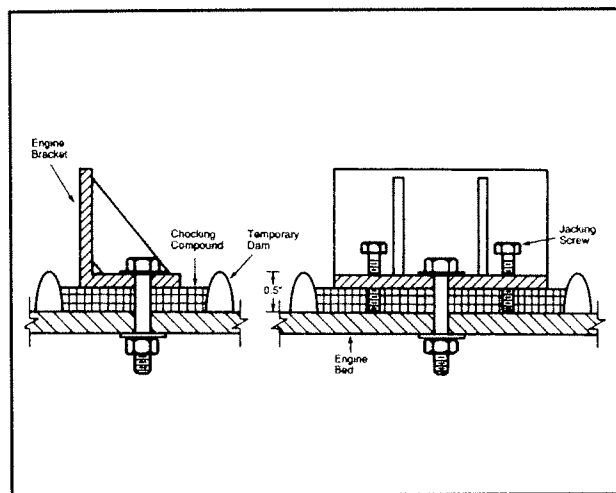
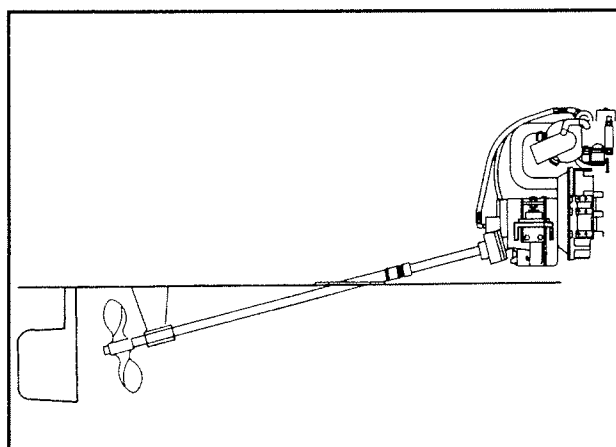


On a solid mounted engine, temporary alignment is made with jacking screws (if available in the engine supports) or with temporary jacks and lifts. Shims are made to fit exactly between the engine mounts and the engine bed. With the engine mounting bolts installed, the jacking screws are backed off or the temporary jacks removed. On wood or soft engine beds, steel plates should be used under jacking screws to prevent damage to the engine bed.

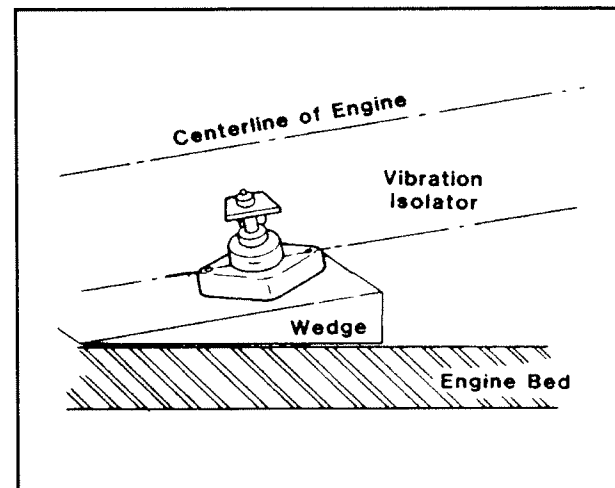


A flexibly mounted engine "moves" on the engine mounts. Therefore the shafting connected to the marine gear output flange must be free to move with the engine. Most recreational boat installations use a flexible stuffing box and a single strut bearing to support the propeller shafting while allowing for freedom of movement in the shafting.



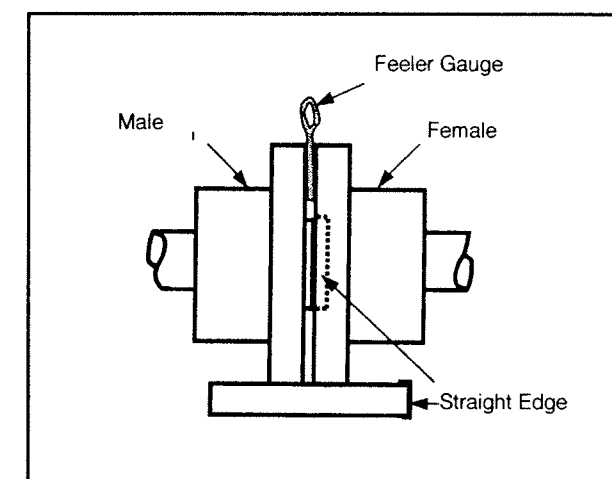
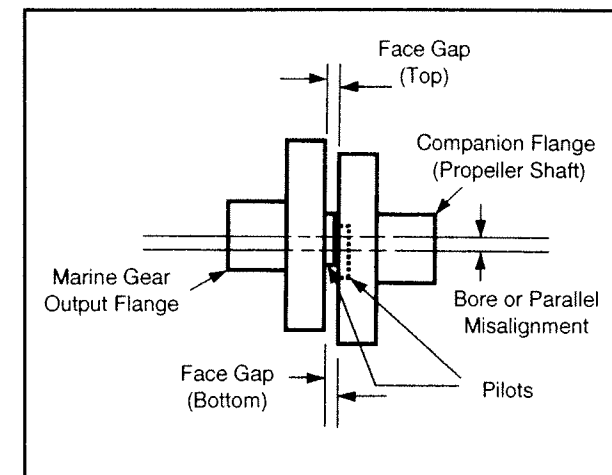
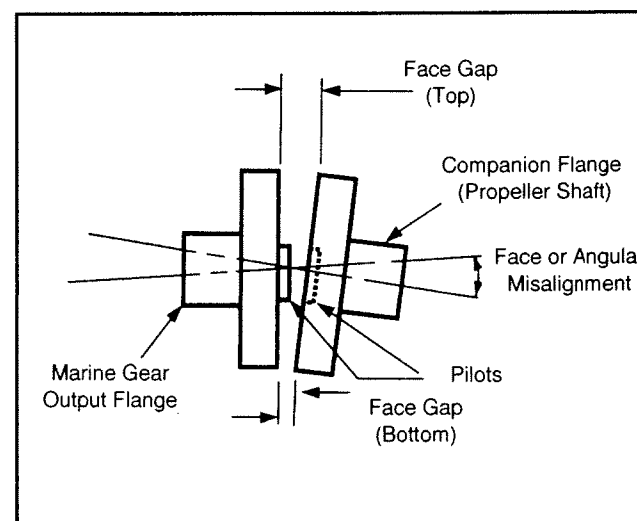
On flexible mounted engines, the engine is aligned using the adjusting nuts on the vibration isolators. Isolator studs are not designed for major adjustments. The maximum and minimum adjustments are indicated in our installation diagrams.

Shimming should be used when additional height is needed. Flexible mounts without a height adjusting nut must be aligned by shimming under the mount.



*The propeller shaft flange bore and face alignment must be within gear manufacturers recommendation.*

While aligning the engine and gear, check both the propeller shaft flange bore and face. The bore alignment must be within gear manufacturers recommendations to allow the propeller shaft flange and marine gear output flange to mate properly. The face alignment must be within gear manufacturers recommendation when checked with a feeler gauge at the top, bottom, and each side of the flanges. Both fixed and flexible mounting arrangements must meet these specifications.



Final alignment should not be done until after the vessel is in the water, and loaded to its normal operating condition. The alignment must be redone each time a flexible mounting system is disconnected from the propeller shaft. Annual alignment checks are recommended.

#### Propeller/Gear/Shafting Mounting

*The engine must reach maximum rated RPM under fully loaded vessel conditions.*

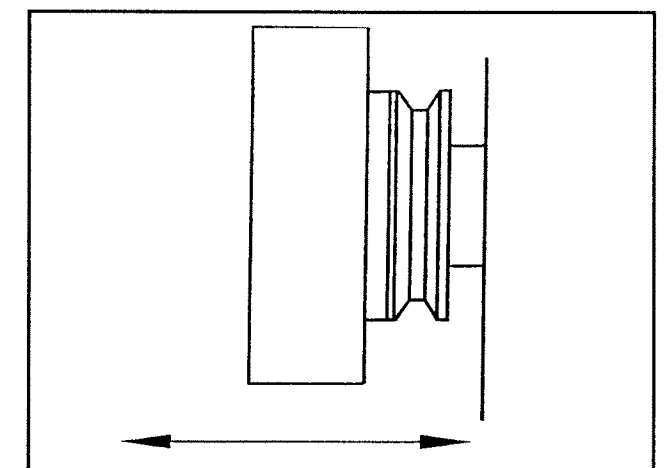
Proper propeller, gear and shafting sizing is very important in ensuring performance and durability. Contact local your Cummins distributor or dealer for assistance in these matches.

*The engine must have sufficient crankshaft end clearance with the marine gear and any FPTO installed.*

Without end clearance, the crankshaft will be turning in solid contact with the engine thrust bearing surface and will damage the thrust bearing and crankshaft. A simple test is to push the crankshaft vibration damper hub in until the crankshaft contacts the thrust bearing. Then pull the crankshaft forward. The crankshaft free axial movement with the marine transmission or front PTO installed is listed below:

B series	
Min.	-.127 mm (.005")
Max.	-.355 mm (.014")
C series	
Min.	-.157 mm (.006")
Max.	-.334 mm (.013")

This should be checked before and after installation of marine gear and PTO to assure these components do not affect crankshaft endplay. Proper installation of the marine gear or PTO is essential. Refer to your local distributor or dealer for proper procedure.



The engine should not be run without sufficient end clearance.

#### Propeller Rotation in Twin Engine Applications

Engine rotation is viewed from the front of the engine, looking at the engine damper. Propeller rotation is viewed from behind the boat, looking forward at the propeller. Therefore, a RH rotation engine and a LH rotation propeller are turning in the same direction.