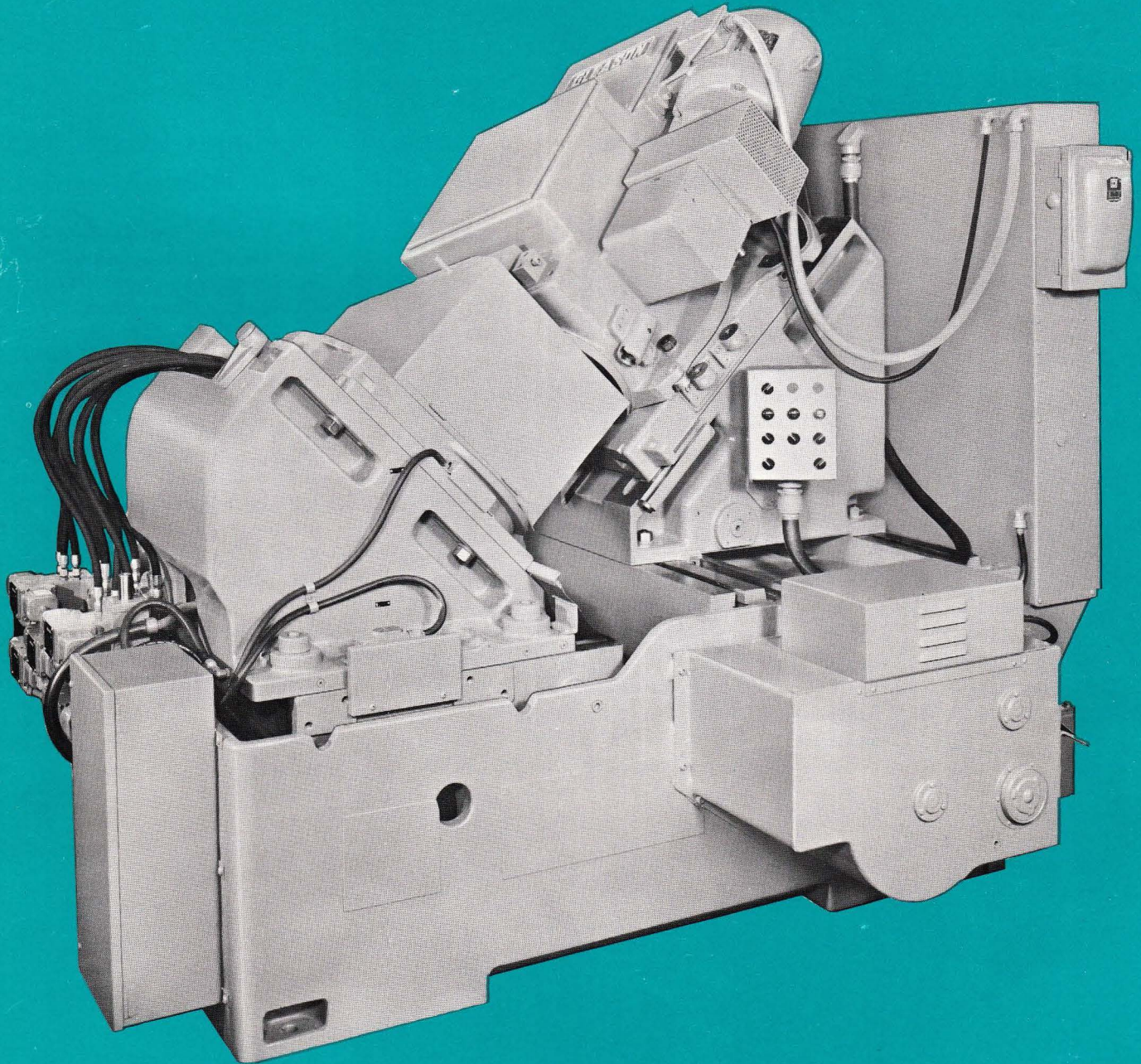


Gleason No. 606

**Hypoid
Gear Rougher**



Gleason No. 606

The Gleason No. 606 Hypoid Gear Rougher sets new standards in precise, high speed roughing of non-generated hypoid and spiral bevel gears up to 10½" diameter at 10 to 1 ratio and 2½ diametral pitch.

Gleason No. 606 advantages

high quality insured

Accurately roughed gears from the No. 606 Rougher contribute to production of the highest quality finished gears on the companion No. 607 Finisher. The new 45° inclined spindle directs cutting forces against the machine bed. This, combined with new workhead clamping arrangements, provides greater cutting rigidity for improved accuracy.

increased production

Greater machine rigidity, new and faster index, new cutter spindle feed mechanism, plus an optional automatic loader, make possible production increases up to 30%.

The No. 606 Machine equipped with the automatic loader — when producing a typical gear with a 4.5 diametral pitch and 37 teeth will produce 21.7 gears per hour — providing a 20% production increase over manual loading machines.

A minimum amount of stock is left after roughing for the finishing operation, substantially reducing finish cutting time and increasing life of finishing cutters.

occupies less floor space

The new compact inclined spindle design of the No. 606 Rougher makes possible a 35% savings in floor space over previous machines, while attaining improved roughing and increased production.

longer cutter life

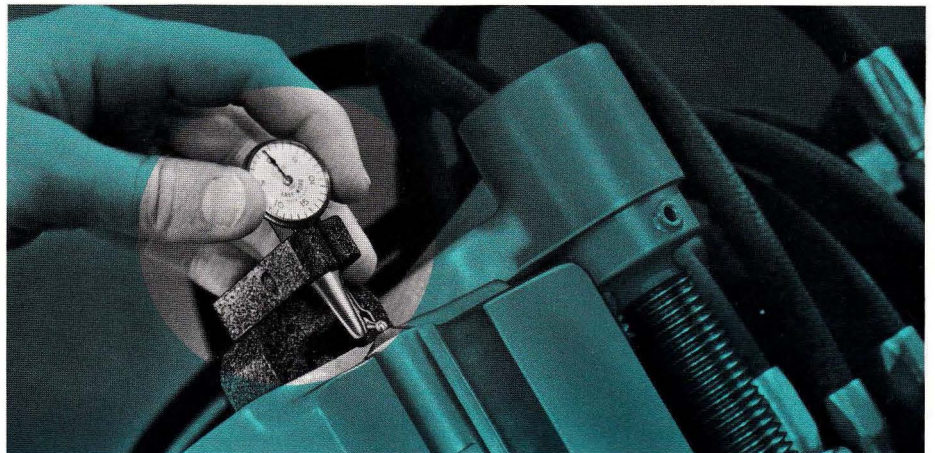
Cutter life is increased on the No. 606 Rougher because of the rigid machine and spindle mounting design. A new coolant system, with splash guards enclosing cutter and work, forces the flow of coolant directly into the cut.

versatility

By simple adjustments of the workhead and cutter head, the No. 606 Rougher can cut spiral bevel or hypoid gears of either right or left hand spiral. A wide range of spiral angles and diameters can be accommodated.

The machine is readily changed from right to left hand gears by angularly adjusting the cutter head along circular guide ways about the axis to either side of its central position, and traversing the work head to either the right or left side of the machine.

ease of set-up



Four simple adjustments accurately relate the cutter and work. The summary settings are quickly obtained through precision setting bars and indicator (pictured above.) They can be used to set any number of ma-

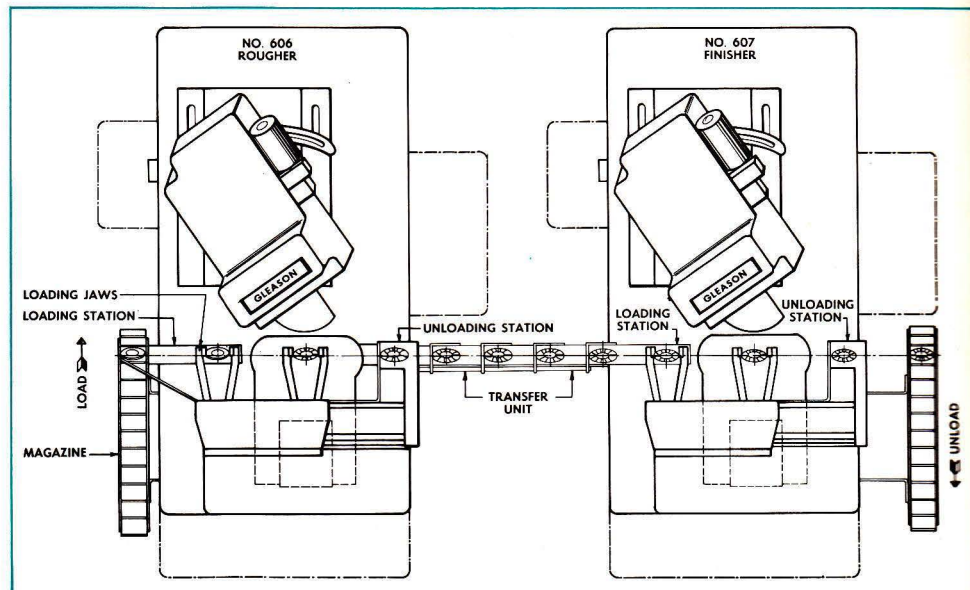
chines to produce identical gears. Scales, verniers and setup fixtures are eliminated. The machine is readily changed from right to left hand gears by changing three settings.

Gleason No. 606 features

automatic loader and transfer unit

The Gleason No. 606 Hypoid Gear Rougher and its companion No. 607 Hypoid Helixform® Gear Finisher can be equipped with a unique automatic loader and transfer unit, which has been designed and developed for low cost, large scale production.

The operating cycle and load and unload units for both the roughing and finishing machines are identical, and are electrically and hydraulically interlocked. Each time a blank is delivered to the rougher, simultaneously a rough cut gear is delivered to the finishing machine. The transfer unit automatically conveys rough cut gears from the Rougher to the Finisher.



operation

No. 606 rougher

1. The magazine for the rougher is supplied with gear blanks, which are swept into the loading jaw at the roughing station.
2. The blank previously delivered to the roughing station is picked up by the loader jaws, placed on the work arbor, and hydraulically chucked. The loader unit returns to its original position. The workhead advances and the rough cut begins.
3. After the gear has been rough cut, the arbor dechucks, and the tooth slot checking device determines that every tooth in the blank has been cut. The gear is then delivered to the unloading station of the No. 606 Rougher.
4. The rough-cut gear is swept from the unloading station of the rougher to the transfer unit.

Simultaneously

Simultaneously

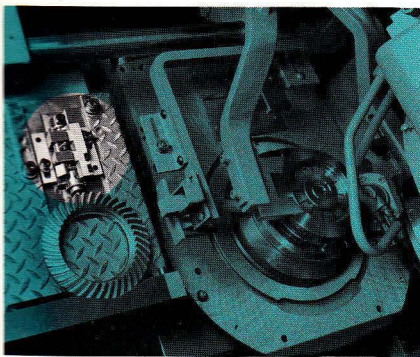
Simultaneously

Simultaneously

No. 607 finisher

5. From the transfer unit the rough cut gear is progressively advanced to the loading station of the No. 607 Finisher.
6. The roughed gear is picked up by the loader jaws of the finisher and pre-stock divided. After the loader jaws have positioned the gear on the arbor, it is final stock-divided and hydraulically chucked. The workhead moves forward and begins to finish cut.
7. After the gear has been finish cut, the arbor dechucks, and the gear is moved to the unload station.
8. The finished gear is swept into the unload magazine ready for further processing.

automatic stamping unit



The No. 606 Rougher, when arranged with the automatic loader, can be equipped with an optional automatic identification stamping assembly.

The stamping assembly automatically imprints any manufacturing symbol desired on the roughed gear, thereby eliminating a separate stamping operation.

magnetic chip removal

A magnetic separator is used to remove chips from the cutting oil. Coolant oil and metal chips are flushed into a reservoir. Here rotating magnetic drums remove the chips and cleaned oil returns to the sump. A constant flow of coolant oil is assured, coolant loss is reduced to a minimum, and periodic cleaning of machine beds is eliminated.

coolant system

A new coolant system integral with the splash guards encloses the cutting area. A direct and positive flow of coolant is delivered at the rate of approximately 40 gallons per minute to assure an abundant supply of coolant for maximum cutter life.

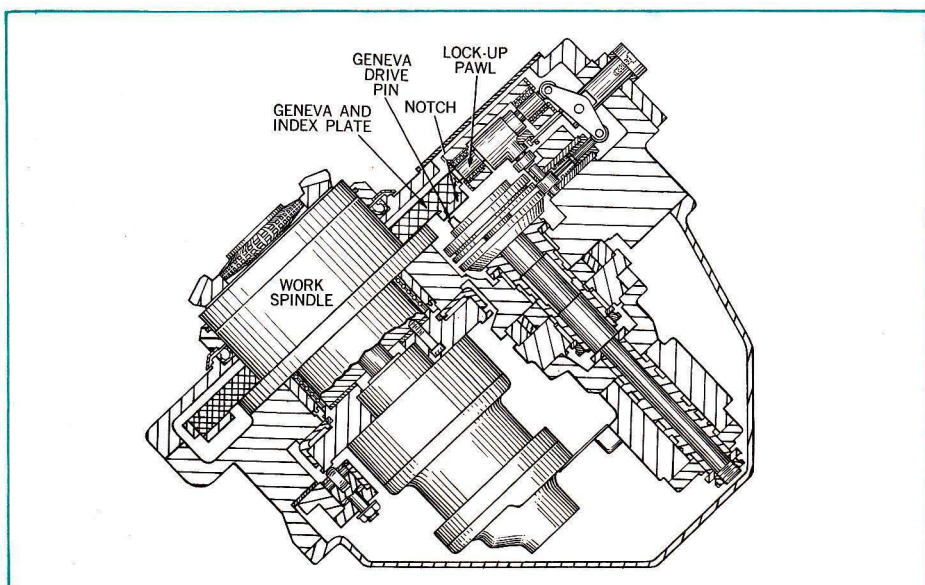
work spindle clamp

A new hydraulic mechanism clamps the work spindle to the housing with a pressure of more than 20,000 lbs., adding rigidity during cutting. The clamp is automatically released each time the work is indexed.

cutter handling device

An optional cutter handling device permits easy cutter changing—resulting in reduced machine downtime. Since access to the cutter head may be from either side of the machine—this device may be conveniently mounted on whichever side is dictated by the hand of the gear.

index mechanism

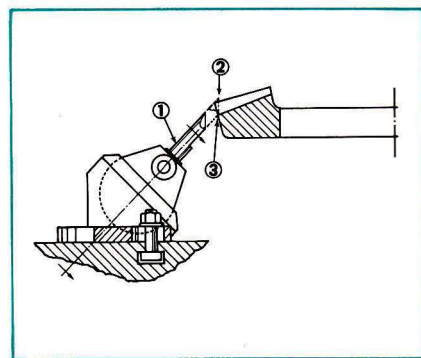


Indexing is accomplished by an entirely new mechanical-hydraulic system which achieves a faster and more accurate index.

When a tooth slot is completed the cutter withdraws and the hydraulic sequence indexes the gear. The work spindle clamp is released, and the lock-up pawl is withdrawn. The Geneva and index plate is then rotated by the

Geneva drive pin, rotating the work piece one tooth space. The lock-up pawl is again advanced for exact positioning and locking of the index plate. Lastly the work spindle clamp is applied and cutting again takes place. This complete indexing sequence takes place in approximately 0.2 seconds, minimizing production time.

chamfering attachment



A new simplified tooth chamfering unit is set with only three simple adjustments and consistently produces a well-proportioned chamfer. The attachment automatically chamfers the acute angle at the outside of each tooth immediately after it has been cut. The tool (1) is so shaped and positioned that during the latter portion of its cutting stroke it progressively chamfers the tooth edge from the top corner (2) to the bottom (3), thus resulting in an easier and smoother cutting action. The tool operates during the normal tooth cutting and indexing cycles of the machine, so that no additional time is required to chamfer the last tooth.

Gleason No. 606 specifications

capacity

	English	Metric
Pitch diameter (Maximum)		
10 to 1 ratio	10 $\frac{1}{2}$ "	266mm
2 $\frac{1}{2}$ to 1 ratio	9 $\frac{3}{8}$ "	238mm
Diametral pitch (Coarsest)	2 $\frac{1}{2}$ D.P.	10 mod.
Extreme ratio (Minimum)	2 $\frac{1}{2}$:1	
Face width (Maximum)	1 $\frac{5}{8}$ "	41mm
Full depth (Maximum)	.750"	19mm
Number of teeth	20-150	

work spindle

Diameter of taper hole at large end	3 $\frac{27}{64}$ "
Taper per foot	$\frac{1}{2}$ "
Depth of Taper	$\frac{5}{8}$ "

cutter diameters

5", 6", 7 $\frac{1}{2}$ "
and 9"

feeds and speeds

Cutter speeds (feet per minute)	82-215	25m-65m
Feeds (seconds per tooth)	2-10	

electrical equipment

	60 cycle	50 cycle
Main motor	7 $\frac{1}{2}$ HP	1800 RPM
Hydraulic motor	3 HP	1500 RPM
Coolant motor	1 $\frac{1}{2}$ HP	1800 RPM
Magnetic chip separator	$\frac{1}{8}$ HP	1500 RPM

miscellaneous

	English	Metric
Floor space	92" x 75"	233 cm x 190 cm
Height (approximate)	80"	203 cm
Net weight	13,500 lbs.	6,123 Kg.
Shipping weight (boxed for export, approximate)	14,500 lbs.	6,577 Kg.
Size of case	102" x 85" x 94"	259 cm x 216 cm x 238 cm

standard equipment

Index arrangement for one gear
(less index and Geneva plate)
Hydraulic chuck
Complete electrical equipment

extra equipment

Index and Geneva plate
Cutter length fixture
Cutter handling equipment
Machine setting bars and indicator assembly
Magnetic chip separator
Chamfering attachment
Automatic loader
Workholding equipment

operation

The gear blank is mounted and chucked on the inclined work spindle. The machine is then started and the completely automatic machine operation takes place. Workhead and workhead slide advance into cutting position. Gear tooth spaces are rough cut, as the cutter feeds into the work. When full tooth depth has been attained, the cutter is then withdrawn to permit indexing. After the last tooth slot is roughed, the machine stops, the workhead slide withdraws, and the gear blank is dechucked.