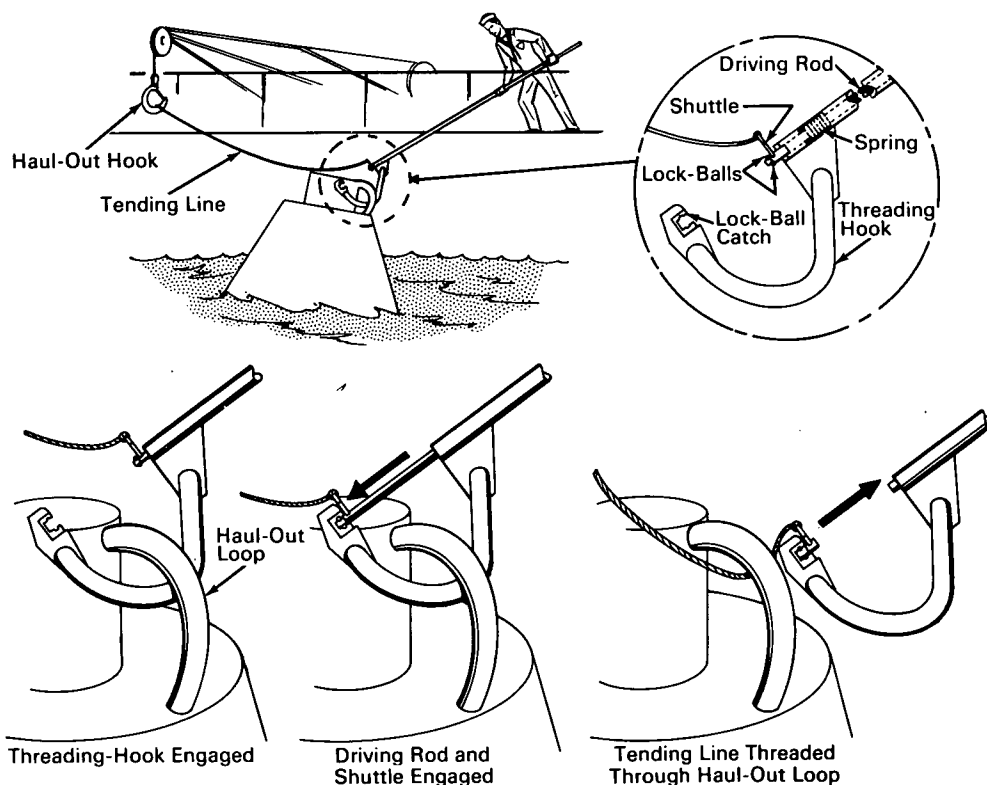


NASA TECH BRIEF



This NASA Tech Brief is issued by the Technology Utilization Division to acquaint industry with the technical content of an innovation derived from the space program.

Threading Hook Facilitates Safe Recovery of Heavy Loads



The problem: Attaching, with a minimum of delay and without hazard to an operating crew, a heavy-duty haul-out hook and cable used for emergency recovery of massive loads afloat in turbulent seas. The solution of this problem was particularly directed to the recovery from the sea of the manned five-ton Apollo command module when it returns to the earth after the Apollo spacecraft completes its lunar mission.

The solution: A C-shaped threading hook and shuttle mounted at one end of a long, lightweight pole that can be easily manipulated by a man to direct the heavy haul-out hook into positive engagement with a haul-out loop secured to the seaborne load.

How it's done: In preparation for a recovery operation, the ends of the tending line are respectively fastened to the haul-out hook and the shuttle at the

(continued overleaf)

end of the long-handled pole. In carrying out a recovery, an operator reaches out with the pole and hooks the haul-out loop on the load. He then pushes a spring-loaded driving rod located inside the pole to move the shuttle to the engaged end of the hook, where the shuttle is locked in position by a lock-ball fastener. When pressure is released on the driving rod, it detaches itself from the locked shuttle and returns to its original position. At this point, the tending line has been threaded through the haul-out loop and the haul-out hook can be easily drawn up, by pulling on the pole, to engage the haul-out loop.

Notes:

1. This device may be useful for picking up loads in other areas where it might be hazardous for

workmen to be present, such as beneath a hovering helicopter, or where heavy-duty cranes are employed.

2. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
Manned Spacecraft Center
P.O. Box 1537
Houston, Texas, 77001
Reference: B64-10185

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated.

Source: James S. Arthur and David C. Williams
(MSC-46)