

EMERGENCY TIRE INFLATION THE EASY WAY

Compressing a 12volt Air Compressor

by Dave Searle

AS WE LEARNED from Don Smith's comparison of tire repair and inflation kits, CO₂ bottles make a relatively poor choice for emergency tire inflating as you need to carry so many of the darn things to actually inflate a tire—plus, they are expensive. Hand pumps, it was revealed, are best used on skinny little bicycle tires, as the effort to inflate a motorcycle tire would leave most of us deflated, sweaty and panting.

The devices that used the engine as a pump were clever and compact, but are limited by the accessibility of the sparkplugs themselves—not always easy to reach.

As one of our readers suggested, you could also convert one of the various cigarette-lighter-powered 12V air compressors into a device small enough to carry on your bike. We liked that idea a lot, and as these lunchbox-sized gadgets sell for only \$20 in most hardware stores, we thought we'd try it out and show you how. Here goes:

Step One—The most commonly available unit in our neck of the woods is sold by Campbell Hausfeld, the RP3000 12Volt Inflator, which incorporates a pressure gauge, a light with a red emergency lens cover, and various adapters for basketballs and air mattresses, etc. It measures 11" X 5.5" x 4" and weighs 1.3 lbs. We got ours at Home Depot for \$19.95.

Step Two—Five screws on the right side (holding the light in front) hold the case halves together, one of which is under the red lens. Pull everything out of the case and you'll see the tiny piston pump and reduction gears driven by the 12V DC motor. We're going to discard the on/off switch, the light switch, the pressure gauge (it reads to 300 psi and won't have useful accuracy at 35–40 psi anyway) and the light. We'll keep the nifty clip-on air line (a useful 30" long) and the cord intended for the cigarette lighter adapter. Of course if you have a bike with a cigarette lighter socket like an Electra Glide, you're halfway there, otherwise, we'll rig it for a conventional battery-charger/electric clothing-type male/female connector.

Step Three—Unsolder the wires that leave the motor, eliminating the switch. Cut

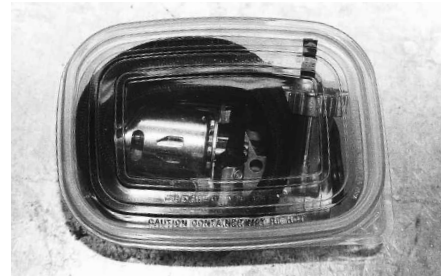
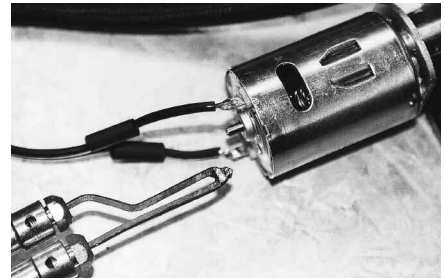
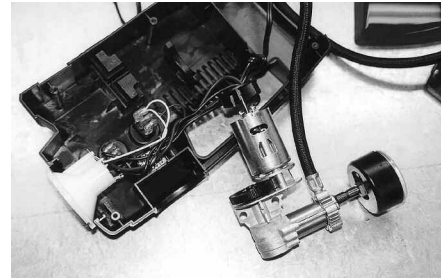
and strip the wire at the lighter plug and solder on the plug that matches your battery charger lead. (Extra leads are available at most motorcycle shops, or they can be ordered from the battery charger supplier at a modest cost.) At the other end of your new battery connection cable, strip and split the cable to allow you to connect to the motor terminals. To make sure it's connected correctly (DC motors won't work if the polarity is wrong), connect the lead to a battery (avoiding any fire hazards, naturally) and tap the motor terminals (the motor will start instantly if you get it right) to determine which wire goes where. Then mark the wire ends so that you will be sure to solder them to the right terminals. Slide a piece of shrink tubing on each wire, well behind your soldering point, connect the wires to the terminals, and once the joint is cool, slide the shrink tubing over the connection and heat it with a match or lighter until it shrinks tight, preventing a short against the motor case.

We bent the wires over and routed them away from the fan shaft, zip-tying them so they wouldn't contact the drive gears.

Step Six—To eliminate the gauge without disturbing the crushed-in hose fitting, we simply cut the air hose off, leaving $\frac{3}{4}$ " attached. We then jammed a small, $\frac{1}{8}$ " ball bearing into the hose and cinched another zip tie above it to prevent it from being forcibly ejected.

Step Five—Should you decide to keep the cooling fan on the DC motor, it can be driven off the shaft with a pin punch, the shaft shortened with a Dremel cut-off wheel, and pressed back on again. We got fancy in the name of making it compact and modified the fan, beveling the fins to work close to the motor without hitting the terminals. When complete, the whole business fits in a cheap waterproof food-storage container, just 5.5" x 4" x 3" and weighs just $\frac{1}{2}$ lb., including a strip-type tire puncture repair kit—small enough to pack almost anywhere.

The little pump works like a charm when it's plugged in—zero to 43 psi in 5 minutes. Because it vibrates when it's running, we tried various tricks to keep from



walking around on the floor, but eventually just decided to hold it off the floor with its air hose—K.I.S.S.

With its work done, the pump will be somewhat warm. We measured a peak temp of just 120° with our Raytek non-contact thermometer, but handle it carefully.

We hope you'll find this an easy, fun and functional project. We sure did. 🍷

Disclaimer: If you regularly hurt yourself trying do-it-yourself projects, please don't try this one.