

NAVAL SHIPS' TECHNICAL MANUAL

CHAPTER 582

MOORING AND TOWING

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SECTION 11. TOWING GUIDELINES AND PROCEDURES

582-11.1 SAFETY PRECAUTIONS

582-11.1.1 The following safety precautions are basic and should always be followed during towing operations:

- a. During heavy weather life jackets will be worn by all personnel topside.
- b. Personnel involved in rigging and un-rigging towing gear and handling lines shall wear life jackets, safety helmets, and safety shoes. Personnel handling messengers and synthetic tow lines may wear gloves. Personnel handling wire rope shall wear gloves. Rings, loose clothing, etc. should not be worn.
- c. Be careful when handling towing hawsers and observe the precautions for using synthetic fiber ropes as stated in using synthetic fiber ropes as stated in NSTM Chapter 613, Wire and Fiber Rope and Rigging. A training video, available from the Naval and Education and Training Support Centers, titled "Synthetic Line Snap-back" (Order No. 82971DN, 1982), shows the hazards associated with synthetic towlines.
- d. When rope is used in towing operations without a towing engine, the towing hawser must have a scope of at least 200 fathoms (1200 feet) especially for long tows and in heavy weather. However, the urgency of the situation or navigational hazards may dictate the use of a single hawser rig, [100 fathoms (600 feet)], even in heavy weather, in order to get the tow under way. A second hawser can be added when conditions permit.
- e. Never let the hawser be sprung so much that it straightens out clear of the water or be allowed to drag on the bottom.
- f. Inspect the towing hawsers thoroughly during overhaul periods. Replace the hawsers if inspection reveals any unsatisfactory conditions.
- g. Take the following precautions before disconnecting the anchor chain on the forecastle for towing and rousing out the anchor chain:

CAUTION

Make sure the wildcat is engaged and the steel bar is removed before operating the wildcat.

1. Use a wire rope preventer of adequate size to support the weight of the anchor, to back the housing stopper and to prevent the accidental dropping of the anchor.
 2. Use a preventer, if available; otherwise insert a steel bar through a link across the upper lip of the chain pipe or lash with rope.
- h. Make provisions for emergency release of the tow line. (An ax, large bolt cutters, cutting torch, release stopper, or pelican hook may be used).
 - i. When getting underway, build up turns slowly; never go from dead-in-the-water to standard speed.
 - j. Ensure that the tow line and the appendages are in good condition. Never use a hawser that is kinked. See NSTM Chapter 613, Wire and Fiber Rope and Rigging, section 2, on the care of synthetic fiber rope hawsers, especially what to do with a hawser that has a severe kink or cockle.

- k. If the tow is sinking, disconnect the tow line immediately.
- l. Unless sinking of the tow appears imminent, do not abandon the tow. It is the towing ship's duty and responsibility to prevent the loss of the tow.
- m. During favorable weather and seas, ensure that a sufficient catenary exists to absorb shock loading. Never tow at short stay in rough weather.
- n. Ensure that all rigging is adequate. If questionable, always over-rig.
- o. Keep a lookout for small weather fronts. A sudden unexpected weather front can cause great damage.
- p. Keep all unnecessary personnel away from the vicinity of the tow line.
- q. Set a towing watch on both ships.
- r. If the towing ship loses power, the course of the towing ship should be altered immediately to prevent being overrun by the towed ship.

582-11.2 COMMUNICATIONS BETWEEN SHIPS DURING TOWING OPERATIONS

582-11.2.1 COMMUNICATION. When towing, a means of communicating between the towing ship and the tow is essential. The best way of communicating is usually by radio or electric powered megaphones (bull horns). When radio or bull horns are not available, or practical, alternate means of communication are needed.

582-11.2.2 SOUND SIGNALS. A fast means of communications is by sound signals, which also may be used to supplement any of the other means. Table 582-11-1 lists the sound signals used by the Navy during towing operations.

Table 582-11-1 NAVY TOWING SOUND SIGNALS

SIGNAL	MEANING
1 short blast	I am putting my rudder right
2 short blasts	I am putting my rudder left
2 short, 1 prolonged blast	Haul away
2 prolonged, 5 short blasts	Let go
2 prolonged blasts	Go ahead
1 short, 2 prolonged blasts	Pay out more line
1 prolonged, 2 short blasts	Stop
3 short blasts	Avast hauling
2 prolonged, 1 short blast	All fast
3 groups of 5 short blasts	I am letting go

582-11.2.3 FLAG SIGNALS. Flag signals may be obtained from Allied Tactical Publication, ATP1, volume II, section 3007 (for naval ships), or National Imagery and Mapping Agency, NIMA, publication 102, International Code of Signals (for merchantmen).

582-11.3 PROCEDURE FOR RIGGING AND PASSING A TOW LINE

582-11.3.1 GENERAL INFORMATION. Procedures for rigging and passing a single pendant tow line for a ship to ship emergency tow are the same, regardless of ship class. The following general procedure lists the steps for preparing and passing the tow line between two surface ships. Figure 582-11-1 shows a typical tow line rigged

for passing to a disabled ship and figure 582-11-2 shows a ship rigged to be towed using chain stoppers and anchor chain.

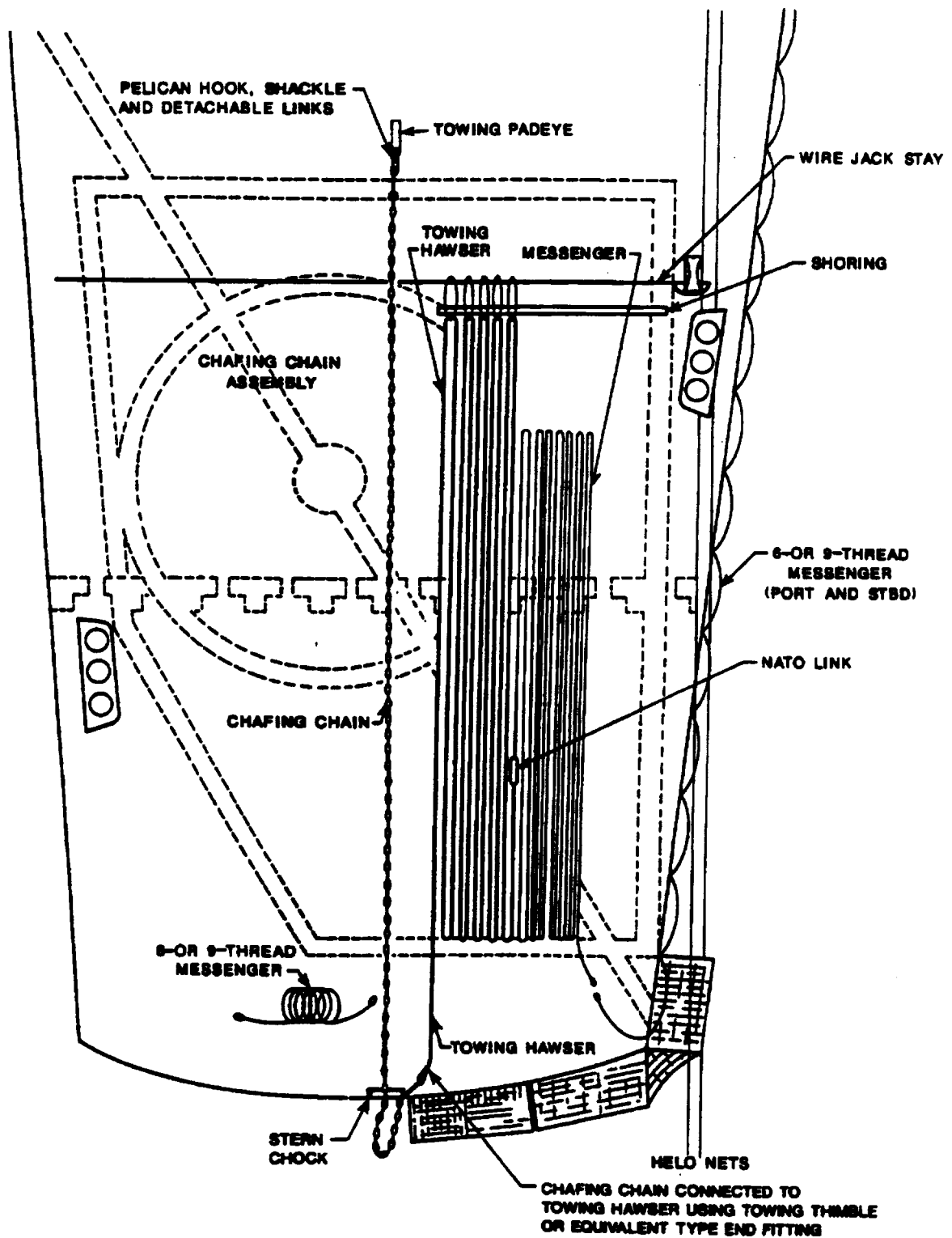


Figure 582-11-1 Ship Rigged to Tow

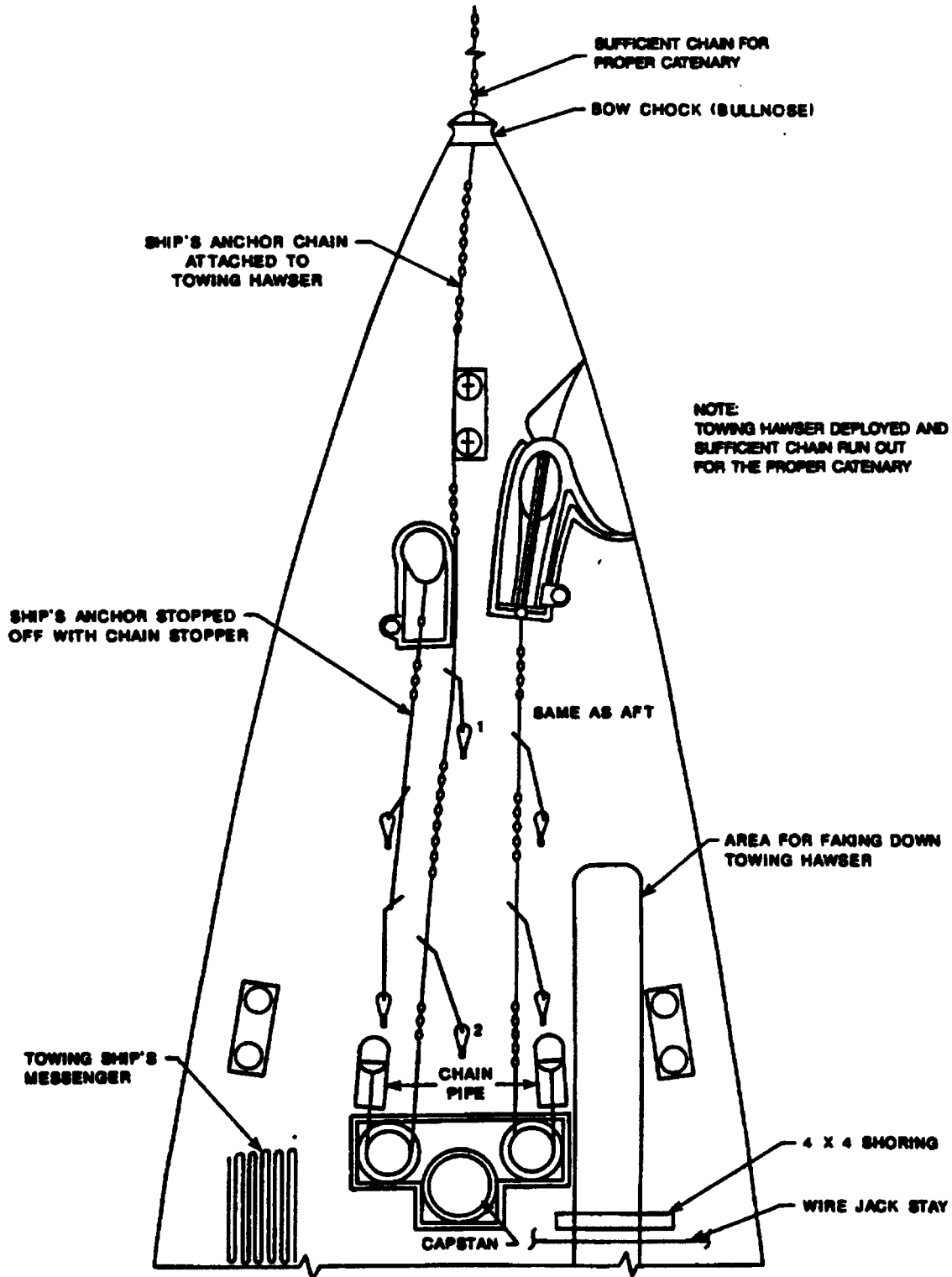
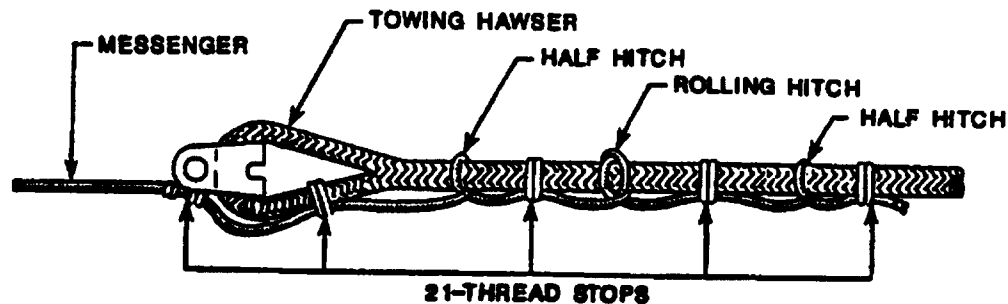


Figure 582-11-2 Ship Rigged for Tow

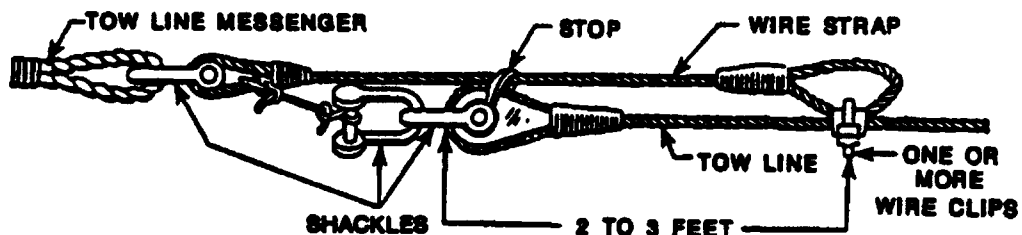
582-11.3.2 PROCEDURE FOR THE TOWING SHIP.

- a. Connect the pelican hook to the after towing pad with a shackle.

- b. Connect the chafing chain with an end link to the pelican hook. Lead the chafing chain through the stern chock.
- c. Connect the towing hawser end fitting to the chafing chain with a detachable link.
- d. Fake down the towing hawser clear for running fore and aft. Stop off each bight of the towing hawser to a jack stay with 21-thread. Place shoring under the stops for ease in cutting.
- e. Connect the NATO towing link to the free end of the towing hawser; see paragraph 582-9.3.5 for a description and availability of the NATO towing link.
- f. Connect a messenger composed of approximately 100 fathoms (600 feet) of three inch circumference line (four inch circumference line for a 10 inch circumference or larger hawser) and 50 fathoms (300 feet) of 1 1/2-inch circumference line to the outboard end of the towing hawser. Fake down the towing hawser messenger clear for running fore and aft. Lead the free end of the messenger through the stern chock.
- g. Stop off a 6-thread or 9-thread messenger outboard on both sides of the ship from the fantail to the forecastle with sail twine, clear for running. Coil a 600 foot length of 6-thread on the fantail for a third messenger. These messengers are rigged to permit the conning officer greater maneuvering freedom when approaching the ship to be towed.
- h. When close enough to the ship to be towed, pass the port, starboard, or fantail, 6 or 9-thread messenger with a heaving line bob or line throwing gun. The forecastle will notify the fantail by telephone as to which side the messenger is being passed so that the appropriate 6 or 9-thread messenger may be connected to the towing hawser messenger. Two methods for connecting a messenger to the tow line are shown in figure 582-11-3.
- i. Pay out the tow line messenger and hawser, cutting the stops of the towline hawser at the 4 x 4 inch to control the speed of paying out, as the ship to be towed takes in the 1 1/2-inch circumference messenger and hawser. The tow line messenger and hawser should be payed out gradually to ease handling of the tow line by the towed ship and to avoid fouling the propellers of the towing ship.



CONNECTING MESSENGER TO SYNTHETIC FIBER ROPE TOWING HAWSER



CONNECTING MESSENGER TO WIRE ROPE TOWING HAWSER

Figure 582-11-3 Connecting a Messenger to the Tow Line

582-11.3.3 PROCEDURE FOR THE TOWED SHIP.

- a. Stop off the anchor (port or starboard) of the anchor chain to be used. Set up on the anchor windlass brake. Pass a pinch bar through the chain, letting the bar rest on the lip of the chain pipe, or pass a preventer to prevent the chain from backing down into the chain locker and a preventer on the anchor to back up the stopper. Break the anchor chain at the detachable link inboard of the swivel. If power is available, haul out the desired length of chain using the anchor windlass. If power is not available, the chain will have to be hauled out manually.
- b. Shackle the towing chain stopper to the designated (towing) padeye on the forecastle for stopping off the anchor chain after the tow is properly adjusted.
- c. Fake out the towed ship's hawser on deck, fore and aft, on the forecastle for clear running, prior to connecting it to the anchor chain. Use the towing ship's messenger to haul the towing hawser from the towing ship on board through the bullnose. Connect it to the towed ship's hawser secured to the end of the anchor chain. If the towed ship's hawser is not to be used, connect it to the anchor chain. Use a detachable link to connect the free end of the towed ship's hawser to the NATO link.
- d. Pay out sufficient anchor chain [5 to 45 fathoms (30 to 270 feet)] to provide a substantial towing catenary when the towing hawser has been payed out. Synthetic rope has a very small catenary.
- e. Set the brake on the wildcat and pass and equalize the chain stoppers, one outboard and one inboard of the detachable link, to take the strain on the towed ship's anchor chain. Disengage the wildcat.

582-11.3.4 GETTING UNDERWAY WITH TOW. Implement the following steps when the towing hawsers are connected and both ships are ready to start the tow:

- a. Start the towing ship's engines ahead as slowly as possible and stop them when the hawser begins to take strain. Increase turns slowly until the inertia of the tow is overcome and both ships are moving slowly with steady tension in the hawser. Increase speed slowly until the desired speed is reached. At no time should an additional amount of strain be placed on the tow hawser to cause it to lift completely out of the water. The course of the tow may be changed gradually, as necessary.
- b. Pay out or haul in (assuming power is available to the anchor windlass) anchor chain as desired to keep the ships in step (that is, taking wave crests at the same time). When a comfortable distance is found, the chain stoppers are passed on the anchor chain and the strain is equalized between the stopper and wildcat. Locking plates are installed and set on both chain stoppers.

582-11.3.5 QUICK RELEASE OF TOWED SHIP. Procedure for quick release(time permitting) of towed ship:

CAUTION

In case of emergency, for quick release, tripping the pelican hook on the towing ship is faster than the following procedures.

- a. Pay out the anchor chain connected to the tow line on board the towed ship so that a detachable link is just forward of the anchor windlass.
- b. To prevent the chain from returning to the chain locker when detached, pass the chain stoppers on the anchor chain and lash the anchor chain just aft of the detachable link or apply the chain compressor where fitted.
- c. Disconnect the anchor chain between the anchor windlass and the chain stoppers so that only the chain stoppers are holding the anchor chain and the tow line. This arrangement allows quick release of the towing hawser and chain.