

# STEAM TURBINES SUPPORTS EXPLAINED

By Sydney Gross

Turbine supports are the method of anchoring and fastening the turbine to the base-plate or foundation in relative location to the coupled equipment and the external connections. Since most turbines operate at high temperatures, the casing and rotor expand thermally in both the axial and radial directions. Therefore, any method of support must accommodate this growth in a controlled way to prevent high casing stresses, bolting failure, misalignment and internal rubs. Although the arrangements presented here are common, there are many different schemes favored by the various manufacturers that achieve the same purposes.

To accommodate axial growth, the turbine case support is fixed at one end and allowed to float at the other end support. Since a turbine's exhaust piping is larger than its inlet piping, it is easier to accommodate the movement on the inlet end and fix the exhaust end.

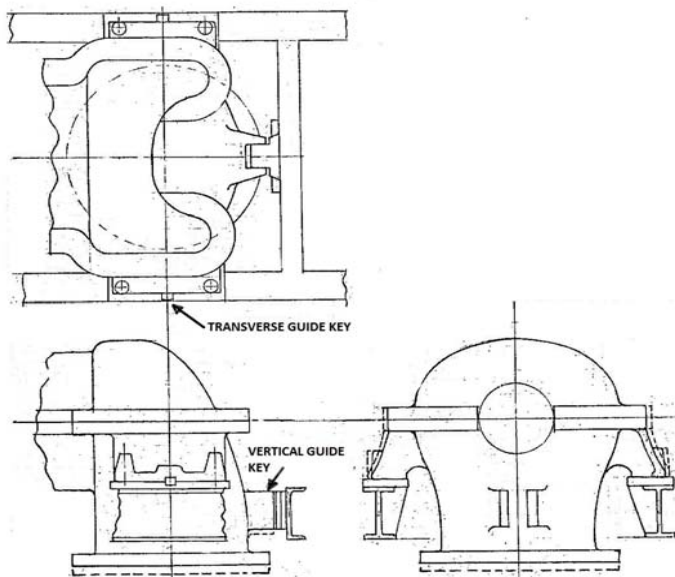


Figure 1: Condensing Turbine Exhaust End Support

However, when fixing the axial position of the exhaust end, one must take into account the radial growth of the casing. For this reason, guide keys are most commonly used to maintain position and alignment. A typical condensing arrangement is shown in Figure 1. Often the transverse keys may be substituted with

flexible supports which allow little resistance to forces in the transverse direction. Back-pressure turbines operate with significantly higher exhaust temperatures and the exhaust casing is normally insulated. For that reason, the support and the bearing housing are usually located away from the casing as shown in Figure 2.

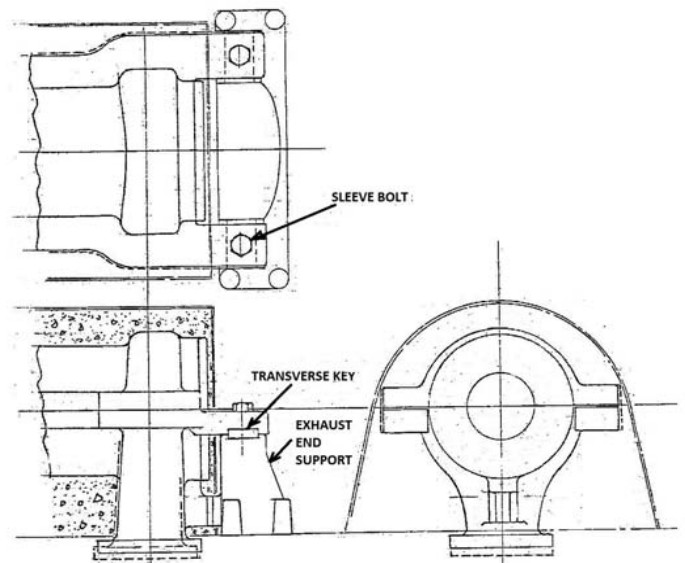


Figure 2: Back Pressure Turbine Exhaust End Support

The inlet end support must take into account the same design considerations as the exhaust except that it needs to float axially. Due to the high temperature of the inlet, the bearing standard is located apart from the inlet casing as in the case of a non-condensing exhaust.

The most common design uses flexible supports, often called wobble feet, under the bearing standard for vertical support while allowing axial movement. Key arrangements maintaining radial alignment are similar to the exhaust end. Figure 3 shows a typical arrangement.

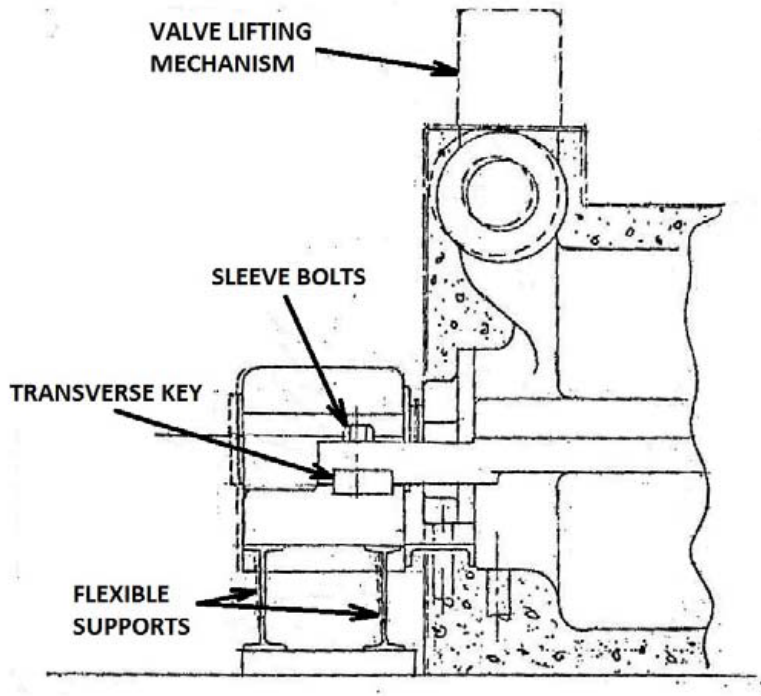


Figure 3: Turbine Inlet End Support

*For more information:*

Sydney Gross

Email: [sgross@rotatingmachinery.com](mailto:sgross@rotatingmachinery.com)

Tel: 484-821-0702

**Headquarters**

2760 Baglyos Cir.

Bethlehem, PA 18020

**Houston Office**

16676 Northchase Dr., Ste 400

Houston, TX 77060



[rotatingmachinery.com](http://rotatingmachinery.com)

Tel: 484-821-0702

Parts: [rms@rotatingmachinery.com](mailto:rms@rotatingmachinery.com)

**Rotating Machinery Services, Inc.** | 2760 Baglyos Circle, Bethlehem, PA 18020 | Tel: 484-821-0702

Legal disclaimers text goes here. Nulparum harchic iandam, ut qui omni as adistia doluptis etum conseqno te dessitati temquamet aut dolo tem volupta tiuntia aspitatur. Dust facepe volor asit liquae volo quae nos dis dolupic tem quidignat lab int, consenis sitatat emperum que dus aut volorem est enitis et et iur atis explaut que et es doluptatium ab ipsunt enihillabore optatqui cor arum faccusae necerit lautendis quam int, occabo. Evel id ex essitat hillitatem ea simet lignatibus expel ius excerum fuga.