

### OVERVIEW

Messenger lines are used to transfer the main tow line to the vessel in tow. A typical 1/2" to 1" diameter messenger line is connected to the eye of the tug's mainline or pendant. To make the connection between the tug and the tow, these lines are first passed between the vessels. The messenger line is pulled up via a capstan winch on the vessel to be towed until the tug's heavy towing arrangement is moved onto the vessel's deck where it will ultimately be connected to a bitt.

Samson has recently identified potential issues with the typical messenger line to tow line attachment methods, which can cause a weak point in the tow line, and offers some recommended alternatives.

### TYPICAL ATTACHMENT OF MESSENGER LINES:

A girth hitch connection between the messenger line and towing arrangement has been the industry-accepted method. The girth hitch method is chosen because of its ease of installation and removal if needed. However, it has been found that the typical girth hitch connection method can cause substantial damage to the eye of the towing arrangement. Under load, the girth hitch bites down on the eye of the towing arrangement, often with intense pressure. Over time, and repeated use, the excessive pressure causes internal abrasion and fiber fusing.

Multiple failures have been reported in the eye of the towline at the messenger line connection point while under tow. Through Samson's residual strength testing program, it has been confirmed that using the direct girth hitch method leads to a weak point in the line in the messenger line connection area.

Another potential problem with the method is poor positioning on the eye of the towline. If the girth hitch is not positioned in the apex of the eye it can lead to unequal loading on the two legs of the eye and cause the splice to slip or pull out.

Therefore, to keep the highest level of strength throughout the service life of the rope and maintain the integrity of the splice, a non-damaging attachment method is strongly recommended. See page 2.

### MESSENGER LINE RECOMMENDATIONS

Along with reducing the pressure at the attachment point, a well thought out messenger line system should also reduce or eliminate twist in the tow line. Twist reduces the strength of braided ropes and can lead to unexpected failures.

#### Swivels help reduce twist

All of the options for messenger line attachment should include a swivel either at or within 8 feet of the attachment point to the tow line. The swivel helps reduce the amount of twist introduced into the tow line as it is heaved aboard the towed vessel.

The recommended swivel is a multi-bend swivel as shown in Fig. 1.

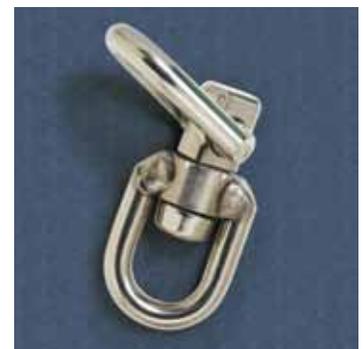
#### Non-rotational braided messenger lines help reduce twist

Messenger lines should be braided, torque balanced ropes rather than twisted ropes. Twisted ropes tend to rotate upon loading, introducing twist to the tow line.

More information on twist can be found in the technical bulletin "The Effect of Twist on Braided Ropes" available for download at [www.SamsonRope.com](http://www.SamsonRope.com)



*Typical messenger line girth-hitch connections can cause excessive pressure on the eye when under load, causing internal abrasion and fiber fusing.*



**FIGURE 1** Swivel hardware



## Tug Boat Messenger Line Attachment

### RECOMMENDED ATTACHMENT AND CONFIGURATION OF MESSENGER LINES:

**The goals are:**

- > Eliminate the pressure and internal abrasion exerted by the direct girth hitch
- > Provide a connection that allows the messenger line to slide freely along the rope's eye

The three options below for attaching the messenger lines all eliminate the pressure on the rope and allow the connection point to slide freely along the eye of the tow line.

**Attachment Method 1:** The messenger line is girth-hitched to a grommet that is folded over the eye of the pendant or mainline. See Fig. 2.



**FIGURE 2** A grommet is folded over the eye and the messenger line is girth-hitched to the grommet



**FIGURE 3** Grommet spliced around the eye

**Attachment Method 2:** A simple grommet is spliced around the eye of the pendant or mainline. See Fig. 3.



**FIGURE 4** Messenger line spliced directly to eye

**Attachment Method 3:** The messenger line is spliced directly to the eye of the pendant or mainline. See Fig. 4.

For additional information on this subject and other available Technical Bulletins, please contact your Samson representative or visit our website: [SamsonRope.com](http://SamsonRope.com)

