

Boat Weighing Update

The Class unanimously passed a modification to Rule 7.3 allowing boats to be weighed as an alternative to using float lines for weight equalization. This new rule came about as a result of the well known difficulties with float lines and the inequity caused by minor differences in the finished hull sizes of boats built using the pre-scrimp method. Fleets have begun to implement weighing so it is a good idea to review progress and pass along the things that have been learned. The general experience has been good and the knowledge that the boats are more equal makes for a stronger class. In the future this effort will greatly streamline the measurement process at major regattas.

Progress Being Made

Fleets 3 (Annapolis), 4 (Lake Ontario), 8 (S. California), 1 (San Francisco) have all implemented weighing programs with the intent of having 100% of their boats certified. To date close to 100 boats have been weighed with more being done each weekend in preparation for the 2006 season. The primary problems involve figuring out the logistics of who will do the work and with what equipment. Fleet 1 had an initial hiccup when the scale turned out to be inaccurate but this was quickly remedied and things are progressing well. All these fleets have worked out a system and are able to weigh boats with minimum problems.

The Data

The Class Technical Committee has been monitoring the results in order to keep track of the success of the rule. Some of the interesting statistics:

- The average Scrimp boat has weighed 8611 while the average pre-scrimp has weighed 8289, for an average delta of 322 pounds.
- Some Scrimp boats have weighed unusually light. This is attributed to keel fairing to minimum offsets, which requires the removal of a significant amount of lead.
- Scrimp boats that have not had extreme keel fairing have ranged from 8530 to 8905 pounds. These boats have keels that are essentially stock in size.
- Pre-scrimp boats have ranged from 8035 to 8450 pounds. There is no data regarding modifications.
- Pre-scrimp boats that were float line equalized had a difference in final compensated weight of about 450 pounds.
- Pre-scrimp boats that were previously float line compensated have weighed up to 300 pounds over the 8577 base weight. This difference has been quite variable, with most around 200 pounds over, while some have been under. This is consistent with the 450 pound delta in compensated boats.

Weighing Rigs

The scale requires a single point of attachment to the lifting mechanism so all the force is directed through the scale. The preferred lifting mechanism is a crane. A spreading frame is best because it allows the lift straps to be located on the boat's lifting points. The arrangement, from the crane's boom down, is scale, ring, cables to the frame, and

straps at the fore and aft lifting points of the boat. Most yacht yards that have a crane also have this rig.

A ring or bar, with straps radiating out, is a simple alternative but should be used with care as the forces are not vertical with the boat's internal bulkheads. There are instances (although none in our weighing of boats) where boats have had damage as a result of lifting by this rig arrangement.

It is possible to make a one point lift by bolting a tab to the aft keel bolt and rigging stabilizers fore and aft. This method is frequently used with smaller boats like the J24 but with adequate care can be used on a J105. The aft keel bolt one inch stainless embedded in 17 inches of solid glass so strength is not a problem.

Fleet 1 has developed a frame that is lifted by a travel lift with the scale and boat suspended from the frame. This is a creative way for those who don't have convenient access to a crane. Contact Fleet 1 Measurer Pat Benedict for details on this rig.

Scales

The scales are generically referred to as "Crane Scales". These were developed for use in measuring loads to be picked by cranes and are set up to be easily attached to a crane. The scales are load cell based, which means that an electronic strain gauge measures the force. These scales are accurate and very rugged. It is important to trace the calibration of the scale. There has already been one case where a scale was not calibrated.

The capacity of the scale must be at least 10,000 pounds to accommodate the boat (up to 8900) plus the rig. The scale can be rented if none is conveniently available. Fleet 8 has purchased a 20,000 pound scale and is willing to lend it out. Contact Bob Kieding (bkieding@chandlery.com) to make arrangements. The larger the capacity of the scale, the lower the resolution. A 10,000 pound scale is accurate to about 10 pounds worst case, while a 20,000 pound scale is accurate to about 20 pounds. The scales are generally much more accurate than the worst case specification and are calibrated to better than 10 pounds.

Some care must be exercised when using the scale. Avoid jerky movements when lifting as this can knock the scale out of calibration. The lifting straps will load up with water. Allow the excess water to drain from the rig and boat before taking the weight and do the same when establishing the tare weight. Tare is the weight that the scale measures with no boat in the rig. Most scales will automatically subtract the tare once it is set.

Organizing a weighing day

The most efficient way to do this is to set up a day when everyone can convene and do all the boats in sequence. This will help minimize costs and minimize the irritation of all involved. A cost of \$100-200 per boat is typical.

A suggested protocol:

- Allow 20 minutes per boat. This provides sufficient time to get the boat into the rig, lift and drain, then lower and release.
- Assign a time to each boat that is about one half hour earlier than the scheduled time.
- Insist that each boat show up emptied out and ready to weigh. If not ready the boat is rescheduled and the others are moved up.
- Maintain duplicate copies of all documentation and start a spreadsheet to keep the data organized.
- Confirm a statistical comparison against previous data as confirmation that the weighing is accurate. Contact the Class Measurer for more detailed data.
- Don't weigh if it's raining or snowing.
- Make sure to check the tanks. Boats have been found with full holding tanks that they thought were never used.