

# OLD SUN ON



**1** The Sun 404 features a tach, a dwell meter, and a vacuum meter, and it can test mechanical and vacuum advance, dwell, worn shaft bushings, breaker point specs, and ignition curve.

A Look  
at Sun  
Distributor  
Machines

By Brad Ocock

If there's one piece of vintage shop equipment everyone wants, it's a Sun distributor machine. Few people own one, and fewer know how to fix them. That last bit is important. While you can find a machine and an operator's manual, 40-year-old mechanical/electrical equipment will need repairs before going into service. Until it works, it's just shop art.

At one time Sun machines were a staple in every service garage and speed shop, but tuning carbs and distributors is nearly

a lost art. Engine builders who have been around a few decades still have these machines and probably even blow the dust off once a year to dial in a distributor.

It could be argued that it's hard to justify the costs and floor space if you're not building a bunch of cars or engines every year. But then again, we have a lot of rarely used shop equipment that patiently waits its turn to shine—and when it's needed, nothing else will do.

We found a Sun 404 for the bargain price of \$250. When we looked for info

on them, our quest led us to Mark Saunders at Paramount Distributor Company. Like us, he needed to tune the occasional distributor. One thing led to another, and now he restores Sun distributor machines and manufactures replacement parts. We dropped in for a lesson on their anatomy, what fails, diagnosing component failure, and their fixes.

The potential of a distributor machine is obvious: recurve the advance rate to increase performance. What's not obvious, but even more important to us, is that

# THE HORIZON



**2** Machines from the '50s on up used a 120V electric motor and a transformer to run 12V distributors. Earlier machines used a motor and 6V car batteries in the cabinet to power 6V distributors.



**3** We started our refurb by removing the clamp and gauge panel—the panel comes out as a unit. The clamp rods were rusted on the surface, requiring a lot of force to move the clamp. Paramount sells new rods, but ours cleaned up with a fine-wire wheel on the bench grinder.



**4** Lifting the "bell" reveals the light chamber and the chuck. The parts in here are expensive, so proceed with care.



**5** Mark Saunders at Paramount Distributor Company said the quickest way to ruin the looks of a machine is to spray on fast-acting chemical cleaners. You'll permanently streak the paint, if not wash it off. He recommends spraying the chemicals on a rag, then wiping the dust and grime. We used GoJo citrus hand-wipes. For stubborn spots, a little shot of Brake Kleen on the towel did the trick.



**6** The black disk is the window that the strobe light flashes through, illuminating the arrow on the ring outside the bell, just like a timing light illuminates the mark on a harmonic balancer. However, instead of picking up the firing signal from one spark plug wire, the tester picks up the firing signal from the points opening for every cam lobe/cylinder, illuminating the arrow four, six, or eight times on the 360-degree ring, according to the number of cylinders. The dark tube wrapped in silver wire is actually the dirty strobe tube. The window is filthy—it should be clear.



**7** The purple high-voltage wire to the strobe can break if the chuck is loose on its shaft. There's a slot on the shaft that the wire runs through below the hole, and if the bolt holding the chuck in place loosens, the shaft twists and cuts the wire. Saunders says one out of 10 machines that don't flash has a cut wire. Not wanting to hurt that wire, we didn't completely disassemble and clean.



**8** The aluminum cone is run off the motor with a belt. The rubber tire drives the distributor chuck. As the wheel runs down the cone, the speed (rpm) of the distributor increases. If you don't back the wheel down to zero rpm before shutting off the machine, or start it with the wheel engaged on the cone, you flat-spot the tire, causing the machine to vibrate during use. According to Saunders, this tire isn't bad compared to most. Besides having worse flat spots, most tires are dry-rotted. The two biggest things he works on are wheels and smoothing out the cones. This tire was pretty good, but we replaced it anyway.



**9** These secure the degree ring to the machine. They capture the edge of the ring while allowing the ring to rotate around the housing. We should have spent the 10 bucks with Paramount for new rubber tires; our ring moves, but it binds on the worn and missing tires.



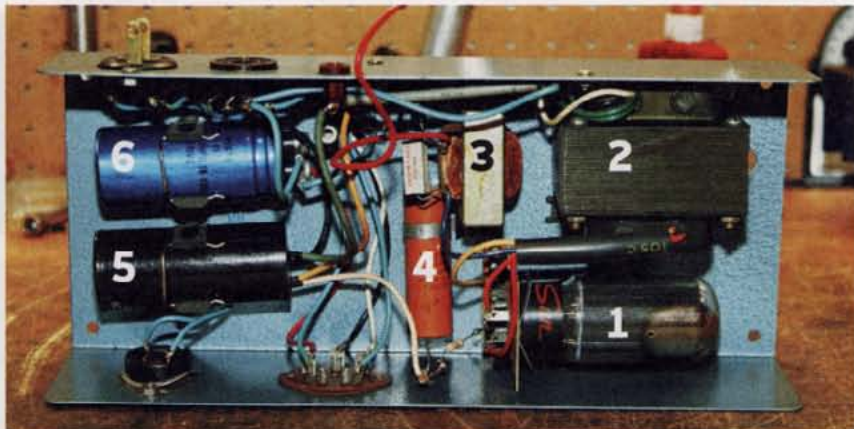
**10** We took apart all our gauges and cleaned them.



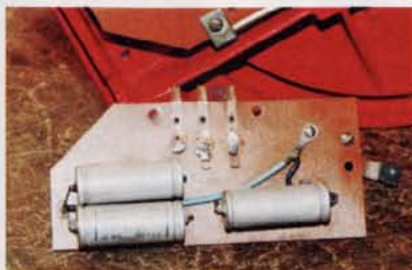
**11** This is the power supply for the strobe mechanism. The copper-colored frame on the left is from '40s and '50s machines, the blue from '60s and '70s.

the distributors we're playing with are old. Springs lose tension; breaker plate bushings go away; and with factory muscle cars, chances are good that someone has been under that breaker plate once before for who-knows-what combination. The curve and total advance in a 40-year-old distributor is anybody's guess, and if it doesn't match your combo, your engine will run like garbage. Just rebuilding to factory specs will help performance and fuel economy—a bread-and-butter job in service stations back in the day.

Our machine cleaned up damn nice, and we'd be lying if we said its looks



**12** The power supply frame includes: (1) a vacuum tube, (2) a transformer, (3) a choke, (4) a capacitor, (5) a trigger coil, and (6) a capacitor for a flash tube. One in 50 machines has a melted trigger coil.



**13** These three capacitors are in all machine models but the 506. Saunders says these are responsible for 75 percent of nonworking flashes.



**14** The 400, 500, 600, and 680 models from the '50s and early '60s used mercury batteries to power the tach and dwell meters, though modern alkaline batteries will work too (they die too, so plan on replacing them periodically, and remove them between uses so they don't corrode the contacts). Sun got rid of the batteries in the '60s and '70s with the 404, 504, and 506 machines. That's the main difference between the models ending in 00 and those ending in 04 or 06. The later machines also came with a dual-range, higher-reading tach.

aren't a source of pride. That vintage styling, the bright red and hammer-tone blue paint, and the nameplate across the top are real eye-catchers. It's definitely shop art, but with a purpose.



**15** If the little white capacitor is burned, it indicates a sheared high-voltage wire or burned-out capacitors.



**16** Early machines used mechanical vacuum pumps driven off the distributor drive cone. These pumps were on if the machine was running. Later machines had a standalone pump operated with a switch when it was needed. Both rarely fail.



**17** The distributor leads plug into tube connector pins. Heat the pins from the outside and pull the wire out when the solder melts, then reverse the process to install new leads.



**18** The knobs and wheels are often missing or broken, and after transporting ours home we saw why: Anything that makes contact with the machine hits the knob first.



**19** For electronic ignitions, a pulse amplifier is used between the machine's leads and the distributor. This is required for HEI, Autolite, Mopar, and some aftermarket electronic ignitions; however, it's not needed for vintage Unilite distributors or Pertronix conversions. This is an original, but Paramount makes a new unit that works the same but looks different.



**20** Paramount sells restored and refurbished distributor machines, as well as cabinets.



**21** Paramount has repro instruction manuals and quick-reference guides, which we found essential. Vintage Motors manuals have mechanical and vacuum advance specs for all cars, including the amount of vacuum needed to move the vacuum pot. We noticed that the Motors manual had low- and high-rpm settings for advance, while some factory manuals had a midrange setting to test.



**22** When the distributor is spun, the strobe lights the arrow for each cylinder at evenly spaced degrees around the ring. As mid-to-upper rpm is hit, the arrows move several degrees. Applying the vacuum moves the arrow more. Bouncing arrows indicate worn shaft bushings.



**23** These are the weights and springs you'd change to make the advance come in slower or faster. This six-cylinder Chevy distributor is from a Corvair that saw almost 10,000 miles last year. What we attributed to points float was actually the weights not moving, plus the new-looking vacuum advance pot was seized, so we had no advance at all. We also found that the shaft bushings were worn. Our machine just earned its keep!



**24** When was your machine made? The main case, gauge panels, and drive housing panel are tagged. The model number is the particular component it's attached to, such as the housing or gauge panel. The serial number is a quarterly code. Here, the "4" indicates the fourth quarter of the year and the "3" the last digit of the year. Since Sun didn't make 404 machines in the early '60s or '50s, that would mean this one is from 1973. The letter ("A") indicates running production changes—version A, B, C, and so on. The last digits indicate the machine's production number. *MCR*

Source

Paramount Distributor Co.  
616/878-9734  
www.paramountd.com