

# How to Replace a Toilet

BY PETER HEMP

There are plenty of adventurous homeowners who are willing to take on formidable projects around the house, but for many of them, replacing a toilet isn't even on the radar screen. Somehow the combination of an imposing, bolted-down ceramic fixture; a pressurized water line; and an open drain leading directly to a sewer is enough to turn off some pretty handy people.

But if you can get past the gamey parts, let me assure you that replacing a toilet isn't that big a deal. Manufacturers have even made the hard part—hooking up the supply line—a lot easier than it used to be. So if you're ready to list that old avocado-green throne on eBay and upgrade to a modern, water-saving commode, here's how to do it.

In this article I'll detail the installation of a close-coupled toilet (drawing facing page). But you also can use this advice to install any toilet, be it a one-piece Kohler or a temperature-controlled Toto. If you're installing a toilet in new construction, I urge you to reinforce the floor under the toilet (sidebar p. 62).

## Turn off the water and drain the toilet

The first order of business is to pull the old toilet. Turn off its water (drawing facing page), and then flush the toilet a couple of times. You're emptying the tank now to reduce the weight of the toilet. You'll still have a bit of water in the bottom of the tank and the bowl. Don't worry about it.

Next, disconnect the supply line to the tank (inset drawing, facing page). It's a good idea to use a small bucket to catch any drips and to keep some rags handy for the occasional mop-up.

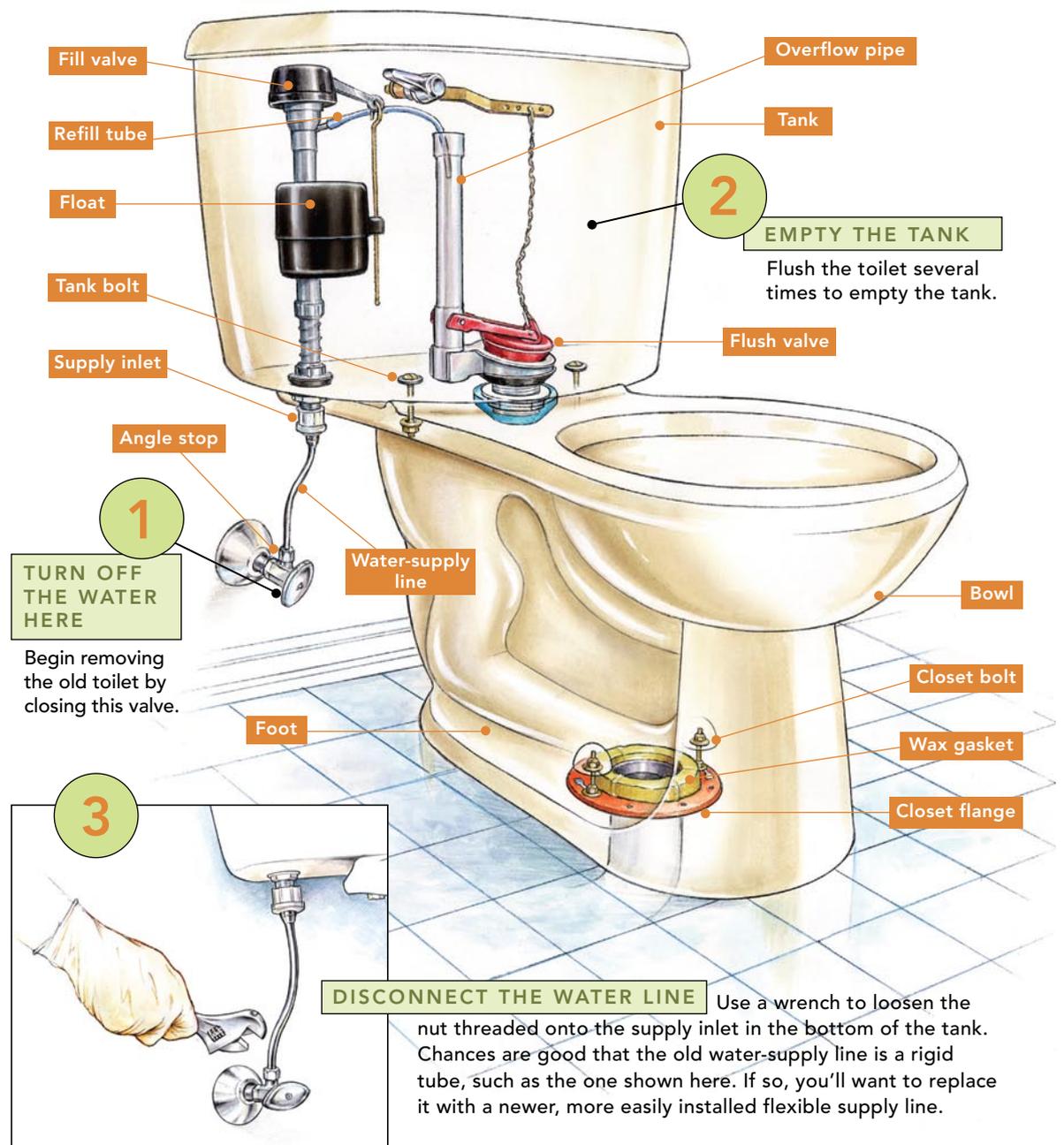
It's now time to disconnect the toilet from the drain line and prepare the closet flange for the



Don't be intimidated. With this step-by-step guide, you can upgrade to a modern, water-saving commode

## INSIDE A CLOSE-COUPLED TOILET

The two-piece, or close-coupled, toilet is by far the most common type. It is affordable and available in many styles. Because the tank and bowl are separate pieces, the close-coupled toilet is easier to maneuver than a one-piece model. At the floor, the toilet connects to the drain line by way of a floor-mounted fitting called a closet flange.





## MAKE THE FLOOR STURDY SO THAT THE TOILET DOES NOT MOVE

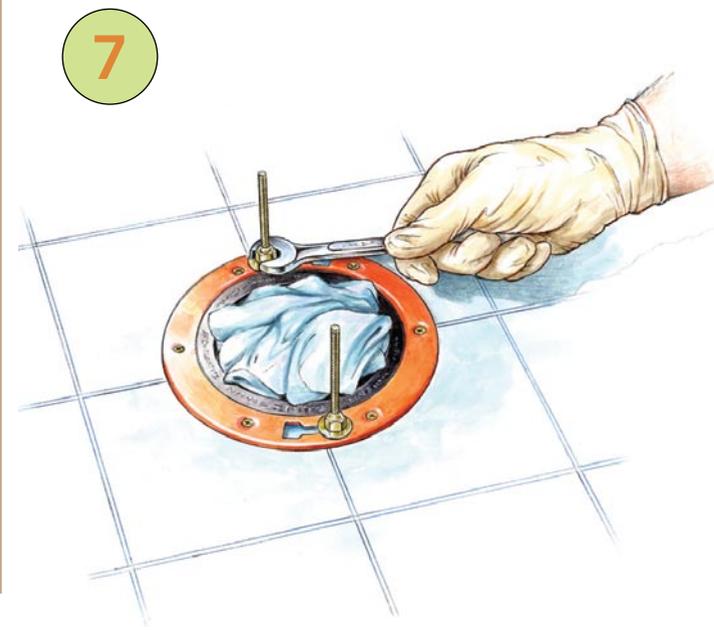
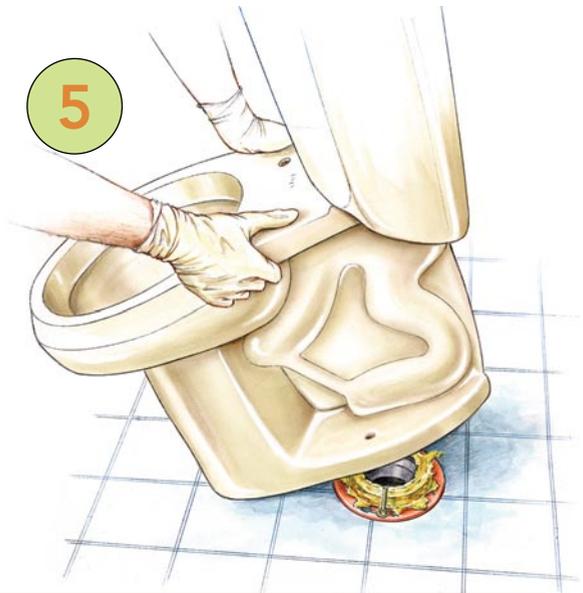
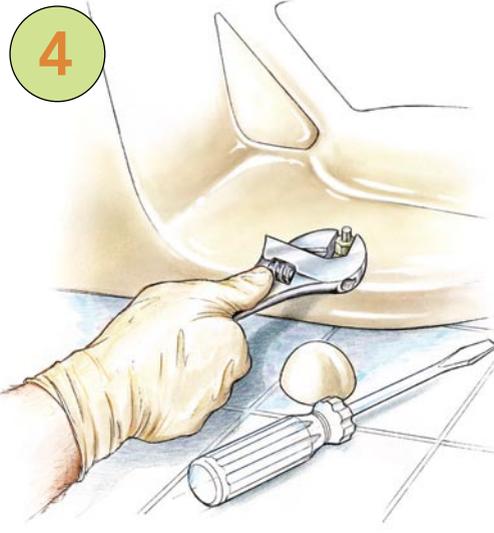
The first rule of toilet installation is: The toilet shall not move. By this, I mean it has to be connected to the floor as firmly as possible, and the floor has to be sturdy enough not to deflect when some-

one is sitting on the throne. If I get my way, the toilet's drain is centered between floor joists that are 12 in. on center, with a pair of blocks flanking the drain to help distribute the weight of the toilet.

This isn't always possible, of course, but worth doing in new construction or where the joists are readily accessible, such as a floor over a basement with an unfinished ceiling.

### PULL THE OLD TOILET, AND PREPARE FOR THE NEW ONE

Once you've shut off the water and drained the tank, pop the closet-bolt caps off the bolts that protrude through the base of the toilet (4). Use a wrench to remove the nuts, and then lift the toilet away from the closet flange (5). The toilet likely will have a ring of wax stuck to its bottom, so don't put it down on a finished surface without a protective layer of paper or cardboard. Plug the drain hole with a rag to keep sewer gases from seeping into the room, and scrape the wax residue off the closet flange (6). Remove the old closet bolts, and affix new ones to the closet flange, equidistant from the wall (7).

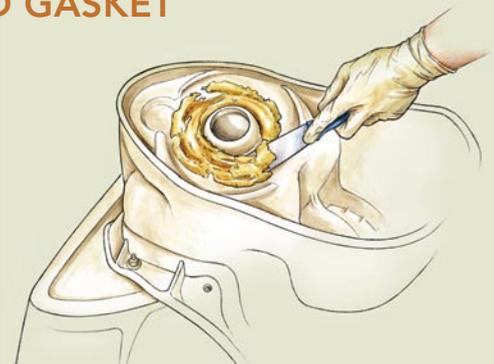


### IF YOU'RE REINSTALLING THE OLD TOILET, SCRAPE OFF THE OLD GASKET

Sometimes a toilet will develop a leak caused by a failed wax gasket. This can happen for several reasons, such as improper installation in the first place, or

pressure from using a plunger while trying to clear a blockage in the toilet. Wax seals even have been known to fail if an electric heater is placed too

close to the toilet. Fixing the problem can be as simple as pulling the toilet, scraping off the old wax seal, and then installing a new gasket.



new toilet (drawings facing page). At this point in the job, I put on a pair of latex gloves. You can get by without them. I just prefer the extra measure of hygiene that they offer.

### Use the correct closet bolts

When it comes to plumbing, a cardinal rule is to use hardware that doesn't corrode in wet locations. This hardware includes the closet bolts, the long, machine-thread bolts that fit into slots in the closet flange and anchor the toilet to the floor. But chances are good that the bolts included with the toilet are brass-plated steel. Check them with a magnet. If they stick to it, don't use them. Same goes for the washers and nuts.

Your local plumbing supply will have brass bolts, nuts, and washers (stainless steel is good, too). If you can find them, get the extralong, 3-in. by 5/16-in.-dia. closet bolts. Take the extra step of affixing the closet bolts to the flange. This will ensure that the closet bolts won't spin when you bolt down the toilet.

Before installing a new toilet, inspect the tank and bowl. With toilet bowls, the main problems that you want to avoid are a deformed inlet (the opening between the bowl and the tank); a crooked foot, where the bowl meets the floor; or a deformed horn on the bottom of the bowl where it meets the closet flange.

### A wax gasket seals the toilet bowl to the closet flange

The bolts will keep the toilet firmly on the floor, but they won't keep sewer gases out of the room, or prevent seepage from the toilet from rotting the subfloor and the framing. That's what wax toilet-bowl gaskets are for (drawing top right). Wax gaskets work fine if they're installed properly. My guess is that future plumbers will use a new generation of seals (sidebar right). But for now, wax is standard.

Contrary to what you might read on the box, the gasket should not be pressed onto the bottom of the toilet bowl. It should be installed on the closet flange. Often, the plastic funnels are not perfectly round and require some manipulation to get them to fit into the flange. You can't do this if the wax is stuck to the bowl. Also, waxes mounted to bowls can twist during installation, causing a partial blockage of the drain line.

With the bolts and wax in place, the toilet bowl can be set (drawing bottom right). The next cardinal rule now comes into play: Do not push on, sit on, or wiggle the bowl downward as it is set. To do so will overcompress



### THE RIGHT WAY TO INSTALL THE WAX GASKET

Contrary to the instructions that accompany many new toilets, the wax doughnut called the toilet-bowl gasket should be placed on the closet flange (8), not on the bottom of the toilet. Once it is centered, lower the toilet straight down (9), not at an angle, onto the gasket. The long closet bolts act as guides to align the bowl correctly.



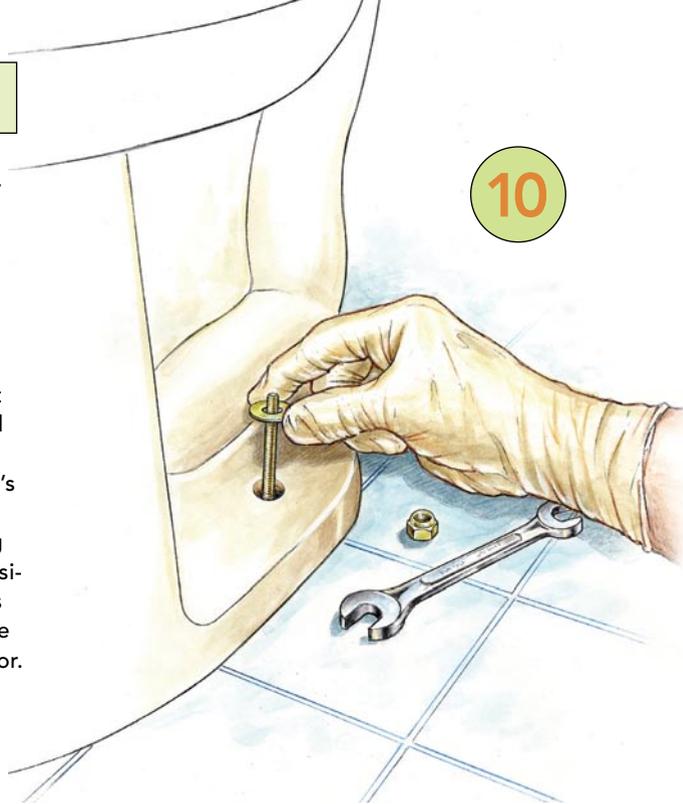
### The gasket of the future



Wax gaskets are inexpensive and easy to use, but they have their drawbacks. They can be installed incorrectly, and using a plunger to clear a clogged toilet can rupture a wax gasket. A new generation of waxless gaskets may take their place. Predco's UltraSeal ([www.plumb-bob.com](http://www.plumb-bob.com); 800-323-6188) and Fluidmaster's WaxFree bowl gasket ([www.fluidmaster.com](http://www.fluidmaster.com); 949-728-2000) are two toilet-bowl gaskets that rely on rubber collars and O-rings to connect a toilet to a drain line. They even can be reused.

### BOLT THE BOWL TO THE FLOOR, SLOWLY

Slip either a brass or a stainless-steel washer over the closet bolt, and then crank down the nut a half-dozen turns on one side, followed by a half-dozen turns on the other side. This slowly will compress the wax ring to the correct thickness. The bowl should be perpendicular to the wall. The holes in the bowl's foot are large enough to give you a little fine-tuning room if the bolts aren't positioned perfectly. Make this final adjustment just before the bowl is tight to the floor.

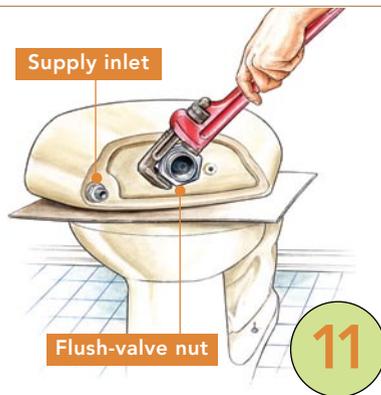


the wax, leading to a potential leak. Instead, use a wrench, alternating six or seven strokes from one nut to the other, until the bowl is snug to the finish floor (drawing left).

Just how tightly do you snug the nuts? If you overtighten them, you can crack the foot of the bowl. I suggest that you grasp the edges of the bowl and try to wiggle it. When the bowl stays put, call it done—for now. Usually, the nuts will loosen a bit after the toilet has been in use, and you might need to make a final tightening of the nuts. For those installers who will be living with the newly installed toilet, this is no great inconvenience. Just check the nuts a few days after the installation.

If your toilet includes plastic washers that act as retainers for the closet-nut caps, don't use them. These disks are time bombs. When someone sits on the bowl, their shifting weight compresses the soft disks, which in turn causes the closet nuts to loosen. Then the bowl begins to move around, the wax seal fails, and

Supply inlet

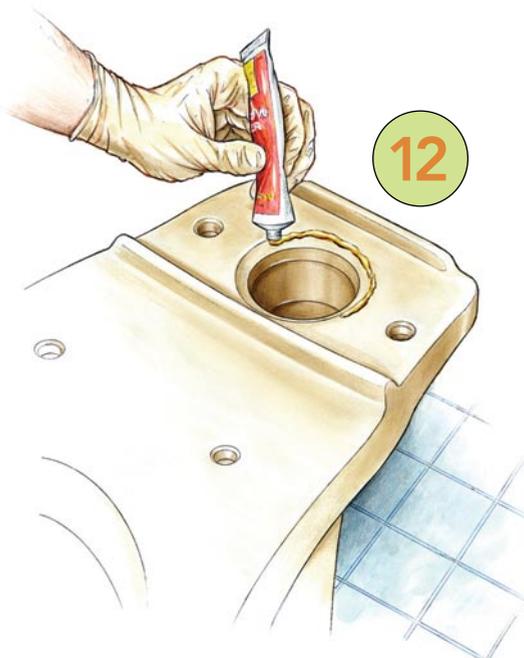


Flush-valve nut

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### THREE PRECAUTIONS FOR LEAK-FREE SERVICE

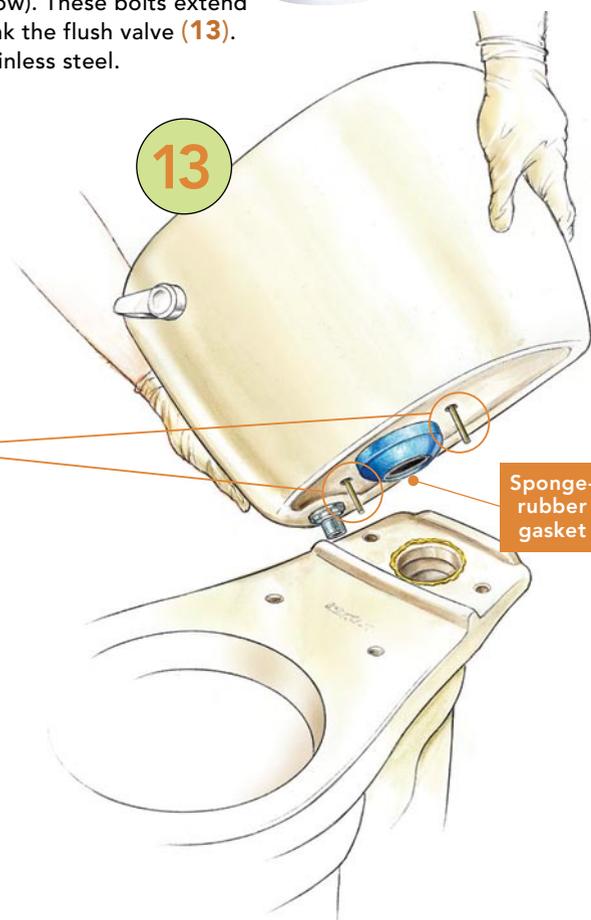
Before setting the tank on the bowl, make sure the water-supply and the flush-valve nuts are tight (11). Then run a bead of silicone grease around the bowl's inlet (12). Pipe-joint compound also will work for this task. Next, wrap small gobs of plumber's putty around the tank bolts on both sides of their washers (photos below). These bolts extend through holes in the bottom of the tank that flank the flush valve (13). Again, make sure the bolts are solid brass or stainless steel.



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Tank bolts tie the two-piece toilet together.



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Sponge-rubber gasket

seepage begins. Usually, the seepage goes on for a long time and does a lot of damage before it is detected. Instead of the plastic disks, I use stainless-steel or brass washers.

### Installing the tank

The typical two-piece toilet has two fittings on the bottom of the tank (drawing bottom left, facing page). The small one is the supply inlet, which connects to the angle-stop valve on the wall behind the toilet. The larger one is the flush-valve lock nut. I check them both to make sure they are tight before setting the tank on the bowl. A big sponge-rubber gasket fits over the flush-valve lock nut (drawing bottom right, facing page). Some toilets come with this gasket preinstalled; others let you do the honors. Insert the tank bolts, lower the tank onto the bowl, and use a long screwdriver and a socket wrench to bolt the two pieces together (top drawing).

### Time to hook up the water supply

There used to be a real art to hooking up the water to a toilet. Plumbers had to custom-cut a supply tube from brass or copper tubing, and then bend it carefully to avoid kinks. Each supply tube was a little different, depending on the location of the angle stop. Not any more. Hooking up the water is the easy part (center drawing).

Before turning on the supply, look in the tank and make sure that the refill tube between the fill valve and the overflow pipe of the flush valve is secured. It is a good idea to open the angle stop just a little bit at a time and fill the tank slowly until the fill valve shuts off automatically for the first time. Depending on the type of fill valve you have, you might need to adjust the water level to match the mark provided on the back wall of the tank. Test the toilet, and once you're sure there are no leaks, cap the closet bolts (bottom drawing).

Finally, should you run a bead of sealant around the base of the toilet at the finish floor? If you've got a 100% watertight marriage of bowl wax and closet flange, a caulking bead will do no damage. But adding one immediately can be an expensive mistake. Seepage that otherwise would soon appear at the edge of the toilet will never appear to warn you. Instead, accumulating liquid will find its way into the flooring and cause damage. □

Peter Hemp is the author of *Plumbing a House* (The Taunton Press, 1996). Photos by Charles Miller.



### CONNECT THE TANK TO THE BOWL

Lower the tank into place, making sure the bolts drop through the holes in the bowl. Next, slide a brass or stainless-steel washer up each bolt, followed by the brass nut. Align the tank to the wall so that it is as parallel as possible, and snug up the nuts with a socket wrench and a long screwdriver. Tighten the nuts slowly, using the wrench to turn the nuts. Alternate five or six revolutions per side, until the tank rests firmly on the bowl.

### HOOKING UP THE WATER IS THE EASY PART

Flexible supply lines called over-braid hoses allow you to connect the tank to the angle stop without a custom-made piece of rigid pipe. Install the angle-stop connection first because these threads are harder to start. Then hook up the 3/8-in. coupling to the tank. If the hose is longer than necessary, make a loop out of the excess and tuck it behind the toilet.



### CHECK FOR LEAKS, AND THEN CAP THE BOLTS

Flush the toilet a half-dozen times, and check for leaks at all the connections. If you've got a leak at the tank connection or in the supply line, tighten the nuts. If water accumulates around the bowl's foot but nothing else is leaking, you've got a problem with the wax ring; you'll have to pull out the toilet and start over again. Once you have a leak-free toilet, use a small hacksaw to cut off the closet bolts. Pack the caps with putty, and place them over the bolt ends.