSOCIATED COMPONENTS. INHALATION OF DUST CAN BE INJURIOUS TO YOUR HEALTH. COMPRESSED AIR OR BRUSHES MUST NOT BE USED TO CLEAN BRAKES, BRAKE DRUMS (1126) AND ASSOCIATED COMPONENTS. A VACUUM CLEANER, SUCH AS ROTUNDA BRAKE/CLUTCH/SERVICE VACUUM 091-R0001 OR EQUIVALENT, EQUIPPED FOR THIS PURPOSE SHOULD BE CAREFULLY USED TO REMOVE ANY DUST. ADHERENT DUST SHOULD BE REMOVED WITH A DAMP RAG. ANY DUST SHOULD BE CONTAINED IN A SEALED AND LABELED BAG FOR DISPOSAL. WEAR AN APPROVED HIGH EFFICIENCY CARTRIDGE OR AIR LINE RESPIRATOR AND USE EXTRA CAUTION TO AVOID BREATHING THIS DUST. ALWAYS USE NON-ASBESTOS REPLACEMENT PARTS.



Removal

1. Raise and support the vehicle so the wheel (1007) is clear of the floor.
2. **⚠ CAUTION: Use of a drum puller or a torch is not recommended. Drum distortion may result.**

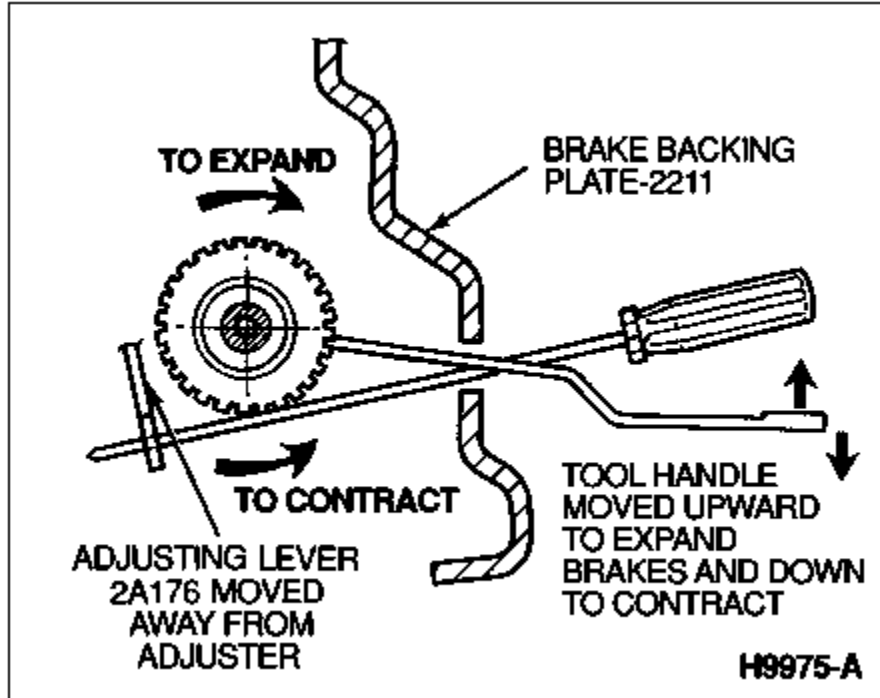
Remove the hub cap, if equipped, and wheel.
3. Remove the retaining nut and remove the brake drum.
4. **⚠ CAUTION: Loosen the adjusting screw only if the brake drum cannot be removed. Do not burr, chip or damage the notches in the adjusting screw assembly or the self adjusting mechanism will not function properly.**

If the brake drum is rusted to the axle shaft pilot, use coarse sandpaper or file to remove the rust buildup, then work the brake drum off.

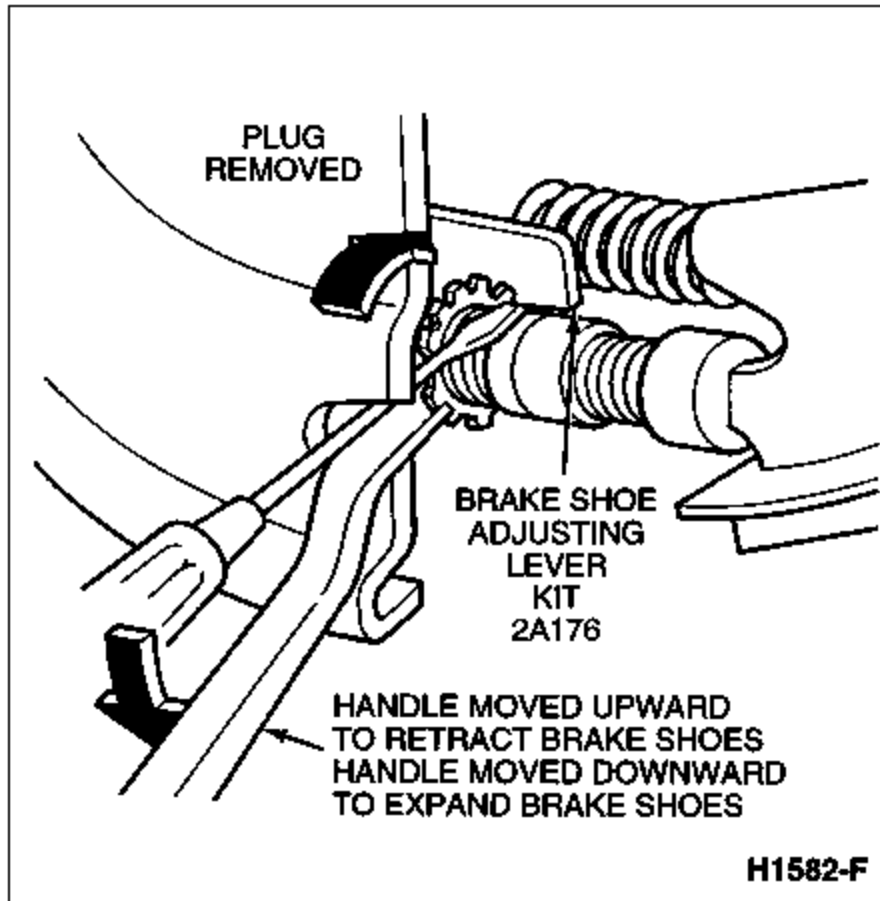
- If the brake drum will not come off, insert a narrow screwdriver through the brake adjusting hole in the brake backing plate (2211), and disengage the adjusting lever from the brake adjusting screw assembly. While holding the adjusting lever away from the brake adjusting

screw assembly, loosen the brake adjusting screw assembly with Brake Adjustment Tool D81L-1103-C or equivalent.

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Installation

1. If a new brake drum is to be installed, remove the protective coating from the new brake drum with carburetor degreaser or equivalent.
2. Adjust the rear brake shoe and lining (2200) as described in this section using Brake Adjustment Gauge D81L-1103A or equivalent. Brake drum turning may be performed as long as the maximum inside diameter is not exceeded. The maximum inside diameter is cast into the drum face.
3. Install the brake drum.
4. Install the wheel on the wheel hub bolts against the brake drum, and tighten the lug nuts (1012) to 135 Nm (100 lb-ft).

Brake Shoes and Lining

SPECIAL SERVICE TOOL(S) REQUIRED

Description	Tool Number
Hold-Down Spring Tool	T73T-2300-A



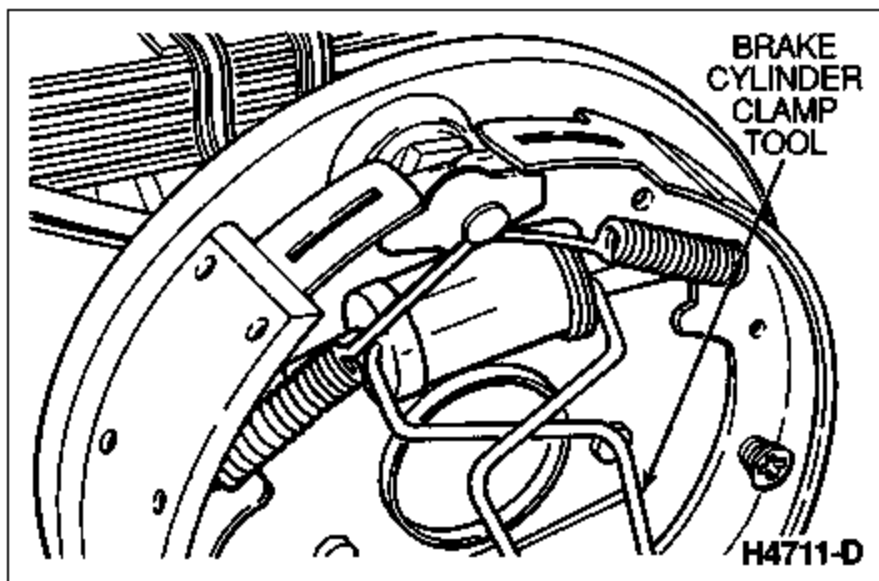
CAUTION: To ensure correct assembly, note the position of each part removed.

Removal

1. Remove the wheel (1007) and brake drum (1126).
2. **NOTE:** If the boots are not removed, brake fluid leakage past the cups may go undetected because the boots may seal the fluid in the rear wheel cylinder. If leaks are found, the rear wheel cylinder must be repaired or replaced.

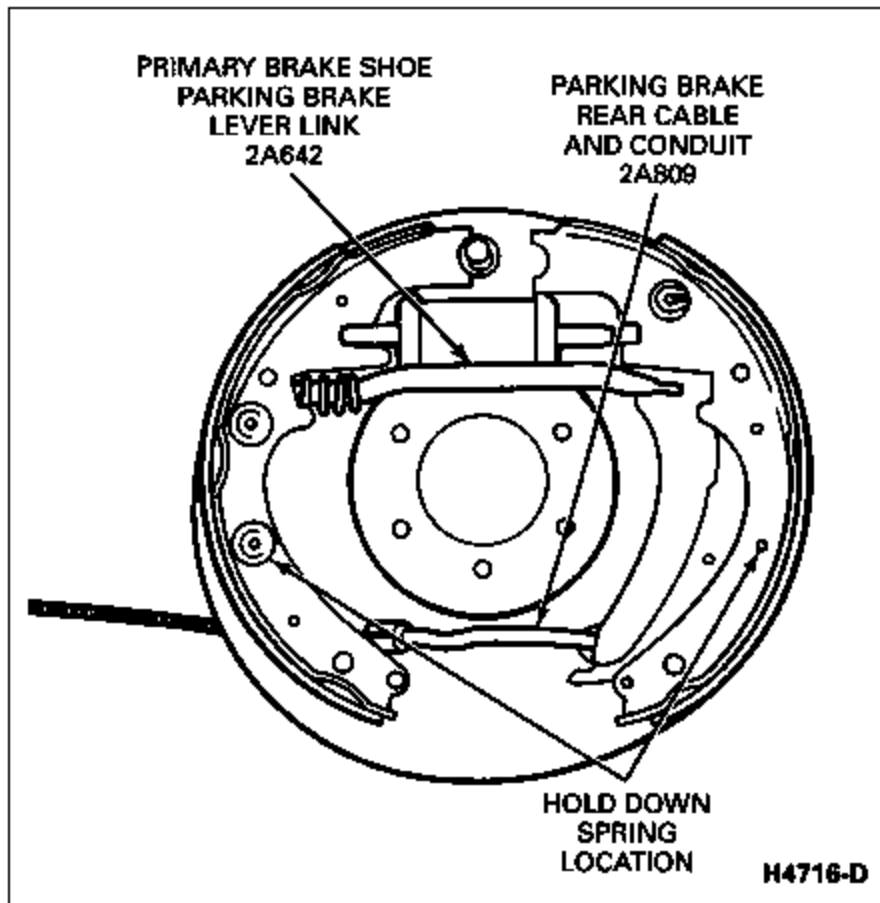
Inspect rear wheel cylinder for signs of leaks or presence of rust by removing the boots and inspecting interior surfaces. Water leaking into the rear wheel cylinder past the boots will cause rust to form and may cause the rear wheel cylinder to seize.

3. If no leaks are found, install brake cylinder clamp over the ends of the rear wheel cylinder as shown.

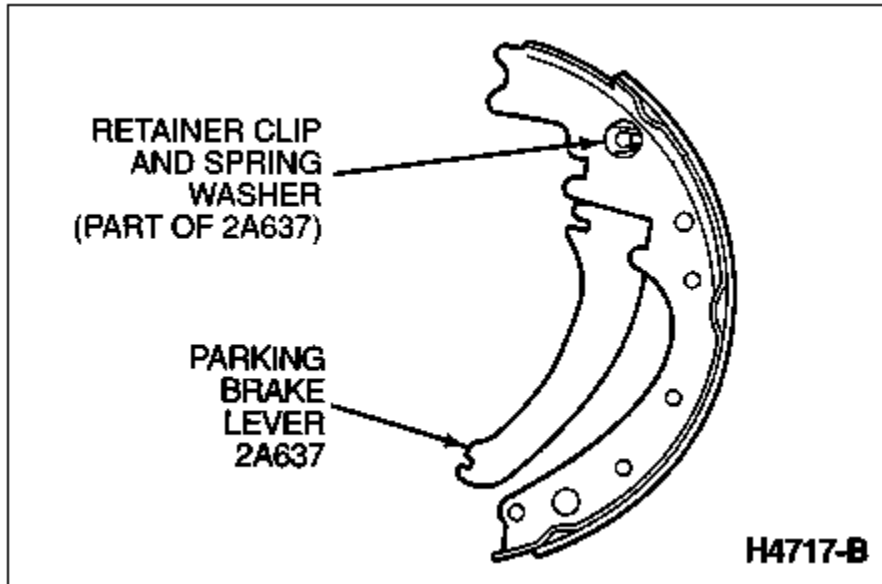


4. Remove the brake shoe retracting springs.

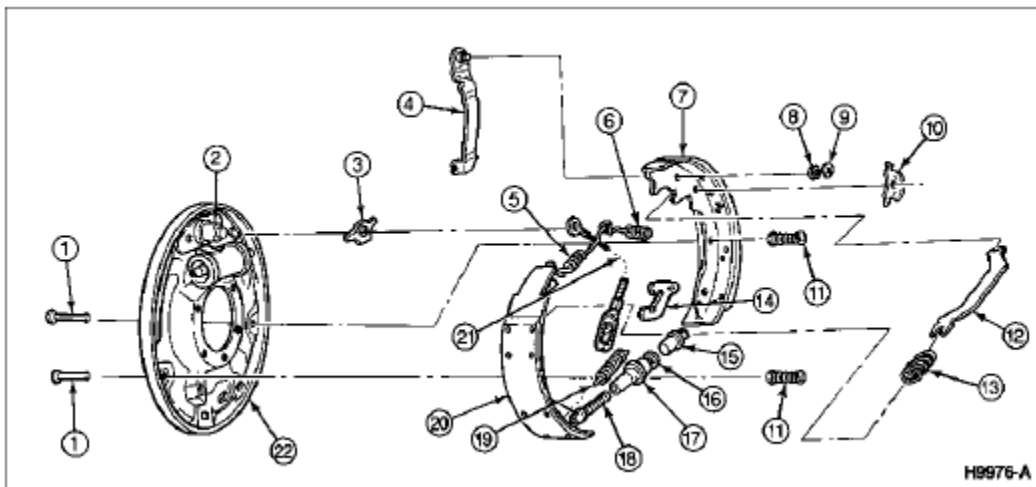
5. Remove the brake shoe adjusting lever cable from the anchor pin, cable guide and adjusting lever.
6. Remove the cable guide from the secondary brake shoe and lining web.
7. Remove the adjusting lever and adjusting lever return spring.
8. Remove the brake shoe adjusting screw spring.
9. Using Hold-Down Spring Tool T73T-2300-A, remove the brake shoe hold-down spring and pin from each rear brake shoe and lining (2200).
10. Remove the brake shoe adjuster assembly.
11. Remove the primary brake shoe parking brake lever link and parking brake link spring.



12. Remove the parking brake rear cable and conduit (2A635) from the parking brake lever.
13. Remove the rear brake shoe and lining from the vehicle.
14. Remove the parking brake lever from the secondary rear brake shoe and lining.



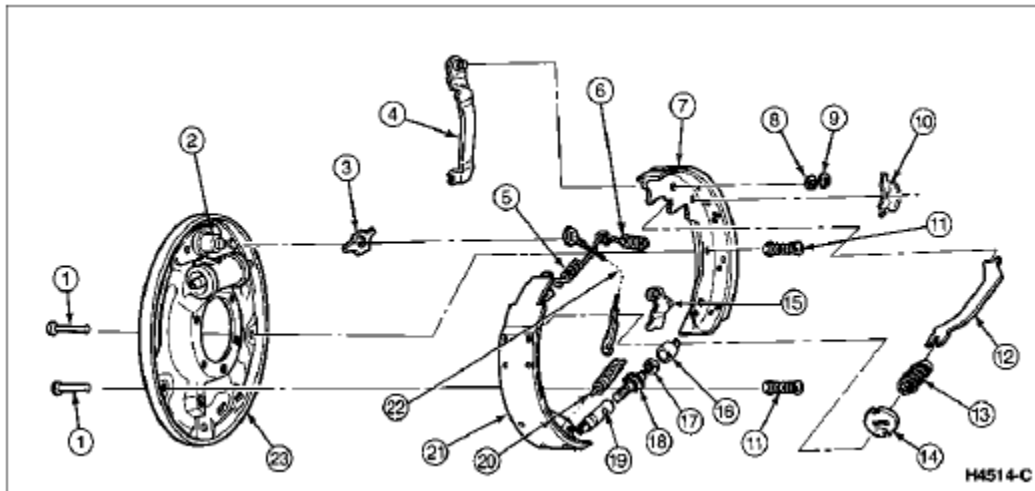
Rear Brake, Ranger



Item	Part Number	Description
1	2069	Brake Shoe Hold-Down Spring Pin
2	—	Anchor Pin (Part of 2211)
3	2028	Brake Shoe Anchor Pin Guide Plate
4	2A637	Parking Brake Lever
5	2296	Brake Shoe Retracting Spring (Short)
6	2296	Brake Shoe Retracting Spring (Long)
7	2200	Rear Brake Shoe and Lining (Secondary)
8	351467-S	Washer
9	2106	Parking Brake Lever Pin Retainer

10	2A179	Cable Guide
11	2068	Brake Shoe Hold-Down Spring
12	2A642	Primary Brake Shoe Parking Brake Lever Link
13	2A601	Parking Brake Link Spring
14	2A176	Brake Shoe Adjusting Lever
15	2048	Brake Shoe Adjusting Screw Stud
16	372583-S	Thrust Washer
17	2047	Brake Shoe Adjusting Screw Nut
18	2041	Brake Adjuster Screw
19	2049	Brake Shoe Adjusting Screw Spring
20	2200	Rear Brake Shoe and Lining (Primary)
21	2A178	Brake Shoe Adjusting Lever Cable
22	2211	Brake Backing Plate

Rear Brake, Aerostar

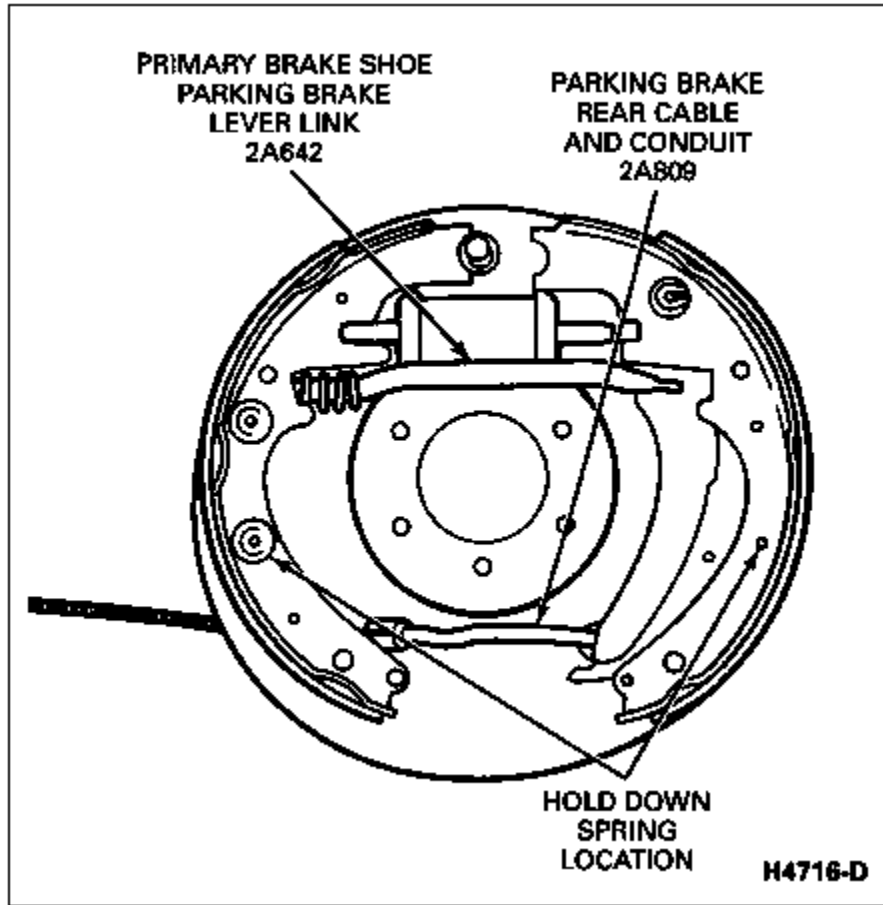


Item	Part Number	Description
1	2069	Brake Shoe Hold-Down Spring Pin
2	—	Anchor Pin (Part of 2211)
3	2028	Brake Shoe Anchor Pin Guide Plate
4	2A637	Parking Brake Lever
5	2296	Brake Shoe Retracting Spring (Short)
6	2296	Brake Shoe Retracting Spring (Long)
7	2200	Rear Brake Shoe and Lining (Secondary)
8	351467-S	Washer
9	2106	Parking Brake Lever Pin Retainer

10	2A179	Cable Guide
11	2068	Brake Shoe Hold-Down Spring
12	2A642	Primary Brake Shoe Parking Brake Lever Link
13	2A601	Parking Brake Link Spring
14	2A787	Parking Brake Spring Retainer
15	2A176	Brake Shoe Adjusting Lever
16	2048	Brake Shoe Adjusting Screw Socket
17	372583-S	Thrust Washer
18	2041	Brake Adjuster Screw
19	2047	Brake Shoe Adjusting Screw Nut
20	2049	Brake Shoe Adjusting Screw Spring
21	2200	Rear Brake Shoe and Lining (Primary)
22	2A178	Brake Shoe Adjusting Lever Cable
23	2211	Brake Backing Plate

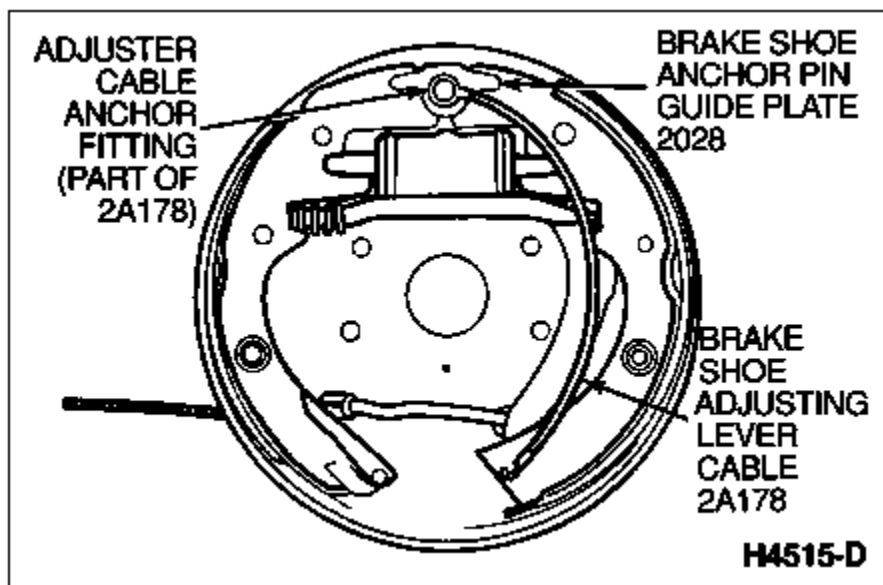
Installation

1. Clean the ledge pads on the brake backing plate.
2. Apply a light coating of Disc Brake Caliper Slide Grease D7AZ-19590-A or equivalent meeting Ford specification ESA-M1C172-A at the points where the brake shoes touch the brake backing plate.
3. Before installing the rear brake shoes and linings, assemble the parking brake lever on the secondary shoe and, on ten-inch brakes, secure with the spring washer and parking brake lever pin retainer.
4. Position the rear brake shoe and lining on the brake backing plate (2211), and install the brake shoe hold-down spring pins, brake shoe hold-down springs, and brake shoe hold-down spring cups using Hold-Down Spring Tool T73T-2300-A. Install the primary brake shoe parking brake lever link, parking brake link spring, and washer. Connect the parking brake rear cable and conduit to the parking brake lever.

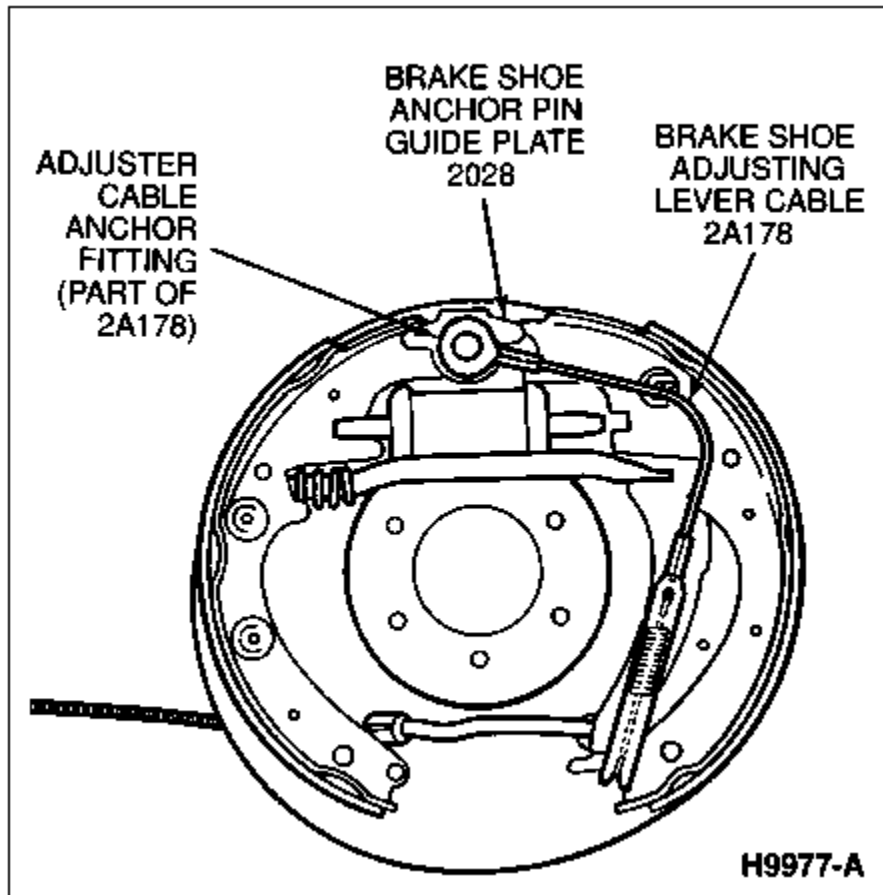


5. Install the brake shoe anchor pin guide plate. Place the brake shoe adjusting lever cable anchor over the anchor pin with the crimped side away from the brake backing plate.

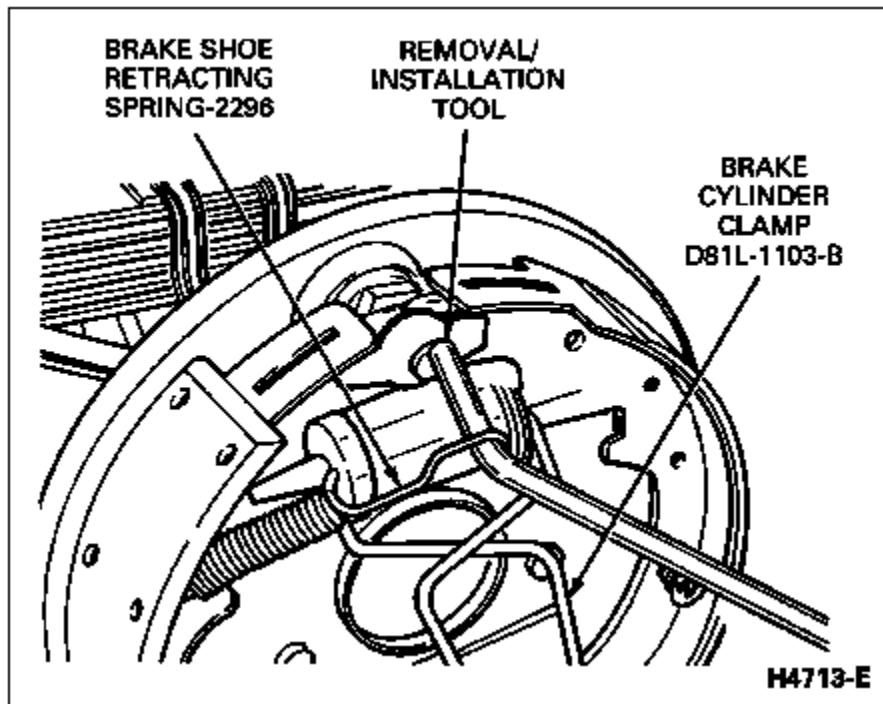
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6. Install the primary shoe-to-anchor (short) spring using a brake spring removal/installation tool.




7. **NOTE:** Make sure the brake shoe adjusting lever cable is positioned in the groove, and not between the cable guide and the shoe web.

Install the cable guide on the secondary shoe web with the flanged holes fitted into the hole in the secondary shoe web. Thread the brake shoe adjusting lever cable around the cable guide groove.

8. **NOTE:** Make sure the cable end is not cocked or binding on the anchor pin when installed. All parts should be flat on the anchor pin.

Install the secondary shoe-to-anchor (long) spring.

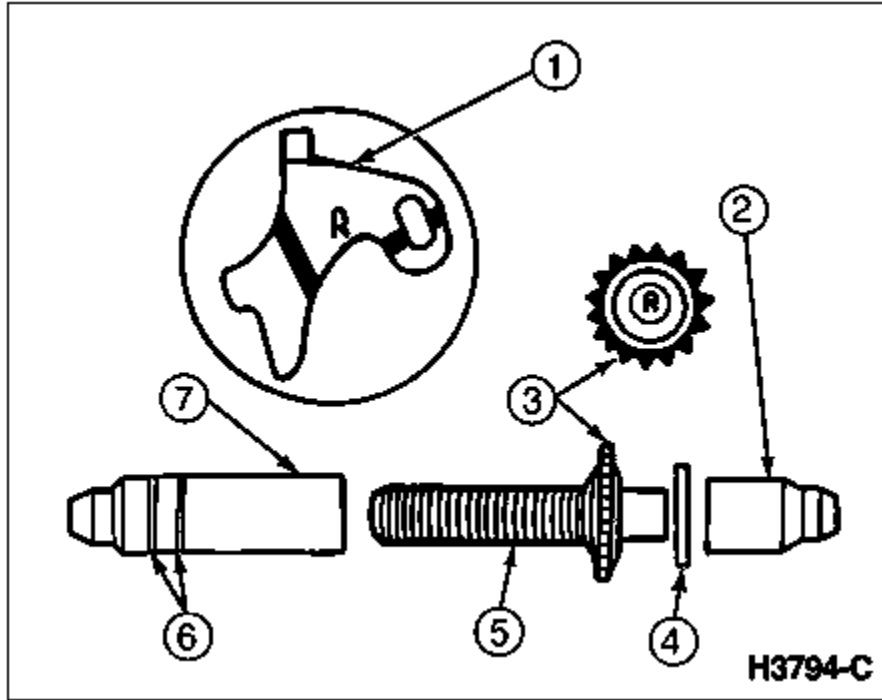
9. Remove the wheel cylinder clamp.

10.  **CAUTION:** Install the brake adjuster screw in the same location from which it was removed. Interchanging the brake adjuster screws from one side of the vehicle to the other will cause the rear brake shoe and lining to retract rather than expand each time the automatic adjusting mechanism is operated.

NOTE: For Aerostar, to prevent incorrect installation, the socket end of each brake shoe adjusting screw is stamped with R or L to indicate their installation on the right or left side of the vehicle. The brake shoe adjusting screw nuts can be distinguished by the number of lines machined around the body of the nut. Two lines indicate a right-hand nut; one line indicates a left-hand nut. Another way to identify adjusters is to check thread pitch. The right side adjuster has right-hand threads while the left side adjuster has left-hand threads. The adjuster will also increase in length when the adjusting lever is operated if properly installed.

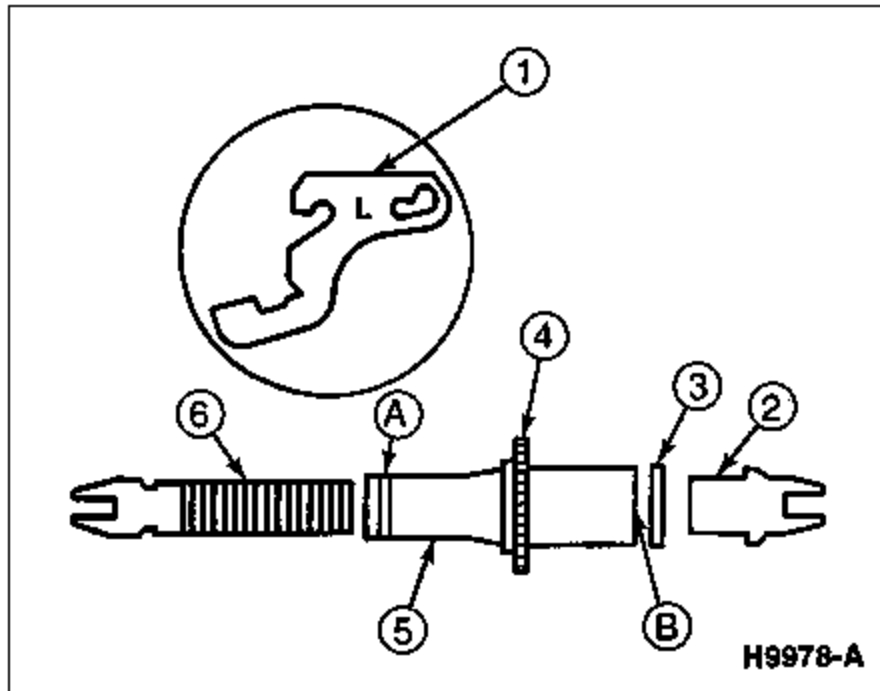
Apply Premium Long-Life Grease XG-1-C or -K or equivalent meeting Ford specification ESA-M1C75-B to the threads of the brake adjuster screw, the thrust washer and the brake shoe adjusting screw stud or socket. Turn the adjusting screw into the brake shoe adjusting screw nut to the end of the threads and then loosen it one-half turn. Refer to illustrations.

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Item	Part Number	Description
1	2A176	Adjusting Lever
2	2048	Brake Shoe Adjusting Screw Socket
3	—	Adjustment Notches (Part of 2041)
4	372583-S	Thrust Washer
5	2041	Brake Shoe Adjusting Screw
6	—	Identification Lines, RH (Part of 2047)
7	2047	Brake Adjuster Screw Nut

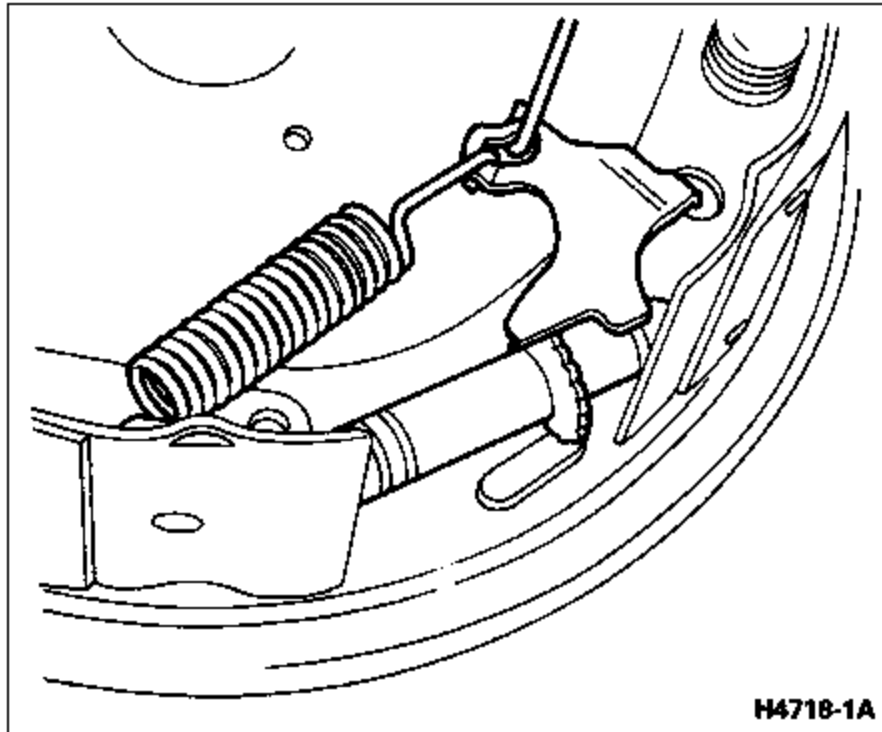
Ranger



Item	Part Number	Description
1	2A176	Adjusting Lever
2	2048	Brake Shoe Adjusting Screw Stud
3	372583-S	Thrust Washer
4	—	Adjustment Notches (Part of 2047)
5	2047	Brake Adjuster Screw Nut
6	2041	Brake Shoe Adjusting Screw
A	—	Left-Hand Identifier Ring
B	—	"L" at Base of Socket

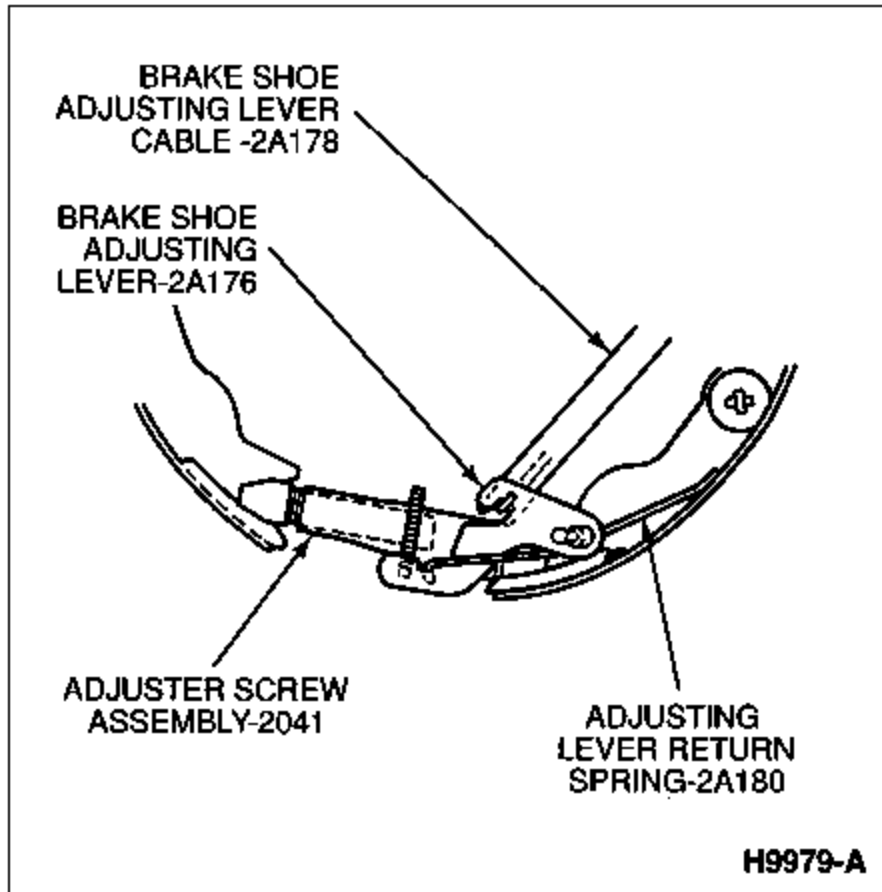
11. Assemble the adjuster and install the assembly between the shoe ends. Refer to illustrations.

Aerostar



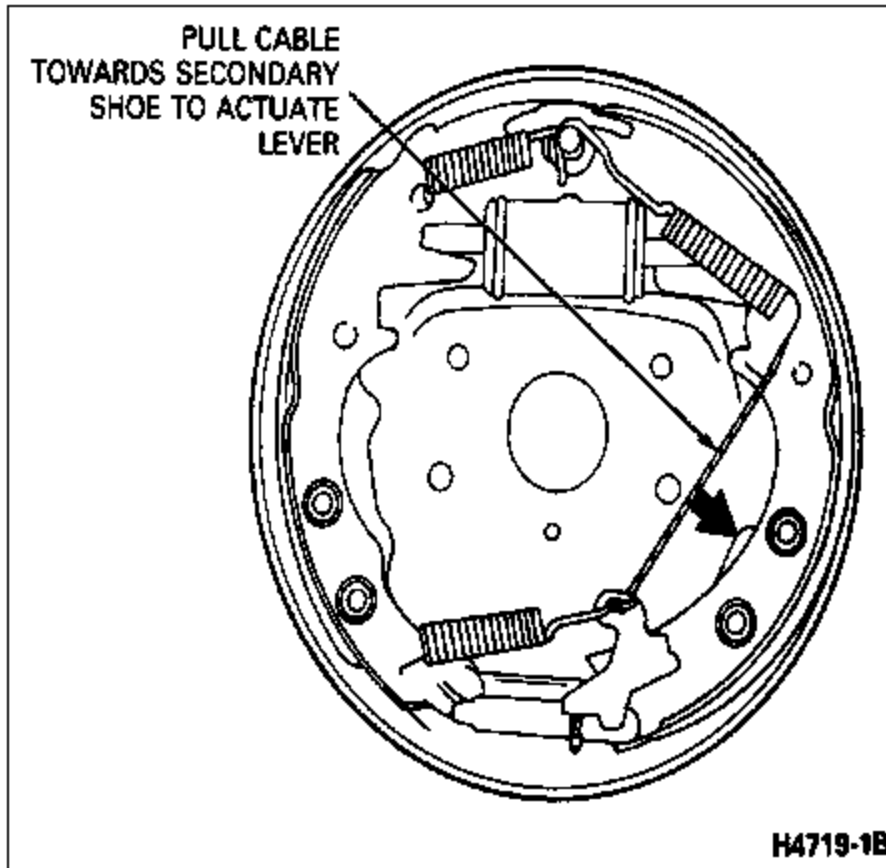
12. On the Aerostar, hook the cable hook into the hole in the brake shoe adjusting lever from the outboard plate side. The brake shoe adjusting levers are also stamped with an R or L to indicate their installation on the right- or left-hand brake assembly.
13. On the Ranger, after installation, the brake shoe adjusting lever should engage the brake adjuster screw nut just below the centerline. Hook the brake shoe adjusting lever cable into the notch in the brake shoe adjusting lever from the inboard side and install the brake shoe adjusting lever and adjusting lever return spring on the pin on the web of the secondary rear brake shoe and lining

Ranger



14. On the Aerostar, install the hooked end of the brake shoe adjusting screw spring in the large hole in the primary shoe web. Connect the loop end of the brake shoe adjusting screw spring to the adjuster lever hole.
15. On the Ranger, install the brake shoe adjusting screw spring in the rear brake shoe and lining.
16. On the Aerostar, pull the brake shoe adjusting lever, brake shoe adjusting lever cable and brake shoe adjusting screw spring down toward the rear to engage the pivot hook in the large hole in the secondary shoe web.
17. On the Aerostar, check the action of the adjuster by pulling brake shoe adjusting lever cable toward secondary shoe, activating brake shoe adjusting lever. Brake shoe adjusting lever should snap in above the next tooth of adjuster. Release brake shoe adjusting lever cable to return brake shoe adjusting lever to original position and the adjuster should turn one notch.

Aerostar

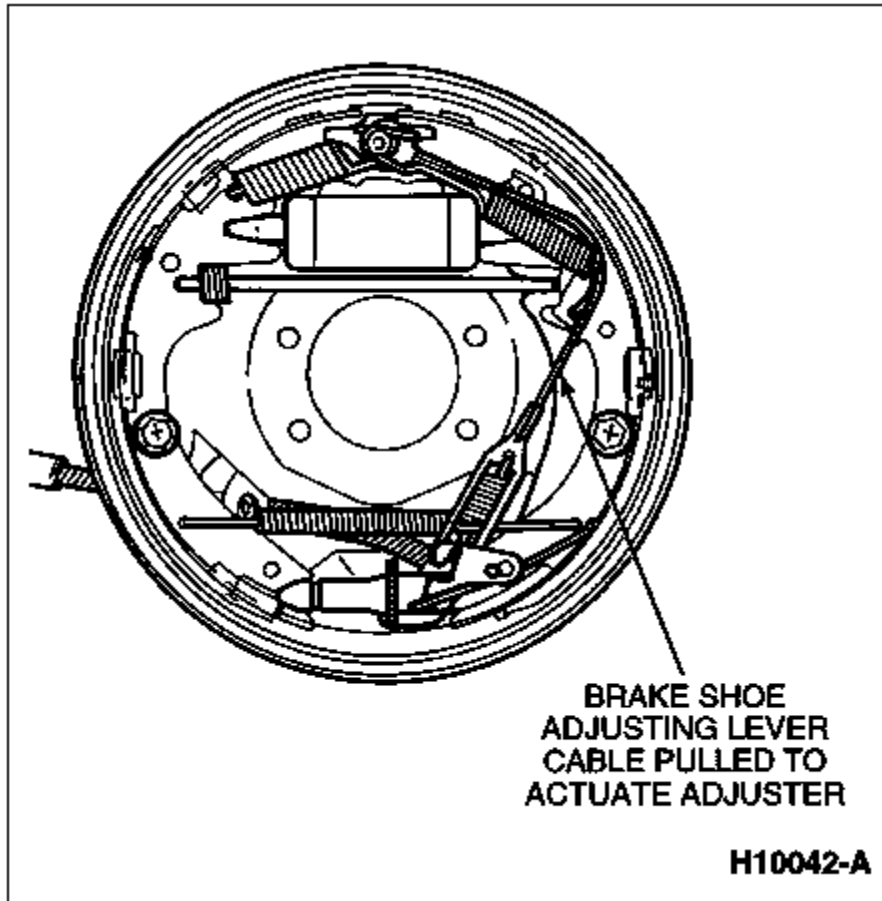


If pulling the brake shoe adjusting lever cable does not produce the action described, or if brake shoe adjusting lever kit action is sluggish instead of positive and sharp, check the position of the brake shoe adjusting lever on the adjusting screw toothed wheel. The brake shoe adjusting lever should contact the adjusting wheel one tooth above the centerline of the brake adjuster screw. If the contact point is below this centerline, the brake shoe adjusting lever will not lock on the teeth in the adjusting screw wheel, and the brake adjuster screw will not be turned as the brake shoe adjusting lever is actuated by the brake shoe adjusting lever cable. Refer to Diagnosis and Testing in [Section 06-00](#) for adjuster diagnosis.

18. Check the action of the Ranger adjuster mechanism:

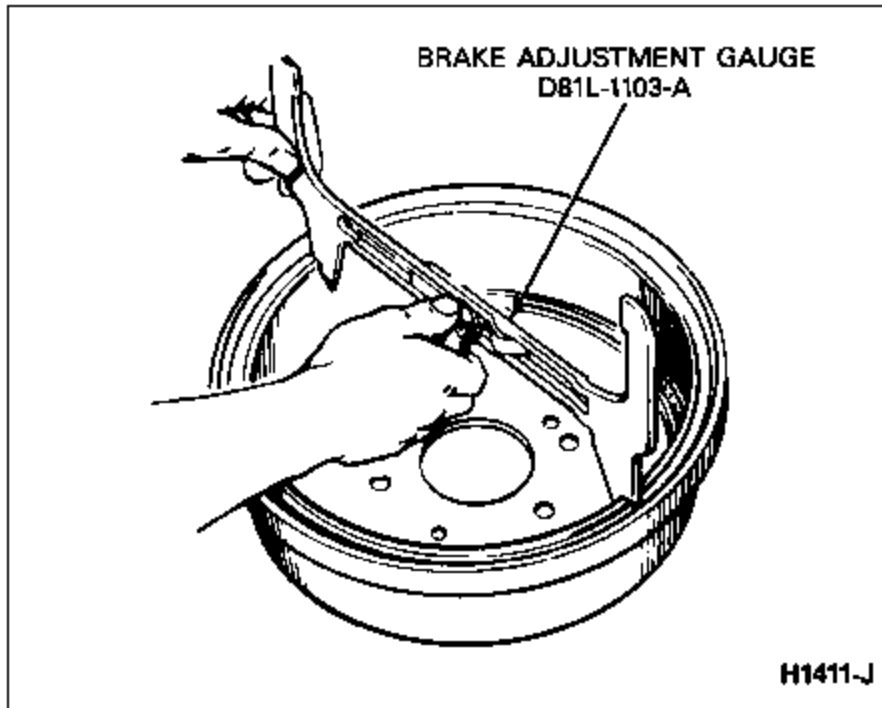
- Pull the brake shoe adjusting lever cable toward the secondary rear brake shoe and lining.
- The brake shoe adjusting lever should turn the adjuster screw nut one tooth.
- Release the brake shoe adjusting lever cable and the brake shoe adjusting lever should drop below the next tooth on the adjuster screw nut.
- If the action is not sharp and definite, check for binding or lack of lubrication.

Adjuster Test, Ranger



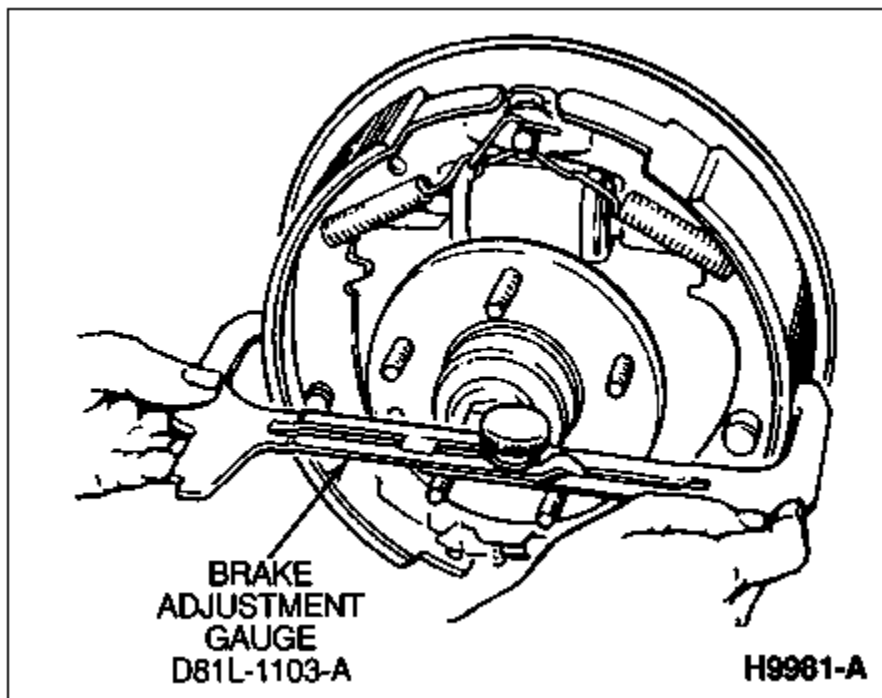
19. Using Brake Adjustment Gauge D81L-1103-A or equivalent, measure the inside diameter of the brake drum.

Measuring Brake Drum



20. Using the brake adjuster screw, adjust the rear brake shoe and lining to the brake drum inside diameter.

Measuring Rear Brake Shoe and Lining



21. Install the brake drum.

22. Install the wheel and tire assembly. Tighten the lug nuts (1012) to 135 Nm (100 lb-ft).
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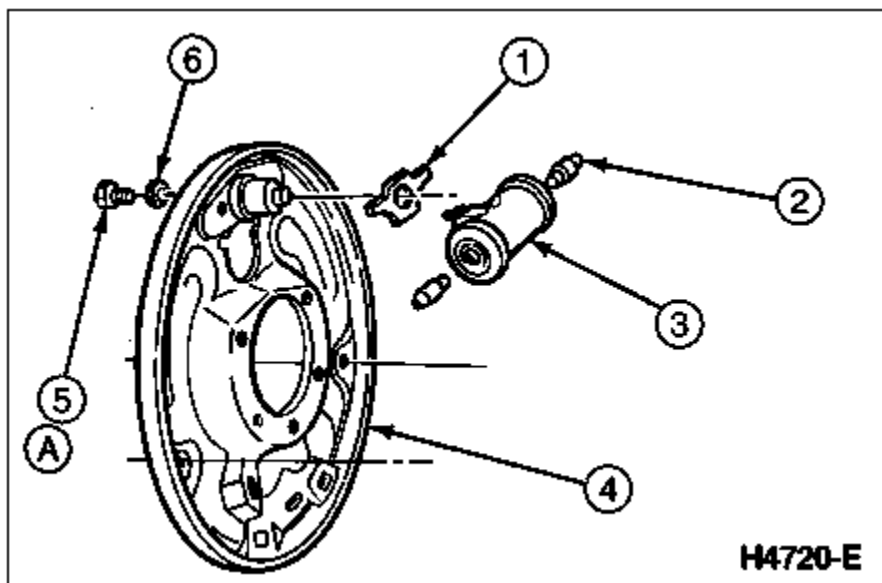
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REMOVAL AND INSTALLATION

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Wheel Cylinder

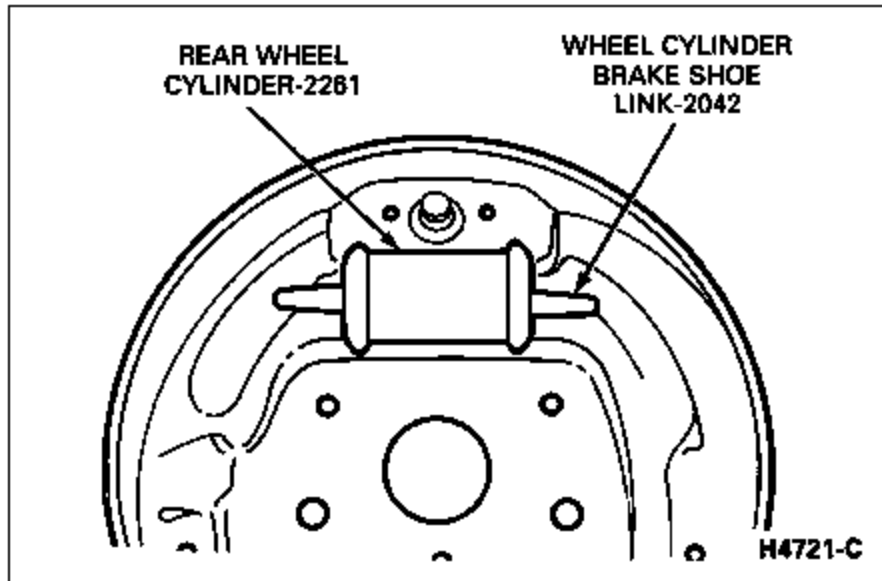
Removal

1. Raise and support vehicle. Remove wheel (1007).



Item	Part Number	Description
1	2028	Brake Shoe Anchor Pin Guide Plate
2	2042	Wheel Cylinder Brake Shoe Link
3	2261	Rear Wheel Cylinder
4	2211	Brake Backing Plate
5	20310-S	Bolt, Wheel Cylinder-to-Backing Plate
6	34941-S	Washer
A	—	Tighten to 12-18 Nm (106-159 Lb-In)

2. Remove the brake drum (1126), and rear brake shoes and linings (2201) as described in this section.



3. Disconnect the brake line from the rear wheel cylinder. Connect a length of hose to the line and submerge end of hose in a can containing a small amount of brake fluid to prevent air from entering the system.
4. Remove the rear wheel cylinder retaining bolts and lockwashers, and then remove the rear wheel cylinder from the brake backing plate.

Installation

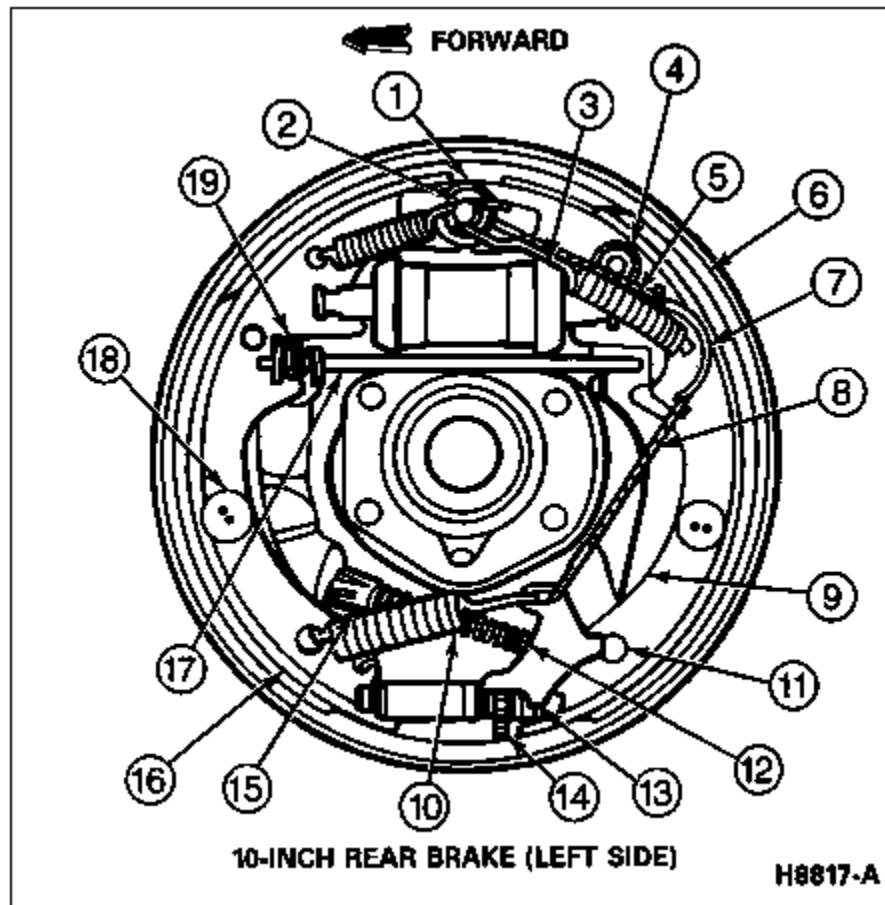
1. Apply Silicone Rubber D6AZ-19562-AA or -BA or equivalent meeting Ford specification ESB-M4G92-A or ESE-M4G195-A to wheel cylinder mounting area to seal backing plate mounting area.
2. Place the rear wheel cylinder on the brake backing plate and install the retaining bolts and lockwashers. Tighten the wheel cylinder-to-backing plate bolts to 12-18 Nm (106-159 lb-in).
3. Connect the brake line to the rear wheel cylinder.
4. Install the rear brake shoe and lining (2200) as described in this section. Install the brake drum and adjust the brakes as described in this section.
5. Install the wheel and tire assembly.
6. Bleed the system as described in [Section 06-06](#). Check brake operation before moving the vehicle.

Brake Backing Plate

Removal

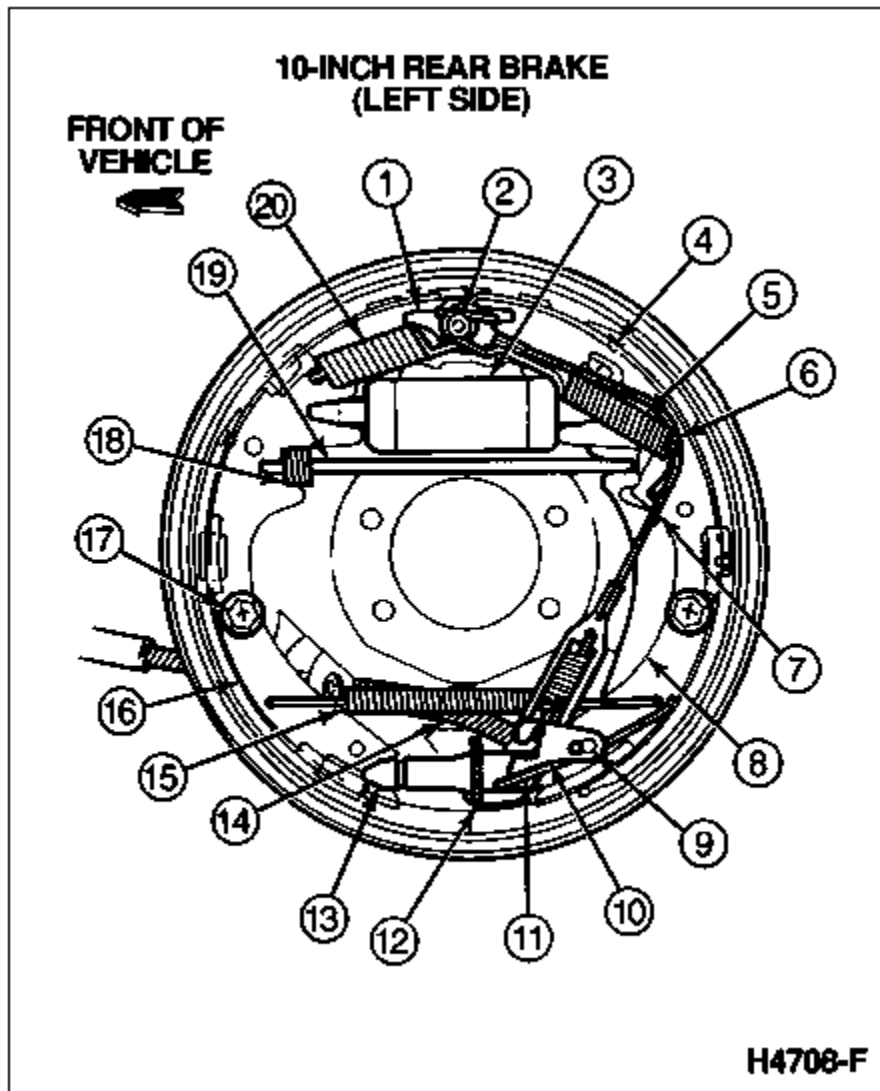
1. Raise and support the vehicle.
2. Remove the rear brake shoe and lining (2200) and the rear wheel cylinder. Refer to the procedures in this section.
3. Disconnect parking brake rear cable and conduit (2A635) from brake backing plate by squeezing locking fingers together using a 9/16-inch flare nut wrench and pulling parking brake rear cable and conduit through brake backing plate.

Aerostar



Item	Part Number	Description
1	2028	Brake Shoe Anchor Pin Guide Plate
2	2027	Anchor Pin
3	2261	Rear Wheel Cylinder
4	351467-S	Washer
5	2296 or 2035	Retracting Spring
6	2200	Rear Brake Shoe and Lining
7	2A179	Cable Guide
8	2A178	Brake Shoe Adjusting Lever Cable
9	2A637	Parking Brake Lever
10	2049	Brake Shoe Adjusting Screw Spring
11	—	Pivot Hook (Part of 2A176)
12	2A635	Parking Brake Rear Cable and Conduit
13	2A176	Brake Shoe Adjusting Lever
14	2041	Adjuster Assembly
15	—	Parking Brake Cable Housing Retainer (Part of 2A809 and 2A635 Cables)
16	2200	Rear Brake Shoe and Lining
17	2A642	Parking Brake Link
18	2A094	Brake Shoe Hold-Down Retainer Repair Kit
19	2A601	Parking Brake Link Spring

Ranger



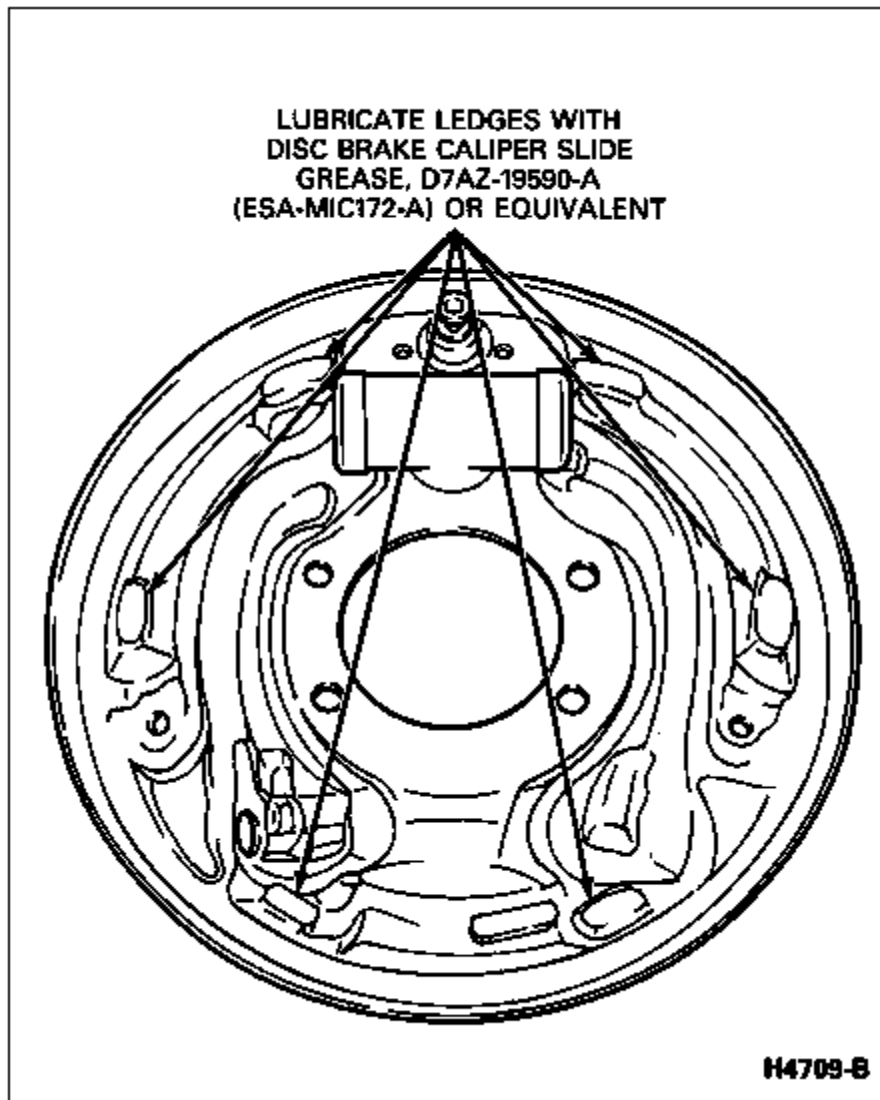
Item	Part Number	Description
1	2028	Brake Shoe Anchor Pin Guide Plate
2	2027	Anchor Pin (Part of 2211)
3	2261	Rear Wheel Cylinder
4	2200	Rear Brake Shoe and Lining (Secondary)
5	2296	Brake Shoe Retracting Spring (Long)
6	2A179	Cable Guide
7	2A178	Brake Shoe Adjusting Lever Cable
8	2A637	Parking Brake Lever
9	—	Adjusting Lever Pin (Part of 2200)
10	2A176	Brake Shoe Adjusting Lever
11	2A180	Adjusting Lever Return Spring
12	2047	Brake Shoe Adjusting Screw Nut

13	2041	Brake Adjuster Screw
14	2A635	Parking Brake Rear Cable and Conduit
15	2049	Brake Shoe Adjusting Screw Spring
16	2200	Rear Brake Shoe and Lining (Primary)
17	2068	Brake Shoe Hold-Down Spring
18	2A601	Parking Brake Link Spring
19	2A642	Primary Brake Shoe Parking Brake Lever Link
20	2296	Brake Shoe Retracting Spring (Short)

4. Remove the axle shaft (4234). Refer to [Section 05-02A](#) or [Section 05-02B](#). Use care not to damage the oil seal.
5. Remove the nuts retaining the brake backing plate to the rear axle housing and remove the brake backing plate and the rear wheel gasket from the rear axle housing.

Installation

1. Apply Silicone Rubber D6AZ-19562-AA or -BA or equivalent meeting Ford specification ESB-M4G92-A or ESE-M4G195-A to braking plate mounting hole to seal axle shaft flange mounting area.
2. Position the brake backing plate and rear wheel gasket on the rear axle housing.
3. Install the backing plate retaining nuts. Alternately and evenly tighten the nuts to 34-47 Nm (25-35 lb-ft).
4. Apply a light coating of Disc Brake Caliper Slide Grease D7AZ-19590-A or equivalent meeting Ford specification ESA-M1C172-A to the ledge pads at the points where the rear brake shoe and lining contact the brake backing plate.



5. Feed the parking brake rear cable and conduit through its hole in the brake backing plate and engage locking fingers.
6. Install the axle shaft. Refer to [Section 05-02A](#) or [Section 05-02B](#) as required in the Powertrain, Drivetrain Service Manual. Use care not to damage the oil seal.
7. Install the rear wheel cylinder and rear brake shoe and lining and adjust using Brake Adjustment Tool D81L-1103-C or equivalent. Connect the parking brake rear cable and conduit to the parking brake lever.
8. Install the rear brake shoe and lining. Refer to the procedure in this section.
9. Connect the brake line to the rear wheel cylinder. Tighten the brake line fitting to 15-20 Nm (11-14 lb-ft).
10. Install the brake drum (1126) and wheel and tire assembly. Tighten the lugnuts to 135 Nm (100 lb-ft).
11. Bleed air from the system as described in [Section 06-06](#).

Wheel Cylinder

Rear wheel cylinders should be rebuilt in full axle sets only. If one side of the vehicle is done, the other side should also be rebuilt.

Rear wheel cylinders should not be disassembled unless they are leaking. Carefully pull lower edges of wheel cylinder boots away from rear wheel cylinder, and note whether interior is wet with brake fluid. Excessive brake fluid at this point indicates leakage past piston cups and a need for rear wheel cylinder overhaul.

NOTE: A slight amount of brake fluid is nearly always present and acts as a lubricant for the wheel cylinder piston. It is not necessary to remove the rear wheel cylinder from the backing plate to disassemble, inspect, hone, and overhaul the rear wheel cylinder. Removal is necessary only if the rear wheel cylinder is damaged or scored beyond service.

Disassembly

1. Remove the rear brake shoe and lining (2200). Refer to the procedure in this section.
2. On ten-inch brakes, remove the wheel cylinder brake shoe links.
3. Disengage rear wheel cylinder boots from retaining grooves in rear wheel cylinder casting. Remove each wheel cylinder boot and wheel cylinder piston from rear wheel cylinder as an assembly.
4. Remove rear wheel cylinder piston cups and wheel cylinder piston cup spring from wheel cylinder bore.
5. Discard all rubber parts.
6. Remove wheel cylinder bleeder screw from rear wheel cylinder.
7. Wash all parts in clean, denatured alcohol.
8. Inspect pistons for scratches, scoring, or other visible damage. Replace if necessary. Always replace rubber parts.
9. Inspect the rear wheel cylinder bore for score marks or rust. If either condition is present, the rear wheel cylinder bore must be honed. **However, the rear wheel cylinder should not be honed more than 0.08mm (0.003 inch) beyond its original diameter.**
10. Wash rear wheel cylinder with clean, denatured alcohol after honing, dry it with compressed air.
11. Inspect the bleeder hole to ensure it is free of obstructions.

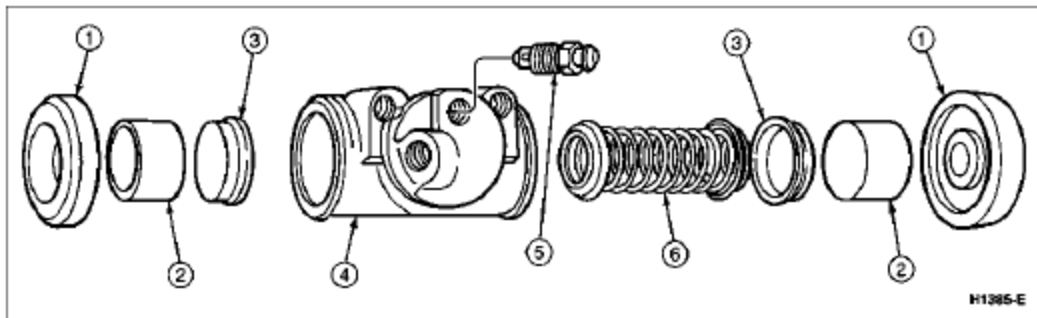
Assembly

Use all parts in the wheel cylinder service kit.

1. Apply a light coating of High Performance DOT 3 Brake Fluid C6AZ-19542-AA or equivalent DOT 3 fluid meeting Ford specification ESA-M6C25-A, DOT 3 to all internal parts.

2. Thread bleeder screw into rear wheel cylinder. Tighten to 7-9 Nm (61-79 lb-in).
3. Insert the wheel cylinder piston cup spring, wheel cylinder piston cups and wheel cylinder pistons into their respective positions in the wheel cylinder bore. Place a wheel cylinder boot over each end of the wheel cylinder.
4. Install the bleeder screw.
5. Install the wheel cylinder brake shoe links, if required.
6. Install rear brake shoe and lining. Refer to the procedure in this section.
7. Install brake drum (1126) and wheel (1007).
8. Bleed brake system. Refer to [Section 06-06](#).

Brake Wheel Cylinder, Disassembled



Item	Part Number	Description
1	—	Wheel Cylinder Boot (Part of 2261)
2	2196	Wheel Cylinder Piston
3	2201	Wheel Cylinder Piston Cup
4	2261	Rear Wheel Cylinder
5	2208	Wheel Cylinder Bleeder Screw
6	2204	Wheel Cylinder Piston Cup Spring

Cleaning



WARNING: BRAKES CONTAIN ASBESTOS FIBERS. AVOID BREATHING DUST. BREATHING ASBESTOS DUST MAY CAUSE ASBESTOSIS AND CANCER.

BREATHING ASBESTOS DUST IS HAZARDOUS TO YOUR HEALTH.

DUST AND DIRT PRESENT ON WHEEL BRAKE AND CLUTCH ASSEMBLIES MAY CONTAIN ASBESTOS FIBERS THAT ARE HAZARDOUS TO HEALTH WHEN MADE AIRBORNE BY CLEANING WITH COMPRESSED AIR OR BY DRY BRUSHING.

WHEEL BRAKE ASSEMBLIES AND CLUTCH FACINGS SHOULD BE CLEANED USING A VACUUM CLEANER RECOMMENDED FOR USE WITH ASBESTOS FIBERS SUCH AS ROTUNDA BRAKE/CLUTCH/SERVICE VACUUM 091-R0001 OR EQUIVALENT. DUST AND DIRT FROM VACUUM SHOULD BE DISPOSED OF IN SUCH A MANNER THAT PREVENTS DUST EXPOSURE, SUCH AS SEALED BAGS. THE BAG MUST BE LABELED AS PER OSHA INSTRUCTIONS AND THE TRASH HAULER NOTIFIED AS TO THE BAG'S CONTENTS.

IF A VACUUM SUITABLE FOR ASBESTOS IS NOT AVAILABLE, CLEANING SHOULD BE DONE WET. IF DUST GENERATION IS STILL POSSIBLE, TECHNICIANS SHOULD WEAR GOVERNMENT-APPROVED TOXIC DUST PURIFYING RESPIRATORS.

GRINDING OR SANDING ON BRAKE LININGS, PADS, ROTORS, DRUMS OR CLUTCH FACINGS SHOULD BE DONE ONLY WHILE USING PROPERLY EXHAUST-VENTILATED EQUIPMENT.

OSHA REQUIRES AREAS WHERE ASBESTOS DUST GENERATION IS POSSIBLE TO BE ISOLATED AND POSTED WITH WARNING SIGNS. ONLY TECHNICIANS CONCERNED WITH PERFORMING BRAKE OR CLUTCH SERVICE SHOULD BE PRESENT IN THE AREA.



CAUTION: Do not use denatured alcohol for flushing the system or cleaning assemblies where alcohol could be trapped and cause eventual failure of rubber components in the system.

1. Denatured alcohol is acceptable for cleaning parts, provided the parts are completely air-dried and coated with brake fluid before installation.
2. To remove brake fluid contamination, clean all parts with denatured alcohol. Do not attempt to clean contaminated lining. Contaminated brake lining must be replaced.

Inspection

Use Rotunda Brake/Clutch/Service Vacuum 091-R0001 or equivalent to remove all dust from backing plates and interior of brake drums (1126).

Wheel Cylinders

1. Rear wheel cylinders should not be disassembled unless they are leaking. Pull back each rear wheel cylinder dust boot and inspect for leakage.
2. Excessive brake fluid at this point indicates leakage past the piston cups and a need for rear wheel cylinder (2261) overhaul. A slight amount of fluid is nearly always present and acts as a lubricant for the pistons. If evidence of leakage is noted, the rear wheel cylinder should be disassembled, inspected and overhauled.
3. Inspect the rear wheel cylinder bore for scratches and pitting. If the rear wheel cylinder is pitted or has deep scratches, the rear wheel cylinder must be replaced.

Brake Drums

1. A brake drum should be visually inspected and measured with Rotunda Brake Drum Micrometer 104-00046 or equivalent. Before making an inspection or measurement, remove grease, brake fluid, or other contaminants from the brake drum using denatured alcohol.
2. Best shop practice requires measuring every brake drum with a brake drum micrometer regardless of visual inspection. The brake drum micrometer is set to the drum diameter and measures the amount and type of wear. Measure the diameter at various points 45-degrees apart around the brake shoe and lining contact area, and at the bottom of the deepest groove to determine if the brake drum requires replacement.

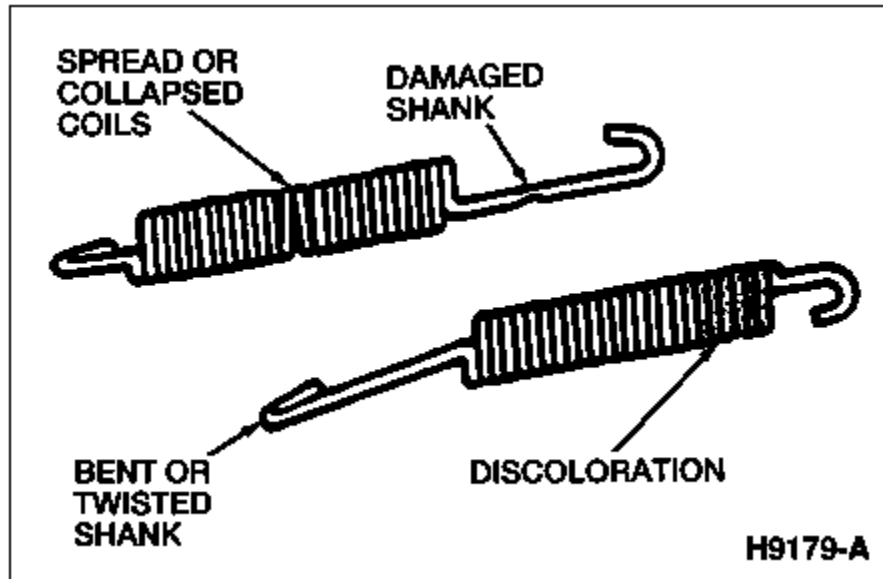
Brake Lining

1. Inspect rear brake shoes and linings (2200) for excessive lining wear or shoe damage. If lining is damaged or worn within 0.79mm (1/32 inch) of the rivet heads on riveted linings, it must be replaced. Replace any rear brake shoe and lining that has been contaminated with oil, grease or brake fluid. Replace rear brake shoe and lining in axle sets only. Never replace just one rear brake shoe and lining of a brake assembly. Replace both primary and secondary shoes. Prior to replacement of lining, brake drum diameter should be checked to determine that brake drum diameter is within specification. If braking surface diameter exceeds specification, the brake drum must be replaced.
2. Check condition of rear brake shoes and linings, retracting spring, hold-down springs, and brake drum for signs of overheating. If rear brake shoe and lining metal parts have a slight blue coloring, indicating overheating, retracting and hold-down springs should be replaced. Overheated springs lose their tension and could allow new rear brake shoe and lining to drag and wear prematurely, if not replaced.

Springs

Check springs for:

- Spread or collapsed coils
- Twisted, bent or damaged shanks
- Discoloration — This is a sign of brake overheating. Overheated springs lose some of their tension and should be replaced.



Brake Backing Plate

1. Inspect the brake backing plate for correct mounting and securely tightened mounting nuts.
 2. Inspect the brake shoe and lining contact pads (where the rear brake shoe and lining rest).
 - Deep grooves in the brake shoe and lining contact pads could restrict brake shoe and lining movement.
 - If grooves exist, hand sand the brake shoe and lining contact pads.
 - If the grooves are still present after hand sanding, the rear brake backing plate must be replaced. Any attempt to remove the grooves by grinding may result in improper brake shoe and lining-to-brake drum contact.
 3. Inspect all other brake parts and replace any that are worn or damaged.
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Brake Drum

Refinishing

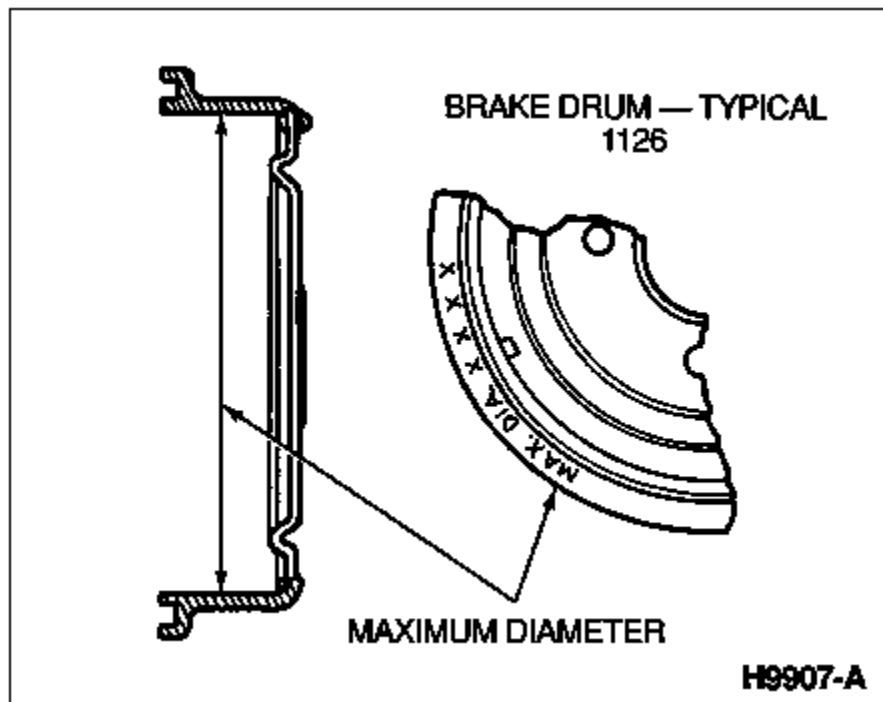
Minor scores on brake drums (1126) can be removed with sandpaper. Do not refinish brake drums to remove score marks. A drum surface which is highly polished can cause brake lockup or noise. This polished condition should be removed with sandpaper. A brake drum that is out of round sufficient to cause vehicle vibration or roughness when braking should be refinished. Remove only enough stock to true-up the brake drum. When brake drum maximum inside diameter shown on the brake drum is exceeded either through wear or refinishing, the brake drum must be replaced.

Check inside diameter of brake drum with Brake Adjustment Gauge D81L-1103-A or Rotunda Brake Drum Micrometer 104-00046 or equivalent.

After a brake drum is refinished, wipe refinished surface with a cloth soaked in clean, denatured alcohol.

Maximum Diameter

Brake drum maximum diameter is cast into the rim of the brake drum. The brake drum may be machined enough to correct scoring but only up to the MAX. DIA. dimension. If, after machining, the brake drum inside braking surface diameter exceeds the specification, it must be discarded.



Brake Shoe and Lining

Drums Removed

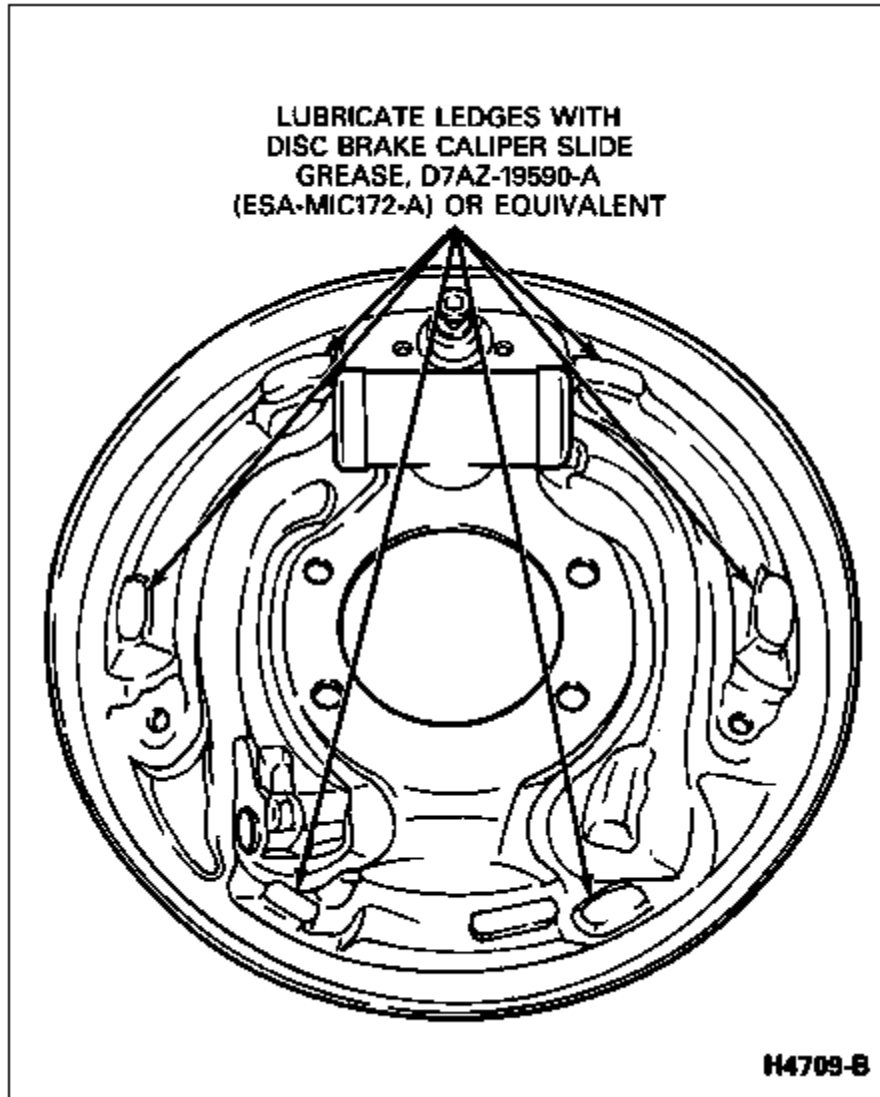


WARNING: DO NOT INHALE DUST FROM BRAKES OR ASSOCIATED COMPONENTS. INHALATION OF DUST CAN BE INJURIOUS TO YOUR HEALTH. COMPRESSED AIR OR BRUSHES MUST NOT BE USED TO CLEAN BRAKES, BRAKE DRUMS AND ASSOCIATED COMPONENTS. A VACUUM CLEANER SUCH AS ROTUNDA BRAKE/CLUTCH/SERVICE VACUUM 091-R0001 OR EQUIVALENT EQUIPPED FOR THIS PURPOSE SHOULD BE CAREFULLY USED TO REMOVE ANY DUST. ADHERENT DUST SHOULD BE REMOVED WITH A DAMP RAG. ANY DUST SHOULD BE CONTAINED IN A SEALED AND LABELED BAG FOR DISPOSAL. WEAR AN APPROVED HIGH EFFICIENCY CARTRIDGE OR AIR LINE RESPIRATOR AND USE EXTRA CAUTION TO AVOID BREATHING THIS DUST. ALWAYS USE NON-ASBESTOS REPLACEMENT PARTS.

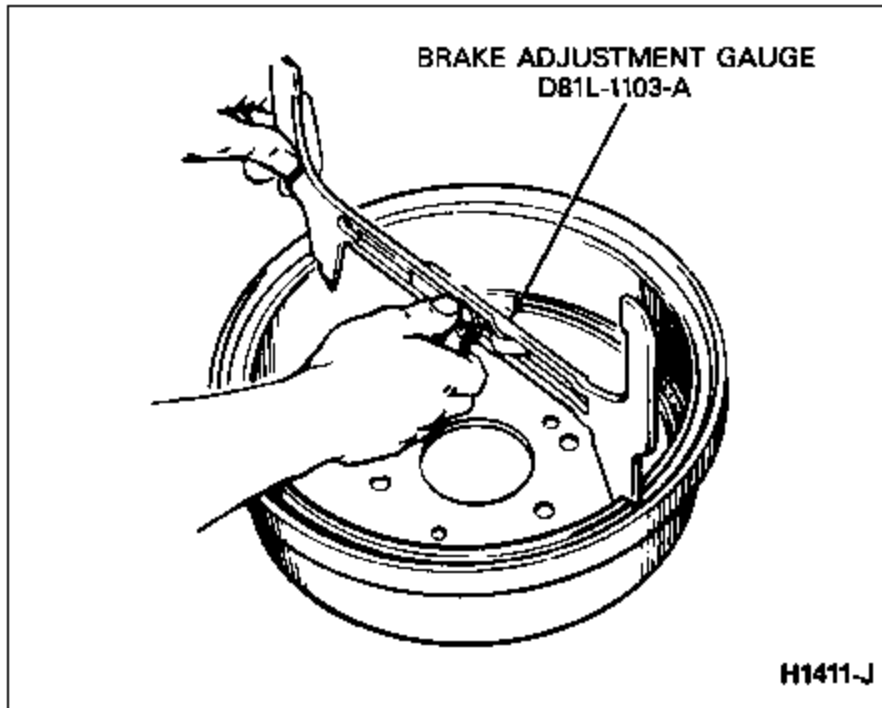
The rear brakes are automatically adjusted while driving the vehicle in reverse and sharply applying the brakes, and then driving forward. It may be necessary to do this several times to obtain the proper rear brake adjustment. Manual brake adjustment is required only after the brake shoes have been replaced, or if brake shoe adjusting lever has malfunctioned and has been repaired or replaced. Perform the manual adjustment with the brake drums (1126) removed, using Brake Adjustment Gauge D81L-1103-A or equivalent and the procedure described below.

When adjusting the rear brake shoes, check the parking brake rear cable and conduit (2A635) for proper operation. Make sure the equalizer operates freely. For parking brake service, refer to [Section 06-05](#).

1. Raise vehicle on hoist. Position suitable safety stands under vehicle. Remove wheel (1007). Remove brake drum as described in this section.
2. Use Rotunda Brake/Clutch/Service Vacuum 091-R0001 or equivalent to remove any dust present on the brake assembly.
3. Carefully remove the brake shoe hold-down spring. Using sandpaper, clean the shoe-to-backing plate contact points while holding the shoe away from the brake backing plate.
4. Check brake backing plate for damage. If any damage is found, it must be replaced. Refer to procedure in this section. If no damage is found, apply a small amount of Disc Brake Caliper Slide Grease D7AZ-19590-A or equivalent meeting Ford specification ESA-M1C172-A to the points where the shoes touch the brake backing plate. Be careful not to get the lubricant on the linings.
 - The following illustration is simplified to show contact point location.

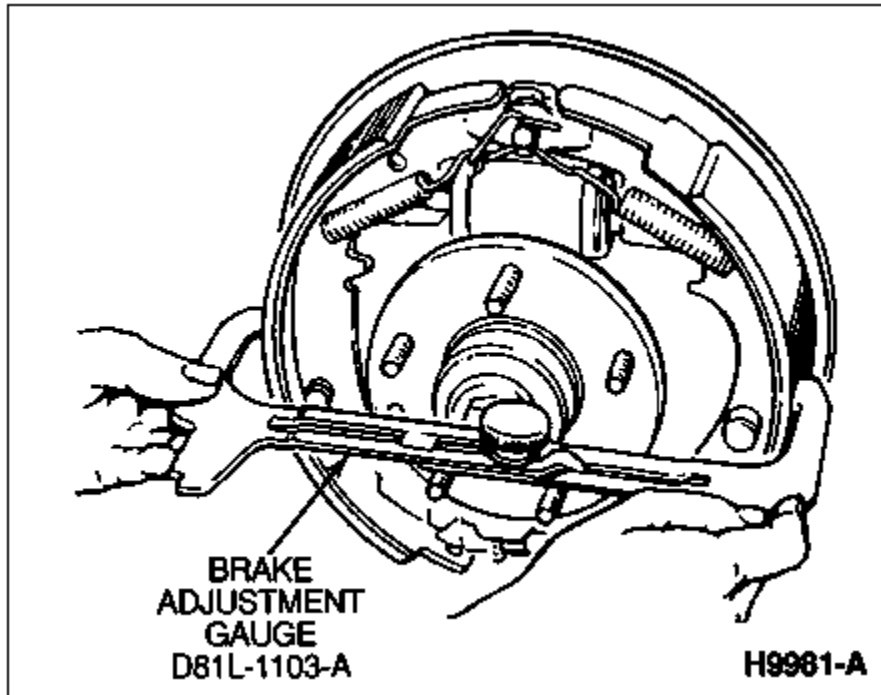


5. Reinstall brake shoe hold-down spring.
6. Set the Brake Adjustment Gauge D81L-1103-A or equivalent to the inside diameter of the drum braking surface.



7. Reverse the tool as shown and adjust the rear brake shoe and lining (2200) until they match the gauge setting. The gauge contact points on the rear brake shoe and lining must be parallel to the vehicle with the center line through the center of the axle.
8. Hold the brake shoe adjusting lever out of engagement while rotating the notched part of the adjuster screw assembly, to prevent burring the notches. Make sure the adjuster rotates freely.
9. If necessary, remove the adjuster for disassembly and cleaning, then lubricate the adjusting screw threads and pilot end with a thin, uniform coating of Disc Brake Caliper Slide Grease D7AZ-19590-A or equivalent meeting Ford specification ESA-M1C172-A.

Checking Adjustment, Typical



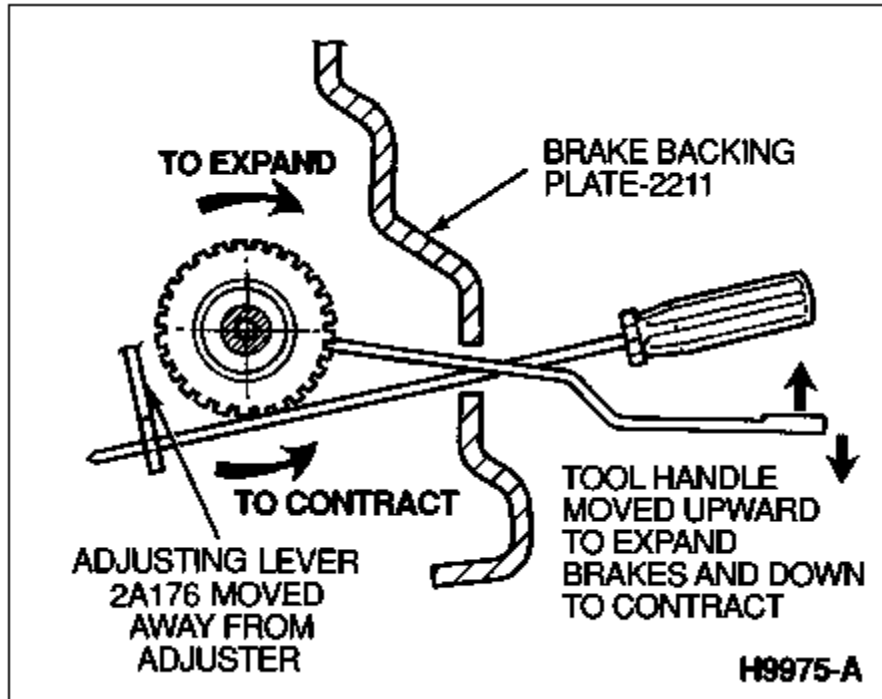
10. Install the brake drums.
11. Install the wheel on the brake drum and tighten the lug nuts (1012) to 135 Nm (100 lb-ft). Remove the safety stands and lower the vehicle.
12. After adjusting the brake shoes, check brake operation before moving the vehicle.
13. Complete the adjustment by sharply applying the brakes several times while driving the vehicle alternately in forward and reverse.

Drums Installed

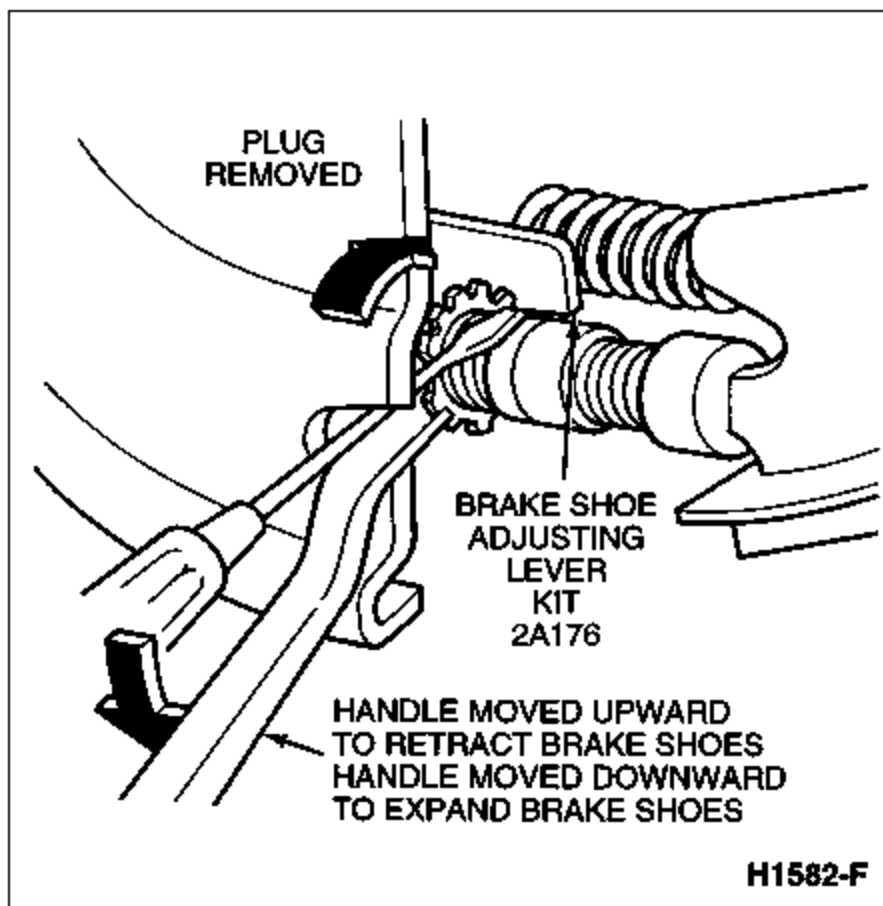
Adjust the single anchor brake by turning the adjusting screw located between the lower ends of the shoes.


1. Place transmission (7003) in neutral. Raise the vehicle until the tires clear the floor. Install safety stands.
2. Remove the cover from the adjusting hole at the bottom of the brake backing plate, and turn the brake shoe adjuster assembly using Brake Adjustment Tool D81L-1103-C or equivalent inside the hole to expand the brake shoes until they lock the brake drum. Refer to illustration.

Ranger



Aerostar



3. When the rear brake shoes and linings are against the brake drum, loosen the brake shoe adjusting screw nut 10 to 12 notches so that the brake drum rotates freely without drag.
4. If the brake drum does not rotate freely, remove the wheel and brake drum, and vacuum out any dust and dirt from the linings using Rotunda Brake/Clutch/Service Vacuum 091-R0001 or equivalent.
5. Using sandpaper, remove any rust from the points where the shoes touch the brake backing plate.
6. Check brake backing plate for damage. If none is found, apply a light coating of Disc Brake Caliper Slide Grease D7AZ-19590-A or equivalent meeting Ford specification ESA-M1C172-A . Do not get the lubricant on the rear brake shoe and lining.
7. Install the wheel and brake drum and adjust the rear brake shoe and lining.
8. Install the adjusting hole cover in the brake backing plate.
9. Check and adjust the other rear brake assembly.
10. Apply the brakes. If the pedal travels more than halfway to the floor, there is too much clearance between the brake shoes and the brake drums. Repeat Steps 2 and 3 of this procedure.
11.  **WARNING: PERFORM THE ROAD TEST ONLY WHEN THE BRAKES WILL APPLY AND THE VEHICLE CAN BE SAFELY STOPPED.**

When the rear brake shoes and linings have been properly adjusted, lower the vehicle and road test

to check brake operation.

Section 06-02: Brakes, Rear Drum
SPECIFICATIONS

1997 Aerostar, Ranger Workshop Manual

SPECIFICATIONS**Fluid Specifications**

Part Number	Description	Specification
C6AZ-19542-AA	Ford High Performance DOT 3 Brake Fluid	ESA-M6C25-A
D7AZ-19590-A	Disc Brake Caliper Slide Grease	ESA-M1C172-A
XG-1-C or K	Premium Long-Life Grease	ESA-M1C75-B
D6AZ-19562-AA or BB	Silicone Rubber Sealant	ESB-M4G92-A or ESE-M4G195-A

Brake Specifications

Truck Series	Ranger Reg. and SuperCab Under 4580 GVWR	Ranger Reg. SuperCab Over 4580 GVWR	All Aerostar
Axle Usage, Front	2540/ 2580/2650	2750 2800	2650
Axle Usage, Rear	2750/2950	2750/3200	2950
Type	DSSA	DSSA	DSSA
Size (Inches)	9x1.75 ^a	10x2.5 ^b	10x2.5

^a Ranger SuperCab with limited slip axles have 10x2.5 inch rear brake regardless of GVWR.

^b 9x1.75 standard with 2.3L engine.

Bore Diameters — Rear Wheel Cylinders

Truck Series	Ranger Reg. and SuperCab Under 4580 GVWR	Ranger Reg. SuperCab Over 4580 GVWR	All Aerostar
Rear Wheel Cylinder Bore (Inches)	0.75	0.75	0.9375

Rear Drum Brake Lining Dimensions

Truck Series	Ranger Reg. and SuperCab Under 4580 GVWR	Ranger Reg. SuperCab Over 4580 GVWR	All Aerostar
Lining Thickness Primary (Inches)	.19	.189	.189
Lining Thickness Secondary (Inches)	.28	.245	.245
Lining Length Primary (Inches)	6.10	8.46	8.46
Lining Length Secondary (Inches)	8.80	10.88	9.59

NOTE: The following torque specifications are for clean, dirt-free and paint-free dry bolt and nut threads.

Torque Specifications

Description	Nm	Lb-Ft	Lb-In
Backing Plate-to-Rear Axle Housing Nuts	34-47	25-35	—
Lugnuts	135	100	—
Wheel Cylinder-to-Backing Plate Bolts	12-18	—	106-159
Brake Line-to-Wheel Cylinder Fitting	15-20	11-14	—
Wheel Cylinder Bleeder Screw	7-9	—	61-79
