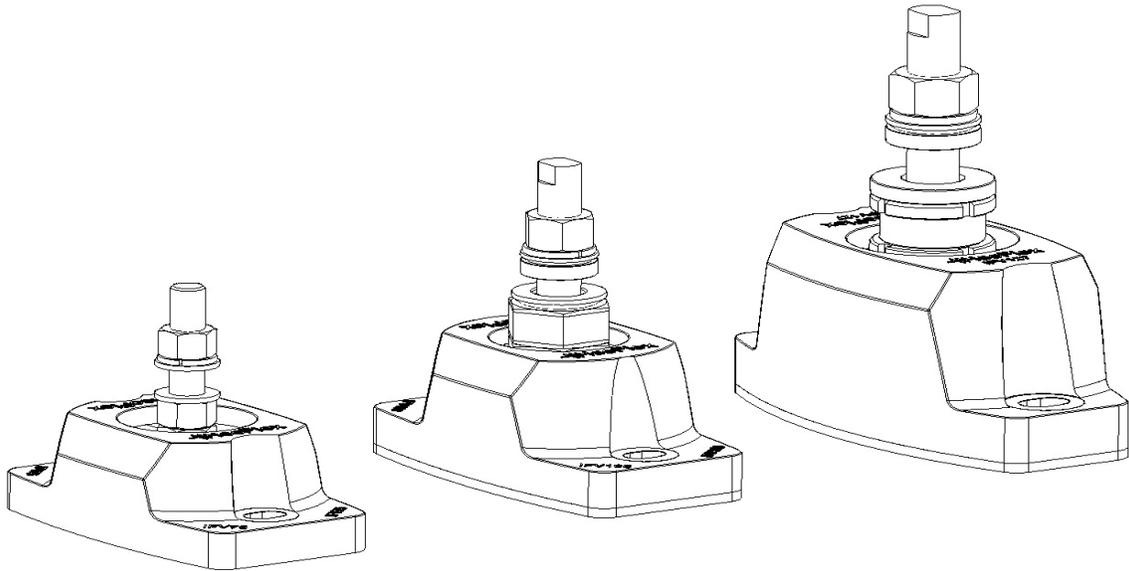




MARINE ENGINE MOUNTS S-TYPE ADJUSTING STUD

IFV and MDV Mounts

INSTALLATION INSTRUCTIONS



INSTRUCTIONS Isoflex Engine Mount Installation (S-type Adjusting Stud)

Before you begin

Thank you for choosing Isoflex engine mounts!

Isoflex engine mounts are designed to control vibration and improve stability. The engineered polymer construction provides superior resistance to degradation in extreme marine environments. Isoflex polymers are highly resistant to oils, fuels, water, hydraulic fluids and climatic conditions.

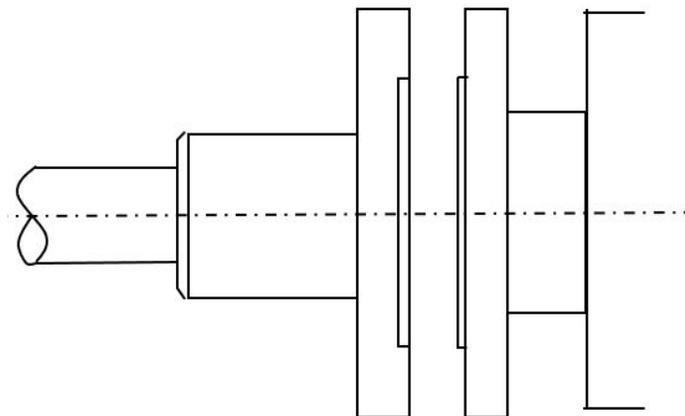
The Isoflex marine engine mounting system is designed and configured to give at least 85% vibration isolation at the worst case engine idle scenario. Isoflex mounts stabilize engine movements in all directions, resulting in significantly reduced thrust-induced misalignment. The sizing range of Isoflex mounts enables replacement of most engine mounts used by the major manufacturers.

Correctly installing and balancing engine mounts is vital to their functionality and reliability. They are the link that connects the thrust from the propeller to your vessel. If they are overloaded, their longevity will be compromised and may result in alignment issues. If they are underloaded, it will likely result in vibration issues. It is well worth the extra time to make sure you have your mounts correctly installed so that your vessel can reach its optimal performance.

A note about shaft alignment

Shaft alignment and engine mount installation go hand in hand. Incorrect shaft alignment can cause unbalanced loading of engine mounts and poorly installed engine mounts can cause incorrect shaft alignment. It is important to make sure it is correct, during and after installing the engine mounts.

The spigot/pilot should align with the shaft in the middle of the range of shaft movement in all directions. Once the spigot alignment is correct, the flange faces should typically have no more than 0.05mm (0.002") misalignment between them. Due to hull flex, it is imperative that alignment is performed in the water.

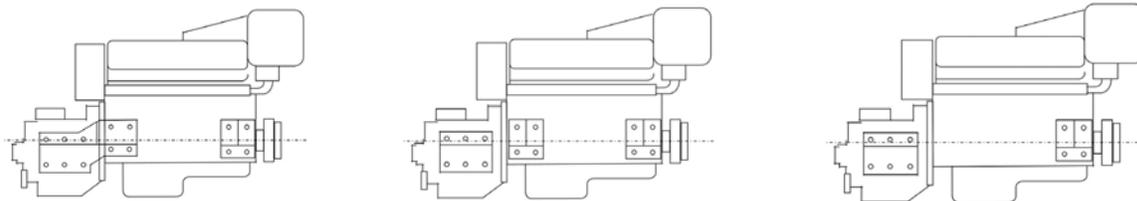


Shaft and spigot alignment

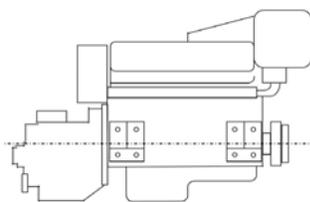
Use the correct mounting points

The engine mounts should always be fitted as close as possible to the engine crankshaft centerline.

The engine and transmission mounting points are dictated by the engine manufacturer and should be used to determine the appropriate mount core selection for a balanced system.



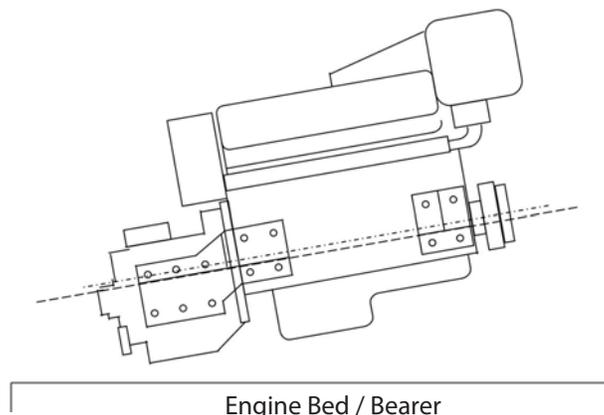
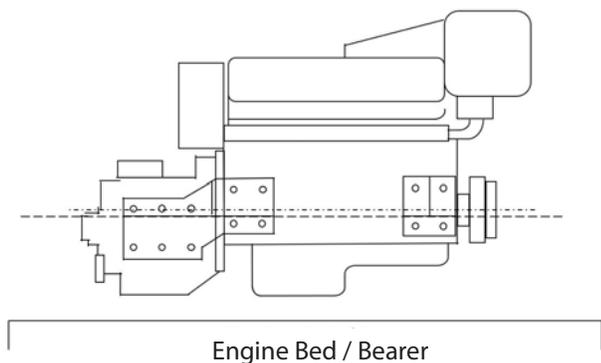
Preferred bracket arrangement



Bracket arrangement NOT recommended.
(Transmission is not supported!)

Brackets and engine bed must be parallel

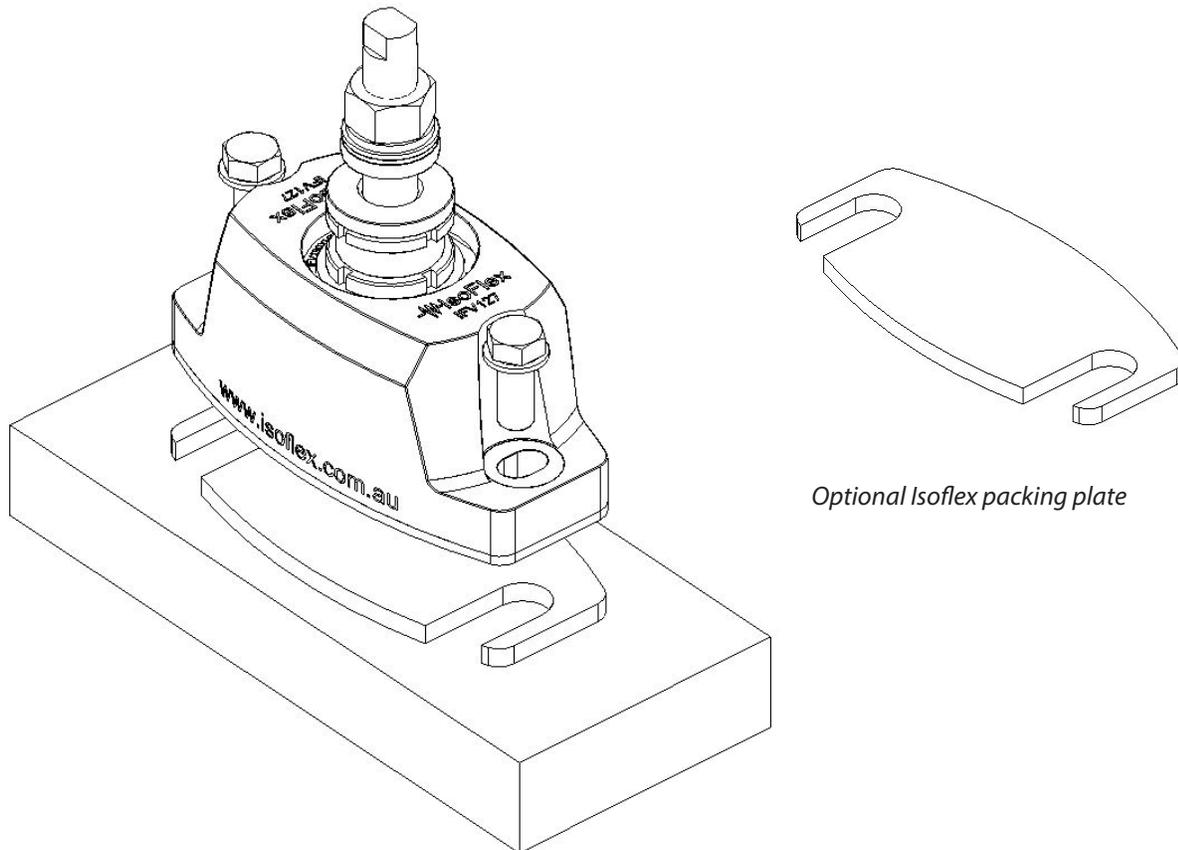
Even when using mounts with swivel adjusters, the mounting bracket should be aligned parallel to the engine bed in the longitudinal and lateral directions.



Ensure your mounts fit

Ensure your Isoflex mounts will fit in the allowed space. If the mounts will not fit, review the selected mounts or make the required modifications. The space between the engine bed and engine bracket (free height) should be as close as possible to the minimum heights of your selected mounts. This will ensure enough range of adjustment to correctly balance and align the engine package.

Isoflex mounts are designed with a maximum height adjustment of 10mm. If the free height is too large for the mount's adjustment range, then Isoflex has packing plates (shims) available in 6mm and 10mm sizes.



Packing plate under engine mount

Optional Isoflex packing plate

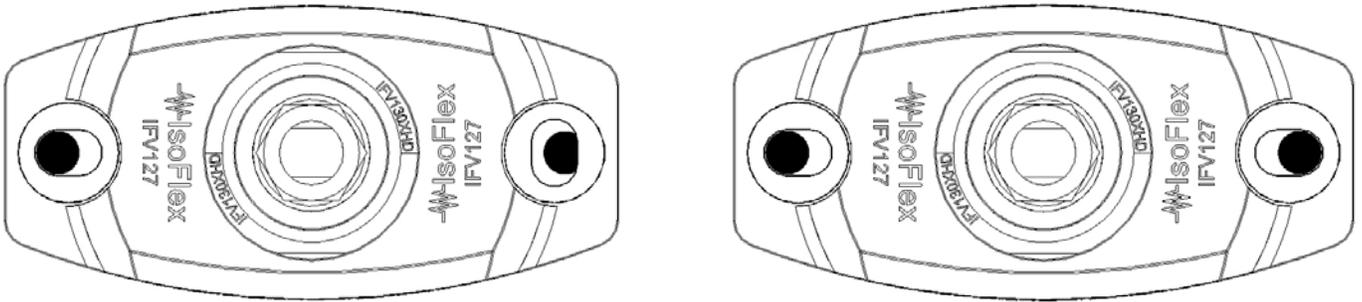
Replacing existing mounts: Option to change slot orientation of the base inserts

The IFV and MDV mounts have been designed so that you can change the slot orientation of the base inserts.

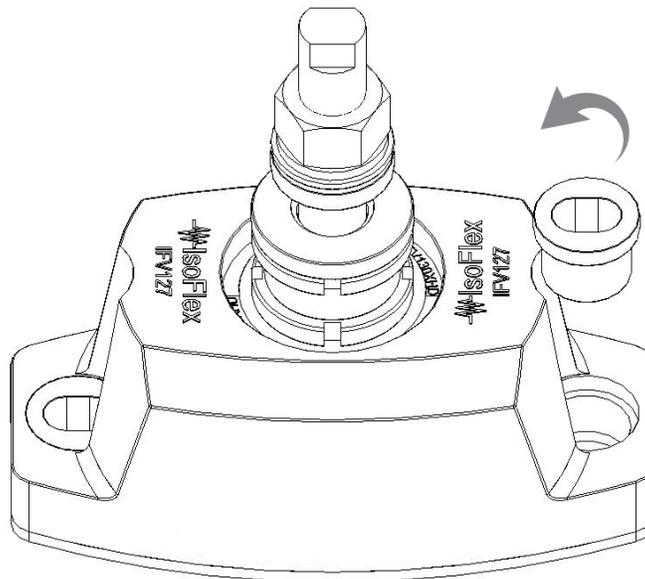
If you are replacing existing mounts and the bolt spacing is slightly off, you may press the insert out, rotate it to the desired location, and press it back in.

This will require the use of a vise or a shop press, as it cannot be done by hand. Isoflex recommends changing one insert at a time to ensure the rest of the mount stays assembled.

Note: This option is not applicable for the IFV30, IFV55, IFV75 and IFV85 mounts.



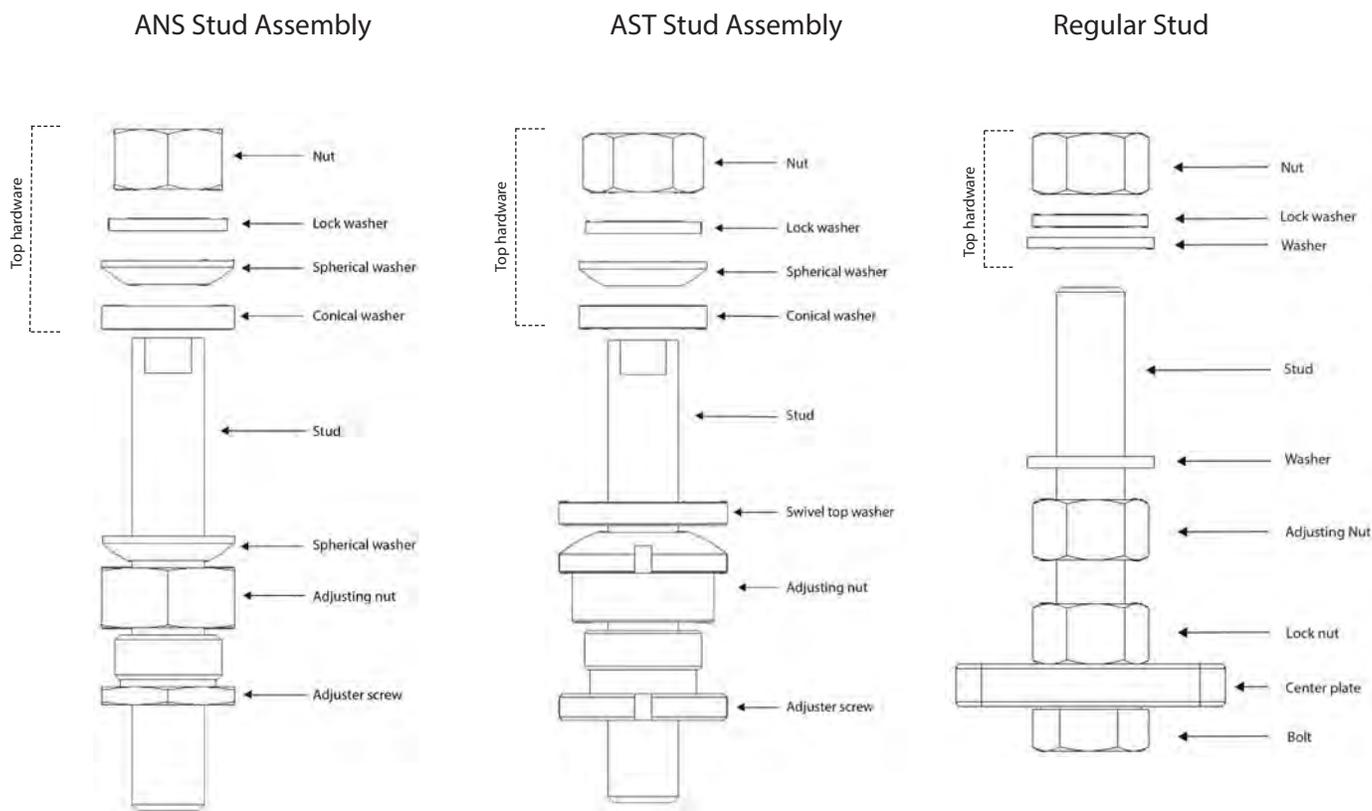
Slot orientation of the base inserts can be changed



Isoflex Mount Stud Assembly Types

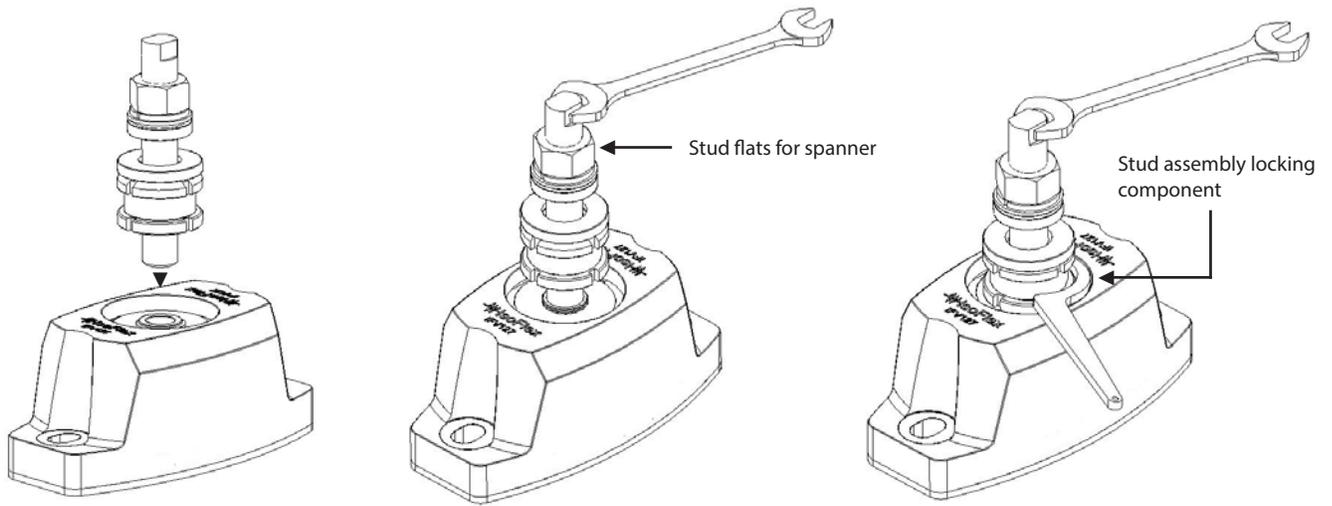
Isoflex offers a range of different stud assemblies based on the size of the mount ordered. These installation instructions use diagrams based on our **AST adjuster system**.

While you may have a different adjuster system with your mount, the installation process is identical for all stud assemblies.



Note: IFV30, IFV55, IFV75 and IFV85 use a bolt in place of a stud, which can only be removed by taking the cores out of the bottom of the base.

Step 1 - Install the stud assembly into the mount



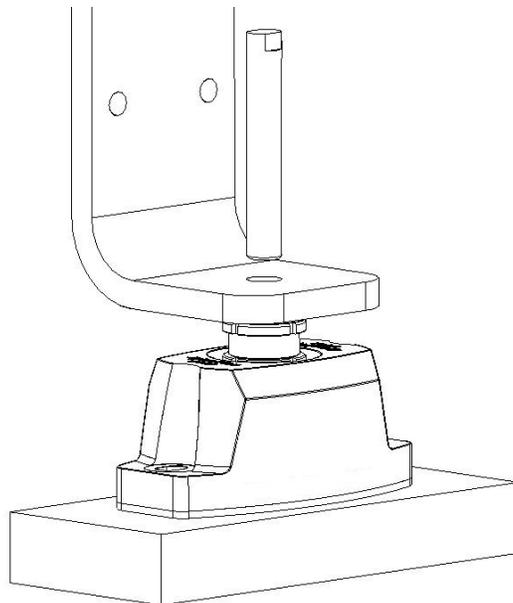
Use the flats on the stud to screw the stud into the mount. Ensure stud is completely installed into the mount.

The recommended torque for installing the stud is 30 Nm (22 ft-lb).

Hold the stud by the flats using a spanner, and lock the stud assembly by tightening the adjuster screw / lock nut into the mount.

For IFV30, IFV55, IFV75 and IFV85 mounts, skip this step.

The stud can be installed after the mount is positioned under the engine bracket if required due to height restrictions or for ease of installation if desired. *(Not applicable for the IFV30, IFV55, IFV75 and IFV85 mounts as the studs cannot be removed).*



Mount positioned under engine bracket

Step 2 - Remove old mounts (if replacing)

Lift and support the engine.

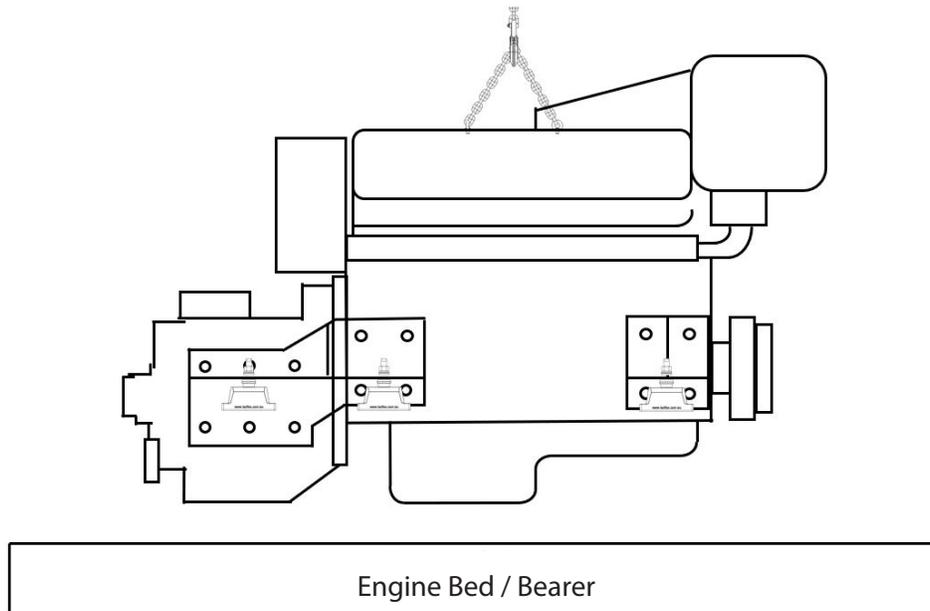
Remove old engine mounts if replacing.

Remove the **top hardware*** (top nut and washers) of the stud assembly. Put the mount studs through the engine brackets and loosely attach with **top hardware** so the mounts are hanging off the brackets.

Alternatively, remove the **top hardware**, place Isoflex engine mounts on the engine bed, and lower the engine so mount studs are through the engine brackets.

Lower the engine and align the transmission with the propeller shaft.

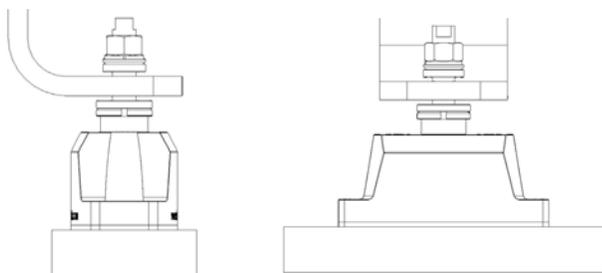
**Refer to Stud Assembly descriptions on page 6 for top hardware information.*



Step 3 - Ensure the mounts sit correctly on the engine bed

The mount must **not** be allowed to overhang the engine bed.

Correct



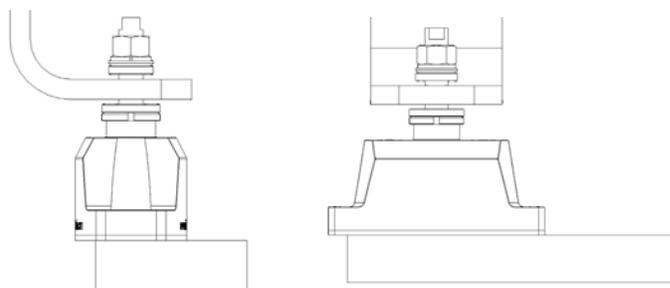
Mount centered



Mount centered



Incorrect



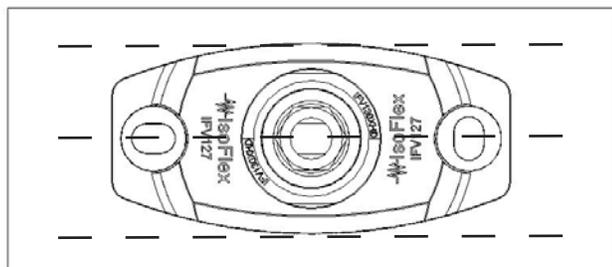
Mount overhangs



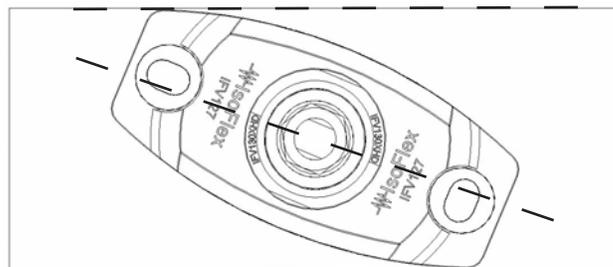
Mount overhangs



The mounts should run parallel with the propeller shaft for optimum thrust capacity.



Parallel

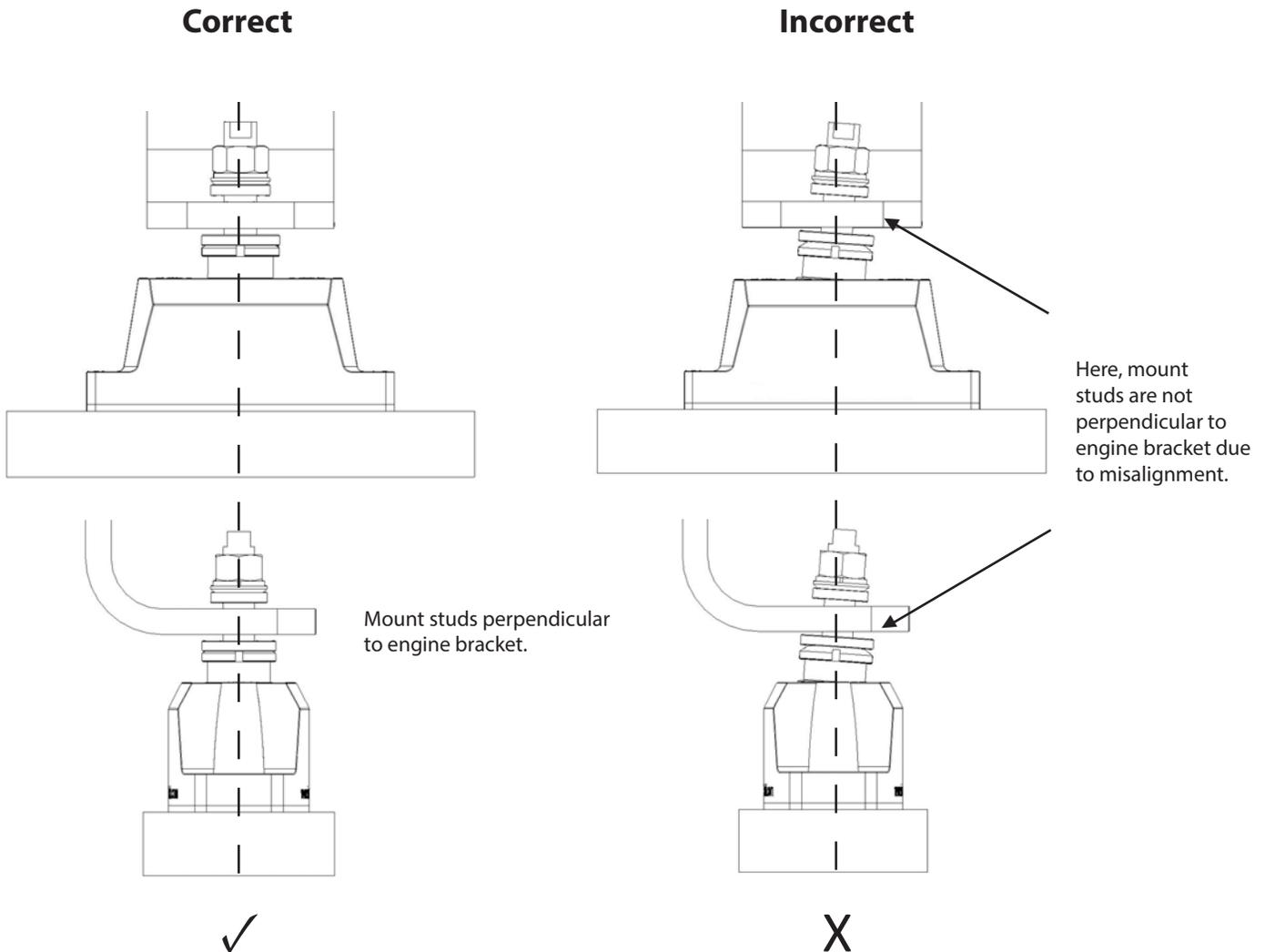


Not parallel



Step 4 - Ensure engine brackets align with the mount

Ensure the mount stud aligns correctly with the engine brackets. If the stud is not perpendicular to the engine brackets and engine bed, then the functionality of the mount will be compromised.



The slotted holes in the mount base will allow for slight repositioning to align the mount, and the Isoflex self-aligning swivel adjuster allows for up to 4° of misalignment between the engine bed and engine brackets.

Make any required modifications to establish the correct position for the mounts and the correct relationship between the engine bed and engine brackets. This may mean modifying the engine beds, slotting engine brackets, or using parallel or tapered packing plates (shims) to fit between the engine bed and mounts.

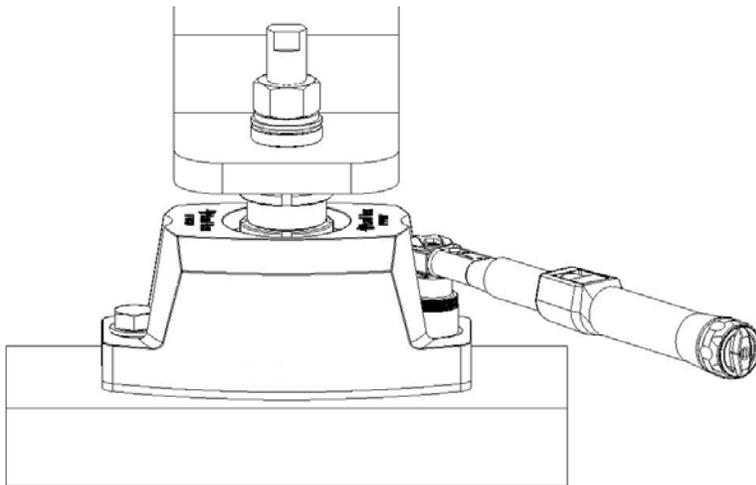
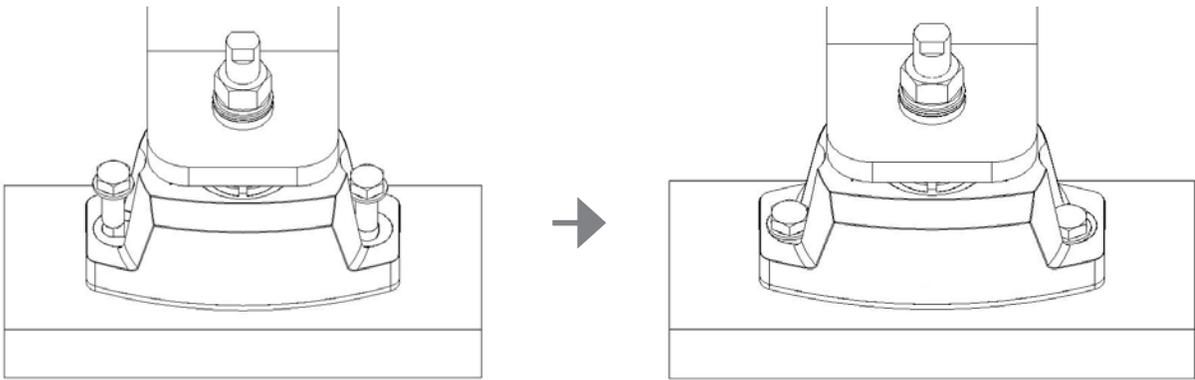
Isoflex has packing plates (shims) available in 6mm and 10mm sizes in case the gap between the engine brackets and engine bed is too large.

Step 5 - Secure the mount to the engine bracket

Once the mounts are correctly aligned to the engine bed and engine brackets, secure the mounts to the engine bed.

The hold-down bolts should be fastened to the correct torque. Refer to the chart below for correct torque.

This torque should be checked again at the end of the installation.



Check hold-down bolts

Hold-down bolt size	Recommended torque	
	Nm	ft-lb
M8 (5/16")	8	6
M10 (3/8")	15	11
M12 (1/2")	30	22
M16 (5/8")	70	52

Step 6 - Note the unloaded height of the mounts

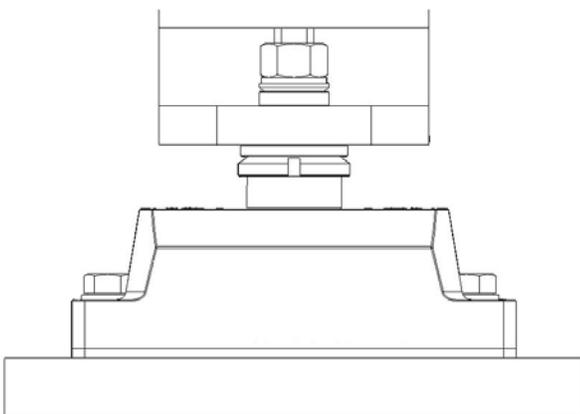
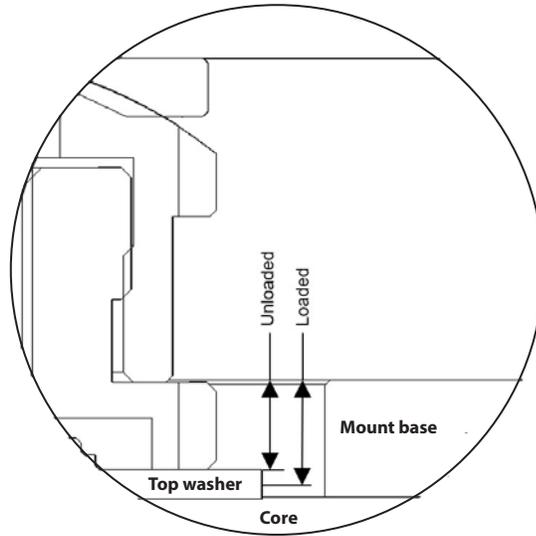
Make note of the **unloaded height** of each mount using the chart below. This is the dimension from the top of the mount base to the top face of the washer.

Record the measurements of your selected mounts on **page 14 (Step 9)**. You may also record your measurements on the *Isoflex Engine Mount Deflection Worksheet*, and submit it to Isoflex (see instructions at the bottom of page 14).

You may also manually measure the unloaded height of the mount.



Important note: Comparing the distance between the engine bracket and engine bed is not an accurate indicator of static deflection in many cases due to engine bed inaccuracies.



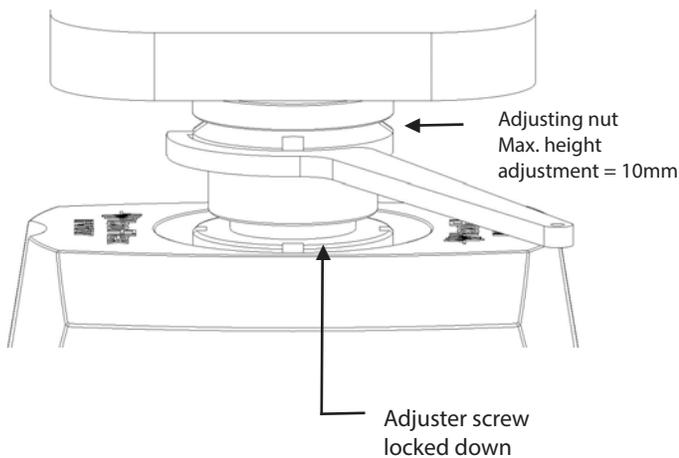
Nominal Unloaded Height		
Mount	mm	inch
IFV30*	5.0	0.20
IFV55*	5.0	0.20
IFV75*	10.0	0.39
IFV85*	10.0	0.39
IFV90	7.0	0.28
IFV100	7.0	0.28
IFV110	7.0	0.28
IFV125	9.0	0.35
IFV127	9.0	0.35
IFV130	9.0	0.35
IFV136	8.0	0.31
IFV139	8.0	0.31
IFV140	8.0	0.31
MDV90	7.0	0.28
MDV100	7.0	0.28
MDV125	9.0	0.35
MDV128	9.0	0.35
MDV130	9.0	0.35
MDV131	9.0	0.35

* These mounts have **no top washer**: Measurements taken from core top surface

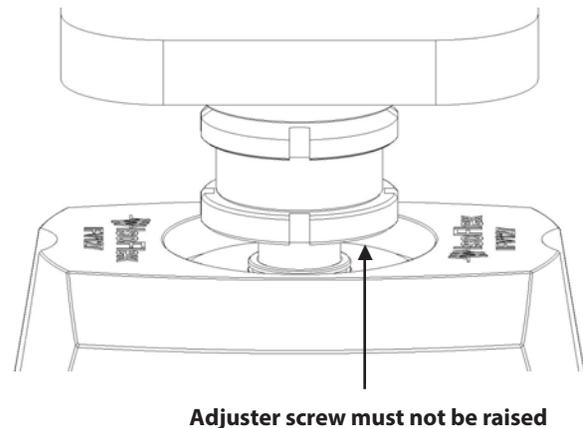
Step 7 - Adjust mount height to fit the engine bracket

Wind the adjusting nuts up the engine bracket until the mounts begin to take load off the engine support. Once all mounts are partially loaded, remove the engine support to transfer the entire weight of the engine package onto the mounts.

Correct



Incorrect



Step 8 - Install the mounts

With the engine fully supported by the mounts, begin winding the mounts up to bring the transmission back into alignment with the shaft. Carefully work all mounts up together, paying close attention to getting equal load sharing on each pair of mounts (front, middle, rear), by measuring the heights of the mounts.

Correctly aligning the engine/gearbox assembly is critical. It is time consuming and in some cases may take up to an entire day. Isoflex mounts are adjustable and are designed to assist this process. This design allows for both shaft alignment and weight distribution.



The adjusting nut must not be raised by more than 10mm.

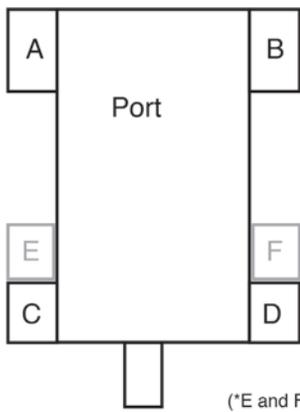
Step 9 - Calculate static deflection

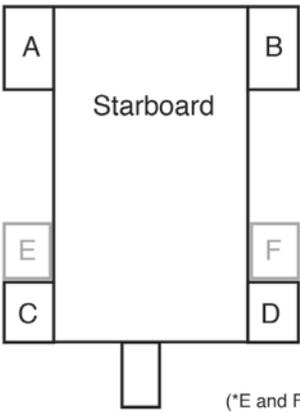
Measure the **loaded** height of each mount as described in **Step 6**. Record your measurements below, then use your recorded measurements to calculate the static deflection for each mount using the formula below.

When measuring the loaded height of a mount, check multiple locations to ensure the mount is not preferentially loaded in any direction. If there is a significant difference in measurements, the mount may not be correctly positioned or the engine load not correctly distributed between mounts.

If using an MDV mount (double mount), both cores must have the same static deflection to ensure the load is evenly distributed between the cores.

$$\text{Static Deflection} = \text{Nominal Loaded Height} - \text{Unloaded Height}$$

	<p>Loaded Heights (PORT)</p> <p>A: _____</p> <p>B: _____</p> <p>C: _____</p> <p>D: _____</p> <p>E*: _____</p> <p>F*: _____</p>	-	<p>Unloaded Heights (PORT)</p> <p>A: _____</p> <p>B: _____</p> <p>C: _____</p> <p>D: _____</p> <p>E*: _____</p> <p>F*: _____</p>	=	<p>Mount Deflections (PORT)</p> <p>A: _____</p> <p>B: _____</p> <p>C: _____</p> <p>D: _____</p> <p>E*: _____</p> <p>F*: _____</p>
(*E and F for a 6-mount system)					

	<p>Loaded Heights (STARBOARD)</p> <p>A: _____</p> <p>B: _____</p> <p>C: _____</p> <p>D: _____</p> <p>E*: _____</p> <p>F*: _____</p>	-	<p>Unloaded Heights (STARBOARD)</p> <p>A: _____</p> <p>B: _____</p> <p>C: _____</p> <p>D: _____</p> <p>E*: _____</p> <p>F*: _____</p>	=	<p>Mount Deflections (STARBOARD)</p> <p>A: _____</p> <p>B: _____</p> <p>C: _____</p> <p>D: _____</p> <p>E*: _____</p> <p>F*: _____</p>
(*E and F for a 6-mount system)					

Static Deflection Requirements: A = B
 C = D
 E = F

If you would like further assistance calculating static deflection please contact Isoflex. If you would like Isoflex to review your static deflection to ensure the mounts were installed correctly, you may complete, scan and send the *Isoflex Engine Mount Deflection Worksheet* by email to info@isoflextech.com, available online at www.isoflextech.com. Please note any warranty claims will require the *Isoflex Engine Mount Deflection Worksheet* to be completed and submitted to Isoflex.

Step 10 - Compare adjusted height

Compare the static deflection of the mounts to ensure they are operating within their correct compression range. Each mount pair should have the same static deflection but the different mount pairs may vary slightly due to the mass distribution and varying mount hardness. Ideally the difference should be no greater than 0.5mm.

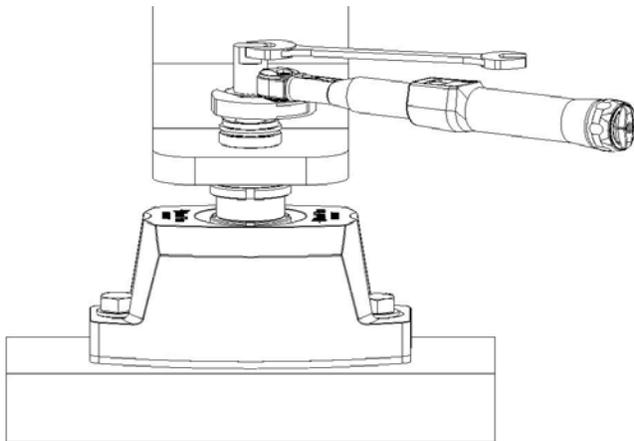
For optimal performance for a 6 cylinder engine, the static deflection of Isoflex mounts should be approximately 2mm to 2.5mm.

For 2 to 4 cylinder engines, the static deflection of Isoflex mounts should be approximately 3mm to 3.5mm.

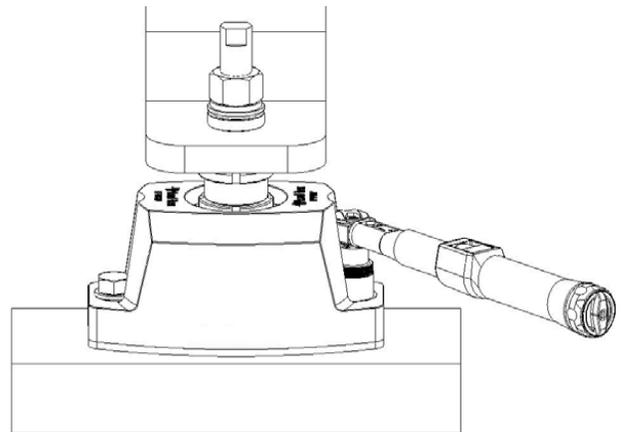
Step 11 - Secure mount to correct torque

With the engine correctly balanced, secure the top nut of the stud assembly to the recommended torque. When doing so, hold the stud so as to avoid twisting it.

Check that the hold-down bolts are still fastened to the correct torque and tighten if required.



Secure the top nut



Check hold-down bolts

Top nut size	Recommended torque	
	Nm	ft-lb
M12	30	22
M16	70	52
M20	135	100
M24	230	170

Hold-down bolt size	Recommended torque	
	Nm	ft-lb
M8 (5/16")	8	6
M10 (3/8")	15	11
M12 (1/2")	30	22
M16 (5/8")	70	52

Step 12 - Recheck alignment

If alignment was performed on land it must be immediately re-done in the water due to hull flex.

Alignment should be rechecked after 50 hours of operation to allow for the system to settle.

Inspection

Mounts should be inspected regularly. Visibly look for deterioration of the mount components and check that fasteners remain tight.

Recheck shaft alignment during annual maintenance.

Care & Maintenance

Isoflex recommends applying to the mounts a regular anti-corrosion lubricant such as Inox to keep components corrosion free. While Isoflex polymer components are chemically resistant to most solvents and oils, etc, it is recommended that any anti-corrosion lubricants are checked for chemical compatibility before application. Isoflex does not recommend painting the mount cores.

Special Notes Regarding the Information in this Document

This installation document gives specific instructions and requirements regarding the installation of Isoflex Marine Engine Mounts, S-type Adjusting Stud. For the effective operation of Isoflex marine engine mounts, the requirements described herein must be met. Failure to meet the requirements may result in decreased reliability and premature wear of the mount(s) and loss of warranty.



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