

Planet Carrier Design

QUESTION

With all the advantages of building float into a planetary gear system, what advantages are there to using a carrier in the first place, rather than simply having your planets float in the system?

Email your question—along with your name, job title and company name (if you wish to remain anonymous, no problem) to: jmcguinn@geartechnology.com; or submit your question by visiting geartechnology.com.

Expert response provided by Chuck Schultz:

Designing planet carriers is one of the challenges awaiting the gearbox engineer. While it is theoretically possible to have load sharing so equalized that a carrier would not be necessary, theory never quite works out in practice due to manufacturing tolerances and gravity. At some point the gear forces of the planets must be transferred to a shaft or the housing; this is the primary function of the planet carrier.

Good carrier designs overcome load-sharing imbalance and allow for accurate assembly without damage to the gears or bearings. The carrier/planet sub-assembly will “self-center” under load, but care must be taken to have sufficient clearance to account for start and stop conditions. Vertically arranged assemblies must have provisions for thrust forces between carriers on multi-stage units. Consideration must also be given to alignment and “tipping” of the stages with respect to each other.

ANSI/AGMA 6123-B06, *Design Manual for Enclosed Epicyclic Gear Drives*, contains the latest thing on this subject from some of the most experienced engineers in the business.

Charles D. Schultz, PE is Chief Engineer for Beyta Gear Service (gearmanx52@gmail.com) in Winfield, Illinois, and a Technical Editor for *Gear Technology* and *Power Transmission Engineering* magazines. He is also a longtime AGMA member, having served on or chaired a number of its committees over the years. And now you can follow Chuck's new *Gear Technology* blog three days a week at geartechnology.com.



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