

CCWBRA ENGINE COMMITTEE

REPORT AND RECOMMENDATIONS

Introduction:

The Engine Committee, mostly by e-mail communication and discussion, but also as a result of a reasonably successful couple of days of testing, has reached the point where a report to the Executive Committee is warranted. Over the past months we have focused on three areas of concern:

1. The apparent speed advantage of the 1976-1979 models of OMC 6hp motors over the earlier models and the resultant question whether the Classic division should be further split or some other steps be taken to ensure reasonably fair competition.
2. The need, if any, to identify those 8hp outboards to include or those to exclude from sanctioned competition.
3. The definition of “stock” as applied to the rule requiring that motors and propellers be stock.

Discussion:

Topic 1: Classic 6s

After discussion and vote at Urbanna a year ago, the 6hp division was split into the Classic -1979 and earlier - and the Open - 1984 and later - classes. (OMC did not rate a motor as 6hp in 1980 to 1983.) The racing the day after that decision, but before it was implemented, showed clearly that the Open motors had such an advantage that the decision to split the division was correct. Only one Classic motor made the finals in the lightweight division. It finished 7th to six “open” motors. The speed difference was obvious.

At the Urbanna meeting, there was some discussion whether the split should be at 1975 rather than 1979. That possibility was suggested by the fact that at least one 1979 motor, Dave Goldner’s from Arizona, was reported to be going faster in

practice than had been seen at Nationals in 2012, where Keith Carew's 1969 had won the heavyweight class and Russ Bowler's 1967 the lightweight. If the earlier split point had been selected, it would have grouped the 1976-1979 motors with the 1984s and later. Although little data was available, it was suggested that the newer motors would have a 2-3 mph advantage, rendering the '76-'79 motors completely non-competitive. Later observation bears that out. The '90s motors, and at least one, Russ's mid '80s 6hp, are 2+ mph faster than the '76 to '79s.

By observation, and a cursory review of results from the 2013 racing, it has become apparent that the 1976-1979 motors can be fast. They took all of the 6hp championships at Nationals. The same motors were fast at Kent Island and Oktoberfest. They were on good boats with good drivers, so the success can not be attributed only to motor differences.

Although the basic power head on the '76 to '79 motors is generally similar to the earlier motors, there are differences that may explain why those motors appear faster. In 1976, OMC went to a new lower-unit design, with higher numerical reduction gear. The result was that the engine is allowed to rev higher for the same propeller speed. The engine thus could run higher on its power curve and possibly develop more power at the propeller, although propeller configuration, pitch and smoothness are important factors. The '76-'79 engines are equipped with a 3-bladed propeller, with more area than the earlier 2-blade. The '77-79 engines also were equipped with new electronic ignition. Although it was postulated that the ignition may have resulted in some improvement, Don Johnson's '76, with which Jack Pettigrew won the heavyweight championship, clearly was and is as fast as the '77-'79 motors he has run against.

In order to develop a bit better understanding of the Classic motors, we ran two days of testing on April 5th and 6th. We ran 13 '66 to '79 motors and Kim Granbery's '62 5.5hp on boat #78, with a lightweight and a heavyweight driver testing each motor for GPS speed. The results are attached hereto. They appear to suggest that the 1976-1979 motors are marginally faster than the earlier motors, but not sufficiently so to justify further class division at this point. The testing was straight line only. The '76-'79 group included all three national championship motors. The best of the earlier motors ran within a mph of them in the lightweight test and a bit more behind them in the heavyweight. Clearly, however, with the speed differences demonstrated, the driver's skill and boat preparation may be the

determining factors in a race. And, as we all know, some motors are faster than others, even if the same model.

An interesting corollary observation was that increased weight made less difference as the speed increased. With the fastest motor(s) the top speed between light and heavy were about the same.

The test weekend certainly didn't lead to unassailable long-term conclusions. We did not test, for instance, for the acceleration capability from pre-start to top speed, or acceleration out of a turn. Those will be variable among motors, as well as according to driver technique. We did reach the consensus, however, that we do not have sufficient basis to recommend a further split or revised handicapping system for the Classic Division at this time. We will be monitoring 2014 results.

Recommendation: We recommend that the Classic motor definitions not be changed for 2014.

Topic 2.

Last Summer, when Robert Edmonds was chairman of the Engine Committee, we had some e-mail discussion about what changes in the class definition might be advisable for the 8hp class. The objective was primarily to attempt to maintain fairly level racing without restricting available choices for the racers, as well as identification of any safety hazards that we could think of. Complete equality is impossible, of course, and some motors will be faster than others even within a make and model.

Suggestions ranged from preparation of a list of approved motors to the opposite: preparation of a list of excluded motors. The Committee never made significant progress toward either of those possibilities, and by decision or inertia has concluded that neither is the right way to go.

One particular motor, the Mercury KG-4 motor rated at 7 ½ did receive special attention, because a West Coast fleet has a number of them, and because Don Johnson ran his at Nationals. It was a crowd pleaser in that it howled by its competition on the straights with significant speed advantage. Rounding a buoy,

however, turned out not to be its strong suit. Don brought it to the April 4-5 test weekend. It ran against Todd Steffes's 8hp OMC in informal straight-line "races." Onlookers estimated that it was at least 5mph faster than the OMC. Neither white-knuckled driver had any desire to test whether it would go around a corner at top speed.

Because of the speed differential with most current competitors, and its reported and demonstrated reluctance to turn safely, the Committee concluded that the KG-4 Mercury should not be allowed to run in sanctioned 8 hp class races. In addition to the speed differential, there is concern that the absence of a neutral and reverse gear make the boat a bit more dangerous in the "pits." Certainly there is some risk that any Cocktail Class boat might back into someone or other boat, which a KG-4 would not do, but it was the consensus of the Committee that the maneuverability with neutral and reverse should be available in our growing fleets in the launch areas. The KG-4 obviously has more power than the current 8hp racers in part because its displacement is significantly larger than the 8hp motors currently running. Since there might be other motors out there with larger displacement and power than the numbers on their covers, the Committee concluded that a 13 CI displacement limit, coupled with the requirement of forward-neutral-reverse would be an appropriate administrative action. Because we do not have specifications on a lot of the motors, particularly 4-stroke motors, the rule should be coupled with a note that a waiver may be granted by the Engine Committee or Executive Committee for a motor of higher displacement if it is submitted for review and testing and appears appropriate to compete.

Recommendation: Motors eligible to run in the 8hp class must be recreational (non-racing) motors of 13 cubic inch or less displacement with forward-neutral-reverse gears. A competitor wishing to run a motor rated at 8 hp or less with more than 13ci displacement should request a waiver and submit the motor for review by the Engine Committee.

Topic 3. Definition of "stock."

There were a number of discussions within the Committee, as well as with members outside the committee of the question "What really constitutes a "stock" engine or propeller?" The issue was briefly discussed at the 2013 Urbanna meeting and after it, with respect to mixing and matching parts from various years and

models of motors and particularly with respect to minor propeller modifications, such as filing and sanding to repair damage, filling dents with epoxy, and the sort of minimal cupping of the trailing edge of the propeller which can be accomplished without breaking it.

There are a number of competing interests in the discussions. First is the desire to make machinery as even as possible, so that the races will be contests of skill. Second, and in some ways opposed to the first, is to keep as part of the competition the building and preparation of the boat and motor to be as fast as can be done within the limits of the rules. Third is the objective of keeping Cocktail Class Racing as an inexpensive sport, where large amounts of money aren't spent to buy speed. Fourth is the desire to avoid such a proliferation of complex rules or rule interpretation that more time has to be spent in scrutineering and enforcement than in more collegial activities.

No recommendation can meet all four objectives, and other concerns inevitably arise as individual possible modifications are discussed. The definition of "stock", therefore isn't a simple one to put together.

Some propositions, particularly applicable to the Classic 6s suggest interpretations of stock which may be usable across the board. The last of those motors was built by OMC about 35 years ago. A few may have been put in climate-controlled storage and be discovered and put to use, but the vast majority have seen a lot of hard years on the backs of fishing, crabbing, sailing or general recreational boats. They may have been maintained, or not; stored carefully with anti corrosion fog, or not; flushed with fresh water after use, or not; filled with mud when run in shallow water, or not; run aground on oyster bars, or not. Odds are a substantial number have had some type of malfunction, resulting in replacement parts being installed by a really skilled mechanic, or a fisherman with a hammer and pair of pliers, or someone who has a fairly similar parts-donor motor in a corner that is six years older, but the particular part bolts right up. There is a very good chance that no available motor will have all the same parts with which it left the factory. An argument could be made that there is no longer any such thing as a stock 1969 OMC 6hp motor.

Given the potential for a performance difference between and among the Classic years' OMC 6s, one project that is entertaining to a few competitors,

including the current Engine Committee Chairman, is to try to figure out what combination of parts that OMC made to bolt together will be the fastest. A simple example is the '76 to '79 lower unit. If a lower unit on a '69 isn't in too great shape and a '79 is available, is the '69 still a stock motor if the '79 lower unit is bolted on? It may be that such a swap was already done before a competitor bought the motor. Perhaps a '79 motor was bought with a '77 carburetor. And a long-shaft motor can generally be converted to short-shaft just by putting a short driveshaft in. Some easily-swapped parts have the same part number from year-to-year. Some don't.

Without question, there are classic motors already racing with parts swapped from other years. Some go well. Some don't go well at all. Certainly no one has discovered the magic OMC part which makes a 6hp classic run away from the competition. The bottom line seems to be that those who wish to mix and match, either to assemble a complete engine from parts, or to try to find the best combination of OMC parts, should be allowed to do so. Not only is research and experimentation part of the fun, but a ban on mixing and matching OMC parts could not possibly be enforced. In many cases, there is no way for a motor owner to determine if a replacement part installed on his motor before he got it was the same year and part number as the one that was initially installed.

Propellers pose a slightly different question in that there are some minor modifications that are inevitable as damage from grounding or other mishap occurs, but there are also a small number of minor modifications that were popular when the earlier classic motors were built but are hard to find now. Dealers and propeller shops, for instance, routinely offered "cupped" propellers even on new motors, but more often as spares or replacements. Vast superiority was claimed for minor cupping leading often to the question: "If cupping is so wonderful, why doesn't OMC cup all its propellers?" The answers to that are buried in a number of engineering texts and now in computer-design programs for propellers, review of which is way beyond the purview of the current Engine Committee. Suffice it to say that some capable people still are around who will bend the trailing edge of a small propeller a bit, and some performance difference may be noted. Anything more than slight bending of an old cast aluminum propeller results in some irregular chips of aluminum and a curious paperweight. So, if the starting point is a prop built for an old OMC 6, no one is going to modify it substantially without breaking it, and even were such modification practicable, there's little reason to

believe the result will be faster around a CCWBRA course. But, conversely, there's no real reason to ban cupping of competition propellers. Where available, it isn't likely to be expensive. If it makes boats faster or makes them corner better, that will become known, and more people will get it done. If it makes them safer we should consider making it mandatory, or conversely prohibiting it if it appears to increase some hazard. Based on discussions so far, we don't have a confident prediction what effect, if any, will be noticed with a cupped propeller. So, the consensus of the Committee is not to stifle experimentation altogether, and to allow minor cupping and commit to evaluate any other propeller modification that might be submitted for possible future adoption.

As with swapping motor parts, enforcement of a rule that propellers have to be exactly as they left the factory 35 years ago would simply be impossible. We do not have information about who made OMC's propellers for the Classic years, but it is likely to have been more than one manufacturer. There were a number of differing options in various years, depending on the original intended uses. There is no list that we have found of all propellers that might fit the old motors. Some currently available replacement propellers, with OMC numbers, are quite different from the originals. We have no templates, dies, patterns or specifications to make technical inspection even possible. If a propeller has been sufficiently modified that it appears clearly different from others, and it seems to give an unfair speed advantage, the issue will have to be dealt with, but the Committee does not see such a situation as probable if the general proposed definition is adopted.

Recommendation: That interpretation of the rule(s) be published to the membership and incorporated into future publications is as follows:

For the purpose of interpretation of the requirement that motors be stock, the word "stock" is defined:

For motors: Any part made by or for OMC or other motor manufacturer for a motor of equal or less rated horsepower that will fit on a motor without modification shall be considered a stock part and a motor with parts installed that are of years or models other than originally specified for that motor shall be considered stock provided the parts are "bolt on" without machine work or other modification of part or motor.

For propellers: A stock propeller is one manufactured by or for OMC or other motor manufacturer as original or optional equipment or is currently generally available as a replacement for the make and horsepower of the motor. A propeller which has undergone maintenance and repairs such as filling or filing dents, sanding, smoothing and painting shall still be considered stock, as will a propeller which has undergone minor cupping. A custom propeller or a propeller which has undergone major modifications, such as significant change in blade shape or area, change in pitch or rake or hub size or shape shall not be considered as stock and shall not be used in sanctioned competition, unless approved by the Executive Committee upon recommendation of the Engine Committee.

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Revised
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APRIL 5-6 TESTS

ID	'76 - '79	Light Sustained	Driver Top	Heavy Sustained	Driver Top	145 lb Sustained	Driver Top
Don J	'76	19.00	19.40	18.50	19.20		
cei white	'77	19.50	20.00	19.50	20.00	20.10	
cei blue	'77	18.00	19.50	18.50	19.20		
Fred A	'77	18.80	19.00	17.60	18.20		
Kim G	'79	18.20	18.70	18.20	18.40		
cei red	'79	18.60	19.00	16.50	18.60		
pre '76							
Fred A	'75	19.00	19.60	18.00	18.80	18.50	19.50
Todd S	'70	16.70	17.00	16.00	17.00		
CEI	'69	18.60	19.00	17.60	18.80		
Kim G	'66	17.40	17.80	16.70	17.40		
Kim G	'66	17.50	17.90	na	na		
Problems							
Carew	'69	17.00		15.50			
Bowler	'67	16	with choke				
cei '69 w/ '78 lower unit - heated & slowed							