

# Technical Pull-Out



Q&A FOR YOUR CATALINA THAT'S BEEN FACTORY APPROVED FOR ACCURACY

## Catalina 470 National Association



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### Exhaust System "Hump Hose"

*Beckoning*, C470-76, recently experienced a leak in the engine exhaust line and the experience merits attention of the Fleet. The engine exhaust mixing elbow is connected to the muffler via a 3.5" ID x ~6" length of heavy-duty rubber hose, the "hump hose." A section of this hose had been abraded by contact and vibration over the years and had begun to leak. This is a serious hazard as it could expose the interior to the boat to exhaust fumes as well as cooling water from the exhaust elbow. To replace the hose, it was necessary to remove the muffler to get sufficient



Hump hose showing abraded area that leaked.

clearance to slip the new hose on. Owner Don Andrew used band hose clamps to attach the replacement hose.

The exhaust hump hose should be periodically inspected to check its integrity and identify any potential sources of abrasion. Abrasion protection capable of withstanding the high temperatures of the exhaust system should be applied



Replacement hump hose and band clamps.

## Catalina// MAINSHEET MAGAZINE SUPPLEMENT

Fall 2014 • Vol. 32 • No. 3

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For advertising information, contact Jim Holder, Eagle Ltd. For subscription information see page 40.

Technical articles are the opinion of the authors and not necessarily the advice of Catalina Yachts, Catalina Mainsheet or the National Associations.

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to any contact points. On *Onward*, I have found that a piece of heavy fiberglass cloth provides good protection.

There are a number of other places on the engine where hoses can become abraded due to the constant vibration while in contact with engine surfaces. Engine hoses should be inspected for these abrasion points and protection applied. I have found that the black ribbed plastic split tubing sold in various sizes for electrical wire conduit/protection provides good abrasion protection for hoses such as the cooling water hoses of the engine fresh water cooling loop pump. It is compatible with the temperatures in this area.

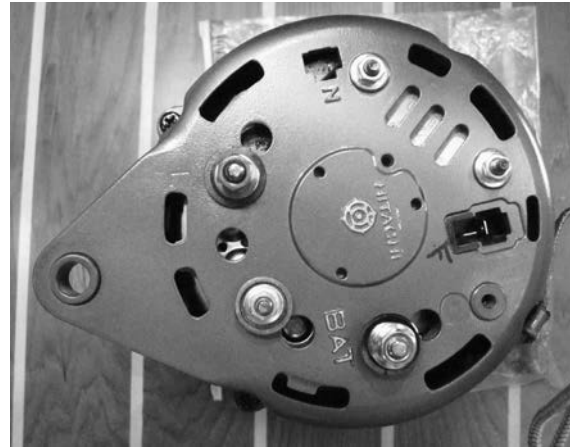
It is also a good idea to carry a spectrum of hose connector bibs and clamps that should a failure occur would allow a damaged hose to be cut to remove the damaged section and then re-spliced together using the bibs and hose clamps as a temporary fix.

It is important to reiterate a recommendation from a previous Tech Note that all hose clamps associated with engine system hoses should be replaced with band-type hose clamps. These clamps are stronger and, more importantly, cause less physical abrasion of the rubber hose area under the clamp.

### Alternator Installation

*Onward*, C470-126, while returning to the US from the Bahamas recently, experienced failure of the alternator. No big deal as a prudent cruising vessel carries a spare. However, in the mounting of the spare lies a good story of what not to do and what to do.

Common alternators used on the Yanmar 4JH3TE series engines have front (pulley side) and rear mounting tangs as well as a positioning tang. In replacing the unit, I partially inserted the hinge bolt through the alternator forward mounting tang and



Alternator rear mounting tang with moveable bushing.

the mounting tab on the engine. I used the alternator positioning bolt to hold the unit in place while I completed the hinge bolt installation. In this, I was frustrated at not being able to see the hinge bolt area while mounting the unit and further frustrated by not being able to get the spacer bushing to fit in the space between the engine mount and the rear mounting tang of the alternator. I had to shorten the spacer about 3 mm - wrong thing to do! I should have walked away from the problem and come back later to see the problem with fresh (and less-piqued) eyes.

The alternator, which had been rigidly bolted in place, vibrated loose after a day of use damaging itself and the fan belt. I subsequently learned two important things. First, the rear mounting tang of the alternator has a moveable bushing (which had seemed fixed). This had extended itself into the space between the two alternator mounting tangs to interfere with the original spacer bushing and this had necessitated the shortening of the spacer bushing. When I had snugged up the hinge bolt, there had been, unknown to me, enough play in the moveable bushing and the spacer bushing that engine vibration could vibrate the bolt loose and induce enough eccentricity to cause the positioning bolt to loosen, too. The fact that the hose to the raw water pump interferes with the end of the hinge bolt didn't help. If I had been able to clearly see the whole hinge, I would have recognized the problem.

The second thing I learned was that when remounting the alternator, the upper positioning bolt should not be used to help hold the alternator in place while installing the hinge bolt. Instead, when a second pair of hands is not available, a short piece of line through the positioning bolt hole that is then tied off to the companionway handrail above it can hold the alternator in position. Most importantly this allows one to fully see the hinge bolt area and work with two hands.

One should be sure to push the moveable bushing in the rear alternator mounting tang toward the stern so it does not protrude beyond the forward surface of the tang. Install the spacer bushing on the hinge bolt and if there is more than about 1 mm of space, insert appropriately sized SS washers to take up the space. Then, when the hinge bolt is tightened, it will then pull the alternator moveable bushing toward the spacer bushing (and washers, if any) to make a snug fit of the rear mounting tang against the engine tab (the moveable bushing should extend beyond the front and rear surfaces of the rear mounting tang when the hinge bolt is snug so the hinge bolt can load the two bushing against the engine tab).

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