

WHAT PUSHES MY BOAT? SECRETS OF THE ENGINE MOUNT

MOST MARINERS UNDERSTAND that a vessel's propeller is the item that converts the torque supplied by the engine into thrust. But few of us think about the item that transfers the thrust to your vessel: the humble engine mount (unless there is a thrust bearing in place). After 35 years developing integrated propulsion systems, Henleys Propellers & Marine have learned that it's not just mariners – very few surveyors, engine suppliers, and even marine engineers recognize the importance of the engine mount ... until something goes wrong.

In the past, engines were solid mounted. Those engines were uncomplicated, slow revving, high torque beasts that (in general) ran smoothly in a wooden or steel vessel. With the engine shimmed or chocked into place, it was relatively easy to maintain engine-gearbox-output flange alignment to the shaft half coupling. The biggest issue with those arrangements was the boat itself deforming over time due to construction methods of the day.

During the 1970s and 80s, there was a change to increase applied BHP, higher revving engines, stiffer hull construction, and the use of rubber mounted engines – at the lower end of the commercial scale. Each supplier vowed to offer the smoothest running “anorexic” (low fuel consumption) engine. The *short term, immediate effects* were: less vibration; a faster vessel; and (sometimes) lower fuel consumption. But the *longer term effects* were: excessive driveline wear; greater gearbox seal leakage; more engine mount failures; and ... more vibration.

Engine mounts have several vital tasks. They must:

- Support the weight of the engine – either when static or when in a seaway – i.e. one ton-plus of engine mass moving in various directions depending on the sea state.
- Restrict the forward movement of the engine when under thrust conditions. When an engine moves forward, the back of the engine also moves – down or up depending on gearbox configuration. Low stability results in thrust-induced misalignment, resulting in wear and vibration.
- Restrict the extra forces applied by the mass and rotation of the engine when a vessel is in a heavy sea state. A good engine mount in good condition helps win the engineer's hard fought battle to achieve true flange-to-flange engine alignment – whether the vessel is in port or at sea, and in all working conditions.

POINTS TO CONSIDER:

Q: How important is axial movement?

A: For most installations that have a down angle, drop centre, or vee drive gearbox, the shaft thrust/axial movement needs to be 2.5mm maximum. (Less is better.) Working within this tolerance will ensure that the true shaft half coupling alignment to the gearbox output flange will be maintained under maximum applied thrust and in any Sea State. This reduces vibration and wear on gearbox/driveline seals and bearings.

Q: Are the standard mounts supplied with my engine configured to my particular installation?

A: No. In Henley's experience, mounts supplied with your engine are often generic. However the gearbox reduction can differ, which can result in different prop sizes/thrust figures – which in turn will result in varying amounts of axial loads and movement.



Isoflex engine mount

Q: Are Isoflex mounts generic?

A: No. Isoflex mounts are configured on a case-by-case basis. The gearbox configuration can be: inline; down-angle; drop-center; or vee-drive. Factors like placement of the mounts; support of the bell housing; the applied mass; anticipated thrust; and working conditions all need to be taken into account.

Q: What are Isoflex mounts made from?

A: Isoflex mounts are manufactured from an advanced engineering grade heat cured polymer and a combination of stainless steel, high tensile steel stud and marine alloy. Isoflex mounts and couplings electrically isolate the engine from the engine bed and drive train. One of their critical advantages over traditional rubber mounts is the high resistance of the engineering polymers to diesel, petrol, hydraulic fluid, water and normal engine lubricants.

Q: How important is the actual installation of Isoflex mounts into the vessel?

A: Installation is critical to the life expectancy of the mount. Fabricated engine bracketing can be out of alignment to the engine bed. Soft rubber-type mounts can be more forgiving in this area – but the downside is that they allow too much axial and horizontal deflection. It is imperative that the top of the engine bed is parallel to the base of the engine mounting bracket in all planes to avoid any pre-load on the engine mount. If your bracket is misaligned, consider the Isoflex swivel adjuster system, which allows up to five degrees of misalignment.

QUESTIONS TO ASK WHEN BUYING YOUR NEXT MARINE ENGINE:

- Soft rubber engine mounts work great in my car – but no thrust, no seaway. How will your mounts work *in my boat*?
- What is the applied thrust of this engine you are about to sell me? Have the mounts been configured to suit my installation?
- Will the mount system retain the engine to 2.5mm maximum movement in all directions and conditions?

The answers may enlighten you! ■

www.henleyspropellers.com