

SCOUT Projects:

Raw Water Impeller Strainer

m/v SCOUT (Great Harbour N37)

Ray Henry

Description

We recently had a complete impeller failure that I would have been interested in getting some advanced warning about 😊 I had read online about a number of people that had put a small water strainer *AFTER* the engine raw water pump. This provides two functions – first, it gives an early visual indication if small pieces of the impeller begin to break up prior to a complete failure. Second, if some or all pieces do come off, they are captured by the strainer and don't move downstream to clog the heat exchanger. I decided to give it a go.

Parts Ordered

1. Water strainer



SKU: GRO WSB500P

Groco Inlet Strainers ...Special Offer!

Protect fresh water pumps from debris. White nylon strainer head and clear plastic sight glass. Glass unscrews for filter basket cleaning. Mounting bracket included. Available with standard plastic basket or as a 3/4" model with stainless basket.

Specifications:

- Choose Your Item: 1" NPT: GRO WSB1000P - \$44.86 x 2 = \$89.72

Price: \$ 89.72
Sub-Total: \$ 89.72

2. Hose barb fittings



SKU: CNN 6590750

Conbraco 90 Degree Pipe to Hose Adapters ...Special Offer!

Cast bronze. Made in U.S.A. NOT TO BE USED IN POTABLE WATER SYSTEMS. Available in sizes from 1/2" to 2".

Specifications:

- Choose Your Item: 1" NPT, 1" Hose: #CNN 6590752 - \$17.17 x 2 = \$34.34

Price: \$ 34.34
Sub-Total: \$ 34.34



Specifications:

- Choose Your Item: 1" NPT, 1" Hose: #GRO PTH1000 - \$10.39 x 2 = \$20.78

Price: \$ 20.78
Sub-Total: \$ 20.78

3. Hose Section



Gates 21488 Molded Coolant Hose

Sold by: Amazon.com Services LLC

\$13.55

Design

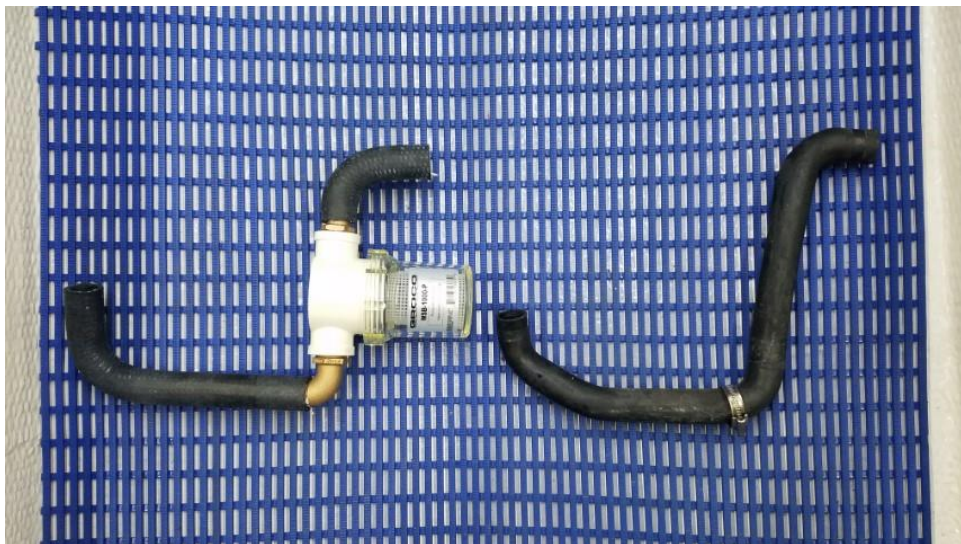
I couldn't have planned the sizing of the components any better if I had fabricated them myself. The combination of the hose elbows, fittings, and strainers went together nearly identically to the endpoints needed for the original Yanmar molded through-hose.

I first ordered one set of the strainer and barb fittings for a size test. It appeared with a bronze elbow fitting at the bottom and a straight fitting on top, a couple of "plain" molded elbow hoses would reach the intended ports just fine.



Test fitting the strainer and barb fittings

The bottom hose molded elbow needed about 8 inches on one of the 'legs' to reach the bronze elbow fitting on the bottom of the strainer. I found that the Gates 21488 molded hose had all the right dimensions and could be cut to fit each of the sections needed.



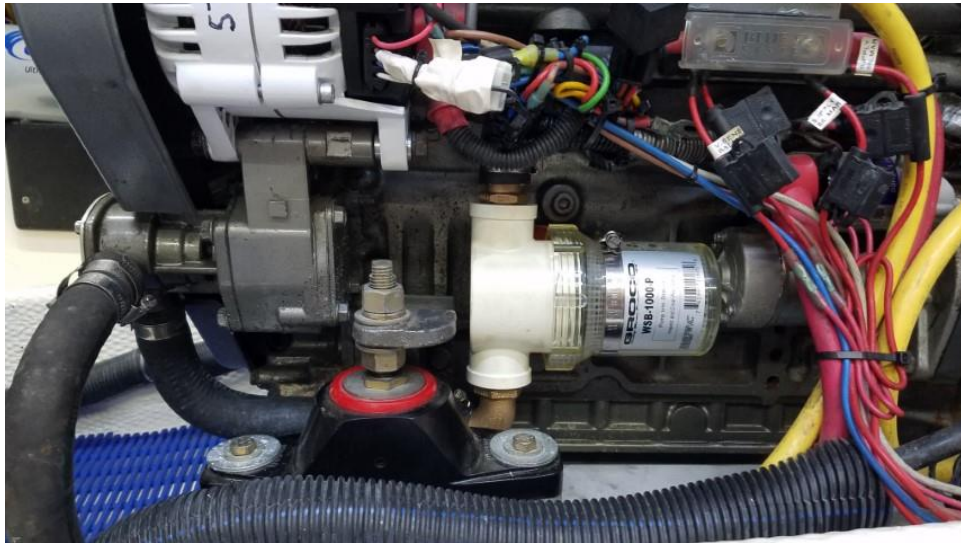
New arrangement vs. old Yanmar hose

Assembly was very straightforward. The only tricky part was cutting the Gates elbow hoses to the right length to go over each of the barb fittings. Some careful measuring, re-measuring, test fitting, and adjusting was all that was needed. One tip is to make the initial cuts about 3/4" longer than the measurements show – it is far easier to trim off another 1/2" if you were wrong than to extend a too-short hose section!

Completion

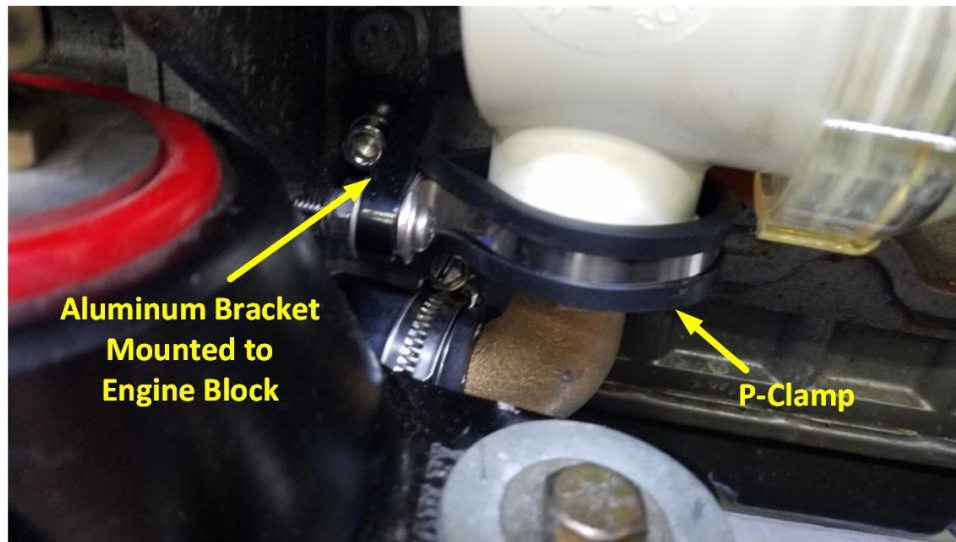
The photo below shows the installed strainer. It tucked up very nicely alongside the engine block where the original Yanmar molded hose ran.

The screw-on rim of the strainer rested against the block of the engine when in position. I was worried about vibration and rubbing, so I clamped a heavy piece of silicone rubber sheet to the back of the strainer for it to rest against the engine on. You can see the clamp around the clear part of the strainer in the photo. This silicone rubber sheet is behind it.



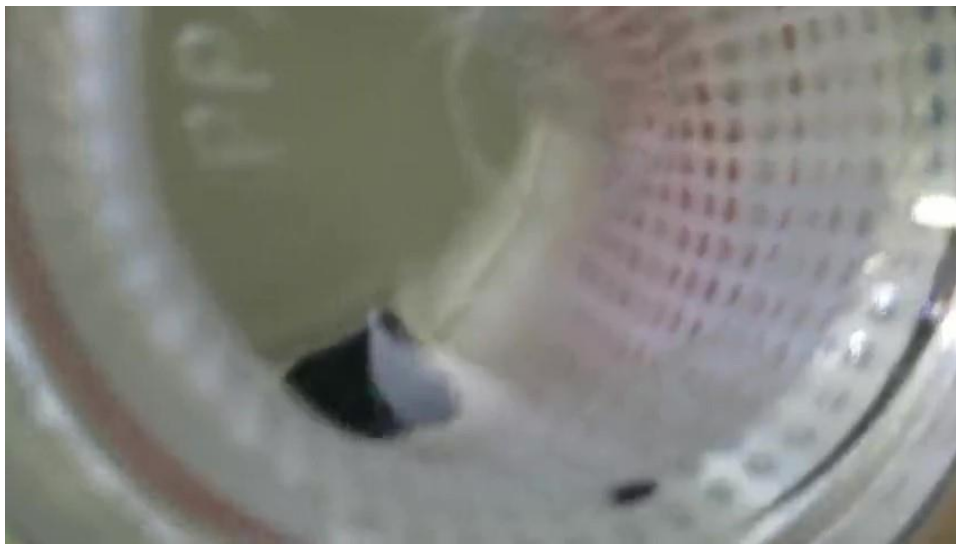
Installed strainer alongside the Yanmar 4JH4E 54hp.

Due to the rigid tube connection point running fore and aft along the engine at the top and the short hose elbows used, the strainer was pretty much self-supporting and didn't appear to need any bracket mount or anything. However, to try to reduce vibration and any other potential problems, I used an aluminum angle mounted to one of the engine block bolts (already there) and a stainless P-clamp to hold the bottom port of the strainer from moving.



Mounting Bracket

On the very first day's test run, the basket on the starboard engine showed a piece of impeller in the strainer bowl!!



Impeller piece captured!

I inspected the newly installed impeller (following the previous total failure) and found it to be in perfect condition. This must have been a leftover piece in the system from the prior incident. This made the project worth it, as it was easily removed from the strainer without having to disassemble the heat exchanger (or even knowing it was floating around in the system!),

Do-Overs and Comments

I peeled off the strainer model number label since the way it had to mount made it impossible to see inside without looking into the end with my phone camera!

After seeing a few other GH N37 engines, even other 4JH series, it appears that the installation arrangement shown here is VERY SPECIFIC to the 54hp 4JH4E engine – strainer mounting and hose routing for other engines would need to be different.