

T R I N I T Y  
**EX-Series  
Modified  
Motors**

## Experimental Horsepower

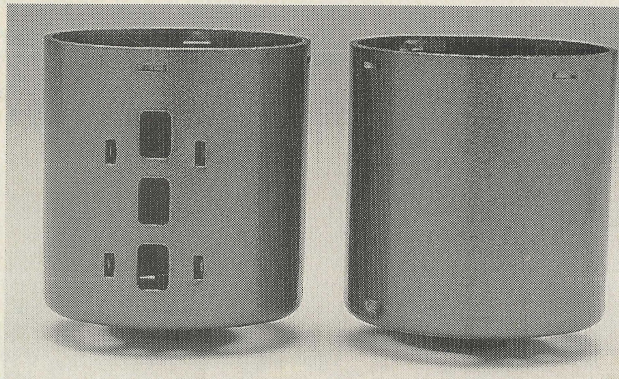
**T**RINITY\* IS definitely on the leading edge when it comes to motor technology. Their stock motors—especially the new Slot Machine 2—incorporate many innovative features that enhance both performance and longevity. Now Trinity has taken what it learned from its stockers and applied their knowledge to the new EX-Series line of modified motors.

I was curious to find out what's new and different about the EX motors, so I took one apart, and this is what I learned.

by  
Scott  
Douglas



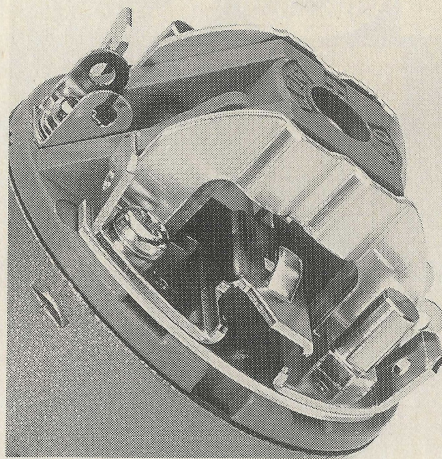
## TRINITY EX-SERIES MOTORS



**Two types of can are available for the EX-Series motor. The vented can (left) keeps the motor running cool, while the full can has a stronger magnetic field.**

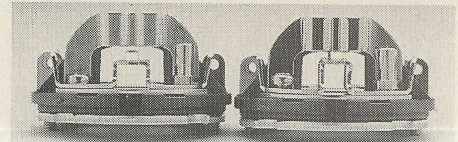
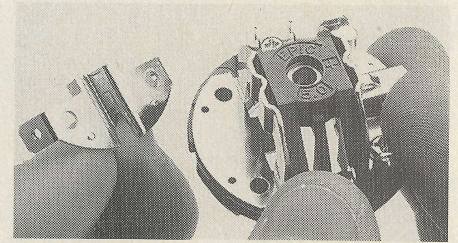
### CAN OPENER

The EX-Series modifieds (which are available in seven to 17 turns) come with a new can that has the latest 5.0 wet magnets for a strong and long-lasting field. What's unique is that there are two different types of can available: a full one and one that has six vent holes in its side. The full can has a stronger field, so you'd use it where you need more "punch," such as in off-road. The vented can has a slightly weaker field, but because the vent holes help to circulate air from the motor, the motor will run cooler. This can lend itself well to longer events. Trinity tells me that there's no concrete rule about the use of the cans, and that the type of can they use varies from race to race, depending on conditions.



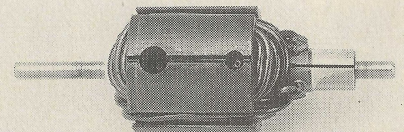
**The brush-hood/endbell design allows air to be pulled under the heat sinks for maximum cooling.**

the EX endbell. As when using the vented can, changing the configuration of the brushes is an additional tuning aid; the standard arrangement may work well under certain conditions, and lay-down brushes may prove advantageous under others. Solid-copper brush hoods are available as options. Because copper is very effective at conducting heat, adding these brush hoods will keep the motor running even cooler. New,



**Top: the brush hoods are keyed into the heat sinks so that proper alignment is maintained. Bottom: Trinity's lay-down brush hoods can be bolted right onto the EX-Series endbell with no additional modification.**

Each of the armature's poles has a slot along the center of the outer part. (Trinity calls this its Armature Balance Concentrator.) This slot guides the drill bit that's used to balance the armature after it has been wound with copper wire. This slot ensures that each balancing hole is drilled dead center on the armature pole. Trinity maintains that the edges of these slots also help move warm air out of the can. Finally, to increase conductivity and durability, the armature windings are welded, not soldered, to the comm segments.



**The commutator has been designed to allow maximum rpm, and the slots on each of the armature poles help guide the balancing drill.**

Using the Competition Electronics\* TURBOdyne, I tested an EX-Series 12-turn, quad-wind motor against a similar type in Trinity's 5.0 version. Look at the chart to see how they compare: as you can see, the EX-Series motor draws more amperage, but it makes more out of what it takes; the EX turned higher rpm than the 5.0 and put out a lot more power (in watts).

From the information yielded by my test, I've concluded that the subtle changes that Trinity has made to its modified motors really do make a difference to performance. After all, the dyno never lies!

*\*Here are the addresses of the companies mentioned in this article:  
Trinity Products Inc., 1901 E. Linden Ave. #8, Linden, NJ 07036; (908) 862-1705.  
Competition Electronics Inc., 3469 Precision Dr., Rockford, IL 61109; (815) 874-8001.*

## IS IT BETTER?

### 5.0 WET MAGNET—CONSTANT 5V

| RPM    | Torque | Watts | Efficiency | Amp draw |
|--------|--------|-------|------------|----------|
| 29,275 | 1.4    | 32    | 50         | 12.6     |
| 27,859 | 2.9    | 61    | 64         | 18.8     |
| 26,650 | 4.0    | 78    | 69         | 22.4     |
| 25,138 | 5.0    | 93    | 72         | 25.7     |
| 24,569 | 6.0    | 109   | 73         | 29.7     |
| 23,167 | 7.1    | 122   | 70         | 34.6     |

### EX-SERIES MODIFIED—CONSTANT 5V

| RPM    | Torque | Watts | Efficiency | Amp draw |
|--------|--------|-------|------------|----------|
| 33,869 | 1.4    | 36    | 49         | 14.7     |
| 32,077 | 2.9    | 70    | 70         | 19.9     |
| 31,030 | 4.0    | 92    | 76         | 24.2     |
| 29,989 | 5.0    | 111   | 79         | 27.9     |
| 29,017 | 6.0    | 128   | 81         | 31.6     |
| 27,994 | 7.0    | 146   | 82         | 35.7     |

### BELL BOTTOMS

The EX motor's endbell fits the can much more tightly; so the armature spins more true. The brush-hood heat sinks are designed to keep the brushes cooler. To take away excess heat, air circulates around the horizontal part as well as the vertical part of the heat sinks. The brush hoods themselves are keyed to the heat sinks so that proper alignment is always maintained.

The EX-Series motors come with standard (vertical) brush hoods; Trinity's lay-down brush hoods can be bolted right onto

two-sided eyelets allow the capacitors to be attached easily.

### ARMED AND DANGEROUS

The EX-Series armature is similar to that of the previous 5.0 (gray can) motor, but there are several enhancements. First, the commutator's internal design has been improved to allow higher rpm with less chance of damage. Also, the armature blank itself has more space in which wire can be placed. This increases efficiency by allowing the use of larger-diameter wire.