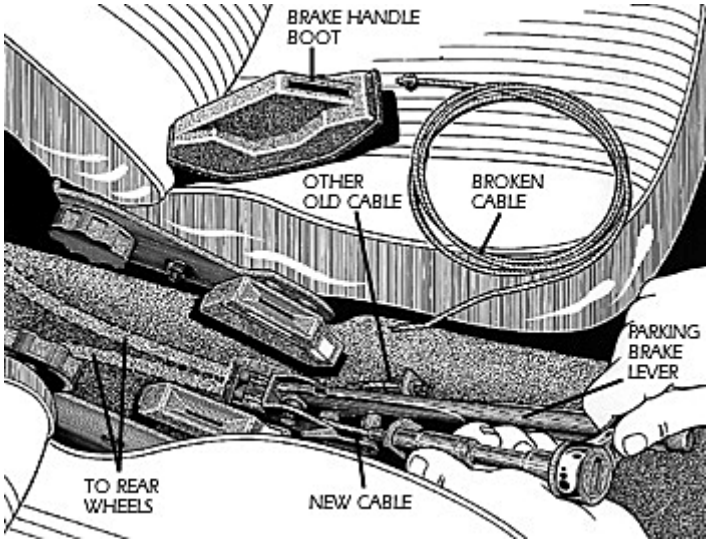
**You've just parallel-parked** your manual-transmission car on a steep side street, carefully setting the parking brake by pulling it up farther than you've ever pulled before. So far that it actually pops a little as it edges up that last click. Exiting the vehicle, you turn to lock the door—just as your car slides forward 3 ft. and nudges the luxury car in front of you in the bumper. Setting off the alarm. Hurriedly, you restart your car and back up to your original position, determined to pull the brake up far enough to anchor the *Titanic* this time. Unfortunately, this time the handbrake offers no resistance whatsoever until the mechanism tops out—and you have no parking brake at all, forcing you to find a flat parking space three streets away and walk through the rain to your job interview.  Not to mention having to replace the parted handbrake cable.

Degree of Difficulty MEDIUM

## Why It Failed



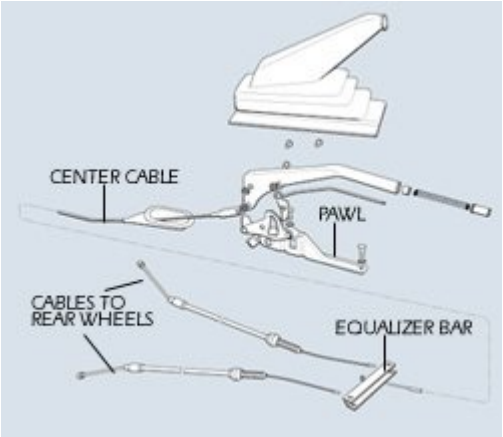

The final adjustment of the new cable is usually done at the handle inside the car. You may need to hold the new cable with locking pliers to keep it from turning as you use a socket on the adjuster nut.

Parking brakes are operated by a long, steel cable that runs between the handle in the cockpit and the rear wheels. It has crimped-on ends that can potentially slip off (unusual but not unknown). More commonly, the rubber-covered outer cable that runs between the car and the rear brakes tears or splits, allowing moisture and road salt to corrode through the inner steel cable. Sooner or later, the corroded cable fails under tension.

Live in the desert where it's flat, and never use your parking brake? Or maybe you have an automatic transmission and just put your car in Park. Then you face another issue—the cable needs to be exercised regularly or it will seize up. So you should use the parking brake regularly. Ever have trouble getting your transmission out of Park when parking on a grade because the parking pawl in the tranny is jammed against its gear? Setting the parking brake before putting the trans in Park and letting the car roll forward will prevent this.

## Getting Dirty

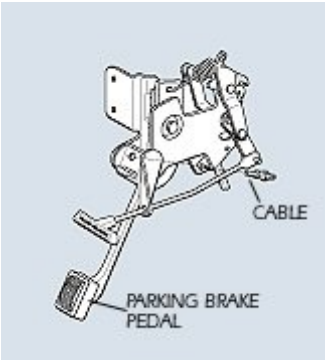
First, you need to determine which cable has parted. Remove the boot over the mechanism between the seats and see which cable is slack. If there's only a single cable to the handle, you'll need to pull up the rear seat and look for the equalizer bar. One cable to the bar will be easy to pull straight out. Warning! Parking brake cables are generally lubricated with thick black grease that will get everywhere, and generally destroy your car interior and your clothes. Be ready with rags to contain the mess. Now, you need to check the outer cable that leads to the rear wheel. If it's damaged, you'll need to replace that as well. You may have no option if the inner and outer cable are sold as an assembly, which they often are. To actually look at the outer cable, you'll need to get under the car. This means either backing onto ramps or jacking up the car and resting it on jackstands. If you're using jackstands, loosen the lug nuts first. (Never get under a car that's lifted on a jack, even a floor jack.) Be sure to block the wheels.



This vehicle uses an equalizer bar to distribute the pull to both rear wheels equally. This means three potential adjustments.

Check the outer cable, which leads from the backing plate of the brakes over to the car body. Don't confuse it with the brake hydraulic line, which is a steel tube connected to the body at some point with a short rubber hose. The brake cable will be much thicker and rubber-covered along its whole length. Look for cracks, abrasions and deteriorated rubber, and don't forget both sides—if the other side is damaged you may as well replace both cables now.

## Inside The Brake Drum



Pedal-operated brakes have a longer cable that runs up under the dashboard.

Once you've determined which cable(s) to replace, get the car up in the air and the wheel or wheels off. Now you need to remove the brake drum. Generally, the drum is simply sandwiched between the axle flange and the wheel, retained by a small sheetmetal clip or Phillips setscrew to keep it from landing on your foot when you remove the wheel. Occasionally, they will become intimately attached to the hub and need persuading. Judicious application of penetrating oil, light hammer taps near the hub, profanity and moderate heat will see them loosen. You may need to back off the adjuster mechanism to get the shoes out of the way if the drum has developed a wear ridge on the inner lip. Now you can see the brake shoes and mechanism. (This might be a good time to replace the shoes if they're worn down to anywhere near the rivets.) If you're replacing only the inner cable, simply disassemble the mechanism far enough to pull out the old cable and thread the new one into place. If you need to replace the outer cable as well, it's probably pretty well rusted onto the backing plate. Spray it with penetrating oil, and twist with pliers until it lets loose. Some cables are retained by snap

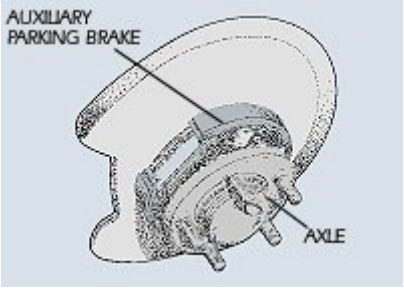
rings or a small collet-style clip—check the new cable for its attachment style.

## Clean It Up

Now's your chance to wire brush rust and dirt from all the hardware and mating surfaces on the brake mechanism, and sparingly lubricate all the moving parts with antiseize compound or high-temp grease. Replace any suspicious hardware like springs and clips. Be sure to clean the mating surface of the axle flange and brake drum, to prevent foreign matter from letting the drum sit square on the flange. Lightly lube the mating surfaces with antiseize so you won't have to cuss the next time you need to take it apart. Reinstall the brakes and drum, hooking up the new cable to the actuating arm. Adjust the brake shoes properly if you needed to back off the adjuster.

## Back Inside

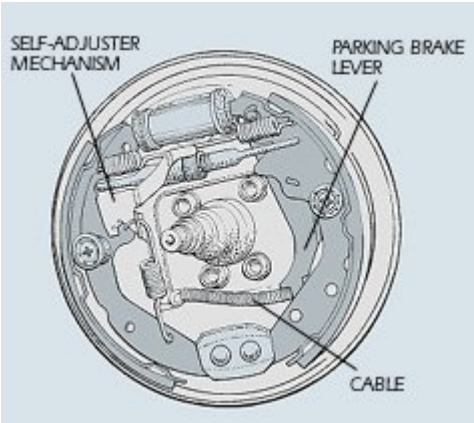
Now it's time to hook up the inner cable's forward end. If it didn't come with a new nut, you'll have to rescue the old one. It may be a locknut, or there may simply be two nuts jammed together. Thread the threaded end of the cable into the equalizer bar or the handle, and lightly run the nut down. Pull the handle up (or depress the pedal) three clicks, and then tighten the adjusting nut until the wheel lightly scrapes as you rotate it. This assumes you had the brake shoes adjusted correctly and they don't scrape with the handle down.



Some cars with rear discs use a small set of brake shoes dedicated to the parking brake.

If you don't have the brake shoes correctly adjusted, and then you adjust the handbrake, bad things can happen. As the brake shoes' automatic adjuster mechanism kicks in over the next few days, the slack in the handbrake cable will gradually disappear, and your brakes will start to drag. Be careful for the first few days that the handbrake retains two or three clicks of free play.

Is the equalizer bar straight? Not cocked over at some wacky angle, but reasonably close to perpendicular to the cables? If not, adjust the nuts appropriately. If your brakes use two separate cables with no equalizer bar, adjust the individual cables so both rear wheels have equal tension when the brakes are actuated.



Be sure the rear brakes are properly adjusted before trying to set the parking brake adjustment.

## Four-Wheel Discs

If your car has four-wheel disc brakes, your job is simpler, because the attachment of the handbrake cable to the

caliper is generally much simpler to get at than with drum brakes, requiring less disassembly and readjustment. Some rear disc brakes actually have a small drum brake system just for the parking brakes, but the cable arrangements are pretty easy to deal with. You generally can replace the cable without removing the disc or caliper.

One last word of advice: Regardless of the state of health of your brakes, always turn your front wheels into the curb when parking on a hill.

## HOW IT WORKS: Self-Adjusting Brakes

Self-adjusting brakes are universal now, except for some elderly Volkswagens still on the road. The service brakes are actuated by a hydraulic cylinder that forces the two shoes apart, jamming them into the inner diameter of the brake drum. But as the lining material wears, a mechanical escapement mechanism is necessary to keep the shoes close to the drum. Otherwise, the pedal would gradually get closer and closer to the floorboards as the friction material wore down. This self-adjust mechanism is actuated by the slight vertical movement of the trailing brake shoe that occurs whenever the brakes are applied in reverse. Normal driving will keep the clearances appropriate. If you have a circular driveway, never back out of parking spots or generally back up like Granny, the mechanism may not be doing its job. Try a few smart applications of the brakes while backing up (needless to say, this needs to happen where you won't hit anything). You don't need to go fast—just walking speed. Hit the brake pedal good enough to stop rapidly, but not fast enough to chirp the tires. You may be surprised—your wimpy handbrake may regain some authority, and your braking may improve. Repeat as necessary. If you've been rocking about with the manual adjuster, you may need to do this a number of times. You'll need to do it if you've disassembled the rear brakes as well.