

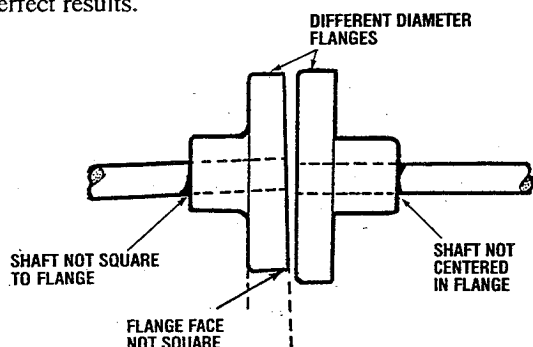
PROPELLER SHAFT ALIGNMENT

ALIGNMENT

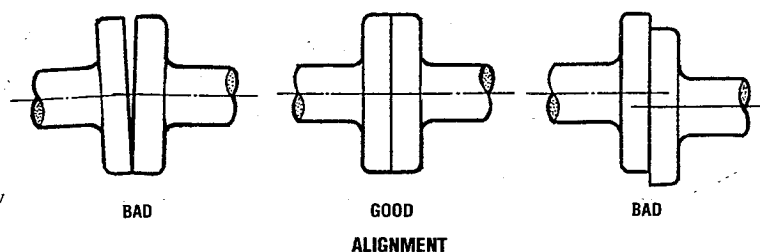
The engine must be exactly aligned with the propeller shaft. No matter what material is used to build a boat, the material will be flexible to some extent. The boat's hull will change its shape to a greater extent than is usually realized when the boat is launched and operated in the water. Therefore, it becomes extremely important to check the engine's alignment at frequent intervals and to correct any errors when they appear.

Misalignment between the engine and the propeller shaft often creates serious problems which are often blamed on other areas suspected of causing the trouble. Misalignment will cause excessive bearing wear, rapid shaft wear, and will, in many cases, reduce the life of the boat's hull by loosening the hull's fastenings. A bent propeller shaft will produce these same effects, therefore a perfectly straight propeller shaft is absolutely necessary. One result of misalignment may be leakage of transmission oil through the transmission's rear oil seal. If oil should leak from this seal, check and make sure that the alignment is within the limits prescribed.

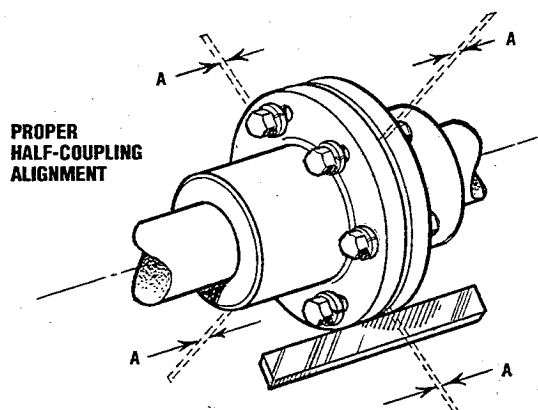
Never attempt a final alignment when the boat is on land. The boat should be in the water and have had an opportunity to assume its final water form. The propeller shaft/transmission coupling alignment is best performed with the fuel and water tanks about half full, with all the usual equipment on board, and, on sailboats, after the mainmast has been stepped and the final rigging has been installed. Take sufficient time to make this alignment — don't be satisfied with less than perfect results.



SHAFT/COUPLING PROBLEMS THAT AFFECT ENGINE ALIGNMENT



The alignment is correct when the propeller shaft can be easily slipped backward and forward into the counterbore, and when a feeler gauge indicates that the flanges come together at all points. The alignment between the propeller shaft half-coupling and the transmission half-coupling can contain an error no greater than .001 in (.025 mm) per inch of the coupling diameter. For example, if your propeller shaft half-coupling is 3 in (76 mm) in diameter, the maximum error that can be allowed in the alignment is .003 in (.076 mm).



In making the final check for alignment, the transmission half-coupling should be held in one position and the alignment with the propeller shaft half-coupling tested with the propeller shaft half-coupling in each of four positions (A), while rotated 90° between each position. This test will also check whether the propeller shaft half-coupling is in exact alignment on its shaft. Then, keeping the propeller shaft half-coupling in one position, the alignment should be checked by rotating the transmission half-coupling in 90° increments, checking dimension (A) while in each 90° position until it has been rotated full-circle.

The engine's alignment should be rechecked after the boat has been in service for one to three weeks and, if necessary, the alignment performed again. Usually it will be found that the engine is no longer in alignment. This does not mean that the first alignment has been done improperly, rather, it means that the boat has taken some time to take its final shape and that the engine's bed and stringers have probably absorbed some moisture. It may even be necessary to realign the coupling halves again at a later time.