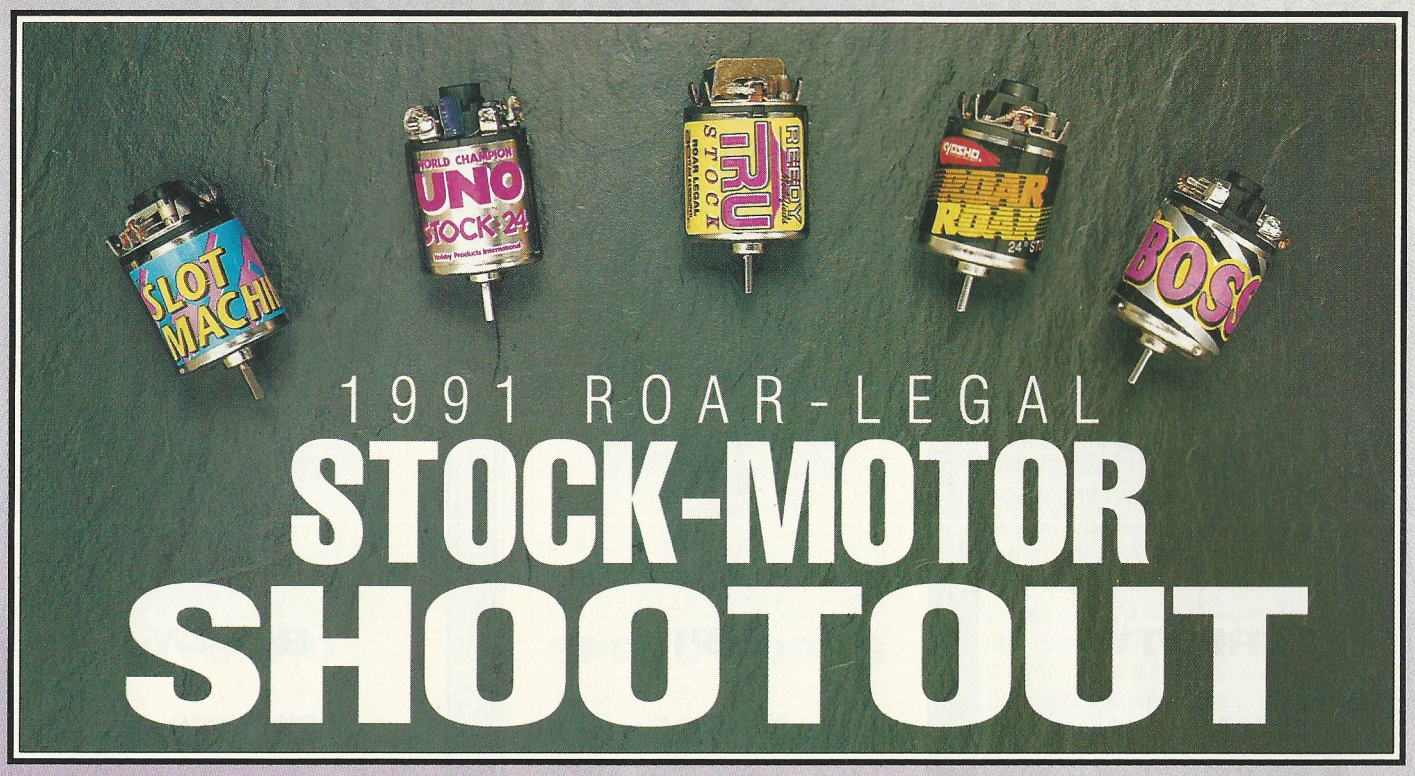


1991 ROAR-LEGAL STOCK-MOTOR SHOOTOUT

IN R/C RACING, controversies come and go, but one of the most enduring has been that concerning stock-class racing and, more specifically, its motors.

By its name, stock-class racing implies that every racer competes on equal ground. Ideally, each car should be similarly equipped, making chassis-tuning skills and superior driving ability the difference between winning and losing. In past years, the rules governing the motors used for this class were loosely regulated. Although they ensured that all motors contained similar components, i.e., the can, the magnet, the armature and the windings, there was no regulation of how these components were assembled. For example, changing the position of the commutator in relation to the armature results in a change of timing that can drastically alter a motor's performance. When motor manufacturers began to notice that increased timing meant increased sales, they fueled the controversy further with fast, but short-lived, motors.

Manufacturers engaged in contests of one-upmanship by always trying to increase the timing of their stock motors more than their competitors increased theirs. The "motor of the week" was the one with the highest degree of timing, and that's no exaggeration; there *was* a new one every week. At the peak of the stock-motor wars, motor timing had soared from a modest 12 degrees to a ridiculous 45 degrees.

A landmark decision by ROAR (Radio Operated Auto Racing), the largest sanctioning organization in the U.S., made great strides toward eliminating the controversy. ROAR required that the timing on stock-class motors be limited to a maximum of 24 degrees as of the 1991 racing season. Furthermore, it ruled that every motor must include a commutator-locking device to prevent the tampering that had become so common.

It took time for manufacturers to react to these changes, but most, if not all, have come to the table with new, ROAR-legal, 24-degree stock motors.

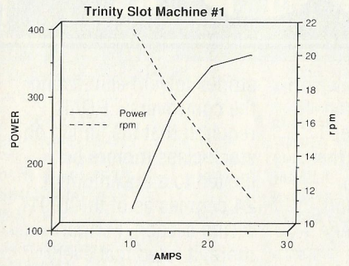
I obtained five representative motors; every motor on the market resembles one of the five tested here. I tested:

- **Kyosho's ROAR '91**
- **Reedy's Yokomo-based Tru-Stock**
- **Trinity's Slot Machine**
- **Speedworks' Boss**
- **HPI's UNO Stock.**

ILLUSTRATION BY GERRY YARRISH

by STEVE POND

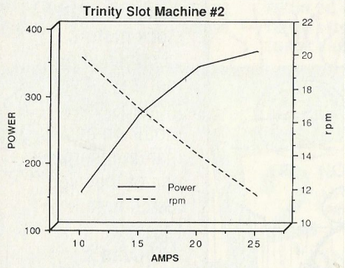
TRINITY



Slot Machine #1

Amps	Power	rpm
10	131	21,900
15	273	17,900
20	343	14,800
25	360	11,900

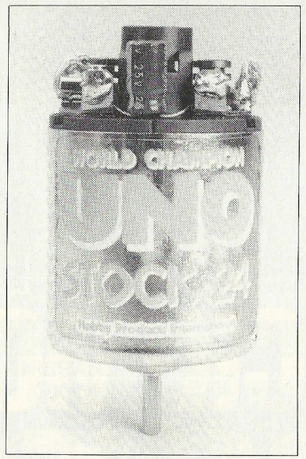
Efficiency rating: 2.8
Ideal current draw: 17.53 amps



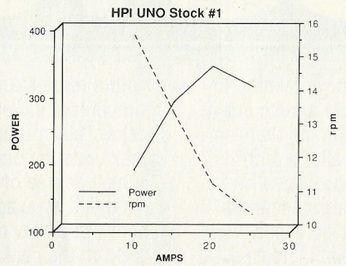
Slot Machine #2

Amps	Power	rpm
10	154	20,200
15	272	17,100
20	341	14,400
25	364	12,000

Efficiency rating: 2.77
Ideal current draw: 16.9 amps



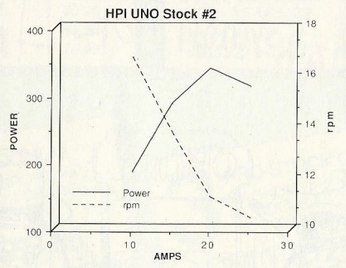
HPI



Uno Stock #1

Amps	Power	rpm
10	190	15,800
15	291	13,500
20	344	11,400
25	315	10,500

Efficiency rating: 3.0
Ideal current draw: 14.08 amps

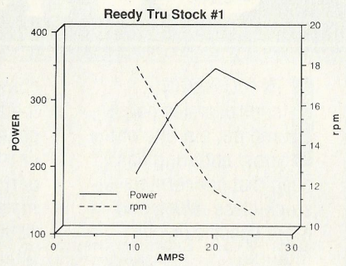


Uno Stock #2

Amps	Power	rpm
10	186	16,900
15	289	13,900
20	341	11,300
25	315	10,500

Efficiency rating: 2.97
Ideal current draw: 14.24 amps

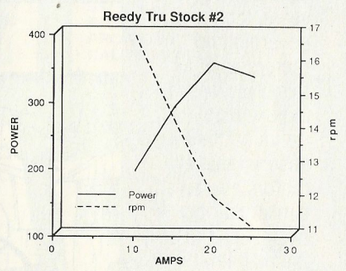
REEDY



Tru-Stock #1

Amps	Power	rpm
10	187	18,200
15	289	14,800
20	343	12,000
25	314	10,900

Efficiency rating: 2.98
Ideal current draw: 14.24 amps

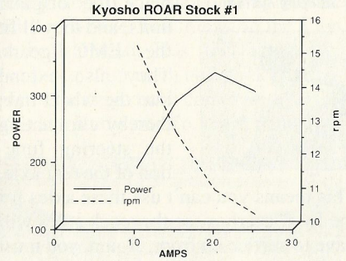


Tru-Stock #2

Amps	Power	rpm
10	194	16,900
15	290	14,400
20	355	12,100
25	335	11,200

Efficiency rating: 3.01
Ideal current draw: 14.32 amps

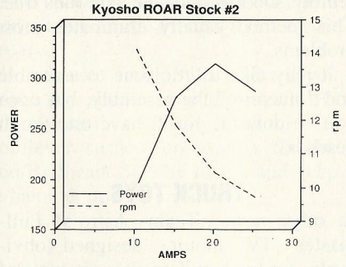
KYOSHO



ROAR '91 Stock #1

Amps	Power	rpm
10	188	15,400
15	287	12,800
20	330	11,100
25	303	10,400

Efficiency rating: 2.94
Ideal current draw: 13.77 amps

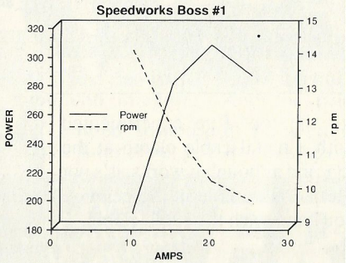


ROAR '91 Stock #2

Amps	Power	rpm
10	186	14,300
15	279	12,000
20	312	10,600
25	285	9,900

Efficiency rating: 2.85
Ideal current draw: 13.22 amps

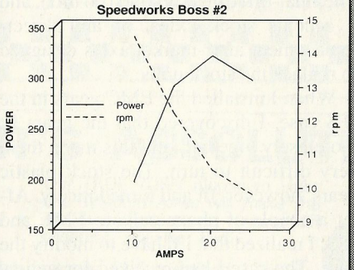
SPEEDWORKS



Boss #1

Amps	Power	rpm
10	190	14,300
15	280	11,900
20	307	10,400
25	286	9,800

Efficiency rating: 2.86
Ideal current draw: 12.6 amps



Boss #2

Amps	Power	rpm
10	199	14,700
15	290	12,400
20	320	10,700
25	296	10,000

Efficiency rating: 2.98
Ideal current draw: 12.52 amps

Before I tested them, I broke-in each motor (two of each motor listed) using the brushes and springs that came with it. (ROAR rules allow racers to change the brushes and springs, but I decided to test the motors as they came.) Using Lavco's Pro Dyno, I tested each motor at 10-, 15-, 20- and 25A loads. The data and the graphs were generated directly from the Pro Dyno's data. The data include the power and rpm readings at each load setting, an ideal current draw for each motor and an efficiency rating at that rpm. Motors with the highest rpm and power rating are preferred. The efficiency rating is fairly important, but if a motor runs at its ideal rpm, duration shouldn't be a problem especially with stock motors.

WHAT DOES IT MEAN?

The Lavco Pro Dyno measures two things—power and rpm. Each measurement is taken at four load settings: 10, 15, 20 and 25 amps.

- **The power rating**. This indicates the efficiency of the motor. Of two motors that yield the same rpm rating, the motor with the higher power rating is more desirable because its performance will be more efficient. Also, the higher the power rating, the faster the motor will accelerate.
- **The rpm rating**. When used with the power rating, this reading will help you to determine the proper gearing. Two motors with identical power ratings but different rpm ratings must be geared differently to attain the same axle speed.

In addition to these two ratings, we included the ideal current draw in the data. This is the current level at which the motor operates at peak efficiency. On the graphs, this is where the power and rpm ratings intersect.

READING THE RESULTS

The Trinity Slot Machine triumphed. It achieved the highest power rating at the 25A setting and the highest rpm throughout the entire range of load settings. The Reedy Tru-Stock was our 2nd-place finisher, followed closely by HPI's UNO stocker. Fourth and 5th place went to the Kyosho ROAR '91 and the Speedworks Boss, respectively. ■