



An Easy Solution to Open and Close Engine Hatches on Boats

INDUSTRY AND APPLICATION

Linear actuators are used in several applications and across industries.

Actuation can help improve accessibility to one of the most important parts of a sea vessel – the engine. Electric linear actuators provide a reliable lift on the engine hatch, making it easier to access the heart of the vessel.

The engine hatch protects the engine from seawater splashes which can corrode and cause further damage to the engine's life span. To ensure the boat engine is well protected, the hatch cover tends to be large and sometimes quite heavy. Opening this alone can be difficult and at times, impossible to do alone. In such cases, a motorized lift for the engine hatch can provide easy access to the engine while retaining the protection needed against the elements.

An actuator is designed to move objects in a linear motion, and due to this functionality, it is being used for lifting or opening doors, windows and more recently, actuators are used within boats, yachts and other sea vessels.

CHALLENGES

We were approached by our customer who needed an automated hatch cover designed and developed for his boat. We first identified three major challenges:

1 Mounting Point

There was limited space to mount the actuator, and we also needed to consider the path the unit would take when the hatch cover opens and closes.

We needed to ensure there was no obstruction to motion when the unit operates and when fully opened.

2 Heavy Lifting

To be able to lift the hatch cover safely, the actuators needed to have a sizeable buffer margin on the force capabilities.

For example, to lift a 400lbs engine hatch cover of a large yacht, you will need at least 500lbs of force rating to operate the lift safely. More importantly, since the actuators were to be mounted at an angle, the actuator force rating needed to lift the hatch could be magnitudes larger than the actual weight of the hatch.

3 Emergency Release

A fail-safe way to access the engine is essential. In the unlikely event of the engine hatch lift failure or loss of power, the user should still be able to access the engine compartment. The lift needs to be able to release the lock on the engine hatch without compromising the lifting capability of the actuator.



SOLUTION

After careful examination of our customers' application, we found the perfect unit.

The PA-04-HS with the push only option unit was able to resolve all the issues.



With the hall effect sensor, we were able to use two units in synchronous with each other.



The feedback signal provided by the sensor allows the control system to monitor the positions of both units continuously and calibrate the motion of each actuator to match the other. With this, our customer was able to mount the actuators on each side of the engine hatch instead of in the middle, which would obstruct the normal path into the engine compartment.



Moreover, two units working together to lift the engine hatch provides additional lifting capability – the combined power of two PA-04 can reach over 2500 lbs of force.



The push-only custom option was added to ensure that the user has access to the engine compartment no matter what. This modification allows the shaft of the actuator to detach from the ACME screw nut in the extending direction only, thus pushing the shaft forward. The ACME screw nut will then retract along the screw bit itself, but the weight of the engine hatch cover will always push the shaft against the screw nut, so the hatch cover will still close as normal.

In the event of power loss or lift failure, the hatch can be manually lifted without any damage to the actuators as the actuator shaft is not attached to the screw nut.



RESULTS



Reduced effort to open and close the hatch cover



Well protected engine



18 Month Warranty in case of unit failures



The solution was implemented on multiple lines of products



PA PRODUCT USED

PA-04-HS with Push Only customization



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