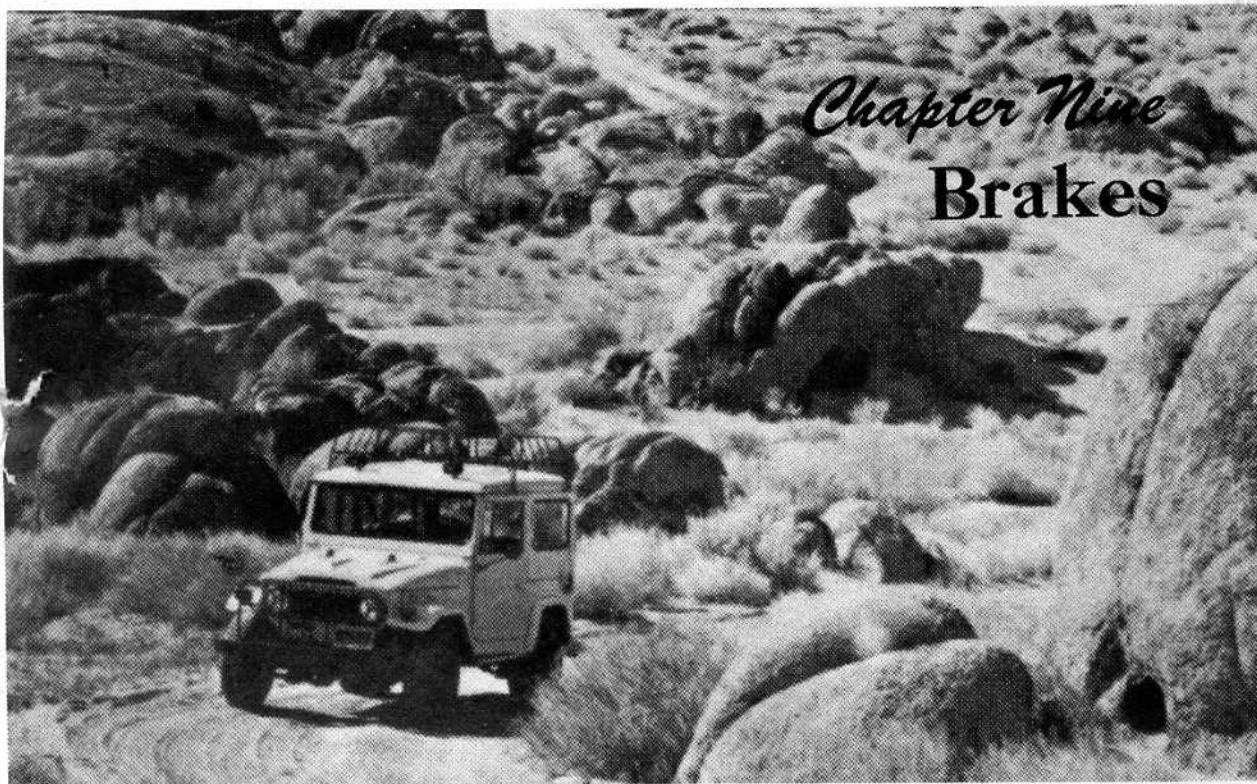


Chapter Nine Brakes



The brakes are internal expanding, hydraulically-operated type, actuated by means of a brake pedal connected to the brake master cylinder via a pushrod.

The front brakes are the two leading shoe type with two brake wheel cylinders on each wheel. The rear brakes are of the dual two leading shoe type with two brake wheel cylinders on each wheel. The front wheel cylinders have one piston; the rear wheel cylinders have two pistons.

A vacuum-operated brake booster is an option on the FJ 55 model.

The parking brake is a mechanical, internal expanding shoe type, mounted at the rear of the transmission. The parking brake exerts braking force on the drive-shaft through the driveline to the rear wheels.

Brake System

Adjustment

Brake shoe adjustment reestablishes the proper brake lining-to-drum clearance and compensates for lining wear. The brakes are adjusted by turning the adjusting nut located on the wheel cylinders' piston. The adjusting screws are

accessible through service holes located in the brake backing plate.

1. Raise the vehicle until the wheels to be adjusted are off the ground. Ideally, all four wheels should be raised off the ground at the same time. However, if the necessary equipment is not available, raise just the wheels on one axle or even one at a time.

2. Release the parking brake completely and make sure that the rear wheels turn freely.

3. Remove the adjusting screw access hole plug from the rear of the backing plate.

4. Expand the brake shoe by turning the wheel cylinder adjusting nut with a brake adjusting tool until the shoe is tight against the drum.

5. Pump the brake pedal a few times to make sure that the entire surface of the brake shoes contact the drum.

6. If the wheel still turns after releasing the brake pedal, turn the adjusting nut further until the wheel is locked completely.

7. Back off the adjusting nut five notches. If the shoe still drags lightly on the drum, back off an additional one or two notches. The wheel should rotate freely after performing the adjustment.

8. Perform the above adjustment for all of the brake shoes (two at each

wheel). Never adjust the shoes with the two adjusting nuts at the same time.

9. Lower the vehicle and road-test it, looking for maximum effectiveness and even straight-line braking.

Hydraulic System

MASTER CYLINDER

Removal and Installation

1. Disconnect the brake tubes from the master cylinder.

2. Disconnect the fluid pressure switch wires.

3. Remove the master cylinder from the vehicle by removing the four attaching bolts.

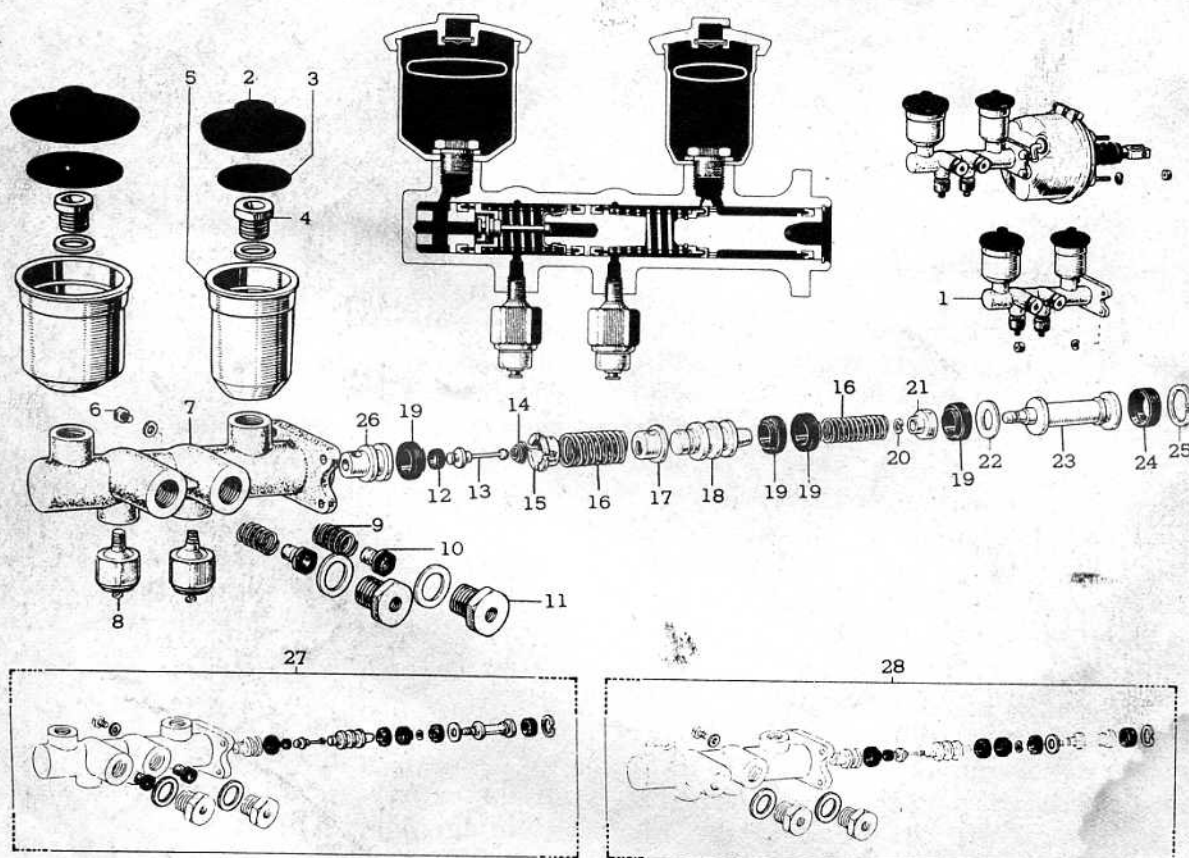
4. Install the master cylinder in the reverse order of removal and bleed the brake hydraulic system.

Overhaul

1. Remove the master cylinder from the vehicle.

2. Remove the fluid pressure switches.

3. Remove the snap-ring and take out the No. 1 piston and spring.



Exploded view of the tandem type brake master cylinder

1. Tandem master cylinder subassembly
2. Reservoir filler cap
3. Reservoir float
4. Reservoir bolt
5. Master cylinder reservoir
6. Bolt
7. Master cylinder body
8. Oil pressure switch
9. Spring
10. Outlet check valve
11. Fluid outlet plug
12. Inlet valve
13. Inlet valve connecting rod
14. Spring

15. Inlet valve case
16. Spring
17. No. 2 piston return spring retainer
18. No. 2 piston
19. Cylinder cup
20. Shaft snap link
21. Piston return spring retainer
22. Piston cup spacer
23. No. 1 piston
24. Snap-ring
25. Master cylinder boot
26. Inlet valve seat
27. Master cylinder kit
28. Master cylinder cup kit

4. Loosen the bolt and take out the No. 2 piston and the inlet valve seat.

5. Remove the outlet plugs and take out the outlet check valves.

6. Disassemble the piston assembly by first prying up on the spring retainer lips and removing the piston. Next, remove the connecting rod from the retainer and remove the inlet valve. Then, remove the piston cap from the piston.

7. Inspect the cylinder bore and the piston for wear or damage. Light scoring can be removed with emery paper or crocus cloth soaked in brake fluid. Flush the parts with brake fluid after polishing them.

8. Wash all the parts to be assembled with clean brake fluid before assembling.

9. Assemble the inlet valve seat. Make sure that it is assembled in the correct direction.

10. Bend down the spring retainer lips.

11. Insert the inlet valve seat into the master cylinder bore.

12. Insert the No. 2 piston into the cylinder bore and install the stop bolt.

13. Insert the return spring into the master cylinder bore.

14. Install the No. 1 piston assembly into the bore and install the snap-ring.

15. Install the spring, outlet check valve, gasket and union bolt.

16. Install the fluid pressure switches.

17. Install the master cylinder reservoirs.

18. Install the master cylinder on the vehicle and bleed the brake hydraulic system.

soft mallet and remove the drum from the hub assembly. Back off the wheel cylinder adjusting nuts if the drum cannot be removed.

NOTE: *Never depress the brake pedal while the brake drum is removed.*

4. Install the brake drum in the reverse order of removal.

Inspection

1. Clean all dirt out of the drum and check for cracks, scores, roughness, deep grooves and out-of-roundness. If any of the above conditions exists, correct them or replace the brake drum, as efficiency of the operation of the brakes can be impaired and also premature failure of the brake linings can occur.

2. Smooth any slight scoring by polishing with fine emery cloth.

3. Deep, heavy, or extensive scoring must be removed by resurfacing the friction surface of the brake drum on a drum lathe. The refinished friction surface must be smooth and free from chatter and tool marks. The diameter of the brake drum is 11.42 in. with the serviceable limit being 11.54 in.

BRAKE SHOES

Inspection

1. Inspect the brake shoes, after removing the brake drum, for wear, deformation, rust and damage. Look for scores and excessive wear indicating the entrance of dirt, stones, or sand. If the brake shoes show signs of being scored by foreign material, then chances are that the brake drum is scored also. If the thickness of the brake lining is less than 0.16 in., replace the brake shoe assembly or have the lining replaced.

Front Drum Brakes

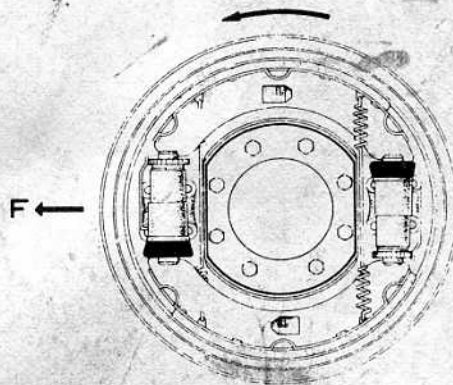
BRAKE DRUMS

Removal and Installation

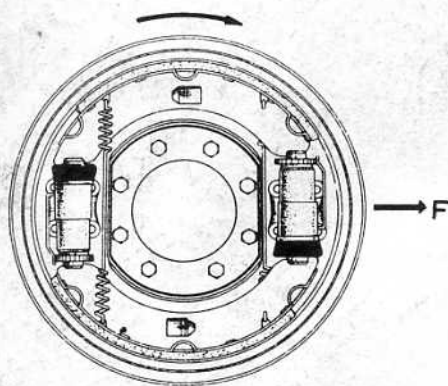
1. Pry off the wheel cap and loosen the hub nuts.

2. Raise the front end of the vehicle and support the front axle housing with jackstands, then remove the front wheel.

3. Loosen and remove the brake drum set screws. Tap the drum lightly with a



Assembled view of the left front brake assembly



Assembled view of the right front brake assembly

Removal and Installation

1. Remove the brake drum.
2. Remove the brake shoe hold-down springs and pins.
3. Remove the brake shoe retracting springs.
4. Remove the upper and lower brake shoes by pulling out the shoe ends, pushing up or down.
5. Position the upper and lower brake shoes into the grooves of the wheel cylinder piston and the adjusting bolt. Holding the shoes in position, install the brake shoe return springs. Hook the

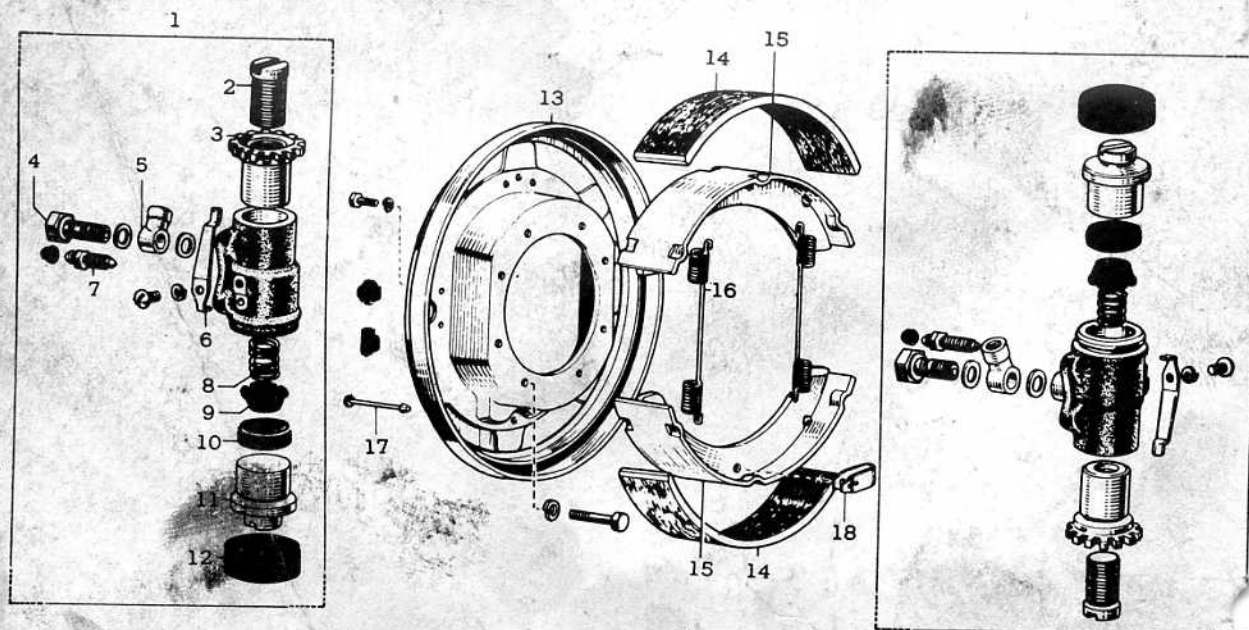
front spring from the rear of the brake shoes and the rear spring from the outer side of the shoes.

6. Install the brake shoe hold-down spring pins and the hold-down springs.

7. Install the brake drum and adjust the brake shoe-to-drum clearance.

WHEEL CYLINDERS**Removal and Installation**

1. Remove the brake drums.
2. Remove the brake shoes.
3. Plug the brake master cylinder reservoir inlet.
4. Loosen and remove the union bolt connecting the union of the wheel cylinder brake tube to the brake wheel cylinder.
5. Remove the wheel cylinder mounting bolts and remove the wheel cylinder assembly from the brake backing plate, taking note of its installed position. Remove the other wheel cylinder in the same manner.
6. Install the wheel cylinders in the reverse order of removal, making sure that they are installed in their original positions.



Exploded view of the front brake assembly components

- | | |
|----------------------------------|-------------------------------|
| 1. Brake wheel cylinder assembly | 10. Cylinder cup |
| 2. Wheel cylinder adjusting bolt | 11. Cylinder piston |
| 3. Wheel cylinder adjusting nut | 12. Wheel cylinder boot |
| 4. Union bolt | 13. Brake backing plate |
| 5. Union | 14. Brake lining |
| 6. Adjuster lock spring | 15. Brake shoe |
| 7. Bleeder plug | 16. Brake shoe return spring |
| 8. Compression spring | 17. Shoe hold-down spring pin |
| 9. Spring seat | 18. Shoe hold-down spring |

Overhaul

1. Remove the wheel cylinders from the brake backing plate.

2. Remove and disassemble the adjusting nut and the adjusting nut bolt.

3. Remove the wheel cylinder boot from the opposite end and remove the cylinder piston, cup, spring seat and spring from the inside of the wheel cylinder through the application of compressed air at the brake fluid inlet hole.

4. Wash all of the parts thoroughly in clean brake fluid or alcohol.

5. Inspect the piston and the cylinder bore for scores, wear, deep scratches or corrosion. Light scoring can be removed with crocus cloth soaked in brake fluid. Replace the wheel cylinder assembly if it is heavily corroded or deeply scored. Make sure that the wheel cylinder adjusting nut and bolt turn freely, replacing them as a set as necessary.

6. Soak all of the parts (new and old) in brake fluid before reassembling the wheel cylinder.

7. Assemble the wheel cylinder in the reverse order of removal, making sure that the left-hand threaded adjusting nut and bolt are installed on the right-side of the brakes and the right-hand threaded adjusting nut and bolt are installed on the left-side.

8. Install the wheel cylinder assemblies onto the brake backing plate.

9. Connect the union bolt and brake fluid line to the wheel cylinder at the rear of the brake backing plate. Install the brake shoes, brake drum, adjust the brakes, and bleed the brake hydraulic system.

Rear Drum Brakes

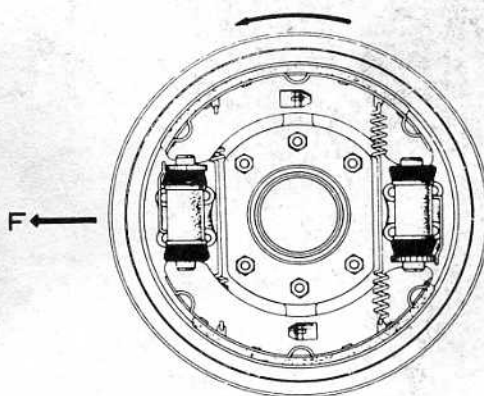
BRAKE DRUMS

Removal and Installation

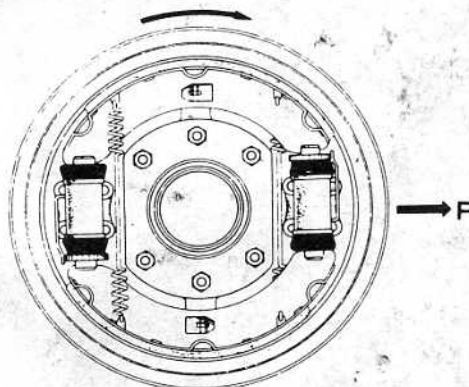
Remove and install the rear brake drums in the exact same manner as the front brake drums.

Inspection

Inspect the rear brake drums in the same manner as the front brake drums.



Assembled view of the left rear brake assembly



Assembled view of the right rear brake assembly

The front and rear brake drums are the same size and have the same service specifications.

BRAKE SHOES

Removal and Installation

The rear brake shoes are replaced in the same manner as the front brake shoes.

WHEEL CYLINDERS

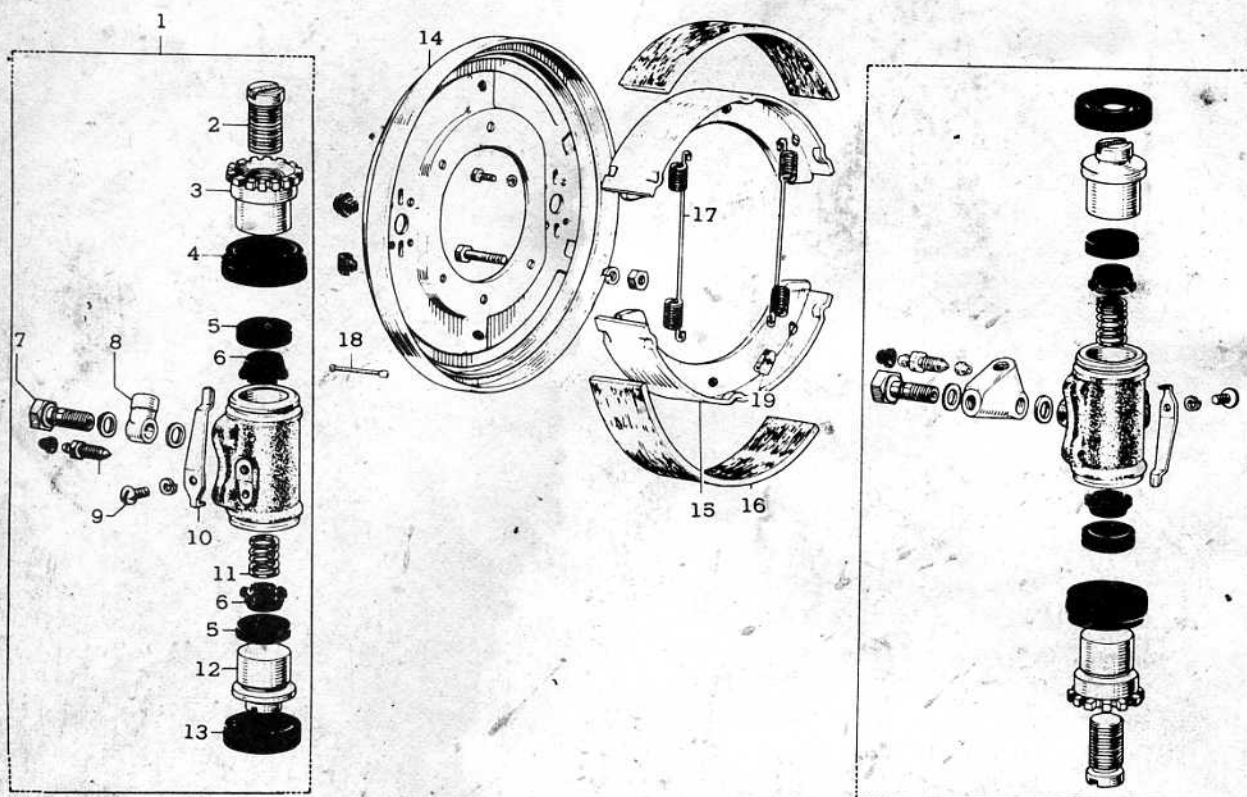
Removal and Installation

The rear wheel cylinders are removed and installed in the same manner as the front wheel cylinders.

Overhaul

The wheel cylinders on the rear wheel brakes are overhauled in the same manner as those on the front. The only difference is that the rear wheel cylinders have two hydraulically-operated pistons instead of just one as on the front. The wheel cylinder adjusting nut acts as the second piston.

Keep in mind that there are two dif



Exploded view of the rear brake assembly components

- | | |
|----------------------------------|-------------------------------|
| 1. Brake wheel cylinder assembly | 11. Compression spring |
| 2. Wheel cylinder adjusting bolt | 12. Cylinder piston |
| 3. Wheel cylinder adjusting nut | 13. Wheel cylinder boot |
| 4. Wheel cylinder boot | 14. Brake backing plate |
| 5. Cylinder cup | 15. Brake shoe |
| 6. Spring seat | 16. Brake lining |
| 7. Union bolt | 17. Brake shoe return spring |
| 8. Union | 18. Shoe hold-down spring pin |
| 9. Bleeder plug | 19. Shoe hold-down spring |
| 10. Adjuster lock spring | |

ferent sets of wheel cylinder adjusting nuts and bolts: left-hand threaded and right-hand threaded. They are installed exactly like the ones on the front wheel cylinders.

Parking Brake

Adjustment

1. Place the parking brake actuator handle in the fully released position, then jack up the rear of the vehicle until the wheels are off the ground and position jackstands under the axle to support it.

2. Turn the parking brake adjuster located on the lower position of the park-

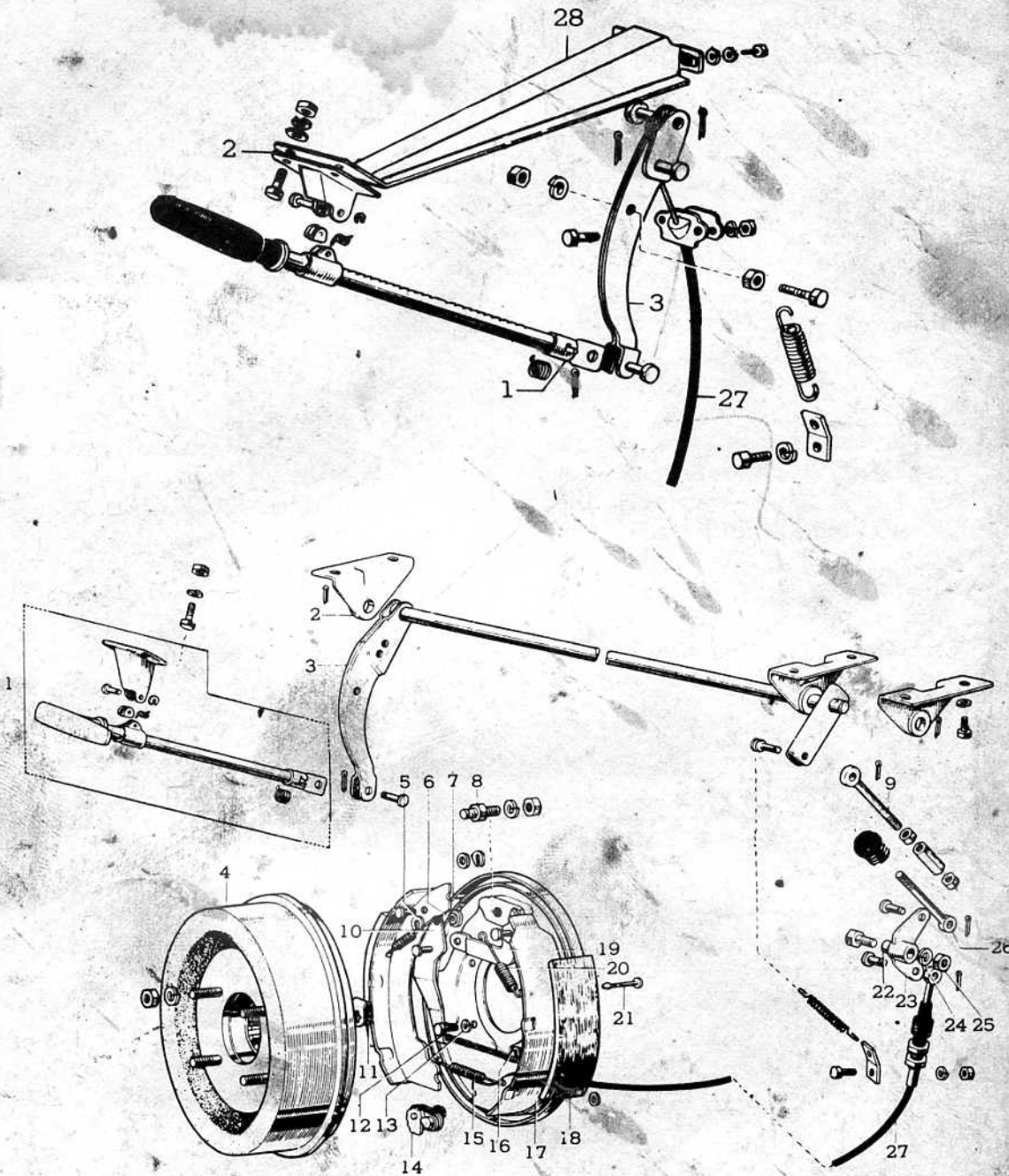
ing brake plate counterclockwise until the shoes seat against the drum. Then, loosen the adjuster one notch.

3. After performing the parking brake shoe adjustment in Step 2, pull the parking brake actuator and apply the parking brake. Check to make sure that the drum is locked.

4. Release the parking brake and check to make sure that the drum rotates freely.

5. Adjust the parking brake cable by adjusting the effective stroke of the actuator handle with the turnbuckle on the intermediate lever pullrods and the adjusting nuts on the parking brake cable end. The effective stroke of the parking brake actuator should be 6-9 notches.

6. After all of the adjustments have been made and you have checked to make sure that the parking brake lock



Exploded view of the parking brake assembly and related components

- | | |
|-------------------------------------|--------------------------------------|
| 1. Parking brake plunger assembly | 15. Tension spring |
| 2. Parking brake plunger bracket | 16. C-washer |
| 3. Parking brake link lever | 17. Parking brake shoe |
| 4. Parking brake drum | 18. Lining |
| 5. C-washer | 19. Parking brake shoe lever strut |
| 6. Washer | 20. Tension spring |
| 7. Brake backing plate | 21. Hold-down spring pin |
| 8. Anchor | 22. Spacer |
| 9. Intermediate lever pullrod No. 1 | 23. Parking brake link lever |
| 10. Brake shoe lever | 24. Lockwasher |
| 11. Brake shoe hold-down spring | 25. Nut |
| 12. Bolt | 26. Intermediate lever pullrod No. 2 |
| 13. Lockwasher | 27. Parking brake cable |
| 14. Parking brake shoe adjuster | 28. Parking brake bracket |

BRAKES

the brake drum when applied and releases properly, test the holding ability of the parking brake.

BRAKE SHOES

Removal and Installation

1. Raise the rear of the vehicle and support it with jackstands.
2. Remove the transmission shield and disconnect the rear driveshaft from the parking brake drum.
3. Drain the lubricant from the transfer case.
4. Pull the cotter pin out of the transfer case output shaft and remove the parking brake drum retaining nut. Remove the parking brake drum.
5. Turn and remove the brake shoe hold-down springs and pins from the backing plate.
6. Unhook the three tension springs from the brake shoes, and also unhook

the parking brake cable from the brake shoe lever.

7. Remove the brake shoes together with the brake shoe lever and the lever strut from the backing plate.

8. Inspect the brake shoes and the drum in the manner which was outlined for the front brakes. Replace the brake shoes if the lining is less than 0.06 in.

9. Install and assemble the parking brake in the reverse order of removal, taking note of the following:

a. Assemble the brake shoes to the backing plate with the shoe adjuster in the fully retracted position;

b. Apply a light coat of grease to all of the points of contact between the backing plate and the brake shoes;

c. Tighten the brake drum retaining bolts to 101–123 ft lbs;

d. Refill the transfer case with gear lubricant;

e. Adjust the parking brake shoes-to-drum clearance.

Brake Specifications

(All measurements are given in in.)

Master Cylinder Bore	Wheel Cylinder Piston Bore		Brake Drum Diameter		New Lining Thickness
	Front	Rear	Front	Rear	
1.001	1.123	1.000①	11.4	11.4	0.26

① FJ45 and FJ55—1.123 in.