Drive System

Section 8B - Propeller Shaft Models

Table of Contents

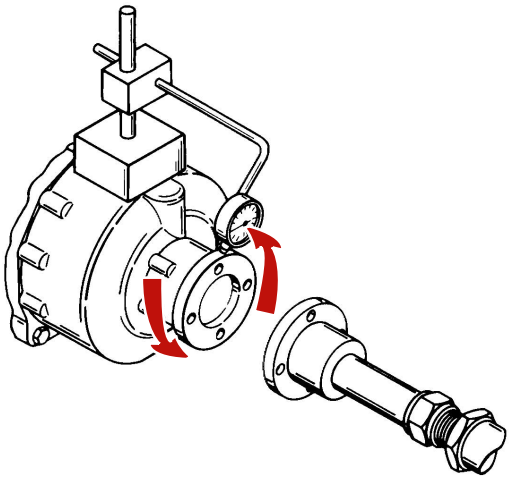
Specifications

Description	
Propeller shaft runout	0.1mm (0.004 in.)

In the Water Inspection

NOTE: *The following information is a basic guide to help identify vibration issues in boats powered by inboard engines. For more in-depth installation, alignment and repair information for the propeller shaft, struts, shaft logs and rudders refer to the boat manufacturer's service manual. If the boat is equipped with V-Drive or a remote mounted V-Drive refer to the boat manufacturer's service manual. For MIE engine installation and alignment, refer to* ***SECTION 2C*** *of this manual.*

1. Disconnect the propeller shaft from the transmission output flange.
2. Inspect the transmission and propeller shaft hubs for damage.
3. Check the fit of the transmission output flange to the propeller shaft.
   a. Loosen the set screws.
   b. Inspect the transmission output and propeller shaft flange mating faces for rust, scratches, metal burrs, and foreign material
   c. Try to move the flanges by hand. They should fit together snugly with no side to side movement.
   d. Check the shaft for wear. If worn, replacement of the shaft may be necessary. If the shaft is not worn try another coupler flange.
4. Check the transmission output flange. Rotate at least two complete revolutions for each check.
   a. Measure runout at the outside diameter of the transmission output flange with a dial indicator and block set.



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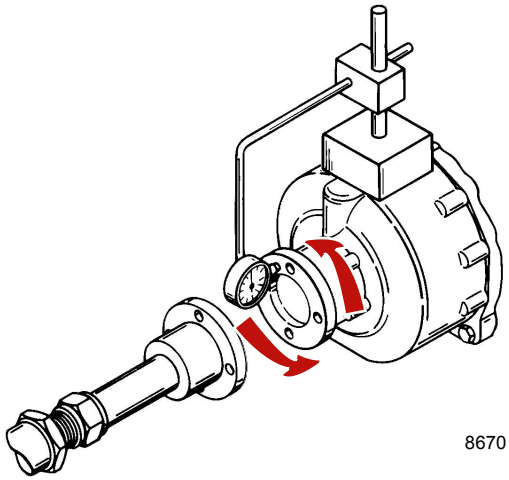
Typical dial indicator setup

b. Measure runout at the outer face of the transmission output flange with a dial indicator and block set.



Typical dial indicator setup

Description	TM345A
Runout, transmission output flange outside diameter	0.1mm (0.004 in.)
Runout, transmission output flange face	

5. If runout specifications are exceeded, replace the output flange and realign the engine.
6. Torque the propeller shaft to transmission output flange bolts.

Description	Nm	lb. ft.
Propeller shaft-to-transmission coupling bolt	68	50

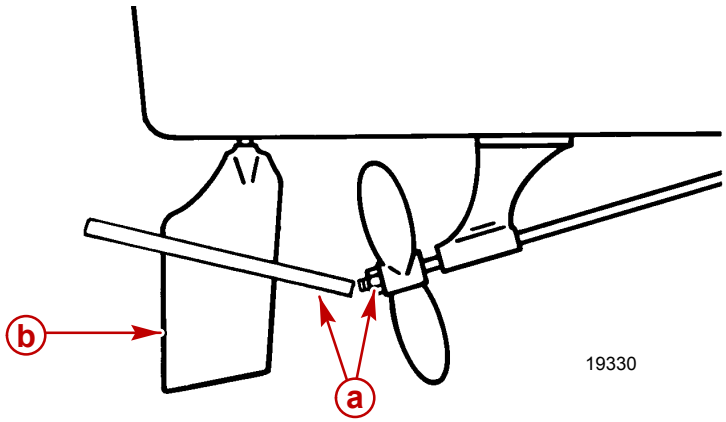
7. Tighten securely and safety wire the set screws, if equipped.

Checks Made With The Boat Out Of The Water And The Propeller Shaft Installed

Possible causes for vibration may be the propeller shaft, propeller-to-shaft fit, or the propeller. All 3 can be checked by using the rudder, a strong metal straight edge and a C-clamp.

1. Check the installation and seating of the propeller to the shaft.
   a. Remove the propeller.
   b. Check for a chipped or cracked keyway in the propeller.
   c. Install the propeller on the shaft without the key.
   d. Mark the shaft (behind the propeller), then remove the propeller.
   e. Install the key and propeller. Ensure that the propeller still lines up with the mark. This ensures that the key is not oversized and holding the tapers apart. Retighten the propeller nut.
   f. Ensure that the key is not sticking out of the propeller.
2. Check the propeller shaft runout to ensure that the shaft is not bent aft of the strut.
   a. Position the corner of the straight edge at the center of the shaft.
   b. Rotate the shaft one complete revolution.

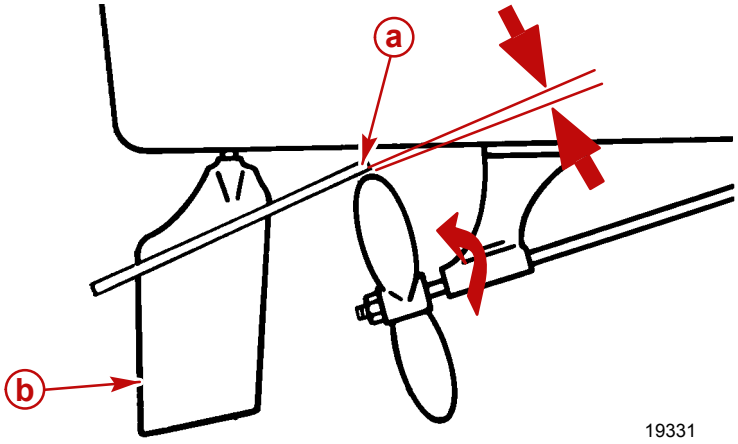
c. If the shaft wobbles, shaft runout is not correct. Replace the shaft.



a - Metal straight edge (held to the rudder with a C-clamp)

b - Rudder

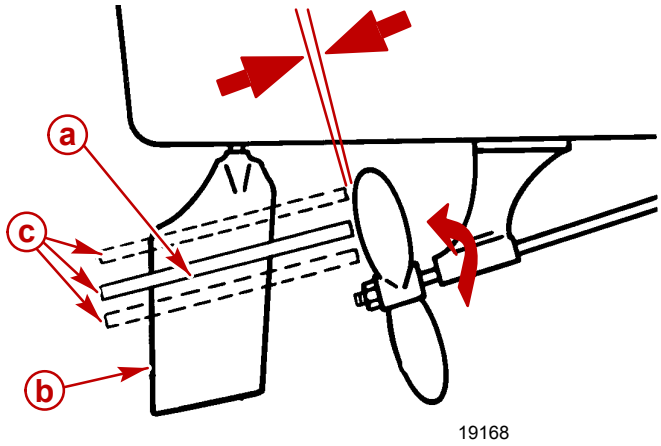
3. Compare the diameter of all propeller blades. If they are not the same, repair or replace the propeller.



a - Metal straight edge (held to the rudder with a C-clamp)

b - Rudder

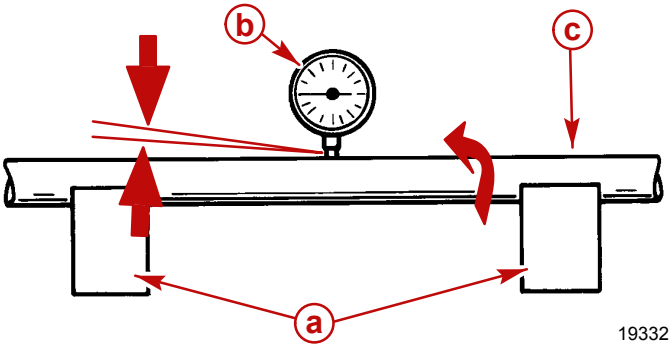
4. Ensure that all propeller blades are the same pitch. Reference at three different points on each blade. If each blade pitch is not the same, repair or replace the propeller.



a - Metal straight edge (held to the rudder with a C-clamp)
b - Rudder
c - Three points of reference

Checks Made With the Propeller Shaft Removed From the Boat

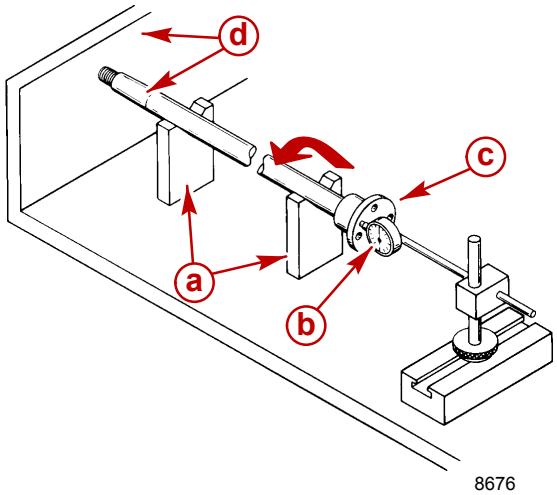
1. Check the propeller shaft runout. Check through one complete revolution, at three or four places. Replace the shaft if the measured value is greater than specified.



a - V-blocks
b - Dial indicator
c - Shaft

Description	
Propeller shaft runout	0.1mm (0.004 in.)

2. Ensure that the bore of the coupler is at 90° to the coupler flange. Check through one complete revolution. Replace the coupler if the measured value is less than or greater than specified.



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a - V-blocks
b - Dial indicator
c - Coupler flange
d - Shaft (against block to prevent fore and aft movement)

Description	
Couple bore-to-face runout	0.00 mm (0.000 in.)

Strut

Refer to the boat manufacturer's service manual for alignment and replacement. Normally, the shaft should be centered in the cutlass bearing. Shims placed between the strut and the hull are used to align the strut to the shaft.