STAYING SHARP
manager's desk

By Keith Jennings

Your shop's working people

Recently, I happened to catch a CNN interview with Ohio Gov. Ted Strickland. I didn't know much about him, but his comments about the needs of "working people" made me listen carefully. The governor lamented about the condition of Ohio's economy and made a case for his preferred presidential candidate. He kept mentioning the working people of Ohio and how they needed to elect Sen. Hillary Clinton as president if they wanted a better future.

While contemplating Gov. Strickland's position, I wondered if he considers shop owners and managers who somehow succeed and annually earn $60,000, $85,000 or $150,000 as working people. Is there an income cutoff that the governor and many of his fellow politicians consider as disqualifying someone as a working person? Normally, the group he describes includes blue-collar workers, who generally lack college degrees, with machine shop employees among them. Of course, this groups works. Do shop owners and managers work? Of course, they do as well. Well, then, aren't owners and managers also working people? After all, many shop owners and managers were once shop employees, who had the discipline and risk tolerance to be promoted up through the ranks or decided to start their own companies, sacrificing untold amounts of time and money to make their businesses work and employing others who themselves may attempt to start their own shops one day.

When I think about all the people I've interviewed, hired and fired over the years, with their multitude of stories and issues, I wonder if politicians have any clue who real working people are. This political characterization of constituents attempts to drive a wedge between shop owners and managers who acquire new business and manage the operation and the workers who provide the needed labor to complete those jobs. The reality is that owners, for example, who excel and increase their income are role models. They pay insurance and taxes and are responsible for the working conditions in their shops. Ultimately, everything is their responsibility.

However, if they earn $150,000 annually, politicians undoubtedly classify them as "wealthy" and no longer part of the group they claim needs government assistance because they're rich and without problems. But a higher salary doesn't automatically exclude someone from being a working person.

Let's look at plant managers, too. Plant managers are commonly promoted from within after proving their worth through years of sacrifice and effective machine operation. Many spent the majority of their working lives receiving hourly wages, working hard so they can advance up through a company's ranks and hopefully increase their income. Who would dare tell them they aren't working?

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Shop managers know working people. They employ them, work with them, train them, listen to their stories, encourage them, console them and sometimes fire them. It's the entry-level deburring guy, the 60-year-old manual machinist, the CNC operator, the successful sales manager who sometimes receives more compensation than the owner and the general manager who probably started at the bottom. And it's most certainly the owner, who risked everything to get into a business, manufacturing, that politicians said was dying.

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About the Author: *Keith Jennings is president of Crow Corp., Tomball, Texas, a family-owned company focusing on machining, laser cutting, metal fabrication and metal stamping. He can be e-mailed at kjennings@jwr.com.*

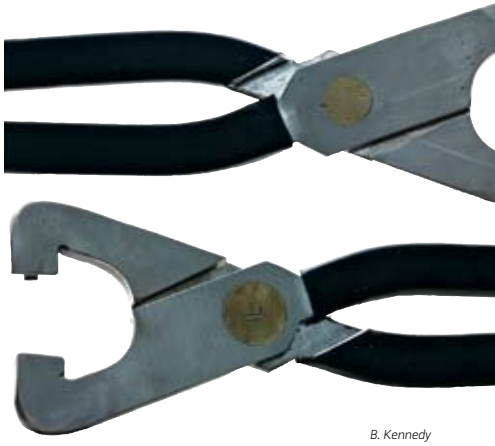
Ringmaster

By Bill Kennedy,
Contributing Editor

John Copello is a third-generation machinist at Larry Copello Inc., his family's job shop in Sonora, Calif. The shop does milling, turning and grinding to make components for medical equipment and parts to test airport X-ray machines.

As a side business, Copello designs and machines replacement parts and tools for classic Volkswagens and Porsches. He said VWs and early Porsches are "kissin' cousins in design and body style," so he makes parts for both, including headrest kits, aluminum knobs, stainless steel seat adjustment levers and clip-on vent window deflectors. His most popular Porsche-related products are tools.

One sought-after tool removes and installs the chrome bezels, or rings, that secure dash switches on 356-series Porsches. The round-shouldered rings have four radial holes spaced at 90° intervals. The curved shoulder can't be gripped with a regular pair of pliers, and the holes are not parallel to the dash but sit on an angle on the shoulder. The original Porsche installation tool was a hook-like spanner wrench with a pin to fit one of the holes on the ring.



B. Kennedy

John Copello designed and machined these tools to remove and install round-shouldered dashboard switch bezels, or rings, on vintage Porsches without any risk of a tool slipping and damaging the car's painted dashboard.

However, the last 356 was built more than 40 years ago, so the remaining 356s have holes that are worn and rings that have become hard to turn. Consequently, when a simple spanner tool slips out of a worn hole, it can scratch the car's painted dashboard. Copello said, "Every car show I went to, people asked, 'can you make something that will take these stinking rings off?'" He said he first thought to copy the spanner but realized the aged rings required extra grip. So he decided to combine two spanner

wrenches into a tool resembling a pair of pliers. Each half of the tool is made up of two parts: a handle and a welded-on contoured tip that grips the ring.

Copello machines the tool handles from 303 or 304 stainless steel flat stock, which is 7" long × ¼" thick × ¾" or 1" wide, "depending on what's on sale." He roughs the handle on a Bridgeport mill, stacking up multiple pieces of stock and milling 4" of the handle to a ⅜" width, using a 1"-dia., 5-flute, solid-carbide endmill run at 900 rpm. The shop's Bridgeport features ProtoTrak CNC, but Copello feeds the cutting tools manually; "If I was making a million of them, I would use CNC," he said. Also, he employs light cuts to extend tool life.

At this point, about 3" of the handle remains the width of the original stock, looking "like a little spatula," Copello said.

He next mills a beveled angle on the handle's end where the tip will eventually be welded, turning the vise on the table to generate the angle and tipping the mill's head to create the bevel.

Copello then mills the tool's center, where the two handles will join, to a thickness of ⅛", so the assembled tool will be ¼" thick.

In that milled area, he drills a ½"-dia. hole for the pivot pin with a screw-length HSS drill and then reams the hole to a diameter of ⅝". The reamed hole has a tolerance of ±0.001", and all other tolerances are ±0.005".

The tool's distinguishing feature is dual tips that exactly conform to the ring's shape and also engage two holes with pins.

Copello employs an imaginative process to make the tips from 5"-dia., 4"-long stainless round bar stock. First, on a Webb engine lathe, he drills an axial hole in the stock's center. The hole diameter depends on the ID of the ring the tool is designed to turn, and Copello makes two different versions of the tool. One size matches the ring on the wiper and headlight switches, and the other is for the ignition switch and hand throttle control. For the headlight switch bezel, the hole is 0.708" in diameter.

Copello faces the stock with a turning tool and then machines a pocket with a radius around the hole with a tool that matches the ring's OD. In the headlight switch bezel's case, that is 25mm in diameter. "You could actually take that chrome ring and put it right in there flush," he said. The same facing and pocketing operations are performed on both sides of the stock.

Then the bar is clamped on the mill with the hole facing vertically. A ¼"-dia., 5-flute, solid-carbide endmill makes four cuts across the hole, ¼" deep and ¾" apart, in a pattern resembling a tick-tack-toe board. The stock is turned over, and the cuts are repeated. Next, the

bar goes back to the lathe, and with a ⅛"-wide parting insert, Copello parts the bar's end to the depth he's just milled. The result is four ¼"-thick segments, or tool tips, shaped to exactly match the ring's profile, "and four little pizza slices that I throw away," Copello said.

One bar produces four tips per end, enough to make four dual-tipped tools. Depending on the number of tools he's making at the time, Copello will repeat the sequence of facing, creating a radius, milling and parting off on the bar stock to make as many tips as needed. "The process is the only way I could figure out how to make a perfect tip that would grab that ring and hold it," Copello said. "It took me forever to figure out how to do that!"

Each tip features a pin to fit a hole on the ring. With an abrasive saw, Copello cuts the ⅜"-long pins from ⅛"-dia. hardened steel drill rod. Then he puts each tip in a vise on the mill table, uses an ⅛"-dia. endmill to spot the hole location and drills a ¼"-deep hole with a ⅛"-dia. HSS drill. Copello press fits the pins into the holes and secures them with Loctite adhesive. He then mills a 45° bevel on one side of each tip to prepare it for welding.

The pivot pins that hold the tool's two sides together are turned from ⅝"-dia. brass rod on a Hardinge chucker lathe. "It looks nice if I make the pivot pin fit flush with the handle," Copello said. He machines a taper on the rod from ⅝" in diameter to ½", then parts the ¼" long pin. He assembles the pin and two handles, but at this point doesn't peen the ½"-dia. end of the pin to lock the handles together.

For welding, Copello supports the assembly with a number of small fixture blocks and sets the handles' tips, aligning them around a chrome ring. After spot TIG welding the tips in place, he completes the welds on the tip front, back and sides.

The handles are then bent on a bending machine to the point where they are straight when the tips are gripping a ring. After peening the pivot pin to lock the tool together, Copello polishes it, cleans it with acetone and dips the handles in Plasti-Dip plastic coating.

Copello said it takes about an hour to complete a tool. He has considered ways to automate the process, but believes that the time savings would be minimal. Copello makes about 25 sets (50 tools) a year, "depending on how many people nag me for them." CTE

Contact Larry Copello at (209) 536-1449.

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If you have manufactured a part that would make a good candidate for a Part Time article, contact Contributing Editor Bill Kennedy at (724) 537-6182 or billk@jwr.com.