

Shimming of Renk-Maag Gearboxes on its Respective Foundation Base Plate

All gearboxes are shimmed on their baseplate as well as the related rotating equipment (GT & compressor) to allow for alignment flexibility. For high speed turbo applications utilizing a parallel shaft configuration; Renk-Maag currently manufacturers three types of gearboxes, the "GB", "G" & "SG".

In standard practice the gearbox is always the focal point whereby the connecting machinery is always aligned to the gear. In new installations this is always the case, however many times with existing installations it just doesn't work that way simply because for example its simpler to move a gearbox/compressor than it is a gas turbine or steam turbine.

The Renk-Maag "G" & "SG" gearboxes utilize a fabricated housing which has a gearbox cover that is integral with the bearing cap. Both of these designs are constructed on the same principal. The housing walls supporting the rotors are overly thick and therefore quite stiff. Mesh alignment is achieved through the application of a single (or double) adjustable pinion bearing(s) which is installed with shims in the bearing bore. Therefore the design philosophy of these style gearboxes are the same. The "G" gearbox is a fully engineered design whereas the "SG" gearbox applies pre-engineered housing features which limit its application range to pre-described conditions.

The "GB" style gearbox utilizes a cast iron housing with separable bearing caps. While the construction includes a robust section under each bearing block, the over all configuration with the use of cast iron permits a considerable amount of flexibility in the housing. (The modulus of elasticity of steel is more than two and one half times that of cast iron). While the robust construction under the bearing blocks, independently mounted, provides a stiff foundation for the rotors, the flexibility in the housing overall is intentional for the purpose of allowing a means of aligning the gearset mesh through the use of external "soft foot" alignment. Alignment of the tooth mesh is achieved by adjusting the shims under the gearbox feet which compensates for bedplate foundation error. This major difference in the design concept results in a different arrangement of the gearbox feet to that of the "G" or "SG" types.

Gearboxes are typically furnished with solid shim plates that are typically 0.200" – 0.300" Adjustments are achieved by applying shims of lesser thickness i.e. 0.100" for final adjustment of the alignment.



26 Commerce Drive
North Branford, CT 06471
www.artec-machine.com

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General Comments associated with Renk-Maag Casing Foot Mounts:

- The "G" & "SG" gearboxes require a total of (4) four shims located under each of four mounting bolts.
- The "GB-47" for example has a total (10) ten anchor bolts, (5) five on each side. There are a total of (6) six shims, (3) three per side. The corner shims are longer than the center shims, since they are required to support two bolts (approximately 300 mm x 120 mm). The center shim supports one bolt (approximately 100 mm x 120 mm).
- The GB-50 for example has a total of (12) twelve anchor bolts, (6) six on each side. The center shims are longer here required to support two bolts (approximately 300 mm x 120 mm).
- Optionally, for the "GB"" gearboxes, the shims can be furnished to cover the entire machined surface area under which they are mounted. In this case we would provide (2) two solid shims, (1) one per side. However when the mounting surface is in error, a soft foot condition exists which has to be corrected with a corner(s) shim(s).

Once a Renk-Maag gearbox is placed on equally dimensioned shims and the tooth contact is checked and shown to be 100% satisfactory it can be assumed that a "zero soft foot" exists. This is verified with a feeler gauge under the feet with the gear loosely placed on the shims. When the gear is bolted down and the tooth contact is unsatisfactory, the foundation is not true and a "soft foot" does exist. Any external shimming done at this point eliminates the soft foot. There are four options for correcting this condition, raise a single corner (diagonally opposite each other LSS or HSS), or lower a corner (diagonally opposite LSS or HSS).

This decision to raise or lower a corner is a function of the current alignment of the gear to the adjacent machinery. If properly planned, this adjustment often times may enhance the external alignment rather than detract from it.



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