



From: Gary Polson
PropellerSafety.com
P.O. Box 1381
Stillwater OK 74076

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To: Department of Homeland Security
U.S. Coast Guard

**Reference: Docket No. USCG-2010-0164
National Boating Safety Advisory Council**

Subject: Large outboard motors striking submerged objects and flipping into boats

Thank you for the opportunity to comment.

Our comment has to do with efforts of the **Boats and Associated Equipment Subcommittee** to encourage design and production of safer boats.

Introduction

The industry has long been aware outboard motors can strike submerged objects and break loose from the transom and enter the boat, or parts of them can enter the boat. When outboards do break loose, they often flip in still running with the propeller rotating. Several people have been maimed or killed. Our web site currently lists over 60 such accidents.

In June 2014 we posted a list (attached) of a subset of these accidents, **large outboard motors striking submerged objects and flipping into boats**. The scenario is well known to professional bass anglers, but seemingly not recognized as a recurring accident scenario by the industry. The industry considers them to be freak accidents or statistical abnormalities.

Even with the severe limitations of Releasable BARD, we were able to identify about 30 instances of large outboard motors flipping into boats. Additional information is available as part of our coverage of outboards of all sizes striking submerged objects and flipping into boats.

The frequency at which large outboard motors strike submerged objects and flip into boats is increasing as more large outboard motors enter the population, boat speeds increase, and with rising popularity of fishing tournaments.

Several "large outboard motor flipped in" accidents involved professional or competitive anglers in bass boats, often striking stumps. Others involve other types of boats striking dredge pipes. At least one accident involved a bass boat striking a dredge pipe.

Large outboard motors flipping into boats result in particularly gruesome accidents. Some happen at midrange to higher speeds. When the outboard propeller leaves the water the propeller rotates faster in air, and often strikes the head or shoulders of those onboard.

At least seven fatalities have resulted.

Prevention

In December 2013 we published a [paper](#) identifying several technologies and approaches for preventing outboard motors from breaking free and entering boats.

Among proposed and existing solutions, several are applicable to large outboard motors, including:

1. Frangible / break away drives
2. Increase time of contact to reduce peak loads (bumpers on nosecone, crushable nosecones, crushable leading edges)
3. Tether the outboard to the transom (similar to how small outboards are tethered)
4. Make sure jack plates and lift plates retain outboards and prevent them from slipping out the top
5. Two stage damping of trim cylinders (less resistance at first)
6. Increase capacity of log strike system
7. Alternative swivel bracket designs

In addition, the outboard engine could be automatically killed when the drive leaves the water after striking a submerged object. Patents accomplishing that function were issued back in the 1950s and 1960s. A 1988 Sanshin (predecessor to Yamaha Marine) patent identified four ways to detect impact with a submerged object.

Tales of a Survivor

A survivor wrote a newspaper column on his experiences following a May 2014 fishing tournament accident. He and his fishing partner were both severely injured.

Outdoors: A Brush With Death on Lake Wheeler
Cullman Times
19 May 2014

The article above can be quickly googled.

Closing

We encourage NBSAC to raise awareness of this accident scenario, and to encourage the industry to address the problem.

Note - the other public comment we are filing separately at this time has direct bearing on this issue. Our inability to access over 10,000 USCG reported accidents makes many "outboard motor flipped in" accidents invisible to us.

Thank you very much for your attention to this matter.

Gary Polson

PropellerSafety.com

attached: list of accidents in which a large outboard motor struck a submerged object and flipped into a boat

Large Outboard Motors Flipped Into Boats Since 1999 partial list					27 Oct 2014	this list was quickly compiled and may contain some errors
PropellerSafety.com		© 2014 Polson Enterprises all rights reserved				bass boat builders are color coded yellow
Date	State	Fatalities	Boat	Outboard Mfg	Outboard HP	Fishing Tournament
4 Jun 2000	FL	fatality	center console	Mercury	200 HP	
27 Oct 2001	MD	possible fatality	Triton	?	225 HP	
7 June 2003	AL	fatality	Ranger	?	175 HP	was during a fishing tournament
21 Sep 2006	KY		Triton	Mercury	225 HP	prefishing USA Bassin Classic Championship
2005-2007	MD		Stratos or Triton	?	225 HP	practicing for BFL tournament, probably 4 Nov. 2006
19 Oct 2007	KY		Ranger	Yamaha	250 HP	BFL Regional Championships
15 Jan 2008	LA		homemade	Mercury	150 HP	
5 Nov 2008	LA		VIP	Honda	225 HP	
7 Jul 2009	Guyana	fatality	?	?	200 HP	
20 Jul 2009	LA		Formula	Evinrude	150 HP	
6 Dec 2009	MD		Ranger	Evinrude	225 HP	Angler's Choice Chesapeake Fall Pro Teams Tourney
2009	Canada		Triton	Mercury	150 HP	
31 May 2010	IA	fatality	Lund	Mercury	175 HP	dredge pipe strike
29 Sep 2011	CA		Ranger	Mercury	250 HP	prefishing Calif. Bass Federation State Championship
2 May 2012	OK		BassCat	Mercury	250 HP	
18 May 2012	AL		BassCat	Mercury	250 HP	
11 Jun 2012	TX		Century	Yamaha	200 HP	dredge pipe strike
16 Sep 2012	MS	fatality	center console	Suzuki	225 HP	dredge pipe strike
7 Dec 2012	AL		Ranger	Mercury	200 HP	
27 Jan 2013	CA		bass boat	Mercury	150 HP	
20 Mar 2013	FL		Phoenix	Mercury	250 HP	competitive angler, not in a contest, dredge pipe strike
13 Apr 2013	AR	fatality	Triton	?	?	
9 May 2013	KY	fatality	Ranger	Yamaha	225 HP	U.S. Angler's Choice Region #3 Team Championship
13 Jun 2013	IL		Sea Ray	?	350 HP	
23 Jun 2013	NC		Skeeter	Johnson	175 HP	
29 Oct 2013	AL		Ranger	Yamaha	250 HP	
10 Nov 2013	LA		Blazer 180 Prov	Mercury	?	
19 Apr 2014*	CA	fatality	Ranger	Mercury	?	Delta/Wine - Delta bass tournament
3 May 2014	AL		Phoenix	Mercury	250 HP	Homeland Security bass tournament Decatur AL
9 May 2014	MD		bass boat	?	?	
More details are available on each of these accidents in the full list of accidents.						
* 19 April 2014 accident broke loose, but may not have flipped in, it did result in a fatality						