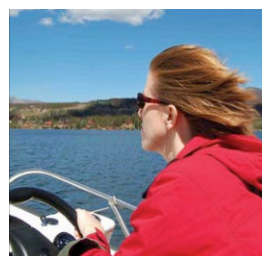
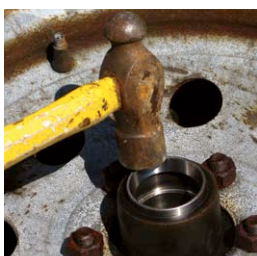


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160+ GREAT TRAILERING TIPS, TACTICS & PROJECTS

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Your Online Resources

The Trailing Guys

Got a question about your boat or trailer? Ask our Trailing Guys. Ted Sensenbrenner, of the BoatU.S. Foundation for Boating Safety and Clean Water, has been pulling and fixing boat trailers for years. Dustin Hoover, of Legendary Trailer Repairs, is a service provider for BoatU.S. Trailer Assist in the Annapolis, Maryland, area. Between them, they're familiar with almost everything that can go wrong with a boat trailer, and they're ready to answer your questions. Email trailing@BoatUS.com; or go to www.BoatUS.com/ask

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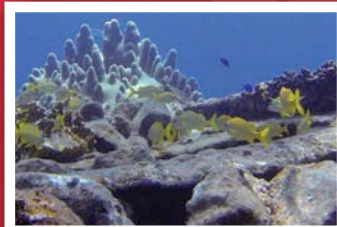
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A SHOUT OUT To Our Contributors

One of the best things about boating is sharing firsthand advice with fellow boat lovers — tricks for maintaining systems, ideas about adding gear, and a helping hand when tackling a bigger project aboard.

It's fun when we all can share what we know. A few months ago, we asked BoatU.S. members, and our editors, to share tips for doing things better aboard. This issue is the result of the scores of terrific ideas everyone contributed. Thank you! Now, let's meet a few of the people who made this issue possible, and whose ingenuity is nothing short of awesome.



Dan Armitage

Licensed U.S. Coast Guard captain, full-time freelance outdoor writer, and syndicated radio show host (buckeye sportsman.net), Dan contributes to national boating magazines and leads boating and fishing seminars

at sports shows across the Midwest from his homeport in Ohio.

Sandy Lindsey

Author of the innovative book, *Quick and Easy Boat Maintenance*, Sandy has also written *Powerboating: A Woman's Guide*. A USCG licensed captain, her award-winning articles have appeared in boating publications for two decades.



Gregg Nestor

Author of *The Trailer Sailer Owner's Manual*, drawn from his own lifetime of experience on the water, Gregg lives in Sandusky, Ohio, and wrote the books *Twenty Affordable*



Sailboats to Take You Anywhere, and *All Hands On Deck: Become Part Of A Caribbean Sailing Adventure*.

Tux Turkel

For 20 years, Tux has been exploring the islands and coastline of Maine's Casco Bay. On his first trip, when a friend said the sea conditions gave him a sense of



"foreboding," Tux took that as a good thing. (See his article on New Brunswick at www.BoatUS.com/Magazine)

Tom Neale

He headed off down a river when he was 13, and shows no sign of stopping. Tom and his wife Mel,



liveaboards, average 3,000 to 5,000 cruising miles a year, and there's nothing he can't fix aboard. He's author of *All In The Same Boat*. In addition to their liveaboard boat, *Chez Nous*, the Neales have two trailerables.

Jeff Nicholas

Based in South Carolina, Jeff and his wife Suzy travel around in a 28-foot Land-n-Sea houseboat built in 1972 called *Big Duck*, or at least they do when he isn't fixing it, or adding clever innovations to it, or blogging about it at 72land-n-sea.blogspot.com



Lenny Rudow

Our electronics editor and Boats.com senior editor, Lenny has written five books on fishing and won 20 Boating Writers International awards. If he's not chained to his desk, hard at work, he's hooked up to a striper on the Chesapeake Bay.





Jim & Lisa Favors

With eight years, 20,000 cruising miles, 27 states, Canada and the Bahamas, and five years living aboard under their belts, Jim and Lisa know a thing or two about trailering. They've written more than 120 twice-monthly articles for our BoatU.S. Cruising Logs website (www.BoatUS.com/Cruising) as well as three books: *When The Water Calls, We Follow*; *Women On Board Cruising*; and their latest, an e-book, *Upside Of Downsizing To A Trailerable Trawler*.

Cliff Steele

Readers of *Heartland Boating* will recognize this popular Midwest trailer boater and his innovative how-to stories. Cliff and Sandy Steele have owned trailer boats for 45 years, since buying a 40-horse Golden Shark outboard for \$250, building a 12 1/2-foot boat from an ad they saw in *Popular Mechanics*, then for \$35 buying a trailer off a local farmer to tow it. From there, the Steele family has trailered a series of boats all over the lakes and rivers of the U.S. They now live near Lake Cumberland, Kentucky.



John Tiger

He owned his first outboard at the age of 7, and since then has owned more than 60 boats and outboards. That's right, 60!

He builds racing engines, and rigs performance boats in his shop in upstate New York. An outboard master technician, John's specialties include high-performance rigging, boat handling, and trailer towing.



Don Casey

Author of *This Old Boat*, the definitive guide to maintaining an older vessel, this boating guru has been advising week-end boat mechanics for decades. You can tap his technical wisdom through our Ask The Experts column, and online at www.BoatUS.com/BoatTECH



Peter Paul

A lot can be ascertained by the online nickname a man selects for himself. Pete's is "Gradymania." This Hampton Roads, Virginia, boater dearly loves his Grady, and when he's not writing for his current-events blog or for the U.S. Naval Institute's *Proceedings* and other publications, he's working on *Daddy's Girl* and on clever innovations to make his trailering life more fun.

Thank You!

We also appreciate the contributions of members from our BoatU.S. online forum (my.BoatUS.com/forum), including Carlos Alvarez and D.C. Gentry; Bill & El Fiero; authors John Vigor (*Practical Encyclopedia of Boating*), Ed Sherman (*The 12-Volt Bible for Boats*), and Natalie Sears (*Boat Cleaning and Detailing*); and International Marine Publishing.

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> TIPS & TACTICS

INSIDE

LIFESTYLE

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MORE



Ramp It UP!

You'll spend hours of your trailerable life sliding up and down a ramp, so make sure you've got the inside track with these tips



Slip Sliding Away

When launching in an extremely low tide or at a shallow ramp, if you can't back up far enough to float the boat, you can still get it off the trailer by "skidding" it. While a friend holds a bow line, pull the truck and trailer up the ramp 10 or 15 feet, then allow the tow vehicle to roll back down the ramp until the tires hit the water. Abruptly apply the brakes, and momentum will keep the boat moving. Obviously, you'll want to do this with care, and only try to skid the

boat back a foot or two at a time until it's moved enough to back off under power.

— Lenny Rudow

Set, And Forget

On a warm sunny day (and at a quiet ramp), don a pair of swim shorts and submerge your trailer at different depths until you find out which is ideal for launching your boat. Then, waded out with a Sharpie, and mark the water level on the trailer. When you get home, make the mark clearer

with some bright paint. In the future, there won't be any more guesswork; just back down until the paint marks hit the water, and you'll know you have it right.

— L.R.

Less Friction

If you're using a trailer with carpet covered bunks, liquid soap or paraffin wax on the bunks makes it easier to slide your boat on and off. — Sandy Lindsey (Quick And Easy Boat Maintenance)



Boat-Ramp Etiquette

Always pull out of the way, prior to launching, to install drain plugs, put on lines, and load gear. That way, you won't clog up the ramp getting ready, while better-prepared boaters have to wait.

— L.R.

Timing Is Everything

Never pull into a ramp at the end of the day, tie up to the dock, and sit there blocking access for everyone else while your driver gets the tow vehicle. Instead, nose

Stop Spinning Your Wheels

- If you've got a 4WD vehicle, now's the time to put it in 4WD Low.
- On a slippery/wet ramp, accelerate slowly so as not to break the traction of the drive wheels in the first place.
- On a dry ramp, if your wheels spin at slow speed, you can increase rpm (burn-out) once, very briefly to heat the tires and get them sticky, for added traction.
- Put additional weight over the drive wheels that are spinning. Loading the back seat of an SUV or in the bed of a pickup can help.
- Unless you have a front-wheel-drive vehicle, increase tongue weight (hence more bumper weight/weight over wheels) by winching the boat all the way up if possible.
- If a front-wheel-drive vehicle spins, try decreasing the tongue weight; too much tongue weight makes the front of the tow vehicle lighter so that it loses traction.
- Scrape the ramp in front of the rear-drive wheels. Add sand if it's handy, perhaps from a nearby beach.
- If none of the above works, deflate the traction tires to create more surface area for the tires to grip the ramp. Reinflate to proper pressure before traveling.
- Have a fellow boater with tow vehicle attach a strap (rated for vehicle recovery) to pull both.
- Remove the boat from the trailer and drive up the ramp without the boat on the trailer. Reposition the trailer and tow vehicle on the ramp, or choose a different "lane" if that's an option. Sometimes ramps at the end of the concrete pad are washed out from people power loading, and there's quite a drop-off where the concrete ends. The trailer wheels can get hung-up here, so repositioning without the boat on the trailer may help. — Ted Sensenbrenner

up to a pier, drop the driver, then back off and circle 100 yards or so away while you wait. This practice speeds up the process for everyone.

— L.R.

Eyes In The Back Of Your Head

A rear back-up camera takes a little getting used to, but once you get the hang of it, you'll match up the ball and tongue in no time.

— T.S.

Galvanized, Aluminum, Or Stainless Trailer?

Galvanized is the most cost effective, aluminum is lighter but more expensive, and stainless steel looks like a million bucks and costs proportionately. Weight savings and looks can't trump the inherent value

and usability of simple galvanized. They're everywhere, so buying used is easier.

— Peter Paul

Line Her Up!

To help line up your receiver hitch and coupling, place a piece of brightly colored tape on your rear window above the hitch. Put another piece on the trailer winch above the coupling. When the pieces of tape line up, you're aligned.

— S.L.

Strap Flap

When using a transom strap, put a few twists in it. This won't weaken the strap, but it will prevent it from flapping back and forth in the wind, which can wear on the boat's fiberglass.

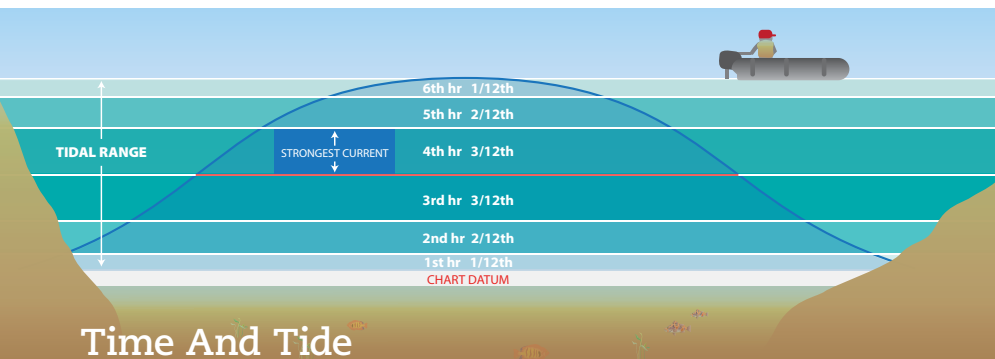
— L.R.



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On The Water



Time And Tide

The Rule of Twelfths can give you an idea of how much tidal range or current to expect during a given portion of the tide cycle. Fishermen love this because current and the bite go hand in hand. For semidiurnal tides (six hours between high and low) the pattern is 1-2-3-3-2-1. That is, 1/12 of the total tidal range occurs in the first hour, 2/12 in the second and so on. In general, the strongest currents coincide with the largest water flow, which means the third and fourth hour after the tide turns. So if you had a 16-foot tide and it was the end of hour four, the current would be slowing and 9/12 of the water will have flowed. The water is now 12 feet above low, and high tide will be four feet above the current water level.

— John Vigor (Practical Encyclopedia of Boating)

In The Weeds

If you get into shallow weed-infested water, oftentimes your prop can get jumbled up with seaweed and limit your boat's handling performance. With the boat's forward motion stopped, engage the transmission into a power reverse, move back into forward, then back to reverse again. This helps release the vegetation from your prop. — Jim Favors

Out Of Your Depth

If you have a spare depth sounder, put it to use. I have my second sounder's transducer mounted at the bow. The aft sounder is set to alarm at 10 to 25 feet depending on speed and waters. The forward sounder is set to alarm at 3 feet. The deep one signals a warning, and to slow down. The shallow one signals danger and reads 20 feet in front of my transom, alerting me before I drag my outdrive. Having two sounders saves the need to reset the alarm going from deep to shallow water. — Jeff Nicholas



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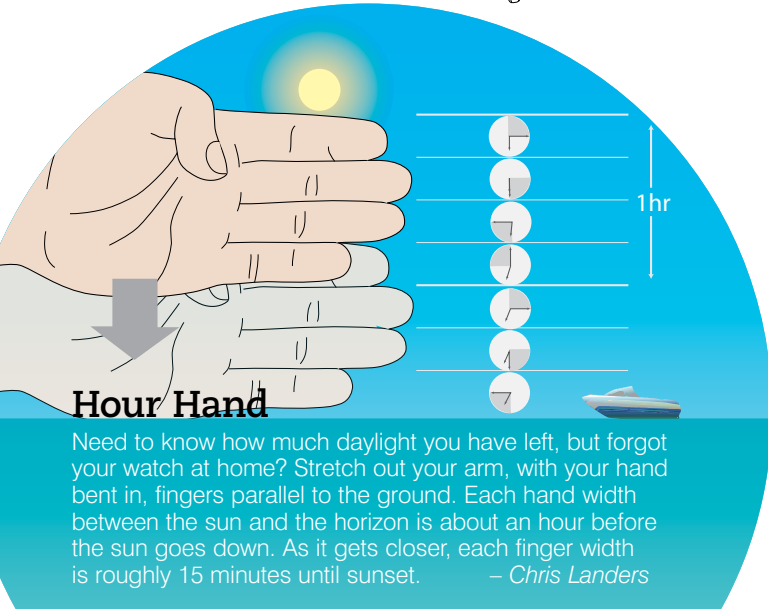
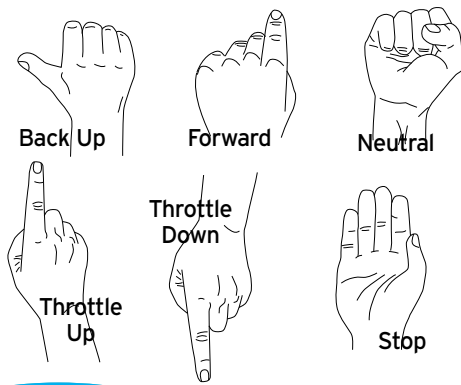
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Hand Signals

Figure out how to anchor without talking, and especially without yelling. Develop and practice hand signals that the person on the bow can use. Then, once you're anchored, give yourselves a big thumbs up!

— Bernadette Bernon



Hour Hand

Need to know how much daylight you have left, but forgot your watch at home? Stretch out your arm, with your hand bent in, fingers parallel to the ground. Each hand width between the sun and the horizon is about an hour before the sun goes down. As it gets closer, each finger width is roughly 15 minutes until sunset.

— Chris Landers

Anchoring

Make Your Own Sand Anchor

If you don't have a second anchor, you can make a sand anchor out of an old pie pan and a long eye bolt. Simply drill a hole in the center of the pie pan big enough for the bolt, back it with a large washer and nut, and tie your stern line to the eye. Burying the pan a foot or two deep while angled toward the pull of the line will keep most boats in place, no problem.

— Michael Vatalaro

Quick And Easy Rode Measurement

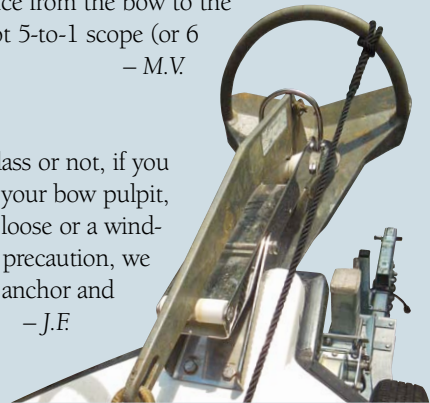
Most people's arm span is roughly equivalent to their height. This means you can pull the same number of arm spans' worth of rode out of the anchor locker as the depth of the water, plus three or four for the distance from the bow to the water, and know you've got 5-to-1 scope (or 6 to 1 if you're tall!)

— M.V.

Anchor Lanyard

Boating or trailering, windlass or not, if you have an anchor resting on your bow pulpit, secure it. Anchors can get loose or a windlass can malfunction. As a precaution, we always tie a lanyard to the anchor and secure the end to a cleat.

— J.F.



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This Floating Life

Here are a few clever suggestions to make your day on the water more pleasant



Lip Service For Your Nose

Use lip balm with sunscreen on your nose as well as your lips. It will stay where you put it and resist perspiration better than sunscreen.

— John & Susan Roberts (Why Didn't I Think Of That?)

Nonskid For Tableware

For a secure spot to put your drink, cut oversize coasters from a roll of rubber nonskid mat. Also, you can give just about any dish a nonskid bottom using silicone caulk. Mark a circle the size of the dish base on a piece of paper. Place a piece of wax paper over the circle, and put a bead of caulk about 1/2-inch inside the circle. Place the dish on the bead and press lightly. Let cure overnight and remove the wax paper. The flattened silicone should keep the dish from sliding about.

— J. & S. Roberts

The Ice Man Cometh

Frozen plastic water jugs keep things cold much longer than ice cubes. Use them for multi-day food storage when you can't buy ice daily. The bonus is an extra few gallons of cold fresh water.

— Carlos Alvarez

Jellyfish Stings

Adolph's Meat Tenderizer or white vinegar breaks down proteins, and should help neutralize the venom. Rinse well after applying to wash any lingering stinging cells off your skin.

— J. & S. Roberts

Oh, For A Hot Shower At The End Of The Day!

We've all seen the black-bag sun showers, which work pretty well but are sometimes awkward to set up on small boats, rather small for two or three people to take a decent freshwater shower, and limited in capacity. Here's a better idea. Buy a garden insecticide sprayer at your local hardware store. Remove the fine-mist sprayer, replace it with a

kitchen-sink sprayer, and secure that with little hose clamps for a tight fit. Sew a dark-color cover to fit snugly over the canister, with a hole at the top for the pump handle and cap to fit through. Now, fill with fresh water, and securely tie it somewhere aboard so it absorbs the heat of the sun. When it's time for your shower, pump the top of the canister, which creates pressure inside, and spray away! You'll have the pleasure of a hot shower, easy

control over the sprayer, and great water pressure. (Note: You can also spray-paint the sprayer with black paint.) — Bernadette Bernon



Keep It From Going Bye-Bye

The nature of boats is for stuff to move about onboard or be taken by the wind. In that respect, Velcro can become your best friend. Use it to keep anything that lies flat in place. Clocks, poles, speakers, hats, maybe even some of your guests!

— Ann Dermody

Remove Stains From Melamine Dishes

Add denture cleaner to water, boil it, and pour it into the cups or dishes. Let sit. — J. & S. Roberts

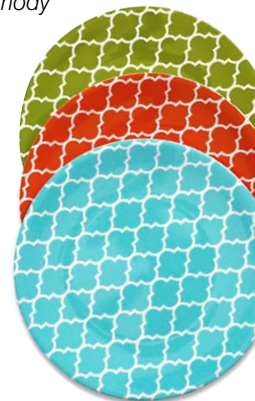


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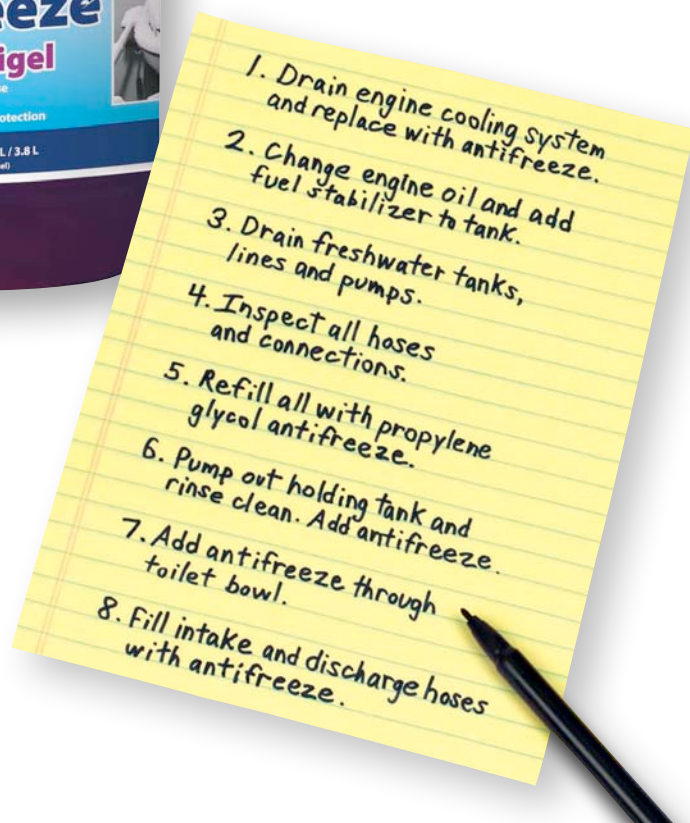
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Chill Out

1 Always dump a tray or two of ice into the fish box before you head for the ramp. By the time you get there, the fish box will be chilled down a bit, and when you put in bags of ice to cool down the catch, it won't have the usual initial melt-off.

– Lenny Rudow

Fresh Thinking

2 Always rinse down your reels if they're exposed while trailering, just as you would after saltwater use. Blowing road grime always seems to make its way into moving parts.

– L.R.

Rod Squad

3 When putting fishing rods in the bed of a pickup to trailer down the road, always lay them with the butt end toward the front of the truck. Lain tip-first, they may break if you have to slam on the brakes and momentum carries them forward.

– L.R.



4

Fish Tranquilizer

If you don't have a fish box aboard where your catch can go safely, a quick way to stop your big catch from flopping around is to blow, spray (with a spray bottle), or pour whiskey, rum, or vodka into its mouth and into its gills. This is easier if you can lift the fish by the leader.

– John & Susan Roberts
(Why Didn't I Think Of That?)

Gone Fishing

According to a recent report, 60 percent of boats purchased are for fishing. A few of those even catch some



Net Profit

Never leave aluminum-handled landing nets in a vertical rod holder while trailering. The wind blast can be strong enough to bend the handle. They can also blow out on the highway. Secure well.

– L.R.

Rigger Tip

6 Stowing outriggers for the haul down the highway is a major-league hassle, especially when the lines get tangled. To prevent this problem, wrap the lines from eyelet to eyelet on the rigger, around the eyelet's bases. Then use a short bungee cord going from the end of the line to the next closest eyelet, to tension it in place.

– L.R.

Talk About Road Rage!

7 If you have fish boxes that drain into the bilge or evacuate via float-controlled pumps, be sure to pump them out before you hit the road for home. Otherwise, the guy in the lane next to you will be thoroughly upset when you hit the gas, bloody water sloshes aft to the float switch, and fish gore goes shooting onto his car.

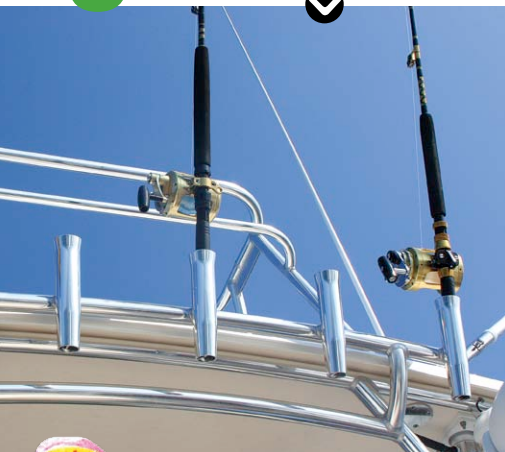
– L.R.



Line Matters

Never tow for more than a few miles at relatively high speeds with rigged rods in a vertical position. Particulates in the air will have a damaging effect on the line, reducing its breaking strength. If you've just towed home with the rods stowed like that after a day of fishing, cut off and throw away the first 10 feet of line before re-rigging them. Secure rods to prevent them blowing out of the holders while on the road. — L.R.

8



Tackle Saver

9 Never leave a Gulp brand plastic bait on a jig head when you pull the boat and head down the road. Wind blast will dry it out in no time, and the plastic will turn rock hard, ruining your jig. Bonus Tip: If this happens, place the jig in a bucket of water overnight. The plastic will usually rehydrate, and in the morning you'll be able to salvage the jig head. — L.R.

Back Saver

10 On a related note, never drop a used-up plastic bait or piece of one down on the deck to pick up "later." They're as slick as grease underfoot. — Michael Vatalaro

PHOTOS: LENNY RUDOW

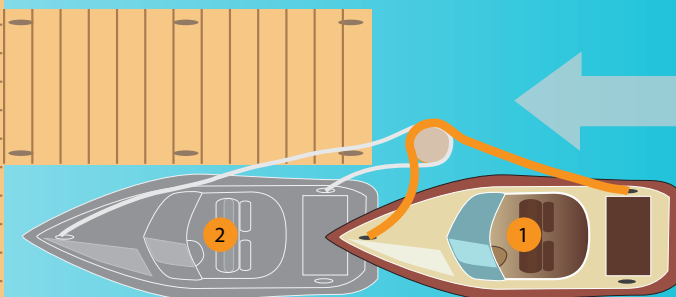
Smart Docking

Fenders Out

When docking, it's important to have lines and fenders set up on BOTH port and starboard sides of the boat, before approaching the dock. You may have been instructed for a bow-in port tie in error, and it ends up being a starboard tie. Or the slip you are assigned is occupied and you get reassigned. Being ready either way only takes a minute and reduces unwanted anxiety when the plan changes at the last second. — Jim Favors

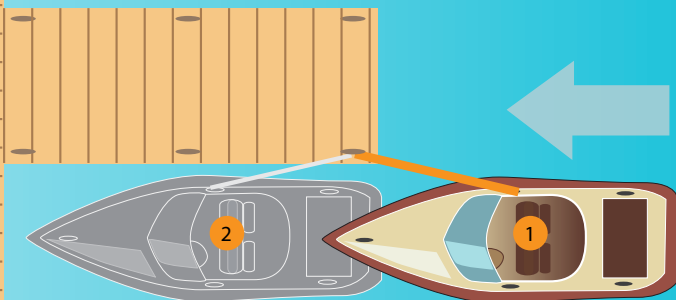
Docking Drama

If you're new to boating and nervous about inching into a slip or alongside a busy dock in current or wind, put the boat in neutral well BEFORE turning in, assess what effects the elements are having on you, then add those effects into your plan. And don't panic. If you feel it's all going wrong, just abandon the approach and start over. Much easier than trying to correct or compensate. — Ann Dermody



When You've Got One Shot

My wife is handicapped and can't run from one end of the boat to the other with lines when we're coming into our slip. Here's a trick we use to get our boat secured. All we have to do is get one line over the piling. — Jeff Nicholas



Hold The Line

As a first mate, never toss a line to a dockhand until the captain has given you the word or signal. Maintain control at all times if possible. When a line is given, it should be a spring line, ideally a midships line, with instructions to secure it to a cleat immediately to halt forward motion. — J.E.



Right Of Way

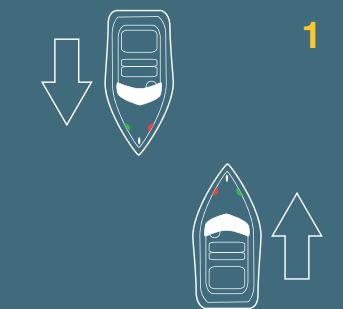
All the gear in the world won't help unless you know the basic rules.

The International Regulations for Preventing Collisions at Sea (COLREGS) say if you are in immediate danger, then a departure from the right-of-way rules may be necessary. Put another way: Don't hit the other boat even if the rules say you're the privileged vessel. See Rules for exact language at www.navcen.uscg.gov/?pageName=navRulesContent

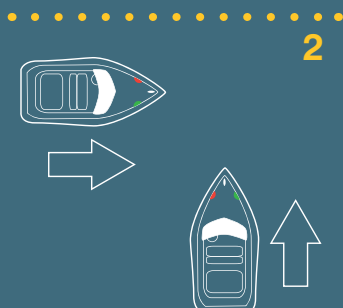
TACTICS BOATERS MUST KNOW:

1 MEETING ANOTHER BOAT HEAD

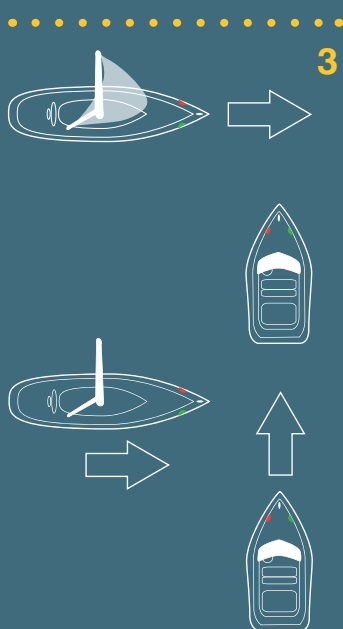
ON: Pass on their port and steer to their starboard. If the approaching boat doesn't show intentions of doing this, the burden is on you to clearly steer to starboard or port and move out of the other boat's path.



2 CROSSING: The boat on your starboard side is the privileged/stand-on vessel so it has right of way, and you should steer toward the boat's stern so as to avoid any confusion. That said, if you are the privileged vessel but the other boat shows no intention of changing course, then slow down and let it pass or steer behind it.



3 SAILBOATS: If under sail, they have right of way. If they're under power, consider the vessel a powerboat and follow the established rules.



My Top 10 Pieces Of Gear For Runabouts

BY TUX TURKEL

There's a lot to be said for owning small runabouts, center consoles, and bow riders. They have their limits, though, if you want to venture into coastal waters and big lakes. But these journeys can still be done, with the right 10 pieces of equipment. Here's what should be aboard every boat 20 feet or smaller. My Top-10 list has been refined from years of small-boat piloting along Maine's coastal islands, where granite outcroppings, sudden fog, and 10-foot tides can turn any cruise into a mini adventure. My list is meant to save your butt, not just meet Coast Guard requirements.

Paddles

Here's why you want two serious paddles on a small boat: If your engine quits, paddles are your propulsion. And if you've got a buddy or a spouse aboard, you can make way. Keeping the outboard or sterndrive down for a rudder, two people can move a small boat great distances, with the right paddles.

My pick is a T-handle paddle, the kind used for whitewater canoeing. The T handle gives you a great grip. The anodized aluminum shaft is light and strong, as is the high-impact plastic blade. Those materials don't mind sitting out in the weather, either. Make sure they're at least five feet long. You'll kill your back bending over the gunwale if the paddle's too short. A long paddle also comes in handy for fending off, and for poling in the shallows when you're fishing or exploring an island.



Dry Box

Small boats typically lack dry storage. That's why I'm a big fan of the plastic marine dry box. These boxes have handles and come in various sizes. Most lids have O-rings to seal out moisture. My box is an extra-deep model. The radio, smartphone, flashlight, and GPS are safe there. There's room for binoculars, cameras, and first aid. In an emergency, your dry box protects essential gear that may not operate well in water. With this, everything is right at hand, and dry.



Anchors & Line

Some small-boat manufacturers barely leave space for a lunch hook. But what happens if your engine quits, or you want to anchor overnight in a windy cove? Stowing two anchors and strategic lengths of line gives you options. Your optimum package will depend on your craft, and the depth and bottom of your cruising grounds. Your bottom conditions may warrant different anchors. Chain between line and anchor also helps. My primary anchor is a Danforth-style model with a slip ring and 50 feet of line. I also have 50 feet of line on a folding grapnel anchor. Also onboard is 100 feet of line, wrapped around a board. I often pay it out from a stern cleat to control my boat from shore, when I set a bow anchor off an island. I also have three docklines.

Wearable Life Jacket

I don't feel safe in a small boat unless I'm wearing a life jacket. Luckily, life jacket design has evolved, and I can find Type III models that are comfortable to wear all day. I have a paddle vest meant for canoeing, and a fishing vest. They're red, not blue or green; I want rescuers to see me. I notice plenty of small-boat pilots these days with inflatable jackets. They're more buoyant, but more costly and require some care. The best choice is any life jacket you'll always wear and that could be the top gear pick on my list. Most small-boat fatalities involve people who weren't wearing a life jacket. Just sayin'.



Compatible, Redundant Electronics: Part I

When your cell phone runs out of juice during a nautical emergency, that's a crisis. Same goes for your flashlight, handheld GPS unit, and VHF radio. Get devices that run on the same power source. My GPS, flashlight, and VHF handheld all use AA batteries. I install fresh, long-life alkalines, but also stow a sealed 12-pack of batteries just in case.

Manual Bailer

Small, closed-deck boats rely on a single, submersible pump to keep the bilge dry. But if that pump fails, or seawater comes over the gunwales, or there's heavy rain, small boats can swamp. Keeping a hand-operated bilge pump aboard is cheap insurance. Marine stores sell them in sizes ranging from around six to 13 gallons a minute.

Air Horn

The Coast Guard says small boats must have a "sound-producing device" for distress signaling, capable of a four-second blast that's audible one quarter-mile away. Many small boaters have a plastic whistle or own boats with installed, electric horns. Both can fall short. Whistles rely on a steady breath and installed boat horns can deteriorate. The horn on my boat sounds like someone is strangling a goose. A better option is a handheld, gas-powered air horn. Coast Guard-approved air horns that can be heard up to one mile away are easy to find for \$10. Keep one at the helm.

Spare Prop, Plus Change-It/Fix-It Tools

A floating log or submerged ledge can whop your prop and cripple your boat. Having a spare prop and the right wrench is common advice, but changing a mangled wheel while afloat is easier said than done. With aluminum props, I've found that it's often possible to bend blades back into serviceable shape, which allows me to continue the trip, or at least get home. Beefy, vice-grip-style locking pliers and slip-joint pliers are essential for this repair.



Compatible, Redundant Electronics: Part II

Cell phones don't run on AA batteries. That's why you need a 12-volt receptacle. Get one that's marine rated, with a weather-proof cap. Mount it away from spray and rain. Now you can plug in your phone, as well as your VHF radio and GPS. Don't forget the charging cords, which you can label for easy ID.

Paper Chart In Plastic Cover

Prudent mariners don't rely solely on electronics. It's old school, but the small-boat experience is enhanced when you learn to use a compass and paper charts. But even a waterproof chart is hard to manage underway in an open boat. Put it in a clear, plastic holder, and wind and water won't matter. Marine stores sell these chart covers or you can make one with clear plastic from the hardware store and duct tape. Size it big enough to fold over.

> MAINTENANCE

INSIDE

BATTERIES

IMPELLERS

TIRES

MORE



More Power To It

If you're a powerboater, then the engine's where it's at: Try some of these tips to keep your motors running smoothly



◆ Change The Zincs

Sacrificial zincs in an engine, on a prop nut, rudder, or thruster are easy to inspect and important to maintain. Important because when dissimilar metals underwater are brought into electrical contact, galvanic corrosion occurs and these zincs act as the sacrificial lamb protecting the engine, driveline, and other metal parts. Check your owner's manual to know where your zincs are located, and how to change them. Carry spares.

— Jim Favors

Protect Those Hoses

Avoid using auto-parts store "dry gas" potions in your fuel. Many contain methanol, which can shorten the life of engine hoses. — S.L.



Cooling System ◆

Getting less water than usual out of your outboard's cooling water tell-tale? Try cleaning the outflow with a piece of heavy monofilament fishing line. Slide it up and down the tube and work it back and forth. If the flow doesn't improve, and you're sure the intake isn't clogged, it may be time to replace the water pump. — Sandy Lindsey (Quick and Easy Boat Maintenance)



Vibrating Outboard Diagnostics

When your outboard begins to vibrate excessively, chances are it's either a damaged prop or a bent prop shaft. If there's no damage to the prop, and it's securely attached, try a spare prop and see if it makes a difference. If it still vibrates, remove the prop and spin the shaft by hand with the engine in neutral. If it wobbles, it's bent and probably needs to be replaced. — S.L.

PHOTOS: DAVID J. SHULER; JOHN TIGER; MICHAEL VATALARO

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Keep On Charging

It's that little box that keeps the whole show running. Show it the respect it deserves with these tips

Load Testing Your Batteries

On a boat, the easiest way to apply enough load to a battery for a meaningful test is to use the starter motor on the engine as the load. Disconnect the ignition coil, if yours is a gas engine, so the engine won't start up, connect your voltmeter to the battery, and have a friend crank the engine. If the voltage falls below 9.6 volts, you need a new battery.

— Ed Sherman
(The 12-Volt Bible For Boats)

It Won't Stop Your Heart, But ...

Direct current (DC) might be less likely to shock you than alternating current (AC), but there's a lot more to safety than not getting shocked. DC sparks around charging batteries can cause an explosion. Battery electrolyte is made from sulfuric acid, which can cause severe burns or blindness. DC systems are relatively safe, but still demand your respect and caution.

— E.S.

Just Add Water ... Carefully!

When topping off lead-acid batteries (wet cells), use a turkey baster to put the right amount of water perfectly into the holes on top of each cell. The acid may ruin the baster but they are cheap.

— John & Susan Roberts
(Why Didn't I Think Of That?)

Charged Up!

A charged battery can't freeze, and a frozen battery won't hold a charge. Keep your battery working over the winter with a marine, properly regulated charger.

— Chris Landers

Battery Grease

Battery terminals and connections need to maintain a good contact for trouble-free operation. Disconnect and clean each contact point, then apply silicone grease, which seals out moisture and helps prevent corrosion on your reconnected terminals, cables, and wires, ensuring a more reliable battery bank.

— Jim Favors

Don't Let Your Batteries Go Boom

Batteries do go boom from time to

time. Explosions involve two things: hydrogen gas and a spark. Hydrogen is the lightest of the elements, so it will disperse quickly if released into a ventilated space. But an explosion could still happen if the electrolyte levels get so low that the plates are no longer covered or, if the vent is clogged, allowing hydrogen to build up. So, be sure your deep-cycle batteries are in a well-ventilated space, check the electrolyte levels regularly, charge

it using a marine charger with a regulator, keep grease and other contaminants away from the vents, and watch out for bulges in the battery case, which indicate a buildup of hydrogen gas.

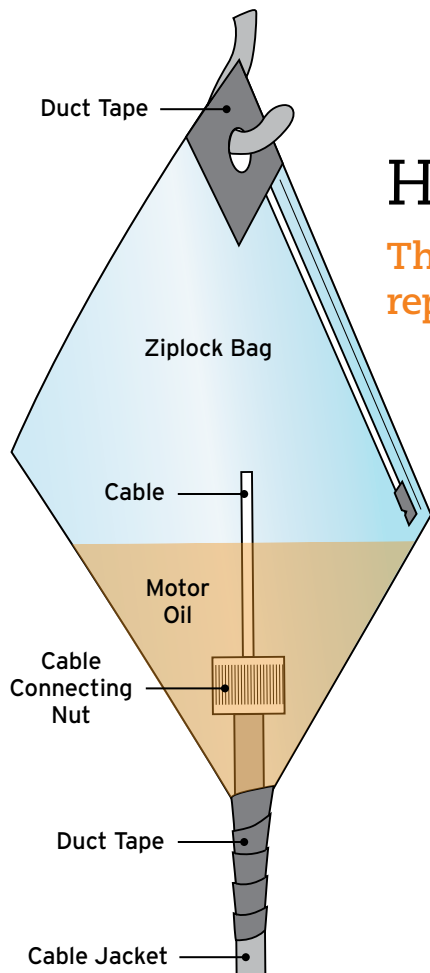
— BoatU.S. Seaworthy Editors

Bake Those Battery Boxes

Spread a layer of baking soda in your battery boxes before installing the batteries. If the electrolyte spills, the baking soda will help neutralize the sulfuric acid.

— J. & S. Roberts





How To Lubricate Control Cables

This band-aid solution can give you a bit more time to replace your stiff shift or throttle cables BY DON CASEY

When your shift or throttle cables get stiff, replacing them is always the preferred solution but unfortunately control cables are expensive and may represent an unwelcome stress on the household budget. Here's a temporary alternative that costs almost nothing and can keep you out on the water for an additional season or longer.

The idea here is to lubricate the cable inside the jacket. Lubricants applied to the ends of the cable tend to penetrate only a short distance, often failing to deliver any meaningful benefit. To lubricate the entire cable, you must remove it from the boat. This can be dead simple or an all-day job, depending on how the cables are installed and routed on your boat. Control cables that are really difficult to remove and install make a strong case for replacement rather than the band-aid repair of lubrication, but if your cables are accessible, lubricating can be an expenditure-deferring alternative.

With the cable out of the boat, insert one end (jacket and all) through a hole you make in a bottom corner of a heavy-duty zip-seal bag. Gather the bag around the jacket and tape it tightly with duct tape to seal the bag to the jacket. Reinforce the diagonal top corner of the bag with the duct tape. Poke a hole through the center of the reinforced area and use it to hang the bag so that the cable hangs down vertically its full length. Pour enough motor oil into the bag to fully submerge the end of the cable jacket and zip the bag closed. Place a container beneath the bottom end of the cable to catch the oil that should eventually drip out of the lower end of the jacket. Allow the cable to hang until the oil drains through. Slide and rotate the cable in the jacket, then give the bag a second shot of oil (it can be the same oil) to assure a thorough lubrication. Remove the bag, reinstall the control cable, and you should be good to go.

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Replacing an Outboard's Water Pump

Don't be put off by the fact that you have to drop the lower unit. Here are some tips to get you through it

BY JOHN TIGER

Outboard water pumps are simple designs. Located just atop the lower gearcase assembly, they're easy to access and service, too. The pump houses a rubber impeller that's keyed to the engine driveshaft. Water enters the lower gearcase through inlets on the sides of the gearcase, just above the

propeller shaft area. The driveshaft turns the pump inside a plastic housing with a stainless steel liner. The pump draws water through the intakes and up into the housing. The impeller blades (vanes) touch the liner at lower speeds as the driveshaft turns, but as the engine revs up, the impeller blades bend back away from the housing liner. The pump sends water out of the top of the housing through a brass tube, typically about a half-inch in diameter, up to the engine's powerhead, where it circulates through the system's cooling passages.

Salt, sand, mud, sticks, and other debris take their toll on the pump impeller, housing, and related parts. That's why most outboard technicians recommend replacement every season, or at worst every other season. There are legions of stories that go "I've had my outboard for twenty years and never replaced the water pump"; however, good preventative maintenance practice includes replacement of the pump and housing at regular intervals.

Backyard Mechanic

Buy a factory service manual for your engine, so you can follow the correct procedure and use the correct parts. An hour or so is all it takes to remove the gearcase, replace the pump, and re-install the gearcase on the engine.

The tricky part of the gearcase removal on some outboards is disconnecting the shift shaft. For example, on most Mercurys the engine must be shifted into forward gear first. On many Johnson/Evinrude outboards, the

service manual specifically denotes which gear the engine should be in to make removal and reinstallation easier. Temporarily removing the shift cable at the engine end will make things much easier as well, especially on engines where the shift shaft disconnection is inside the cowling. The engine should be tilted all the way up for gearcase removal.

Typically there are two attachments per each side of the engine; on some there is also a nut in the front. There are usually at least one or two hidden nuts or bolts up under the anti-ventilation plate (that flat plate just above the propeller). You may have to also remove the trim tab to access one of these attachment bolts. Before you completely remove that last bolt or nut, prepare yourself to catch the gearcase in case it drops right out. Typically this won't happen; it will usually require some wiggling and pulling to remove it, even with all the bolts/nuts out.

Stand It Up

The lower unit should be placed in a work stand. Clamping the skeg firmly in a vise will work fine; protect the finish by padding the jaws of the vise with a rag or other soft material. With the unit secured, you can remove the old water pump.

Reinstallation

Remember that the gearcase must be in the correct gear before installation. Hopefully you didn't move the shift rod at all while servicing the water pump. When reinstalling the unit:

- Clean the top of the drive shaft, then dab a small amount of marine grease on the splines — NOT on the top. Greasing the top may prevent the shaft from seating properly inside the crankshaft. Greasing the splines will make removal of the gearcase next time easier.
- Be sure the exhaust adapter is properly positioned in the midsection.
- While sliding the unit up into the midsection, ensure that the drive shaft, shift shaft, and water tube are positioned properly. Be especially



careful that the water tube enters the top of the water pump properly; if it misses, the engine will not receive cooling water and will overheat.

- After the installation is complete and you've reconnected the shift shaft and shift cable, start the engine and ensure that it is pumping water, running properly at the proper temperature, and shifting correctly. Consider also servicing the engine's thermostats at this time, so that the entire cooling system is refreshed and ready for service.

General Tips

Follow the water pump replacement in the factory manual carefully, paying particular attention to the cautions and warnings. Here's a few general tips that apply to most water pumps, regardless of brand or engine size:

- Use compressed air to clear debris from the intake passages and the top of the gearcase surrounding the pump. When you remove the pump and the impeller plate, use the air gun with an extended tip to reach far down into the intake passages to blow out any accumulated sand and silt. Blow compressed air up into the brass water tube in the engine midsection to clear any debris.
- Use correct sealants when called for in the manual.
- When installing the impeller into the housing, be sure of rotation (clockwise); then, install the impeller into the housing while turning it so the blades compress in the proper direction.
- Use a dab of non-petroleum-based lubricant on the impeller blades when installing the impeller into the housing, so that it's slightly pre-lubricated upon start-up of the engine when it's all reassembled. Also, this makes compressing the blades into the housing easier.
- Carefully tighten the housing screws; do not over-torque, or you may crack the housing and cause a leak later, which could lead to overheating.
- After completing the pump installation, it's a great time to drain, check, and refill the gear lubricant.

1. Dropping the gearcase to access the water pump requires removal of the mounting bolts.

2. Don't forget the bolt located under the trim tab. Mark the position of the trim tab before removing it so you can correctly position it for reinstallation. If you don't, you will have to re-adjust it after water testing the rig, so it will steer neutrally and won't pull to port or starboard.

3. Water pump is ready to be removed, using a fitting socket on the four mounting bolts. Notice that the gearcase is also being drained of old lubricant while the author completes the water pump job.

4. Lay out and identify all parts on a clean cloth and then remove the old pump housing and impeller.

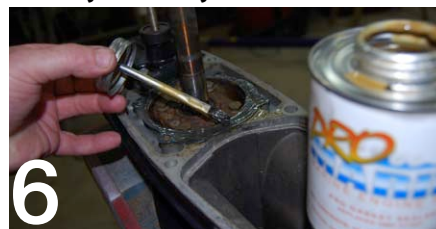
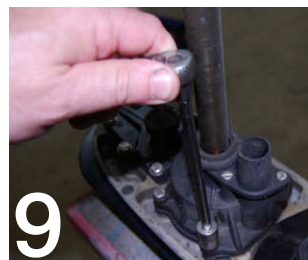
5. Old impeller (on right) blades have taken a set; compare to the new one on the left.

6. Use of proper sealer on gaskets is mandatory to reduce the chance of leaks.

7. The impeller is pushed into the housing liner with a slight clockwise twist.

8. Impeller key is placed in the flat on the driveshaft, then the housing and impeller assembly is carefully lowered in place.

9. Be careful not to overtighten the housing mounting screws.





Take Care Of Your Trailer

And It Will Take Care Of Your Boat



GETTING HITCHED

If you mount an additional Class 3 hitch on the front of your two-wheel-drive tow vehicle, you can maneuver your boat trailer in tight places more easily when there's poor traction. Sometimes the grade or surface of the ramp is a challenge, especially if it's wet or oil-soaked. With a front hitch, your rear-drive wheels will be on dry surfaces. I have posi-traction on our '96 Dodge with our 9,000-pound rig and never get stuck or spin tires. Many folks ask about our twin hitches. I reply, "We have two boats."

— Cliff Steele

Wound Up

Ask your hitch installer to avoid winding the wire for your lights around your fuel line under your car to reach the battery. It's impossible to get this undone later when you need to inspect or fix anything.

— Claire Wyngaard

Swing Out

Long trailers take a narrower radius through turns than tow vehicles.

If you forget this, you'll run over curbs. Swing out wide through turns to ensure your trailer and boat get safely around the corner.

— Pat Piper

Protect The Winch

A cheap, small barbecue grill cover makes

a good cover for the winch on most trailers. Use a bungee or Velcro strap to tie the bottom closed. This keeps rain from repeatedly causing oxidation or the sun from rotting the strap.

— Carlos Alvarez

Skeg Saver

If a transom saver

doesn't fit your rig (often a problem with power catamarans), keep the motor elevated by tilting it up, inserting a pine (or other soft wood) two-by-four between the motor mount and the motor, then tilting the motor back down until it rests on the wood. Secure to prevent it falling out.

— Lenny Rudow

Bungee No-No's

Never use a bungee or stretchable line (such as polypropylene) for boat tie-downs. The boat will get loose and bounce off the trailer. Avoid overstretching bungees when tying down gear. Never stretch as far as it can go; that's the breaking point.

— C.W.

Loose Nut

Trailers get twisted, bounced, and banged around, so naturally bolts may become loose. Once a year, I go around the trailer, when it's empty, and tighten every bolt nut on the framing and support brackets. I always find a dozen or so that require

a few turns of the wrench.

— Jim Favors

Trailer Tongue

Get an extra long one. It's a lot easier to back up, and gives plenty of room for the spare tire. Later, you can get a bigger boat and still keep the trailer. Trailer-tongue extensions are also sold as add-ons. Check to see that tongue load is OK.

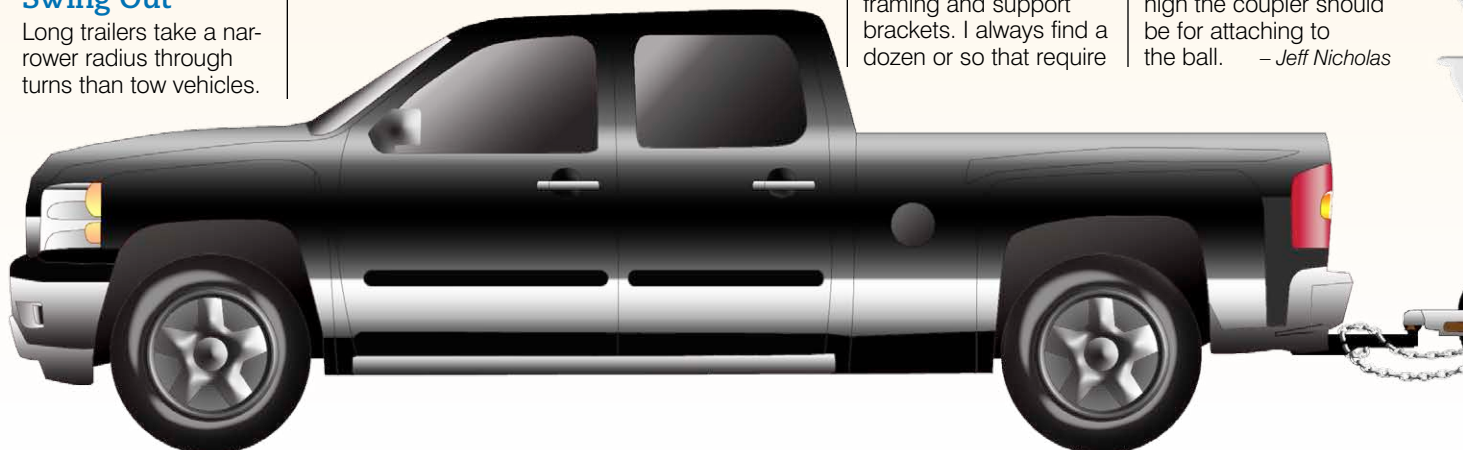
— C.W.



SIMPLE MEASUREMENT

I use a chain (with a keeper magnet for when not in use) to know how high the coupler should be for attaching to the ball.

— Jeff Nicholas





BLOCK IT UP

When your trailer sits idle for long periods, block the trailer off the ground. This will take the load off the tires and allow you to periodically spin the wheels to be certain grease is evenly distributed. This is especially important with oil-bath hubs.

— Ted Sensenbrenner

Double Check

When we're towing our boat, I like to stop after the first few miles, pull over on the side of the road where space permits, and do a safety recheck — to make sure everything is still fastened and connected properly or that we didn't forget any walk-around details on the initial go-around. An ounce of prevention is worth a pound of cure.

— J.F.

Sinking Feeling

If you have to leave a trailer on the side of the road during a sunny, hot summer day, place a board under the jack-stand. When the temperature is in the upper 90s or above, asphalt turns soft. The jack-stand may sink into the asphalt.

— L.R.

Once-Over

Before we head out onto the highway to adventure, we perform a walk-around of our trailered boat. We look to make sure straps are secure; antenna is placed down; windows and hatches are closed; drain plug is removed; and the hitch is secure. We also do a trailer-light test where one of us stands at the rear of the rig (within view of the driver) and verifies with hand signals that the trailer brake, running, and turn signals all function properly.

— J.F.

Level Thinking

Make long hauls with an empty boat fuel tank, and fill up near the ramp. This significantly

reduces your load; a boat with a 100-gallon fuel tank, for example, will have an additional 600 pounds of towing weight when filled.

— L.R.

Practice First

Practice backing up your trailer in an empty parking lot to build confidence. Use lined spaces or traffic cones to simulate backing down a boat ramp.

— T.S.

Fit Kit

Every smart trailer boater carries a roadside emergency kit. Make sure yours has all the necessities — spare bearings, tools, a grease gun, light bulbs, and light plugs.

— L.R.

CARRYING CAPACITY

Make sure your trailer is rated about 10-15 percent OVER the total boat weight, including engines. Don't be cheap; be safe. A broken axle is serious, possibly deadly. My boat is listed at 7,600 pounds. I took her to the truck highway weigh station — surprise! — she was 11,200 pounds including trailer and full fuel tanks, NOT including ice and gear. The trailer I bought had a capacity of 9,600 pounds, three axles, and I didn't skimp on tires. Estimate another 500 to 700 pounds for all your gear, ice chests, and so on. Splurge on tow capacity.

— Peter Paul



SECURE STRAPS

The less a boat moves on a trailer, the better. Less stress on the trailer equals safer travel. A taut safety strap mounted from a boat's bow straight down to the trailer keeps the bow in check, while side-to-side stern straps do the same for the transom.

— J.F.





Where Rubber Meets The Road

Pay attention to your tires — that thin layer of rubber can make the difference between a day on the water and a day by the side of the road

Tire SOS Kit

I carry a tire “ramp,” air pump, tool kit, and wrenches. For longer trips I include a tire plug kit, kneeling pad, 1/2-inch breaker bar with deep lug socket, Li-Ion battery impact wrench, 1/2-inch torque wrench, flags and flares, 20-ton bottle jack, and first aid kit. All this is a result of thinking about what I wished I had in the truck after changing a tire. I also include 16-ounce red plastic beer cups and hose clamps that will work as a temp fix for a lost dust cover on a hub.

— D.C. Gentry

Calling For Help

When calling BoatU.S. Roadside Assistance to fix a bearing or a tire, it's helpful to know your bearing, tire, and wheel size so they can bring the proper parts with them and get you back on your way quickly.

— Ted Sensenbrenner

Uneven Wear

An uneven wear pattern on trailer tires usually indicates an improperly inflated tire. If that's not the case, check axle alignment by measuring from the trailer tongue to the center of each hub on both sides. The measurement should be the same side to side.

— T.S.

Sunscreen For Tires

Protect your sunny-side trailer tire (and spare) from the sun to avoid ultraviolet damage and dry rot, which significantly shorten the life of the tires. I use an old garbage can top, but you can use anything — commercial tire covers, plywood. Improvise!

— Claire Wyngaard

Trailer Tires

Don't ever purchase a tire for your trailer that isn't specifically rated for a trailer. It will typically indicate either “Trailer Use Only” or be stamped with “ST,” which stands for “Special Trailer.”

— T.S.

Tire Storage

Extend tire life by removing tires and storing them inside if your trailer will be unattended for long periods of time. This will also prevent theft of the boat and trailer.

— T.S.

Tire Temps

Use a non-contact thermometer for checking tire and hub temperatures.

— Jeff Nicholas





HOW TO HANDLE A BLOWOUT

1. Keep a firm grip on the wheel. Do NOT slam on your brakes.
2. Accelerate lightly for an instant to preserve vehicle momentum (or at least maintain constant accelerator pedal pressure).
3. At the same time, steer gently away from the side of the flat to offset the pulling caused by the blown tire and to keep the vehicle in its lane.
4. Once you've stabilized your vehicle, turn on your hazard flashers.
5. Brake slowly and lightly to slow down. Again, do not slam on the brakes.
6. Make your way carefully to the side of the road.
7. Reduce speed to 15 mph or less before leaving the pavement and pulling onto an unpaved shoulder.
8. Park your rig as far off to the side of the shoulder as possible to allow yourself room to change the blown tire without your backside hanging out in the travel lane.
9. Set out the emergency road triangle found in your vehicle safety kit (you have one, right?) to warn other drivers that your vehicle is stopped.
10. Proceed to change the flat.

— Bruce W. Smith (The Complete Guide To Trailering Your Boat)

Carry A Spare

The most common call for BoatU.S. roadside assistance is for trailer tire problems, so always carry a properly sized tire mounted on the rim, inflated and ready to go. You'll also need a jack of adequate capacity and a proper-sized lug wrench. — T.S.

Big Wheels

When buying a trailer, get the biggest tires you can within the specs for the trailer and boat. They'll take the road heat better. — C.W.

The Pressure

I use a digital tire gauge to check the pressure every morning of a road trip. Too much or too little is dangerous. I also check to make sure the wheel bearings aren't flinging grease, and do a visual inspection of the brake rotors and linings. I have a professional inspection every two years where the wheels come off and get balanced, the linings are inspected and serviced if needed, and the wheel bearings are checked, adjusted, packed, or repaired.

— Jim Favors

If You Knew Jack

Be sure to have a jack that reaches the height of your trailer axle, or have thick nonskid boards to make up the difference, or carry a shovel to dig a hole for the tire. On trips far from home, bring a board to put under your jack on mud or soft ground. — C.W.

Jacked Up

Test your vehicle's jack ahead of time to make sure it fits your trailer. All jacks are not created equal. Those intended for trucks won't necessarily work on a trailer.

— Lenny Rudow

New Use For The Trailer Tongue

In a pinch, a trailer tongue jack can be used to change a trailer tire. First, disengage the coupler and lower the jack all the way to the ground, then pile logs, or whatever else is handy, underneath the rear end of the trailer side frames. The tongue jack should be able to lift the front enough that the tire clears the ground. Be sure all supports and trailer are stable before work. Be careful. — Sandy Lindsey (Quick and Easy Boat Maintenance)



Jack Innovation

If you have a multi-axle trailer, carry one of the ramps that let you roll the good tire on and then lift the bad tire off the ground. I found myself in a situation where a normal jack was useless, but the ramp was quick and effective. Be sure the trailer is stable. Also, carry a high-power tire pump with a long cord that reaches from the truck to the tires. I've been able to air up a leaking tire in minutes and get back on the road until it could be fixed. Get a pump with high air output per minute; most trailer tires take quite a long time to inflate. Expect to spend at least \$60 for a good pump.

— Carlos Alvarez



Make The Connection

Keeping the electrics on your boat and trailer shipshape can save you time and trouble later. Let these tips spark your enthusiasm

Solder On

1 Two key words to good soldering are “clean” and “shiny.” A proper solder joint will be shiny bright. If it doesn’t look right, it probably isn’t and will cause trouble in the future. – *Ed Sherman* (The 12-Volt Bible For Boats)

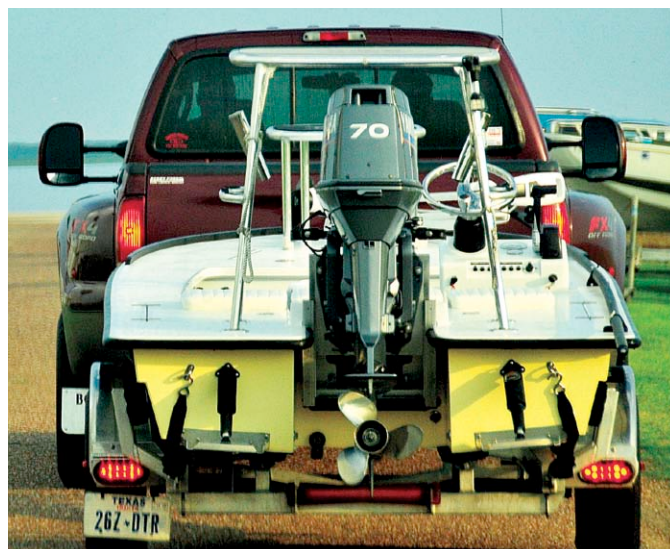


Connect Better

2 We want the drivers behind us on the road to see our trailer lights working properly, so I periodically clean the electrical wire harness connection between the truck and the trailer. After I’ve cleaned it, I apply silicone grease to ward off moisture and protect and facilitate better electrical contact, which translates into more reliable and longer-lasting trailer lights. – *Jim Favors*

Going To Ground

3 The most common cause of trailer-light problems is a loose or



disconnected ground wire.

- Be certain you have a good connection from the white ground wire to the trailer frame, usually located at or near the tongue.

- Chafing is the second most common issue. Check each wire run to be certain a wire clamp securing it to the frame or bend in the wire hasn’t resulted in exposing bare wire.

- The trailer wiring harness often gets mangled in storage when it droops to the ground and gets stepped on or run over. Replacing the wire harness is often easier than troubleshooting the small wires that converge in this area, which is factory assembled on most trailers.

– *Ted Sensenbrenner*

Keep It High

4 No lighting system can tolerate repeated immersion, even those rated “waterproof.” Saltwater is especially aggravating. Having the trailer lights removable or mounted high enough so that they don’t get immersed goes a long way in reducing premature lighting failures. If that can’t be done, disconnect them from the tow vehicle prior to backing down the launch ramp. Remember, heated bulbs can crack when touched by cold water. – *Gregg Nestor* (The Trailer Sailor)

Connection Cure

5 To make trailer-light connections 100-percent waterproof, dab liquid

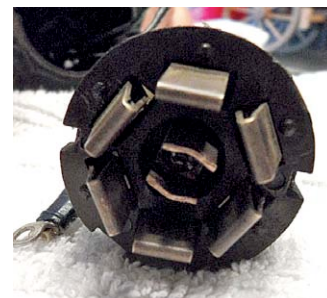
electrical tape on either end of the heat-shrink tubing.

– *Lenny Rudow*



Cord Keeper

6 Tying two extension cords together like this (above) keeps them from popping apart while you’re running the buffer. – *Natalie Sears* (The Insider’s Guide To Boat Cleaning And Detailing)



Clean Connection

7 Don’t wait until a dark rainy night to discover that you have no lights from a faulty connection. Keep the copper contacts in your trailer-light plugs clean: Go over the male and female socket connections with a wire brush, and spray the sockets with a good, quick-drying electrical connector cleaner.

– *Cliff Steele*

Keep It Rolling

Tires get a lot of attention, but they aren't the only things keeping your trailer off the ground

Lights, Laws, And More Electrical Tips

Laws governing trailers — including the lights they must carry — vary from state to state, are subject to federal regulations, and are always subject to change. Know your jurisdiction and rig. You'll find a state-by-state summary here: www.drivinglaws.aaa.com/laws/trailer-lighting

The two most common ways to blow out a bulb are by immersing a hot bulb in cold water and by letting corrosion cause a short. Some trailer lights can be removed before launching. Don't let the connector plug to the car touch the water.

Use only tinned stranded wire, which is more flexible and chafe resistant. Secure exposed wire every 18 inches to prevent chafing. Inspect the entire system twice a year for bare or chafed wire, and give all contacts a protective dab of silicone grease. Don't forget the spare bulbs and fuses.

When trailer lights begin to fail, consider a total system replacement. Just cut wires at the rear end of the trailer and use old wires to pull new system wires through the trailer frame. Simply hook up a new light kit, and you have a brand new system.

Consider adding a heavy-duty flasher to your tow vehicle to help avoid the strain on turn signals (some turn signals will slow down to a crawl after a tow vehicle has been hooked up.)

www.BoatUS.com/BoatTECH



Feel The Heat

Every time you stop during a haul, walk around the trailer and touch the hubs. They should be cool or warm to the touch; if they're hot as fire, you're about to have a bearing failure. — L.R.

Quick Replacement

In a pinch, lost trailer-bearing covers can be replaced by snipping off the bottom of an aluminum soda can.

— Sandy Lindsey (Quick and Easy Boat Maintenance)

How Many Axles?

That flat tire you'll inevitably get one day will derail you if you have a single axle. My triple axle has had flats and I didn't even know it until a passing motorist waved me over. The more axles you have, the safer you are, and the easier it is to back up. Plus, single axles are notoriously squirrely. Triple axles are forgiving and easy to correct. For larger trailerable boats, I'd say dual axle is a fair compromise. But I wouldn't trade my triple axle.

— Peter Paul

The More Brakes The Better

Get a brake wash-down kit installed for every wheel.

possible. Grease is essentially waterproof, but look for one specifically designed for the marine environment. — T.S.



Brake Bath

To help maximize the longevity of our trailer brake linings, calipers, and rotors, we carry a two-gallon spray container filled with fresh water. After we've launched or retrieved from saltwater, I use the sprayer to rinse as much of the salty water as I can from the braking system. — J.F.

Buy brakes on every axle. If someone cuts you off, you can't have too much stopping power. — P.P.

Grease Loyalty

Try to stick with one brand of grease and don't mix them if

Dust Cap Removal:

Method One

Get a piece of galvanized pipe of proper size to fit easily and snugly over your dust cap. Around a foot long should do. Hit the other end of the pipe with a mallet, alternating sides. This will remove it without any damage. You can reinstall the cap with the pipe by placing it against the flange of the dust cap and hitting the other end with the mallet. Again, no damage to the dust cap. If they're difficult to get back on, put them in the freezer for 15 minutes or so to shrink them so they slip in. When they return to ambient temperature, they'll be tight. — T.S.

Method Two

It's tough to spend \$30 on a tool you won't use that often, but here's a good one: dust cap pliers. You may have to give them a slight tap with a hammer to set them, but then the cap will come off easily without damage. Now you'll look forward to wheel bearing maintenance! — Jeff Nicholas





Scoring A Clean, Lean Dream Machine

Most boat owners like to sport a clean rig. The trick is to get the cleaning and maintenance finished so you can maximize your time on the water



The Hull Truth

If you boat in saltwater, barnacles are your number-one enemy. Sure, bottom paint slows them down, but they still grow, especially on unpainted underwater boat hardware. With the boat out of the water, first scrape and/or power wash as many barnacles off as possible. Next, apply a marine product called On & Off (by MaryKate) and stand back and watch the remaining crustaceans dissolve. A clean boat bottom equals better performance on the water.

— Jim Favors

Fresh Water & Woolite

Eisenglass (clear flexible vinyl) should not be cleaned with an ammonia-based glass cleaner because the ammonia breaks it down and will dry it out. The best approach is to wash eisenglass with fresh water, add some Woolite for a second wash, then rinse. Dry the eisenglass with a soft cotton or microfiber cloth and apply 210 Plastic Cleaner or Plexus for long-lasting protection.

— J.F.



Slow The March Down

Wondering why you have so many ants or bugs aboard? Chances are they're using your docklines or shore power cord like corridors. Spray your lines with bug repellant or bug killer (but not over the water) and watch your onboard colonies depopulate.

— Ann Dermody

Keep Chemicals Out Of The Water

If you must resort to using stronger chemical cleaners like Lysol Mildew Remover to get tough stains out, wiping them off rather than hosing them off the surface will keep these harsh, nonbiodegradable chemicals out of the water.

— Natalie Sears (The Insider's Guide to Boat Cleaning and Detailing)

Waterline Wars

Nothing's worse than leaving the boat ramp with a dingy waterline stain, but there's no reason to let that nasty stain linger. After hauling the boat, soak a sponge in vinegar and wipe down the water stains. Some will disappear immediately; usually what remains will be gone by the time you get home. Some stains require other products.

— Lenny Rudow

Road Rage

Few things are as upsetting as road tar and asphalt marks on your pristine white hull. And these can be extremely difficult to remove. At least, they are if you don't know that oven cleaner will eat them right up. Be sure to rinse the hull thoroughly after using this stuff, and don't get it on vinyl pinstriping.

— L.R.

Skin Deep

Surface rust can be taken off metal and fiberglass with a paste made of water and baking soda (50-50). Rust that's more than skin deep, however, requires a potent cleaner containing oxalic acid. Find several to choose from at West Marine. Always remember to thoroughly rinse it away after the rust disappears because the acid can damage metals and fiberglass if left on too long.

— L.R.

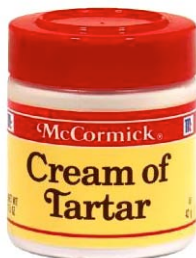
Rain, Rain, Go Away!

I use Rain-X on my boat's exterior glass. Once Rain-X is applied, I find the glass doesn't attract or retain hard water spots as easily, and unless I'm in a downpour I don't need to run my wipers because the water simply slips off the glass. — J.F.

Tart Up Aluminum

Dissolve two table-spoons of cream of tartar in one quart of hot water, and use it as a polish with a soft cloth.

— Gregg Nestor
(The Trailer Sailer Owner's Manual)



Preventive Maintenance

If you want a clean windshield when you arrive at the boat ramp after a long haul down the road, simply cover your windshield with a strip of plastic wrap before leaving home. Secure it well. When you arrive at the boat launch, peel the plastic wrap off and unavoidable bug splatters and road grime will peel away with it.

— L.R.

Cockroach Killer

Use equal parts baking soda and powdered sugar. The sugar attracts them and the baking soda kills them. — G.N.
Editors' Note: Cockroach hotels are another option.

Clean And Green

Save major cleaning jobs for when the boat is out of the water. When using cleaning products keep them near the center of the boat to reduce the chance of an overboard spill, and when performing bigger jobs on land, try to conduct the work as far from the water's edge as possible.

— Susan Shingledecker

Don't Forget The Canvas

Every time you wash your boat with a soft deck brush, use the same brush and soap on the boat cover or other canvas, which will keep canvas clean for a long time.

— Natalie Sears (The Insider's Guide to Boat Cleaning and Detailing)

Fog B Gone

When acrylic windscreens and opening ports become foggy looking from countless tiny scratches, buff them out with regular toothpaste (not gel). It has just the right amount of abrasives to buff out those scratches without making a bunch of new ones. All it takes is time, elbow grease, and lots of circular motion with a cotton rag. Try out on a small spot first. — L.R.

Stain Magic

Magic Eraser, a Procter & Gamble Mr. Clean product, is a great tool to have on the boat. It gets rid of stubborn stains, skid marks, and streaks on just about any surface. I use a Magic Eraser pad for nonskid deck areas. You'll need to rinse your work area as you go; if it remains in contact with an area for an extended time, its "magic" will remove a waxed finish. — J.F.



Remove Rust Stains From Dacron Sails

Here's a tip reminiscent of Heloise, but it works. Rust stains on Dacron sails yield to a gritty mixture of salt and lime juice — fresh-squeezed or out of a bottle. Sponge the juice/salt mixture onto the stain and let it sit in direct sunlight for an hour or more. Fresh stains disappear like magic. Older stains can be more stubborn and require multiple applications.

— D.C.

MILDEW	1/2 cup VINEGAR	Put in washing machine during rinse cycle or wipe down boat surfaces that have mildew
WINDOWS	1 part VINEGAR + 1 part WATER	Spray and wipe off
SILVER, PEWTER, COPPER, BRASS	1 tbs VINEGAR + 1 tsp SALT + 1 tbs FLOUR	Apply to metal, let stand 15 min, rinse with warm water, polish with soft cloth
WOOD PANELS	1/2 cup VINEGAR + 1/2 cup OLIVE OIL + 2 cups warm WATER	Apply with soft cloth, dry with clean cloth
GELCOAT SHINE	1/2 cup VINEGAR + 1/2 cup AMMONIA + 2 tbs CORN STARCH	Dissolve in 1 gal warm water
CANVAS COLOR SETTER	1 part VINEGAR + 20 parts WATER	Soak 20 minutes
BOAT CLEANER RESIDUE	VINEGAR	Rinse down deck and hull after cleaning, then wax
ROAD TAR AND BUGS	1 part APPLE CIDER VINEGAR + 1 part WATER	Spray and wipe off
FRESHWATER HOSE CLEANOUT	VINEGAR	Run it through the system to remove buildup
MOSQUITO BITES	VINEGAR	Rub a small amount on the bite

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Under Lock And Key

More than 50 percent of all boats stolen are on trailers. Make sure yours isn't an easy "get"



Restore That Lock

When the padlock you use to lock your trailer's receiver gets stiff from too much exposure to salt and water, soak it for 30 minutes in a solution of one part vinegar to four parts water. Allow it to dry and spray it inside and out with WD-40 or similar. The lock will work like new.

— John & Susan Roberts (Why Didn't I Think Of That?)

Take The Legs Off

There is a wide variety of locks and security plates for trailers. Nothing is totally theft-proof, and many thefts occur when the thief simply removes the coupler latch bolt and tows the trailer away without a latch attached. If you're putting your boat away for any length of time, consider removing one or all of the wheels from your trailer. This will make it hard to steal, and it will extend the life of your trailer tires because they won't be exposed to the elements.

— BoatU.S. Editors



Protect Your Prop

Expensive propellers attract thieves; prop locks can discourage them. Some prop locks, such as those made by McGard, work on the same principle as locking nuts, and replace the prop nut. Others, such as those made by SecureProp and BSafe, secure and cover the prop nut to prevent tampering. The nuts on through-bolted outboard motors and sterndrive lower units can be removed

and replaced with locking nuts similar to the locking lug nuts used on expensive automotive wheels. With items that are relatively easy to remove like props, putting up any barrier is likely to cause the thief to move on to an easier mark.

— L.R.



Special-Purpose Locks

Trailer tongue locks, like those offered by Master Lock, Reese, and Steal Shield, will keep a thief from attaching a vehicle to the trailer. Some work by preventing the coupler mechanism from opening or closing, some lock the coupler over a ball and secure a flat surface to the bottom of the tongue, and some completely enclose over the tongue and coupler. If you have a removable tongue, you can remove it, but some thieves carry trailer tongues with them! One alternative is to find a way to lock the tongue to the trailer; another is a wheel lock like those made by Trimax or The Club.

— Lenny Rudow

Lights Off

Make up a removable set of lights that hang on your transom for towing (see page 32). If you can hang your trailer's license plate there, even better. When storing your boat, remove the lights and plate.

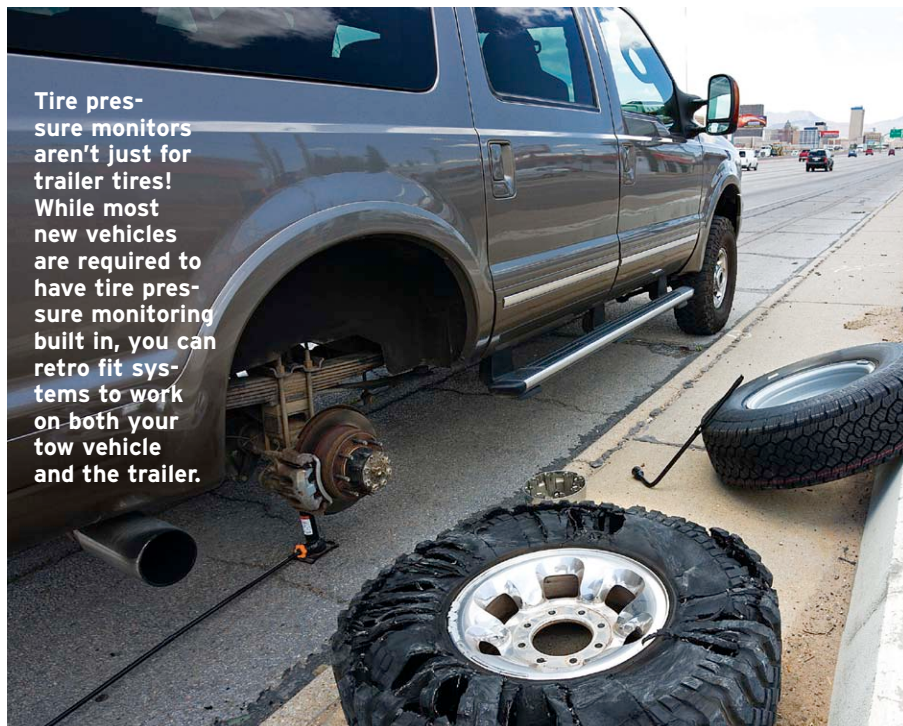
Thieves know that towing a trailer at night — when it's most likely to get stolen — without lights or license plates is a sure way to attract law enforcement.

— BoatU.S. Seaworthy Editors

Use A Tire-Pressure Monitoring System

BY JEFF NICHOLAS

You may be the last to know you have a flat. Then it's way too late. Here's a way to keep track of your tires on the go

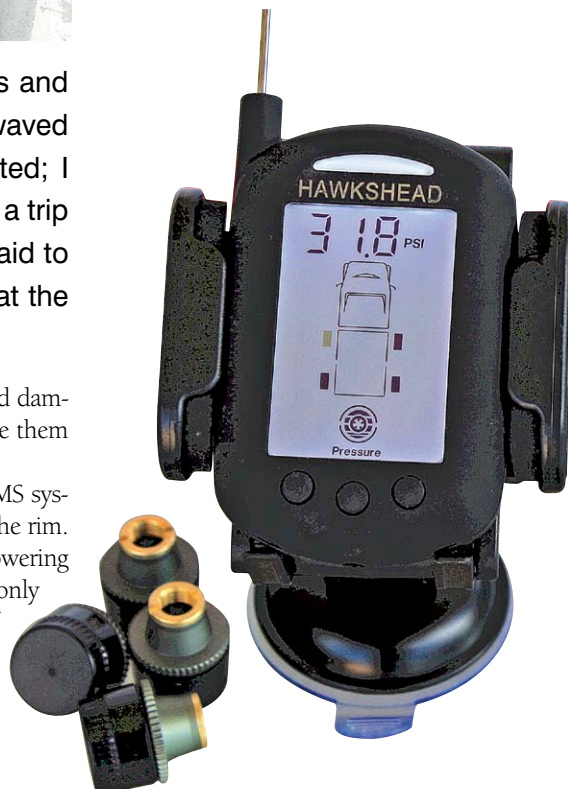


In my research, I came across HawksHead. One of their products will monitor up to 140 psi and screw right on the valve stem, and they have replaceable batteries. The sender just screws on the valve stem, but the receiver needs to be programmed to know which wheels have the senders and what psi and temp are associated with each. The receiver can manage up to 22 wheels. It will sound an alarm if there's a blowout, slow leak, or high temperature. The receiver is battery powered and it uses the auxiliary 12-volt plug, so you can take it with you as you walk around the rig, toggling through the pressure and temp of each tire. With the receiver in hand, if you unscrew the sender from the valve stem (resulting in zero pressure), it will alarm with a blinking position — a great way to know the system is set up correctly and working. It retails for about \$239.

I've towed trailers more than 60,000 miles. I've had blowouts and flats on the trailer go unnoticed until a passing motorist waved at me frantically. One guy blew his horn, waved, and pointed; I thought to myself, "Yes, thanks, it IS a nice boat, isn't it?" On a trip to Alaska from South Carolina along the Alaska Highway, I said to my wife, "That's a new noise." There was no other indication that the travel-trailer tire was flat and shredding itself.

If not caught soon enough, these shredding tires can easily take out a fender and damage the trailer or cargo, not to mention overloading the other tires, which can cause them to fail. The solution is to install a Tire-Pressure Monitoring System (TPMS).

Most new cars come with a TPMS. There are several varieties of aftermarket TPMS systems, most of which require demounting the tire and installing the sender inside the rim. It's not uncommon for these systems to require new senders when the battery powering it expires. Some work only when the vehicle is moving. Some have a range limited only to passenger-car tire pressures. My trailer tires called for 120 psi, which is out of the range of many systems.



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How To Build A Light Bar

Now here's a foolproof, fairly simple way to make sure your salty trailer always has working lights

BY TUX TURKEL

A light bar gets your trailer lights up where other motorists can see them, and they never get dunked. Always check and comply with all local and federal laws.

STEP 1 Rewire The Trailer

Most small-boat trailer lighting systems use a standard, flat-four, quick-connect plug. Decide which side you want the light bar plug to be on. Then snake new wire through that side of the trailer frame, forward to aft. Make sure the plug at the tongue of your trailer mates up with the plug coming from your vehicle.

At the stern end of the trailer, mount an outdoor marine-grade electrical work-box. This is where you'll hook up the new wiring to a short pigtail and your quick-connect plug.

Don't just wrap bare wires with electrical tape. Use waterproof butt connectors and heat-shrink tubing. Or as the photo shows, use household wire nuts and fill each nut completely with silicone sealant. Waterproof any openings and the cover seal with silicone or other marine sealant. Screw on a plastic box cover when done.

STEP 2 Build & Wire It

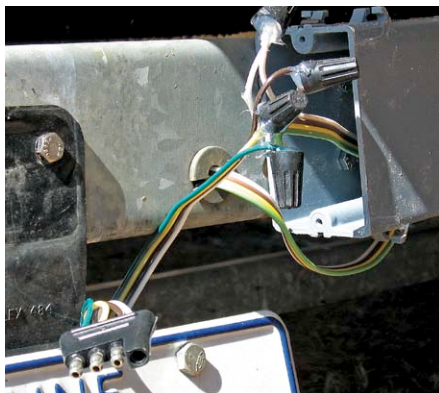
Measure a 2x4 or similar lumber to fit across your gunwales. Decide where and how it will be secured to the boat.

Mount a basic trailer light kit on each



IF YOUR BOAT'S ON A TRAILER — especially an aging one — chances are you have light problems. You try to avoid trouble, of course. You check connections and coat stuff with grease. But you still can't count on all your lights working, all the time. Especially if you boat in saltwater.

Here's a bright idea: Build a light bar — a portable, trailer lighting system mounted to a length of wood. You attach it to your boat for travel, remove it when dunking the trailer, and store it when you get to the ramp and back home. With proper design, a good light bar is a low-cost solution that will perform reliably for the life of your boat.



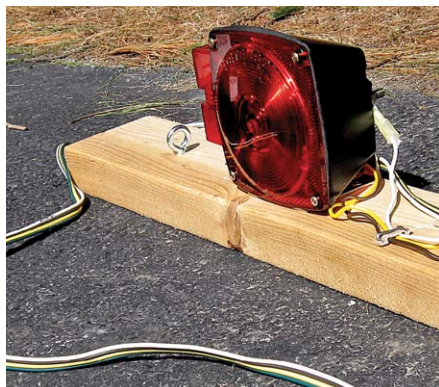
end of the bar, as shown. Hook up the wires and the quick-connect plug lead in another workbox, with silicone-filled wire nuts. Use stainless insulated wire staples for a neat run across the bar. The wires running from the bar to the trailer plug should be long enough to comfortably reach, but not so long that they could rub on the ground or get tangled.

STEP 3 Set The Bar

You might include screw eyes at each end of the bar, so it can be secured with cords around port and starboard stern cleats, for example. If you're worried about scratching your boat, pad the bar with bunk carpet.

Set the bar on the gunwales and secure it. Plug the bar into the pigtail on the trailer, and plug your forward connection into the vehicle. Now you have lights you can depend on!

Wires running from the light bar to the trailer plug need to be long enough to reach, but not so long that they hang on the ground or get knotted up.



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BEFORE YOU START

Everyone's boat and trailer are a bit different. But consider some basic design principles:

- The light bar should sit on the gunwales, so drivers behind you can clearly see the lights.
- Your light bar must be easy to attach and remove and should fit in your vehicle while you're off boating.
- Use all-new marine-grade wiring with secure, waterproof connections. You don't want wires getting snagged or shorting out.
- Permanently attach a new harness to the trailer frame. That way, you don't have a long coil to deal with when the light bar is removed for storage. You need only a short pigtail to plug in your light bar.
- A light bar is really best for small boats. If your craft is more than 80 inches wide, the federal government requires side marker lights. You also need a white light over your trailer's license plate at night if you tow after dark. Check and comply with all local and federal laws. These may change.

Don't let minor repairs limit your time on the water

New WEST SYSTEM **Six10® Thickened Epoxy Adhesive** is the fastest way to make strong, lasting, waterproof repairs with epoxy. The dual-chambered, self-metering cartridge fits into any standard caulking gun. The static mixer delivers fully mixed, thickened WEST SYSTEM epoxy in the amount you need for the job at hand. No waste. No mess.

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How To Make A Quick Custom Coupler Fit

Too much “play” between your trailer coupler and the ball hitch can result in more than a headache from clunking sounds

BY DAN ARMITAGE

IF THE FIT OF YOUR TRAILER COUPLER and the ball on your tow vehicle is too loose, the coupler could work loose from or “jump” the ball, leaving only the safety chains to keep the tow vehicle and trailer connected. On the other hand, if the fit is too snug, the trailer may struggle when turning. That can result in equipment failure, not to mention sounds that can be felt clear down to the fillings in your teeth. Avoiding both extremes is simple, and requires only a wrench and a few minutes for a custom fit.



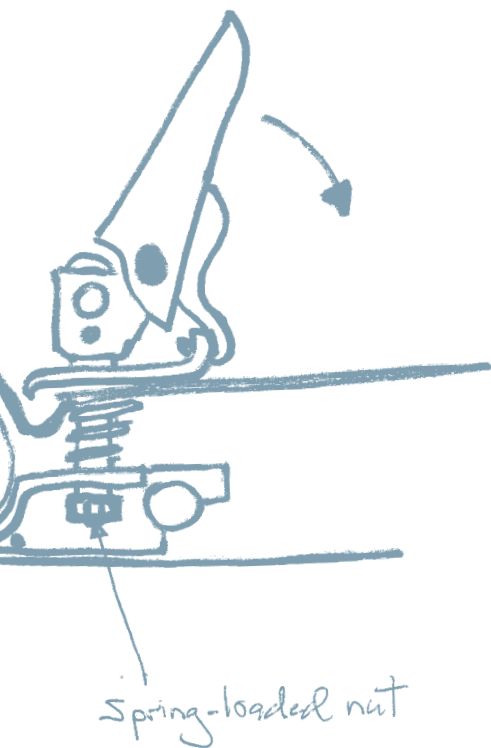
First, separate the ball from the receiver hitch and make sure it's the correct diameter for the coupler on the trailer. In this case, it's a two-inch ball.

Next, look under the coupler to locate the tension nut on the end of the spring-loaded bolt that attaches to the coupler lever. Select the correct size wrench to fit the nut, in this case 3/4-inch.

Open the coupler by lifting the lever, place the hitch ball in the cup, and close the lever by lowering it. The ball should stay securely in the coupler but with enough play to rotate easily by hand. If the fit is too loose, use the wrench to tighten the coupler nut. If you cannot fully close the coupler lever, or when the lever is pushed all the way down and the hitch ball is held too tightly to turn by hand: Loosen the nut until you can twist the ball around in the coupler with your hand, but it still feels secure.

At that point, remove the ball and secure it to the receiver hitch on the tow vehicle, knowing the coupler tension has been custom set for your rig and it's ready to hit the road with the boat in tow.





PHOTOS: DAN ARMITAGE, TOM NEALE

Replacing Rollers With Bunks

BY TOM NEALE

The rollers on your trailer will eventually rust and/or break. Sometimes older ones seize up in their mounts, scarring the hull when you load the trailer. Bunk boards don't have moving parts, are usually cheaper than a full set of rollers, provide more even weight support, require almost no maintenance, and with new-style coverings make launching and retrieval relatively easy. Now you can get bunk boards covered by slick plastic-type surfaces with Teflon or similar material. If it becomes less slick, periodically apply Teflon or a similar lubricant from a spray can. If the cover becomes damaged, it's easy to get a new cover and staple or screw it into the wooden bunk.



1. All you need to custom fit your boat trailer's coupler is the proper size hitch ball and a wrench.

2. Locate the tension adjustment nut on the spring-loaded bolt on the underside of the coupler.

3. Identify the correct size wrench (open-ended, crescent, or socket) to fit the nut.

4. Open the coupler lever and place the hitch ball in the coupler.



5. Close the coupler lever to grasp the hitch ball.

6. Test the connection for excessive looseness or tightness.

7. Tighten or loosen the grip of the coupler on the hitch ball, using the wrench to turn the tension nut.

8. When you are able to rotate the hitch ball with your hand while it remains secure, with little play, in the coupler, the custom setting is complete.

Here are some tips from Keith Whelan of Whelan's Marina in Farnham, Virginia, (www.whelansmarina.com) who has serviced and rigged many trailers and boats: Your trailer manufacturer may sell bunk boards for your specific rig and there are many suppliers from which you can buy. It's important to get boards that fit your trailer and boat; consult the trailer manufacturer or a qualified dealer. Many prefer cypress wood boards. If your roller-angle brackets and their U-bolts aren't impaired by rust, you may be able to reuse them, leaving them in place. When you bolt the bunk boards to them, the boards may already be positioned properly for your rig. If the brackets are compromised by rust, you may need to cut them off with a grinder or similar tool. If you install new angle brackets, make note of the position of the old rollers for reference when positioning the new brackets and bunk boards.

Before you begin, offload the boat into the water where you can dock it for a few hours. Install the bunk boards following manufacturer recommendations. Usually this is a simple matter of attaching the brackets to the trailer frame (unless you're reusing the old ones) and the boards to the brackets. With bolts tight, but before final tightening down, back the trailer into water and slowly pull the boat up to fine-tune positioning of the boards. The boat should ride on them so that they place the boat into a center stable position by guiding its bottom strakes. This will greatly facilitate getting the boat on the trailer in the future. This may require several relaunches, but it's worth the time. When you're happy with the position of the bunks, tighten securely. The plastic bunk board cover is usually stapled on. If these staples rust in the following years, simply staple again with stainless or use 316 SS screws, countersunk and in places that won't impact the hull.



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12 STEPS To Repacking or Replacing Your Bearings

If you choose to tackle this job yourself, here's a general guideline

BY PAT PIPER

What you'll need

- A jack and a stand
- Boat-trailer bearing kit with the proper size bearings, races, and a double-lip grease seal. NOTE: Bearing kits are usually one of five sizes: 3/4", 1", 1 3/8", 1 1/4", 1 1/16". If unsure, each bearing and race has a stamped part number.
- Bearing Grease — Don't mix different brands
- A large flat screwdriver, needle-nose pliers, a lug wrench or channel locks
- A hammer and a soft hammer (made with brass and designed not to damage surfaces upon impact)
- Goggles and gloves



STEP 1: Jack the trailer tire on one side high enough so that the tire spins freely and place a jack stand beneath the frame. Chock the opposite trailer wheel. Some will leave the trailer connected to the tow vehicle to ensure there is no movement. Shake the tire up and down and from side to side. If there is movement, chances are good the bearings are bad. Spin the tire and listen for sounds. In many cases, bad bearings can be heard but be aware this can also be nothing more than brake pads or shoes catching the hub.



STEP 2: Remove the dust cover or Bearing Buddy with a screwdriver. If the grease is milky, water has entered the bearing assembly. If the grease has a different color, it can mean newer grease was added. Wipe all grease away with a rag or towel.



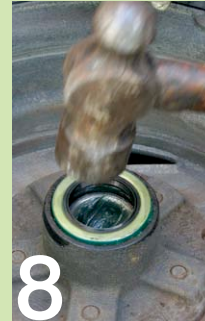
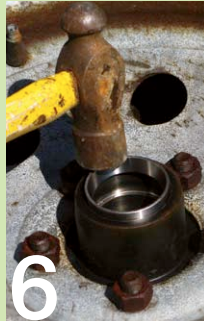
STEP 3: Now remove the cotter pin, castle washer (some trailers have castle-style axle nuts — see diagram — in which case there's no castle washer), axle nut, spindle/axle washer and set aside for safekeeping as you'll be using them again. Shake the tire and the outer bearing should come off. Wipe away bearing

grease (look for evidence of metal, which points to a bearing or race failure) and inspect for signs of wear including discoloration (a gold color is evidence of heat) and scoring, pitting or dents. If you see any of these, it's time to replace, rather than repack, the bearings. Pull the hub off the spindle and lay it with the inner sidewall facing up. Inspect the spindle for any visible damage and then, feel it with your hand. The surface should be smooth. NOTE: Avoid cleaning bearings and races with gasoline because this can harm the inner seal; paper towels

FOUR SIGNS OF BEARING WEAR

1. The hub feels hot to the touch during refueling stops on the highway. This can also be the result of a brake shoe or brake pad rubbing while traveling.
2. There is grease on the bottom of the boat hull near the trailer wheel or grease on the trailer frame near the trailer wheel.

3. Obvious noise is heard when spinning the wheel while it is jacked up.
4. If the usually reliable dust cover suddenly comes off, this can be the result of excessive heat and pressure buildup in the bearing assembly.



and rags will do the job.

STEP 4: Remove the grease seal. Notice the grease on the inner hub in this photo. That's proof the inner seal has failed. Use channel locks or a seal puller to remove the seal. Remove the inner bearing and inspect it just as you did with the outer bearing in Step 3. **NOTE:** Anytime you remove the inner seal, replace it.

STEP 5: Just like the outer bearing, the inner bearing is seated in a race, also called a bearing cup or a bearing cone. If the bearings are in good condition, remove all the remaining grease in the hub and inspect both the inner and outer races for pitting, scars and/or discoloration. If everything looks good, all you need to do is repack with fresh grease and a new seal and cotter pin (Go to Step 7). However,

if any show signs of wear, it's time to replace everything. **NOTE:** If a bearing shows wear but the race looks fine, you still replace both.

STEP 6: Getting races out of the hub requires placing a round punch placed against the inside edge of the race and, with small taps with a hammer, moving in a circular motion to dislodge it from the hub. The inner race is removed with the outer sidewall facing you and the outer race is removed with the inner sidewall facing you. Some folks use a wooden dowel instead of the round punch. Whatever you choose, wear eye protection. Place a new race on the hub and with a soft hammer, pound the race all the way in with a circular motion so that its outer edge is flush with the hub. Others position the old race above the new one and pound it in that way. There's even

a race insertion tool available at auto-parts stores. You'll know it's in the proper position because it won't go in any further and the sound will change when properly seated.

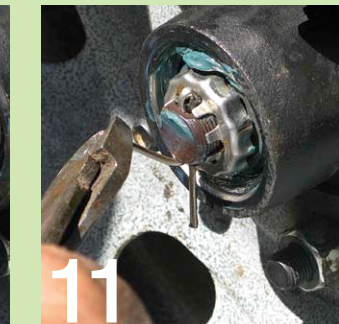
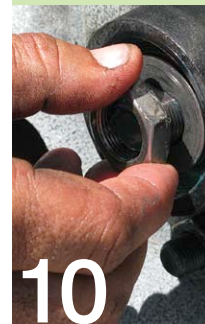
STEP 7: Grease the inner hub and then pack the inner bearing with grease. Legendary Trailers uses a bearing packer (pictured), which can be found at most auto-parts stores for less than \$15. Another way is to put grease in the palm of your hand and then place two fingers of your other hand through the larger side of the bearing. Now pack grease into the bearing rollers while rotating the bearing into your palm. You'll do the same with the outer bearing later.

STEP 8: Now install the new and double-lipped grease seal. Double-lipped grease seals have a better chance of keeping water

out of the bearing assembly than single-lip seals. It's usually included in bearing kits so be sure to ask or do some research prior to buying. The kits sold at West Marine from CE Smith have double-lip seals. Many prefer using a board across the seal to hammer against, thus protecting the seal. You have now completed the inner bearing assembly!

STEP 9: Turn the wheel over and install the outer race. Then lift the wheel onto the spindle being careful not to poke the grease seal with the spindle's outer edge. Grease the race and add the outer bearing.

STEP 10: Next, add the spindle washer, the axle nut/castle nut tightening until it stops. Bo Adams, vice president of CE Smith (they make bearings for West Marine), says the nut "should be a snug fit" but if too tight, the assembly



can be damaged as a result of heat generated when the trailer tires are going down the road. If too loose, the wheel will wobble. Finally, add the castle nut or the castle-style axle washer.

STEP 11: Now put a new cotter pin on the assembly, turning both ends in the same direction to lock it in place.

STEP 12: Add the



Bearing Buddy or dust cap and spin the wheel. You shouldn't hear any sound except your own voice saying, "Yes!"



How To Replace A Trailer Fender

It's easy to do yourself, as long as you have about an hour, and a clever 12-year-old to help! BY DAN ARMITAGE

A DRAMATIC TIRE BLOWOUT at highway speed had literally “blown out” the aluminum fender on the trailer under the boat we’d just purchased. We bought the rig for a good price partially because of the damage, for which the seller had received estimates of up to \$200 to repair. I knew it was a doable DIY job and got to it shortly after the boat and trailer found their new home in my yard.

Most major trailer manufacturers offer replacement fenders, and I was able to secure an aluminum, diamond-plate-pattern boat trailer fender from Continental Trailers. Several sources also offer generic replacement fenders for a variety of boat-trailer applications, which can be ordered online or found at local trailer supply stores and at some big-box retailers. When I received the replacement fender from Continental, I was surprised at how light it was, that it wasn’t pre-drilled with holes to secure it to the trailer frames, as well as how “bendable” the aluminum fender was without the support of the trailer frame brackets to help stiffen it. With the assistance of my 12-year-old son, we had the old fender off and the new one on within an hour. Here’s how we did it:

1. The tools required for the job include wrenches for the nuts and bolts that secure the fender to the frame, a drill with a bit matching the bolts, penetrant to loosen the old hardware, and a spring clamp if you don't have a helping hand to temporarily hold the fender in place.

2. Apply penetrating spray to loosen old nuts and bolts if needed.

3. Using the wrenches, remove the hardware securing the damaged fender to the brackets on the trailer frame. Keep the nuts, bolts, and washers to reuse if they are not damaged. If bolts are hopelessly frozen, you may be able to cut them with a grinding tool.

4. Use a spring clamp, or a helping hand, to hold the new fender in place to mark the locations of holes that will be



How To Repair The Towing Eye

Your tow eye takes a lot of stress. Inspect it, and if you need to replace it or beef it up, here's how

BY TOM NEALE



drilled into the fender to secure it to the existing brackets.

5. Most fender brackets, such as these on the Continental Trailer, offer slotted holes for the hardware to allow the fender's position to be adjusted closer or farther from the frame before being secured to the brackets.



Install the new fender using the old hardware or new, depending on condition.

6. Drill the holes for the mounting hardware in the new fender.

7. Finished!



Some boats aren't built heavily enough in the bow stem area where the towing eye is located. Stress from pulling the boat up on the trailer, securing for trips with the strap, and towing in the water can weaken the attachment over time, sometimes resulting in the eye pulling out. If your boat has this issue, it's easier to repair before the eye pulls through.

Remove the nut(s) from the eye bolt(s) that goes through the stem. Remove the eye fitting and check carefully for signs of crevice corrosion (especially where it goes through the hull and under the nut). If there's any question, buy a new eye — the stronger the better. It'll have to fit in the existing flattened base in the stem unless you want to carefully enlarge that with a file or power tools.

Beef up the area behind the stem by thoroughly sanding, cleaning with solvent, and epoxying on heavy layers of woven fiberglass cloth according to product instructions. Within reason, the more layers and the more area covered, the better. While the new fiberglass is still soft, flatten the area around the bolt hole(s) to provide a base for nut and backing. With a drill, extend the hole(s) through added layers. Install the eye and as large a backup plate as possible. Depending on circumstances, backing could be a heavy, large-diameter stainless washer or, preferably, a 316 stainless plate that will fit in the V area.





How To Install A Folding Swing Tongue

Shortening your rig by a few inches may make the difference between storing your boat and trailer in your garage and not BY JOHN TIGER

What you'll need

Aftermarket trailer parts and accessories manufacturers like Fulton make retrofit kits that can be installed in an afternoon using tools that you probably have in your garage. The Fulton kits range from \$70 for the smaller models to over \$120 for the largest. Note

the special Torx bit for installing hinge bolts. The newer kits include only the hinge and installation hardware; the original coupler and tongue section is reused.



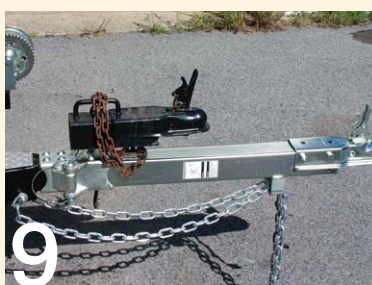
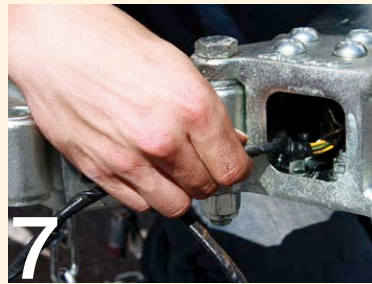
YOUR BOAT MIGHT sit outside all winter because it's too long to fit inside your garage with the door closed. If that's the case, you might benefit from adding a swing or removable trailer tongue. Many new rigs come with this as a standard or optional feature. If yours didn't, no worries: It's a fairly easy task to add one.



A folding or removable trailer tongue usually adds a few inches of overall length to the trailer. But the benefit is that by simply removing one pin, the tongue can be removed or folded to the side for more clearance in tight garages. A swing or removable tongue can shave off as much as two feet when in the storage position; oftentimes, that's just enough to allow the boat to fit where it couldn't before.

Measuring your tongue is critical before ordering the kit. Most are 2" x 3", 3" x 3", 3" x 4", or 3" x 5". Fulton makes kits in all these sizes, rated by weight capacity. Kits are available in either bolt-on or weld-on styles. If you're not a highly qualified, experienced welder, buy the bolt-on style. A poor welding job on the trailer tongue is a recipe for disaster.

If your trailer has brakes, you must install a coupling or a flexible hose section for the brake line that runs through the trailer frame.



1. The tongue is measured and scribed for the cut using a square and tape measure.

2. Sawzall is used to quickly cut off the tongue.

3. Edges are filed smooth before installing the hinge.

4. Holes are drilled for hinge bolts.

5. Hinge bolts are installed.

6. The hinge pivot bolt is installed and torqued.

7. The trailer light harness is pulled through the hinge section.

8. The hinge securing pin is installed with a clip.

9. The new tongue and hinge in the towing position. Note the new tongue is longer than the old tongue, but not when folded. New, longer safety chains are required to reach the hitch.

10. The tongue in folded position. Note that the wire harness has enough play to not be stretched when folding.

The tongue section cannot be folded back for storage without this feature because the brake line will collapse and break. Check into this with a local trailer repair shop before attempting to install the folding coupler kit.

The electrical harness for the trailer lights must be carefully extended to ensure that it's long enough to protrude from the extended tongue, and also "fished" through the hinge section so it doesn't get caught or folded inside when the tongue is folded for storage. It's advisable to use a section of loom or other protective covering where the harness passes through the folding joint.

When cutting off the original tongue, care must be exercised to not damage the trailer wiring or brake line. This is done by moving both away from the cutting line, then bending the tongue slightly out of the way as the saw cuts through the tongue. This way, the wires

and brake line can be held out of the way as the cut is completed.

The safety chains must be extended to reach the hitch. In addition, they should be reattached to the tongue behind the hinge section, not forward of it.

The hinge bolts must be torqued to the specification noted in the installation instructions, then checked periodically for tightness. If welded, the welds should be checked for cracks. The tongue forward and rearward of the hinge joint should also be visually inspected for cracks and fatigue.

Finally, care must be taken to ensure that when the tongue is folded forward into the towing position, the hinge pin protrudes completely through the hinge and is secured with the clip. For this story, the Fulton 3" x 3" hinge kit was installed on a 20-foot Allison Boats trailer.



BEFORE

The Rebirth Of A Trailer

He bought his current trailer 33 years ago, but never gave its appearance much thought ... until now

BY CLIFF STEELE

A TRIP TO YOUR LOCAL LAUNCH ramp will show you many trailers have peeling paint, dangling electrical wiring, and missing or inoperative safety lighting. I once was one of those guilty trailer boaters who kept our 24-foot pocket cruiser in Bristol condition, but did little more than simple maintenance (tires, brakes, bearings, and an occasional taillight bulb) on our 10,000-pound-capacity trailer. But recently I undertook an ambitious project to restore our older boat trailer to better-than-new appearance and increased its utility at the same time. A word of warning, this project is for the very capable and skilled DIYer.

The Facelift

The first step was to investigate the best paint products, which had to be easily applied, give outstanding gloss, and last the remainder of my boating years. A tall order! Among several good companies, I chose Interlux because their products seemed easy to apply and their extensive website guided me throughout the project. Next, I found a great sandblasting outfit not far from our home. For a pittance, our rusted old trailer was disassembled and prepped by wiping down the entire unit using Interlux 2316N to remove waxes and such before sandblasting. Next the entire trailer was sandblasted, making it ready for undercoating primer.

After sandblasting, one must start the undercoating process within a few hours, as freshly sandblasted metal allows corrosion to start immediately. The first coats on bare metal were Interlux's Vinyl Lux zinc chromate primer within six hours of



AFTER

sandblasting, followed by two coats of epoxy Primekote. Lastly, I sprayed two finish coats of Perfection color. All products are two-part mixes (find further info on Interlux's website or requested data sheets).

I have my own spray guns and the shop offered me their paint booth, a deal I just couldn't pass up! But outside painting is permissible due to the coatings' speedy drying (chemical curing). A good paint sprayer will set you back about \$80 to \$100; this method will give even a first-time user fantastic results. Remember, the "pot life," or useful working time, on two-part mixes is short (average five hours) so time is against you. Upon completion of the painting, I was impressed with the deep brilliance and extreme hardness of the finish. It took about two hours to spray each of the three products onto the once very tired and aged 28-foot trailer.

Next step was to dress up the new trailer finish with pinstriping. If you can hold a pencil, you can pinstripe. Beugler still sells a striping kit (Deluxe #471) similar to one I used 60 years ago on my bicycle fenders! Fill the tool with your color choice and guide the nifty tool along any edge for professional results.



Bringing a trailer back to its former glory is a multistep process, beginning with the removal of rollers and hardware. Sandblasting, priming, painting, and pinstriping finish the look. A new electric winch with remote makes it more functional.



The Improvements

After years of replacing filament lightbulbs and repairing frayed wires along the side of dark highways, I decided to install the best possible lighting and matching waterproof custom harness on the market. I went with an LED trailer-lighting kit from Grote. The Ultima kit harness is custom crafted and designed to be waterproof, not just water resistant.

Our trailer has four-sided box beams so it took a little fishing to route the new harness. I also added a set of their rear-facing, high-intensity five-inch white LEDs that brilliantly light the ramp or dark storage lot for those nighttime backings of the rig.

The original electric retrieving winch had not served me well lately. Grinding gears, metal shavings, and motor smoke told me one of these days would be its last. Researching heavy-duty retrieving winches, one company caught my interest — Dutton-Lainson, which started making products in 1886! One model, SA 12015 DC, has a neat remote-control feature and enough power to retrieve 30,000 pounds up a five-percent grade, single line! In other words, this winch can pull BIG stumps! You could say it really “pulled” this restoration project together. It was easy to mount using the

1/4-inch-thick mounting plate. The 10-foot remote controller can be unplugged and stored to prevent loss or theft. Also included is an emergency crank that really works as intended.

To power the winch and the backup LEDs, I added a battery and holder to the trailer, which I had welded up and mounted directly onto the trailer tongue. This resulted in a shorter cable run to the winch, giving it more power. The winch now can draw a full 70 amps while retrieving our heavy boat.

Final Touches

To finish the look, I added a coat of flat varnish to the faux-teak trailer step board. I also bought a set of metal hub trim rings for the wheel rims that can be found at most auto-supply stores, and added a vinyl cover for the spare tire to protect it from the sun. I won't be around when my restored trailer starts to show some wear. It's comforting to know that someday a pocket cruiser in the year 2038 will still be enjoying my DIY project.



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How To Install A One-Way Scupper Valve

If you find your feet getting wet on your boat's self-bailing deck, something's amiss **BY DAN ARMITAGE**

WHETHER IT'S WORN scupper-valve flaps or the weight of a heavier four-stroke outboard (or crew members!) at the transom of your boat submerging the self-bailing drains, if your deck scuppers are allowing your deck to flood when weight is shifted to the transom, or the boat is backing, consider installing an aftermarket scupper system that allows water to flow in only one direction: off the deck and out of the boat.

Several styles of one-way scuppers designed for use on self-bailing decks are available: duckbill, flapper valve, and ball style are most common, for which aftermarket versions are available. The ball style is popular among owners of trailerable boats for their effectiveness and relative simplicity, and we selected T-H Marine Supply's Flow-Max Ball Scupper (\$14.99 at www.WestMarine.com) for our application. The T-H offers a large exit hole for quick draining, and a twist-off feature makes for easy cleaning when leaves or other debris clog the system.



The Flow-Max (www.thmarine.com) meets all ABYC standards, includes a stainless-steel security pin, multiple mounting holes, and a neutral buoyancy ball that won't float up and break the seal. All one-way scupper valves should be checked regularly for possible debris.



Here are the steps we took when installing one of two Flow-Max drains on a center-console boat:

1. First, remove the original scupper assembly. See tools needed (left).

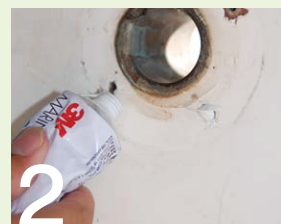
2. Fill the original screw-mounting holes with marine-grade sealant.

3. Fit the Flow-Max base-mounting plate over the scupper hole and use the screws supplied to secure to the transom. In most cases, such as this, the plate's holes will align perfectly with those that secured the original scupper-valve mounting plate so no drilling is required.

4. Secure the scupper bowl assembly to the base with a twist-and-lock motion.

5. Using the lock screws supplied, secure the bowl to the base. All that's needed to clean the bowl is removal of the screws and twisting the ball unit free of the mounting plate.

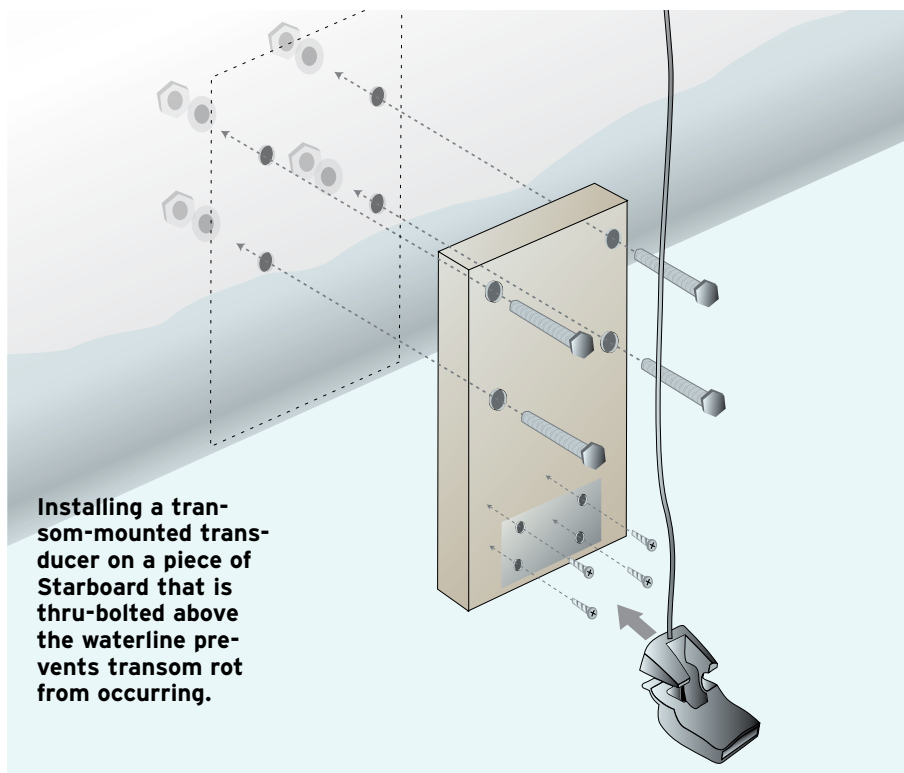
6. Installation is complete.



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Install A Transducer Without Holes Below The Waterline

Two ways to install a transducer that won't compromise your hull



Installing a transom-mounted transducer on a piece of Starboard that is thru-bolted above the waterline prevents transom rot from occurring.

METHOD 1 Substitute Transom

There are alternatives to drilling a hole in your bottom for a transducer. Transom-mount transducers are common on smaller boats, but the mounting screw holes can allow water in, causing rot in the transom core. Even careful sealing will eventually fail because of the stress of running on plane. A better option uses a piece of “plastic wood” such as structural grade Starboard as a mounting point. Cut a piece long enough to extend from the bottom of the transom to a point at least six inches above the waterline, and several inches wider than the mount. Thru-bolt it to the transom using four stainless bolts. All holes should be well above the waterline and fit the bolts snugly. Dry fit everything, carefully following depth finder instructions, to be sure you’ve got the right fit and positioning.

Seal the transom core inside the bolt

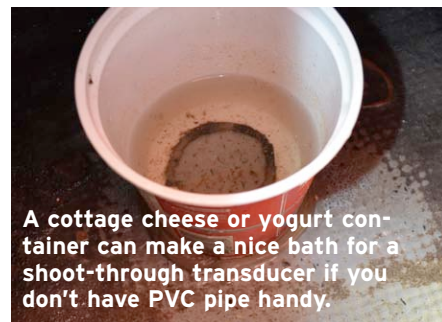
holes with epoxy resin. Use a syringe to inject the resin into the hole and a Q-tip or toothbrush to spread it around inside. Do this immediately before you insert the bolts. Seal and “glue” the board to the transom with 3M 5200 applied over the back of the board. The bottom edge of the board should be approximately 1/4-inch above the bottom of the boat and far enough above the bottom of the hull to avoid turbulence. Taper the bottom edge of the board, making it parallel to the surface of the water when running on plane. Mounting screw holes in the board now shouldn’t puncture the transom; you’ll have room for mistakes and the ability to add different transducers later. — Tom Neale

To find the right spot inside your hull, experiment by filling a Ziploc bag with water and placing the transducer inside. Sit the transducer and bag down against the test areas while running the boat to find one that works well. — Tom Neale

METHOD 2 Shoot Through The Hull

If the bottom of your hull is solid fiberglass, meaning not cored, you can shoot through the hull by mounting a transducer inside the boat. I’m not a fan of epoxying a transducer directly to the inside of the hull, although it’s definitely the easiest. I prefer to mount the transducer in a plastic pipe, then fix the pipe to the hull.

Fit a piece of plastic pipe to the hull where you want the transducer mounted. Put a wire brush on your drill and clean/roughen the hull where the pipe will attach. Mount the transducer in the pipe in the same orientation you’d have it if it were hanging off the transom. Seal the mounting holes with the 5200. Leave a half-inch or so between transducer and hull.



A cottage cheese or yogurt container can make a nice bath for a shoot-through transducer if you don't have PVC pipe handy.

Swab the place of pipe attachment liberally with acetone. When dry, use 5200 to fix the pipe to the hull. Fill the pipe with water or antifreeze and you’re done. If you want to keep the water/antifreeze in the pipe from evaporating, drip enough hot wax on the liquid in the pipe to seal it. I don’t bother with the wax; I use water and only need to refill it once a season. Don’t like the spot? Tear up the pipe, clean up the 5200 on the hull with the wire brush, and try another place. — Jeff Nicholas



On The Importance Of ... Trailers!

You don't need a big boat to see the great country around you.
In fact, a little boat may be the perfect ticket

BY BILL FIERO

IN THIS BOATU.S. SPECIAL EDITION, *160+ Best Trailering Tips, Tactics & Projects*, there have been so many fine suggestions submitted by our fellow boaters on this topic of boat maintenance. And it's great to have add-on extras to make trailering more convenient and safe. For lots of boaters, it's a real joy to have do-it-yourself projects that relate to the boating experience.

BUT... let's not forget that the most important part of owning a trailer is so that you can respond to your "get up and go" incentive, get in your truck or whatever, with your boat behind you, and GO SOMEWHERE — to fish, to play, to see what's down the road!

For those who may not know us, my wife El and I are retired teachers, and have lived on a trailerable boat for over a decade, trailering and cruising it all over North America,

and logging over 36,000 nautical miles on the water and probably twice that on our two trailers. Whether you maintain and create new ideas with your trailer, or have it maintained by a commercial service, the bottom line for owning a trailer, we believe, is to use it so you can quickly, safely, and economically open up all the marvelous waterways of our continent — at the height of each area's best boating season. Enjoy the mobility and convenience of your trailer. It can open up your whole world. 🚤

PHOTO: GARY KRAMER



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