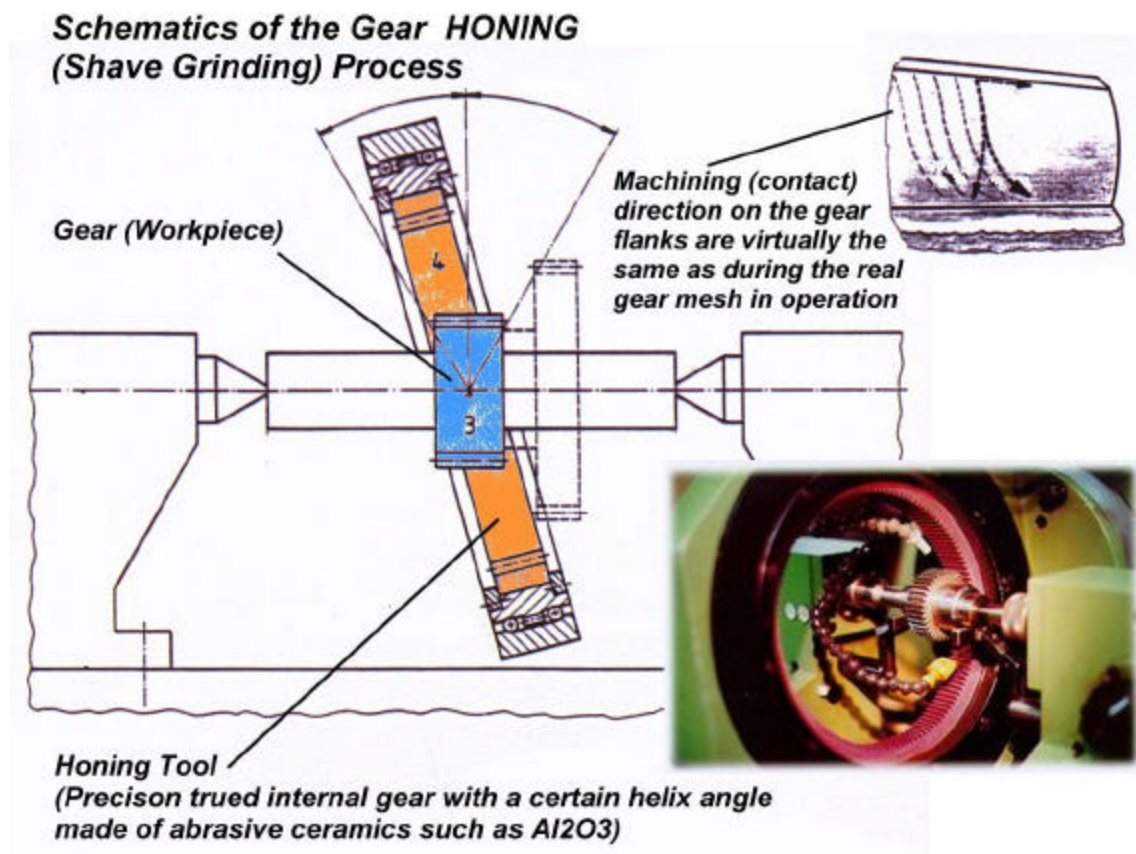


Gear Honing *NEUGART Servo Gears with the Honed Advantage*

Some of us might still recall the “old days” when you had to change the transmission oil in your new car after a couple of hundred miles of “run in”; and the car sales man used to refer to the gear noise from the transmission as “singing gears are happy gears”.

Things have changed; the modern transmission gears are optimized and machined to a high quality grade. Honing has become widely used for automotive components.

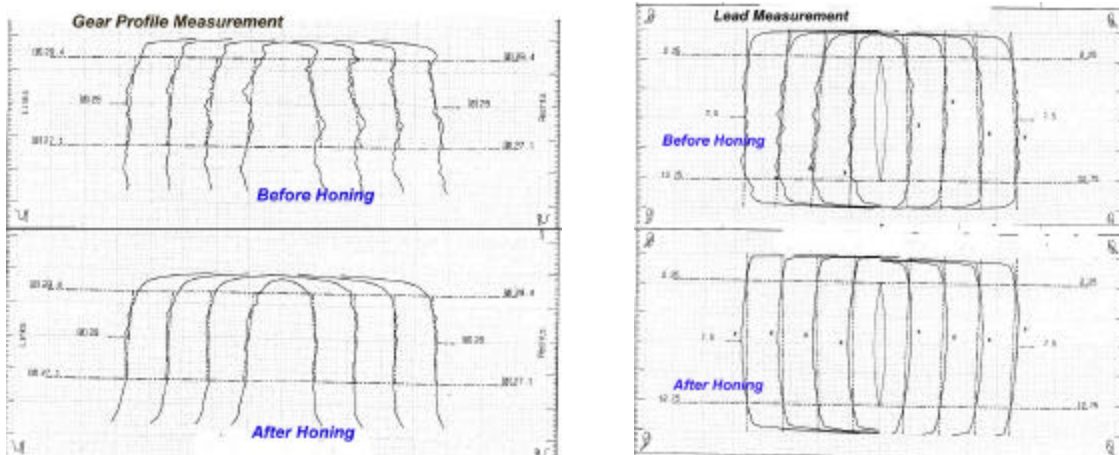
Gear Honing is a hard finishing method to eliminate the gear errors after hardening and smooth the surface of the gear teeth. Honing is also called “Shave Grinding”. The machining kinematics and the tool geometry is similar to gear shaving, the tool material and cutting speeds are similar to the grinding.



Conventional gear grinding removes material from the gear flanks leaving machining marks not in the direction of the gear contact in the mesh, but perpendicular to it. The honing process simulates the true kinematics in the gear mesh. Furthermore honing provides a better surface finish than grinding.

A common misconception is that honing does not improve the profile error, lead error etc. from the previous machining (hobbling) and the distortions from the hardening. This

is however not correct, modern specialized gear honing (shave girding) machines can remove a substantial amount of material to correct the gear errors, especially in gears which are previously precision hobbled and case hardened under constantly controlled process which means the gear errors are minimized already before the honing.



Gear honing requires dedicated specialized tools and also special very stiff dedicated machines. Currently only NEUGART is applying gear honing as a hard finishing method for industrial servo gears.

The added expenses for this gear hard finishing method is more than compensated by the quality advantages the NEUGART servo planetary gears offer:

- Reduced noise generation
- Higher input speeds
- Increased surface durability and loadability
- No “wear in” no lubricant contamination with wear particles
- Virtually no increase of backlash
- Improved gear efficiency
- High gear quality (AGMA 12 or higher)

Recently some servo planetary gearbox manufacturers introduced helical gears to improve noise behavior and loadability sacrificing the balanced planetary system. Honing allows Neugart to surpass the performance of the helical gears by keeping straight gear flanks and consequently not introducing unbalanced forces into the planetary system.

Experience the Honed Advantage with the servo gears from NEUGART