

Nonprofit Organization Grants:

Coast Guard Office of Auxiliary and Boating Safety
Recreational Boating Safety

Federal Grant Title:	National Non-Profit Organization Grant Program
Federal Agency:	United States Coast Guard
Funding Opportunity Number:	DHS-USCG-2021-001
Type of Funding:	Cooperative Agreement
CFDA Numbers:	97.012
CFDA Descriptions:	Boating Safety Financial Assistance

Grantee: American Boat & Yacht Council (ABYC)
Grant Number: 3321FAN201101
Grant Title: FY 2021 Center of Gravity Analysis
Period of Performance: 1 year grant

Award Amount: \$125,000.00

Summary:

Engine Weight and Center of Gravity Analysis - Traditional gasoline powered outboard style propulsion has been a known quantity since the 1950s. Best results are obtained when the “worst case” weight of an outboard engine is determined during a level-flotation test on a boat under controlled lab conditions over results obtainable with the actual outboard in a test pond. It is fairly easy to achieve repeatable results by clamping a basket to a transom and then filling that basket with weights equal to the published weight of an outboard that corresponds to the boat’s rated horsepower. Tables exist that offer engine weights based on “horsepower families” that are within an acceptable margin of error across all engine manufacturers.

There is a need for a method to adjust the simulated outboard test weight basket to accurately replicate the differences based on propulsion options that are outside of “traditional” options. This difference lies mostly in the center of gravity and existence of accessories such as large capacity battery banks. The concentration and distribution of weight is not suitably simulated by current testing means.

The challenge for this project is that the center of gravity is not a data point that is tested and cataloged by most outboard manufacturers. To add to the complications, the center of gravity cannot be easily determined by engineering drawings and dimensions. The center of gravity must be physically measured or obtained by advanced simulation software, which in many cases can be much more time consuming than physical testing. However, the test procedure can be done in a very simple manner. A simple, affordable test method must be designed and made available to the affected boat and engine manufacturers.

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