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Complimentary
Guest Pass**

Expanding Capacity in China

China manufacturing plant continues to gear up.

With the Far East continuing to soak up most of the production capacity of its Ritto, Japan plant, Mitsubishi's need to ramp up production at its recently opened Shanghai, China facility takes on new meaning. Initially thinking that five hobbing machines per month would satisfy the capacity needs of the Far Eastern giant, a re-evaluation has determined that double that number is closer to reality. While trying to increase production over the short term always creates challenges, the good news is that the technology transfer from the main plant in Japan has been seamless, thus enabling the capacity increase to be realized.

This demand shows no indication of slowing down justifying the capital investment to create this facility. With a combination of trained Chinese technicians and supervisory help from Japan, the ability to turn out GE15A hobbing machines quickly, according to the high quality levels demanded by the main factory, has been a success.

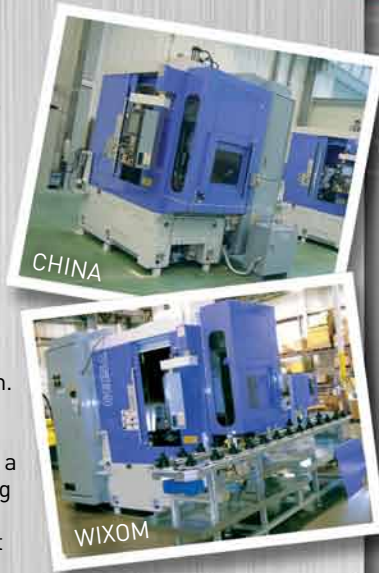


GE15A Wins the Popularity Contest.

It may be a little unfair to the other machines in Mitsubishi's comprehensive line up of gear machines (due to the fact that 80% of the world's gears are under 150mm diameter), however, the popularity of this model, known for its performance and great reliability, cannot be denied.

You can see from the accompanying photographs that the machine dominates the floors of Mitsubishi facilities in Japan, China, and Wixom, Michigan. Even more impressive is the wide variety of customers it satisfies. The machine is equally at home on a high production line manufacturing thousands of the same gear or in a job shop which requires frequent changeovers per day.

In America, the GE15A is normally found to be in stock as either a manual load machine or with automation in the form of a ringloader. The ringloader versions can also be easily integrated to American made pallet conveyors (as can be seen in the photograph) or to any other kind of storage system. With a working range which can handle bore or shaft type gears, the GE15A can satisfy any type of end user without compromise. Whether it is high speed dry hobbing of gears with low carbon steels or the aircraft industry with gears manufactured of highly alloyed materials, the GE15A is equally at home in either environment.



**GE15A
GEAR HOBBER**



TECH CENTER

Internal Gear Shaping: Shortcomings of the Shaping Process.

One of the greatest potentials of the shaping process is its ability to handle internal gears. There are, however, various types of interference which can be experienced between the cutter and the gear. These are:

1. Radial Feeding interference;
2. Involute interference;
3. Relief interference – rubbing of the cutter flanks occurring during the relief stroke.

Figure 1 shows a condition peculiar to the shaping process in that the interference occurs when trying to infeed to cutter depth. Since most modern shapers use digressive style infeed this shortcoming is easily corrected. The other option would be to minimize cutter diameter so it is possible to insert the cutter at the correct center distance.

Figure 2 shows pure involute interference resulting from cutter being too small. The base circle of the cutter at the end of line of action lies inside the bore diameter of the internal gear, thus no involute is produced beyond this point. It is this portion which represents a source of interference. Increasing the cutter diameter would be one way to fix the problem. Another solution is to increase bore diameter of the part beyond start of interference.

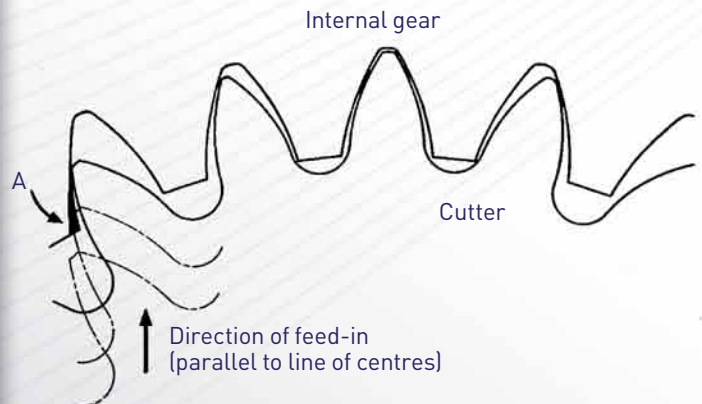


FIGURE 1 :
Infeed interference – internal gear

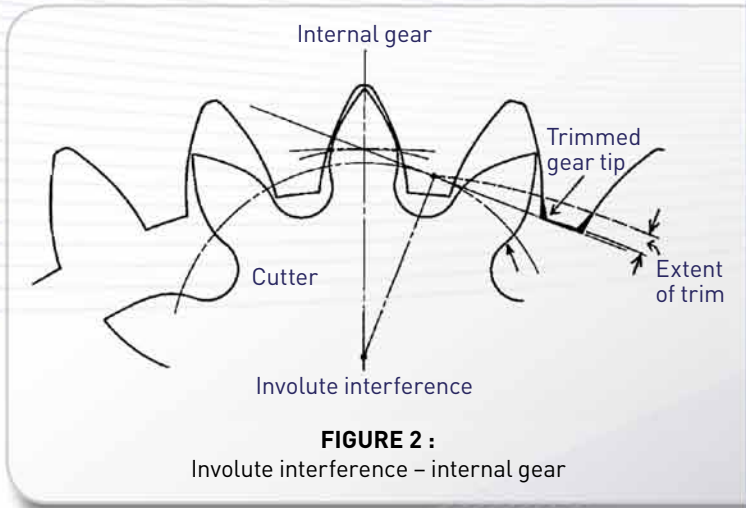


FIGURE 2 :
Involute interference - internal gear

Figure 3 shows the third kind of interference. The symptoms are a tendency for the cutter to pick up or rub on the tooth flanks resulting in poor cutter life. Since the controlling characteristic is the line which is tangential to the base circle and perpendicular to the direction of relief, the problem can be resolved in three ways.

One is a simple solution, where digressive cutting will automatically eliminate points of interference.

A second solution, if the traditional method of radial infeed is being used, would be to use a cutter modified to produce chamfer on the gear.

A third method would be to apply lateral offset by moving the machines spindle head tangentially to the gear circle in one direction or the other depending on the rotary direction of shaping. In this way the line of interference, being tangential to the base circle and perpendicular to the direction of relief, will change its position. It may be stated that this type of interference is particularly troublesome when the number of teeth in the cutter has to be small and where the ratio of number of teeth in the work piece to the number of teeth in the cutter is less than 3 to 1.

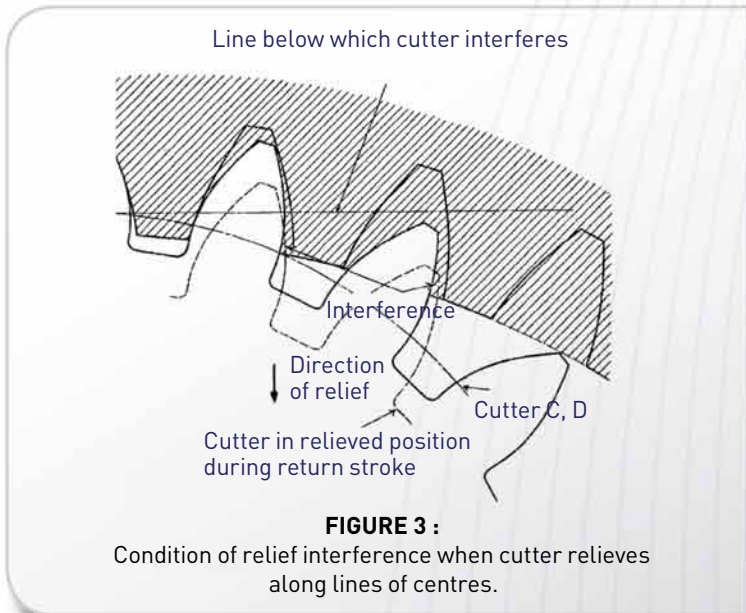


FIGURE 3 :
Condition of relief interference when cutter relieves along lines of centres.



2011 AGMA GEAR EXPO

NOVEMBER 1-3, CINCINNATI, OHIO

As has been the case ever since the AGMA started its biannual fall expos, Mitsubishi will entertain and intrigue audiences with a combination of new and well proven product at the 2011 event.

The new will take the shape of a gear grinder which combines measuring, meshing and dressing in a 400mm package incorporating generating and form grinding in one and the same machine. Mitsubishi has chosen the AGMA Expo to be the launch platform for the new ZE40A grinder in the North American market. With proven attendance by industry leaders in gear design, process and management, it was felt by Mitsubishi that AGMA's exposition could not be bettered.

Complimenting the ZE40A will be another hi-tech Mitsubishi product in the guise of an ST25CNC "programmable lead guide" shaping machine. The machine on display will be available for immediate delivery after the Expo to a customer lucky enough to secure it for themselves. This machine with +/- 35 degree programmable helix capability and up to 1000SPM speed is bound to wow interested parties.

Come on down and enjoy the boisterous discussions about gear manufacturing and how a Mitsubishi can improve your bottom line.

See page 4 for instructions on how to register for your FREE PASS to the show!





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Gear News

GEAREXPO

The Worldwide Gear Industry Event



2011

November 1-3, 2011
Duke Energy Convention Center
Cincinnati, OH

OFFICIAL SHOW HOURS:

Tuesday, November 1: 9 am-6 pm
 Wednesday, November 2: 9 am-5 pm
 Thursday, November 3: 9 am-4 pm

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and discover the newest gear technology, unparalleled education and networking combined into one powerful destination.

YOUR COMPLIMENTARY GUEST PASS

Courtesy of Mitsubishi Heavy Industries America, Inc. Machine Tool Division
 Booth # 315
 for AGMA's Gear Expo 2011, The Worldwide Gear Industry Event!
Guest Pass Registration Code: mhige11

HOW TO REGISTER

When issued by a Gear Expo 2011 exhibitor, this Guest Pass entitles the bearer to one complimentary expo-only admission, good during the official show hours. Visit www.gearexpo.com and enter your Guest Pass Registration Code (listed above) to pre-register for an expo-only admission at no charge.

WWW.GEAREXPO.COM

Your Complimentary Guest Pass saves you \$50 in on-site registration fees.

