CONCRETE CUTTING & DRILLING

A renter's guide to the tools that demolish concrete

by Clayton DeKorne

Unless you regularly need to break up concrete slabs or cut through foundations, you probably can't justify the cost of buying a jackhammer or a portable cutoff saw. But when the need does arise, it's useful to know what tools are available for hire, or you may find yourself (as I have) rattling your brains out with nothing but a sledge hammer and cold chisel.

Breaking Concrete

There are several options for breaking up concrete. The most common tool is a paving breaker, otherwise known as a jackhammer. Which you choose depends on the strength and amount of the concrete you have to remove, and the availability of the tools.

Electric jackhammers. Electric jackhammers are the easiest and cheapest to use because they don't require a compressor or hoses. A 60-pound hammer, the largest electric model, costs about $50 per day. But electric hammers don't have as much striking force as a pneumatic or hydraulic model. They are best for a small amount of normal-strength concrete, soft concrete, or asphalt. A 60-pound electric breaker is much bulkier than a pneumatic or hydraulic model, and the return blow is uncushioned, so these hammers can shake up and tire the operator much faster.

An electric jackhammer has less striking force than a pneumatic or hydraulic hammer, but is easy to rent because it doesn't require a compressor or hoses.

Pneumatic jackhammers. Pneumatic jackhammers deliver a lot more power than an electric model and are worth the extra cost for the compressor and hoses if you have a lot of asphalt or concrete to break up. The air cushions the return blow so you take less of a blow in your arms. Pneumatic hammers commonly come in 30-, 60-, and 80-pound sizes at a charge of $20, $25, and $30, respectively.

These hammers require a high-volume, tow-along compressor and 3/4-inch hoses. You'll need a 75-cfm compressor (the smallest tow-along model available) for a 30-pound breaker, and a 100-cfm compressor for an 80-pound breaker. If you're running two breakers, you'll need at least 150 cfm. The rental yard will have checked the oil level and filters, and adjusted the air pressure of the compressor to match the tool. A compressor rents for between $50 and $70 per day, depending on the size. Hoses cost about $5 per day per 50-foot length.

Chipping hammers. Chipping hammers are useful for small-scale demolition. At 10 to 25 pounds, these hammers are lightweight and maneuverable, and work well in confined spaces or overhead. Small hammers are often all that's needed to remove brick, or bust up concrete block.

Both electric and pneumatic chipping hammers are widely available. Electric chipping hammers rent for about $35 per day. Pneumatic chipping hammers have a bit more striking force. They require only a 1/2-inch-diameter hose, but still need a continuous volume of air, so you'll have to rent at least a 75-cfm compressor. For a pneumatic chipping hammer the charge is about $20 per day, without bits, hose, or compressor.

Hydraulic jackhammers. Hydraulic jackhammers aren't always available. If you can rent them in your area, they're worth it when you have a lot of rock or high-strength concrete to remove. Hydraulic hammers are smaller and weigh less than their pneumatic counterparts. They are also more powerful and inflict even less stress to the operator than a pneumatic hammer. With one of these, you have a better chance of being able to move your hands at the end of a day.

For a hydraulic hammer, you'll need a power unit. Portable units are either gas-powered or electric. Make sure the rental yard has paired the power unit to the tool you rent, so you don't have to worry about flow rates, back pressures, and cooling capacities, which vary with the type of tool you might have. The charge for a complete package is about $100 per day.

Hydraulic breakers. Hydraulic breakers that mount on the front of a skid steer are also available. If you have a large slab and enough room,

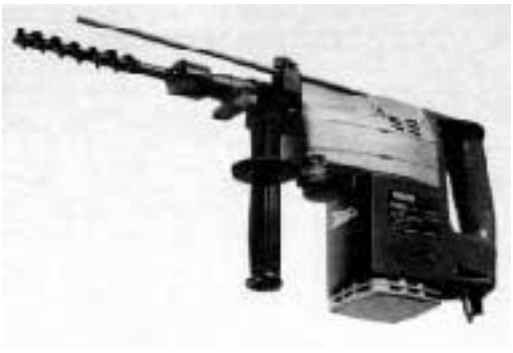
If you need to break up a large slab and have the room, consider renting a hydraulic breaker that mounts on the front of a skid steer.

these big breakers can really save your back. Costs run about $75 per day for the hammer and $150 per day for the skid steer.

Bits. Bits for jackhammers and chipping hammers cost about $4 each per day to rent. You'll need to choose the right bit for the type of material you are breaking up, as follows:

- ***Normal-strength concrete.*** A *bull point* (sometimes called a *moil point*) and a *narrow chisel*, 1 to 1 1/4 inches wide, are the most common all-purpose concrete breakers. Both have a hexagonal section. If you're prying up chunks of slab as you go, you might want to use a *heavy-duty moil* or a *cut chisel*, which have round sections for added strength.
- ***Soft concrete.*** A bull point or narrow chisel will simply punch holes in soft concrete, instead of breaking it up into chunks. For low-strength concrete, or old concrete made with lime or unwashed river sand, use a *3-inch chisel* instead.
- ***Asphalt.*** A 5-inch-wide *asphalt cutter* is effective on deteriorated asphalt. For stronger asphalt or for prying up asphalt as you break it up, use a thicker *asphalt wedge*. For especially thick asphalt use a *digging chisel*.
- ***Clay or frozen ground.*** *Clay spades* have a thin, curved section that looks like a garden spade. A *clay pick* has a wide, wedge-shaped section for hard soils. Both are used for trimming the sides of trenches and excavated holes. A *frost wedge* is a very stout 1 1/2-inch wedge for digging in frozen ground.
- ***Roughing up concrete surfaces.*** For scoring the surface of normal-strength concrete, you can use a 3-inch chisel. But if you have a wide swath to rough up, use a *bushing tool*. These bits have a serrated face with rows of hardened steel or carbide points that resemble meat tenderizers. They are good for pulverizing concrete and are mostly used for roughing up a slab at construction joints or before pouring a concrete topping.

A bushing tool is good for roughing up concrete.



A rotary hammer drill can accept up to a 1 1/2-inch-diameter bit, and will take much more abuse than a standard hammer drill.

While you can take down slight high spots on floors, don't expect to take down anything more than a fraction of an inch in floor height in any reasonable time.

- ***For stake driving and earth tamping.*** Jack hammers can work like mini pile drivers with *pin driver* and *pipe driver* bits. Pin drivers come in 5/8- to 2 1/2-inch diameters for driving rebar, foundation pins, construction stakes, or ground spikes. Pipe drivers come in standard pipe sizes. *Tamping pads* come in 4- to 8-inch round and square configurations for tamping down sub-slab surfaces or backfill. Blunt point *form vibrators*, with or without a rubber tip, are available for chipping hammers.

Drilling Concrete

For jobs larger than setting a lead anchor, you'll be a lot happier renting one of the following:

Rotary hammer drills. Most rotary hammer drills accept up to about a 1 1/2-inch-diameter bit. Some larger models will take a 1 3/4-inch bit. If you're not too concerned about a ragged edge, large holes can be punched through concrete by drilling a series of holes around the perimeter. Larger rotary hammers will also accept chisel bits, so you can knock out the concrete between each hole with the same tool.

Rotary hammers come in two varieties — *SDS* and *spline drive*. The smaller SDS hammers have a slotted chuck to accept configured drill bits that lock in place. All SDS bits rotate with the chuck. In addition to driving drill bits up to 1 1/2 inches in diameter, a rotating bull point is available. An SDS hammer rents for about $15 per day. Bits are $5 per day.

Larger spline-drive hammers have a lock-in chuck with a gear-shaped drive at the bottom. Rotating bits fit all the way into this spline-drive and spin with the chuck. Chisel points lock in above this and drive with impact, but don't spin. Standard size spline-drive hammers accept solid drill bits up to 1 3/4 inches in diameter, and core bits up to about 3 1/2 inches in diameter. A wide variety of chisel points are available for spline-drive hammers, including scaling and gouging chisels, bushing tools, and small tampers. These rent for about $25 per day.

For a few dollars more, you can occasionally rent a 2-inch rotary hammer that will drive up to a 2-inch solid bit, a 3-inch carbide-tip or diamond-tip star drill, or a 5-inch core bit.

A core drilling rig — a portable drill press that bolts to a slab or wall — can drill holes up to 18 inches in diameter.

Rock splitters. Rock splitters resemble pneumatic jack hammers that rotate as well as impact. These are used most often for placing foundation pins or dynamite in ledge. Rock splitters are available in 30- and 60-pound sizes. Rental runs $20 and $30 per day. Standard bits are 1 3/4-inch diamond-tip star drills. They are available up to 3 1/2 inches in diameter in 18-inch to 20-foot lengths.

Core drilling rigs. These are portable drill presses that can be bolted to a slab or wall, or held in place by a vacuum pump. A standard rig will bore holes 1/2 inch to 8 inches in diameter. With spacers that place the drill motor farther from the stand, you can drill up to 18-inch diameters. The rig rents for $50 per day.

Core drill bits have diamond-tips that will cut through high-strength concrete and rebar. Rental houses usually charge for the amount of wear on the bits — about $40 per .0025 inch (measured with a micrometer). According to one rental house, the average wear is about .0035 inch per day, for an average charge of about $110 for the whole setup.

Diamond core bits must be cooled with water. A garden hose connects to the chuck, directing water through the center of the bit. A wet/dry vac is useful to suck up the overflow.

Cutting Concrete

For cutting concrete you have the choice of dry cutting with abrasive blades or wet cutting with diamond-tip blades.

Cutoff saws. These saws are most commonly gas-driven or electric, though hydraulic ones are sometimes available in rental yards. Gas-driven saws have more power than the electric versions, but are noisy, and the exhaust makes them unsuitable on many remodel jobs.

The standard blade size is 12 inches. But even with a 14-inch saw, the maximum depth of cut is only about 5 inches, so you have to cut from two sides to get through an 8-inch foundation wall.

Dry-cutting saws use carborundum blades. Because these cut by abrasion and wear away quickly, you have to buy the blades, at about $10 each. Dry-cutting diamond blades are sometimes available at the standard wear charge of $40 per .0025 inch.

With either blade, dust is a big issue. Two commonly rented electric saws — the Bosch 1333 and the

Concrete Cutting Services

Doug Anderson of Vermont Concrete Cutting, in Barre, Vt., uses a 2x4 to guide his final cut for a foundation door-way (A). After cutting down each side, Anderson slips the saw blade under the sill plate to cut a foundation anchor (B). Using a sledge hammer, John Anderson, Doug's father, knocks the first cutout loose from inside (C). Then the rest of the doorway is easily pushed out (D).

Once you learn what it takes to cut through a foundation wall, you may not be too excited about handling the job yourself. Chances are you'll spend at least one day with a concrete saw or a jackhammer, or both, to cut a full-size doorway through a foundation wall. Add up labor costs, equipment rental, and blade charges, and you're in for at least $500 — if you're lucky. Chances are you'll shell out close to a thousand bucks, and a couple days of aggravation.

Compare this to calling up a sub, scheduling a time, and paying a flat fee. One such sub, John Anderson of Vermont Concrete Cutting, charges $450 to cut a standard door opening through an 8-inch foundation wall. For other wall cuts, he charges a rate of about $3 per foot per inch thickness. Floor cuts cost $1 per foot per inch. The minimum charge is $200.

Anderson uses a *Partner K3500*, a hydraulic concrete saw that will cut to a depth of 10 inches. With this saw and the help of one of his sons, it takes Anderson about an hour to cut a doorway. All he needs is a water spigot and a 110-volt power line. He leaves you with the cutout and a crisp opening that doesn't need to be patched at the edges.

Subcontractors specializing in cutting concrete are common, but are only well-known to the commercial and industrial trades. However, most will serve residential contractors. And like Anderson, many offer a variety of services, including concrete coring, crack repair, floor cutting, and grooving. You can find concrete cutters in the Yellow Pages under "Concrete Breaking, Cutting, and Sawing." Or contact their trade association, The Concrete Sawing and Drilling Association (6077 Rosswell Rd., Suite 205, Atlanta, GA 30328; 404/257-1777). They can put you in touch with a local cutter.

Most concrete cutters use a diamond-blade wet saw, rather than an abrasive-blade cutoff saw. If they don't use a wet saw, avoid them unless they can give you assurances that the dust won't be a problem. With wet saws, though, you have to deal with the over-spray.

Anderson usually masks the interior face of the wall with poly, creating a pond in the bottom to collect the spray. He then sucks out the water with a wet/dry vacuum. In addition, Andersen does most of the cutting from one side, cutting about 2 inches deep in a pass. The saw not only cuts more efficiently at this depth, but all the spray is kept to one side of the wall until the last pass, reducing the amount of water he has to remove. Using this method, Anderson claims he can cut to the inside of a finished basement without getting so much as a drop of water on the carpet. Still, he says, he encourages the contractor to mask a finished interior. "I've worked in places where I had to take my shoes off before I walked in the door. But if I have to take extra pains to protect a finished space, I'll charge for it," says Anderson.

If you decide to use a concrete cutting service, keep in mind that most cutters will not take away the cutout. If they do, it's extra. Also, the quoted price usually just includes the minimum number of cuts needed (see photos). If you want the cutout diced up into smaller, more manageable pieces, you'll be charged for each additional cut.

If you have a choice, don't pour the new slab until the cut is made. For a doorway into an addition, for example, call the cutter while the excavator is still on site. Often the cutout can be dropped into the new foundation hole. Then the excavator can either drag it out with his backhoe, or he can dig it in so the slab can be poured over it. If the building is unheated, however, remove the cutout, otherwise it can get pushed through the new slab if the ground freezes and heaves.

Sometimes Anderson is called to make openings in new foundations. In this case he usually has to drop the cutout on the inside, unless the contractor wants to widen the perimeter of the foundation hole. "If I drop onto a slab, I usually dice the cutouts into smaller pieces, at a higher cost, and then drop the pieces onto tires to break the fall. They still drop hard. I haven't cracked a slab yet, but I figure it's only a matter of time."

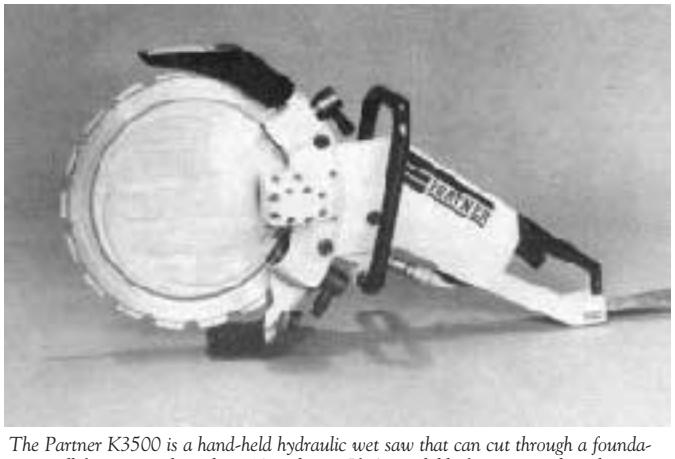
— *C.D.*

Gas-driven cutoff saws have more power than the electric models, but are noisy, and the dust and exhaust make them unsuitable on many remodel jobs.

Partner K2000EL — will accommodate a shop vac to pull away the majority of the dust. With gas-driven saws you can have a helper run a hose near the blade to keep the dust down.

Diamond-blade wet saws. Sometimes called wall saws, these are commonly used by professional concrete cutters, and come with blades up to 56 inches in diameter. about $7,500 and blades cost about $700 each, rental houses charge about $200 per day (including the power unit) and a higher wear charge. The average charge for a blade is about $100 per day. Even at this price it is a popular rental item, because it's lightweight, can cut through a foundation wall from one side, and doesn't require much setup.

Saw carts. Saw carts are useful for



The Partner K3500 is a hand-held hydraulic wet saw that can cut through a foundation wall from one side with its 10-inch cut. If it's available from a rental yard, expect to pay a high rental fee.

Rental units sometimes carry smaller pneumatic or hydraulic versions at 36 inches with a maximum cutting depth of about 15 inches. It's possible to cut through an 8-inch wall in one pass, but the setup is time consuming. The saw runs on tracks that are bolted to the wall. The cost for the saw is about $250 per day plus the standard wear charge of $40 per .0025-inches.

A more common rental unit is the Partner K3500, a hand-held hydraulic wet saw that can cut 10 inches deep. This saw has a ring-shaped blade that is driven by small metal rollers. Since the saw lists for long floor cuts and control joints in slabs. These walk-behind saws are usually gas driven, include a water tank, and are self-propelled so you just have to steer, allowing for straighter cuts than you could easily get with a cut-off saw. Standard sizes take up to a 14-inch blade, with a maximum depth of cut of 4 inches. The machine rents for $60 per day plus the standard wear charge for diamond blades. Average blade cost runs about $60 per day. ■

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