INFLUENCE OF MECHANISM GEOMETRY ON THE LOAD CAPACITY OF A VEHICLE'S GEAR TRANSMISSION

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Adjustment by cutting tool offset is a very convenient and common means of improving the basic performance of gears. It does not require special tools, equipment and complex technological setup.

Gear adjustment can be height, angular and tangential. For bevel gears, the area of expedient application of height adjustment is expanded, and the area of application of angular adjustment, on the contrary, is very limited, since its application is associated with the need to change the given center-to-center angle. But tangential adjustment is convenient for bevel gears, which is not used for cylindrical gears, since it requires a special tool for them. Tangential adjustment of bevel gears does not require a special tool, since it is carried out by spreading the cutters that process the opposite sides of the teeth.

In practice, a combination of elevation and tangential adjustment is used for bevel gears. The former is used to equalize the specific slip of the gear teeth and wheels, thereby increasing the wear resistance, anti-seize resistance of the teeth, and the contact strength of the transmission, and the latter is used to equalize the strength of the teeth when the gear and wheel bend.

Adjustments are made to increase the bending strength of the teeth, contact strength, wear resistance and resistance to seizing of the teeth, fitting the transmission into the specified center distance, eliminating undercutting of the teeth (for wheels with a small number of teeth), and ensuring the possibility of repairing the gear transmission.

Increasing the strength of the teeth during bending during adjustment is achieved by giving the tooth a shape that is more favorable in terms of strength and the additional possibility of increasing the module with the same overall dimensions by reducing the number of teeth.

To increase bending strength, the optimal distribution of the total tool displacement coefficient between paired wheels in a gear train is such that the teeth of both wheels become equal in strength; to do this, the smaller wheel should be strengthened by adjustment at the expense of the larger one.

Angular adjustment allows you to increase the bending strength of the teeth of external gears if the maximum stresses in the tooth occur when loaded at the apex. However, this adjustment does not have a noticeable effect at maximum tooth tension from the load applied in the single-pair meshing zone, because the closer the tooth's stressed state is to shear, the less stress concentration affects its strength.