

DECO

MAGAZINE

10

3/99

SEPTEMBER



THE PATHS TO PERFECTION



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IMPRESSUM DECO-MAGAZINE 3/99

Industrial magazine dedicated to turned parts:

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From the beginning

I was eight years old the first time I saw an automatic screw machine. The machine was made of lots of parts called cams and gears and shafts and levers and rollers and other parts with names that made no sense to me. Some were chucks or dogs or slides or form tools. The parts all seemed to move at once but in a rhythm that complemented each other. The noise was ear shattering and there was oil flying everywhere. I was impressed!

Then a man took a steel bar and put it in the machine. He pushed some buttons and moved a lever and then the most amazing thing happened – A part came out of the machine, then another and another. It only took about 15 seconds for each part. They were like the form tool I was shown and each part was EXACTLY like every other part being made. This was the most incredible thing I could ever imagine – a Duplicating Machine. You put bars in and got parts out. It couldn't be any easier!

Years later I went to work in a screw machine job shop, as an operator; eventually learning how to setup the machines. And all the time making parts, millions and millions of parts. Each part EXACTLY the same as every other part being made. I could verify this with a micrometer. It measured sizes smaller than a human hair. Differences so small you couldn't see them with your eyes. That's almost perfection!

There were many types of screw machines there, single spindle, multi-spindle, Swiss type and coil fed. I enjoyed working on the multi-spindle machines the most. They had the most parts, the most cams, more slides, more tools, just more of everything. They were challenging to work on. When a new part had to be made I might get to do the setup. That was exciting, making parts was boring. Every part is EXACTLY like the one before it. The setup might take two or three days. There were lots of cams and gears and tools to change. If the part was tightly tolerated the setup could take several days more. Some parts had tolerances as low as +/- .001". An absurd figure!

With wrenches in hand I would move tools right or left, in or out. Until at last I had parts for 1st piece inspection. I felt good. A little later the inspector would tell me the samples were good, EXCEPT for one dimension that was .0002" off. Resubmit new samples. Was he crazy? .0002", Two Ten Thousands

of one inch. How can anyone move a tool so little? If I loosened the tool holder to move it, it would move .002" just by looking at it. This called for ingenuity. Perhaps if I did not loosen the tool holder and just hit it with a small hammer it might move .0002". Eventually I was successful.

Over the years other challenges came along. Form tool chips that wouldn't break – I would grind chip breakers into the cam. Hoping that I wouldn't ruin the cam in the process. A drill needs to have a pull-out in its cam. Grind it in. We can't let the machine sit idle while a new cam is ordered. A machine sitting idle waiting for a cam doesn't make any money. Only machines making parts make money.

Over the years I acquired many "tricks of the trade", that would make a machine run just a little better. So, we could run just this one job. Then there would always be another job, pushing the limits of the machine even further. This was not challenging anymore, it was just plain work. The machines were always being stopped to tweak dimensions, efficiencies were low and setups took too long. Things had to change!

And they did. Customers started applying SPC to dimensions, thereby reducing the range a dimension could be in. Engineers started dimensioning prints in MICRONS. Thousands and ten-thousands weren't small enough anymore. And young people stopped coming into the industry. Screw machines were noisy, oily, dirty and not very exciting to run. They went to work at MacDonald's or KMART.

Then some improvements began to appear. Better guards kept oil and noise in, making for a quieter and cleaner work place. Machine builders introduced NC controlled machines, then CNC controlled and eventually PNC controlled, from TORNOS-BECHLER, in the 1990's. Young people started coming back. It was more exciting to run a computer than to cook a hamburger.

In 1997 TORNOS-BECHLER introduced the MULTIDECO 26/6, controlled by PNC DECO technology.

In early 1998 the first MULTIDECO 26/6 was delivered to a customer in Michigan. I had a chance to work on the machine. There were no cams for the tool slides, no rollers, no levers. There were no gears to change. The machine was completely enclosed and very quiet.

I was impressed!

We began setting the first workpiece. The material was 52 100 bearing steel. The chips would not break-up. We programmed some chip breakers into the slide movement and solved the problem. All without removing, grinding and replacing a cam. Later we decided we wanted the 1st position tool moved to 3rd, the 2nd tool moved to 4th and the 3rd position tool moved to first. We rewrote the program and preset the tools, for their new position, using a presetter. We were done in less than an hour. I was awe struck!

During the next several weeks, I learned tool movements were in MICRONS. Adjustments could be made without stopping the machine and without wrenches. The machine was user friendly. There is spindle error compensation, tool life management. Adding or deleting drill pull-outs or chip breakers took only minutes, changing feed rates or the spindle speed is just a program change. It couldn't be any easier!

I won't tell you each part is EXACTLY the same as every other part being made. But the parts are closer than any other machine I know.

During the past year I have looked at dozens of prints for many customers. I can only conclude that how we process these parts is only limited by our own imaginations. The possibilities are amazing. And I know this is only the beginning.



Tom Broe
District Sales
Manager for the State
of Michigan

E

New version available!

We presented the TB-DECO 5.0 and its different characteristics in our previous edition and would now like to come back to the DECO 2000 concept and the remarkable technological progress made by TORNOS-BECHLER.

TB-DECO 5.0

TORNOS
BECHLER



To illustrate this, let us take a customer – “Mr. Example” – who purchased one of the first DECO 2000 machines, say in December 1996.

This pioneer, who demonstrated his trust in us whilst the market was highly sceptical about the significance of our concept, especially separating the PC from the numeric control, is now in a position to upgrade his fleet of machines for a modest sum, thus saving on considerable programming time and benefiting from the vast power of modern computing technology, simply by purchasing a new TB-DECO version!

What sweet revenge on the cynics of that time!

Thanks to TB-DECO, this customer enjoys the same benefits of speed and potential as he would with a new machine... without the drawbacks of unfamiliarity. All he needs to do is install the TB-DECO 5.0.

With the aim of helping our customers to benefit from the advantages of version 5.0 (see DECO-Magazine 9) for their entire fleet of machines, we decided not to work like the software industry by invoicing each individual workstation installed, but rather by offering a more extensive service. From a strategic aspect, buying the TB-DECO 5.0 will provide the facility to program all machines (and all types of DECO 2000) already with the client. The licence will be in the form of a general operator’s licence for the company.

For machine purchasers, version 5.0 of the TB-DECO will be supplied automatically and the training adapted accordingly.

For clients already in possession of machines, a document outlining the main differences between the two versions can be obtained from TORNOS-BECHLER or can be downloaded from the Internet at the following address:

http://www.tornos.ch/eng/products/prodFrame_catalogues.html



A specific training module for making the “transition from 4.32 to 5.0 “ in one day has already been developed. If you are interested, please contact Mr. Simon Lovis at the TORNOS-BECHLER training centre.

Tel. : ++41 32 493 59 88

In cases of doubt: Training will make the scheduled transition easy!

Training venue:

Professional “Tornos Training Centre” and at all subsidiary companies.

Duration: 1 day’s programming.

Purpose of training:

To enable the trainee to produce a DECO program for the new software version and understand the differences between the two versions.

Training content:

- New TB-DECO environment.
- Creating a new program.
- Converting a version 4 program to version 5.0 and vice-versa.
- Using the program for a simplified contour.

Today, the slogan used since launching the DECO 2000 is even more pertinent than ever before:

With the DECO 2000, let us face the challenges of the future together!

Minimum configuration required

- Compatible PC with CD player
- Processor: Pentium 60 MHz
- Disk space required: 60 Mb
- RAM: 16 Mb
- Screen: VGA 16 colours
- OS: Windows 95 or 98

Recommended configuration

- Compatible PC with CD player
- Processor: Pentium 400 MHz
- Disk space required: 120 Mb
- RAM: 96 Mb
- Screen: SVGA 256 colour 17”
- OS: Windows NT4, sp4

The TB-DECO 5.0 is supplied on CD-ROM. The CD can be installed in all the machines and provide on-line programming instructions. These instructions can be called up at any time by pressing the “F1” key.

For hard copy users, the CD will also allow you to print out the complete documentation.

This latest version, which allows you to program all the DECO and MULTIDECO machines is available from now on. It will allow you to work on several PCs and upgrade all your DECO 2000 and MULTIDECO machines to the latest state of technology!

And what does the future hold ?

The limits of future developments are far from being exhausted. You can be assured that our engineers will come up with even more surprises when unveiling new, more powerful solutions adapted to the ever-growing requirements of our customers.



Installation procedure

(From the TB-DECO and all additional machines):

Insert the CD ROM. If the procedure does not start up on its own, type in:

Start > Execute > Run > CD player letter, for example D : \TB-DECO\DISK1\Setup.exe

All you have to do then is follow the instructions on the screen.

- ◆ *Validate the licence*
- ◆ *Type the licence number*
- ◆ *Choose the working language for TB-DECO*
- ◆ *Choose the machine(s) you want to install*

Important notice: Under Windows NT you will have to be in administrator's mode to install the software.

New model available!

More for multi-spindle than single spindle application, tool presetting and setting are important factors for the profitability of the machine.

We propose two presetting models for the MULTIDECO 26/6, from manufacturers specialising in tooling and presetting. Since the machine uses standard tooling, standard presetting solutions are fully utilised. The large number of clients already in possession of such a unit can simply preset the tools required for the MULTIDECO 26/6, with little adaptation.

We would now like to unveil a new, simple presetting device – the first of its kind in the world – which has been produced exclusively for TORNOS-BECHLER by a specialist in this field. This unit is of good value, reduced size and very straightforward to use – and is an alternative to purchasing the larger and more specialised models.

Why bother with presetting?

In our modern economic times where performance and profit go hand-in-hand with ever demanding precision and quality requirements, it seems inconceivable to the professional, that he has to “waste precious time” with inappropriate methods. To respond to such a trend, we can no longer wait for the tools to be mounted on the machine before starting the setting work, as machine productivity is very important. The possibility of tool presetting is therefore essential.

The use of standard, commercially available tooling for presetting work provides an open solution, thus dispensing with the need to invest vast sums in specialist equipment.

The tool fitting time is considerably reduced through the use of preset tools.

Adapting work on the tooling on the complete machine and the

setting and optimisation phases can now begin. On a cam-operated lathe, it would be at this point that the problems start, with cam optimisation, readjusting the inclines, changing the gearing and so on...

Although this procedure guarantees perfect optimisation of production, it lacks flexibility and requires a lot of (and excessive) time.

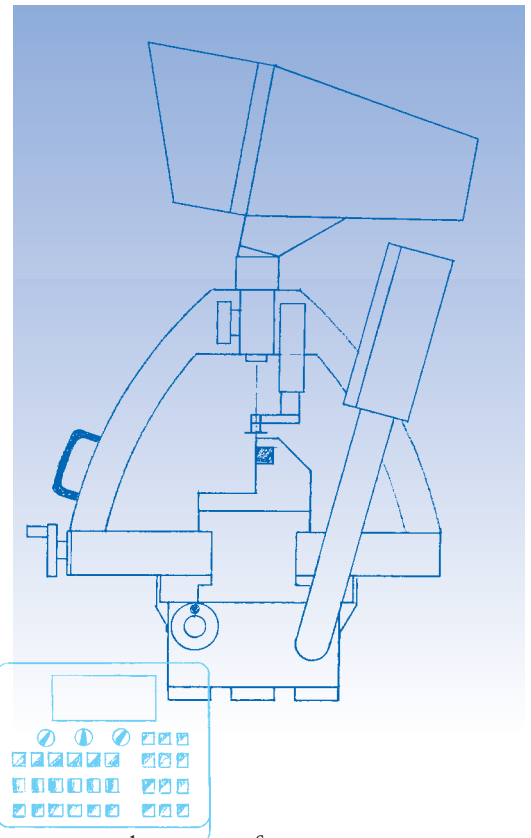
The optimisation phase on the MULTIDECO is simply carried out using the control. It is no longer necessary to change cams or gearing and both time and investments are considerably reduced.

When carrying out subsequent setting work caused by tool wear, the setting time on the MULTIDECO is far shorter than with conventional, cam-operated machines. Corrections are carried out directly via the machine control, using the wear functions.

Pre-setting, therefore, is one of the most important components in the profitability of the MULTIDECO.

The choice of the presetter is governed by the fleet of machines and requirements for universality, enabling it to be adapted to all types of machine. The key element in reaching a decision, in

many cases, is the price-to-functionality-to-integration ratio. The new Tornos-Bechler presetter can obviously be adapted to the entire MULTIDECO family, as well as to the other multi-spindle machines produced by the company, which allows for perfect incorporation into the different generations of machines.



Technical properties:

Travel

Longitudinal travel (axis Z): 320 mm.
Transverse travel (axis X): 250 mm.
Vertical travel to measure the height: 60 mm.

Measuring system

Using Sylvac scales, resolution 0.001. Precision 0.01 over 500 mm.

Travel

Rapid feed in X and Z by way of a coupling system and fine adjustment using a hand-wheel.

Projector

Aubert diameter 150, magnification 20 X.

Control

Alphanumeric keyboard.
Display screen 50 mm / 80 mm.
Display and luminous keys.
RS 232 to communicate with PC and / or printer.
Mains supply between 100 and 240 volts, 47 to 63 Hertz (mains filter).
Memory for 25 tools/geometries.
Switch-over from axes X and Z.
Tool display / geometries stored by keys 1 to 25.

Weight: 80 Kg.

Skills shared

A company like TORNOS-BECHLER has an effect on associated industries and jobs. Consequently several manufacturers producing complementary products to our machines set themselves up (in the vicinity of the company) and grew with the company.

This new heading will highlight their contribution to the trade.



In this first article, we introduce Harold Habegger SA from Court by presenting the company's products, particularly the new, type C roller guide bush.

The innovative feature of this roller guide bush, which has been displayed at exhibitions in 1999 since EMO, on the DECO 2000, 13 mm capacity and is currently being displayed at our various internal exhibitions, fully justifies this choice.

A little background history

The Habegger company started up in 1960. Production of the thread rolling dies was started in 1963 by the founder, Harold Habegger. The range was strategically completed by the hard metal guide bushes in 1968. The com-

pany also manufactures self-opening die heads, which prevent spindle inversion following threading, as well as a range of other products, a detailed description of which is provided below.

This medium-sized company, with its thirty employees, exports roughly 60 % of its production. It is a family run firm with the founder's sons ensuring its continuity. Production is 100 % at Court and the worldwide sales network operates via its agents, who are also responsible for pre- and post sales services.

The guide bushes

Development of the company's "guide bush" department went hand in hand with the development of TORNOS-BECHLER machines. Since the days of the cam

operated lathes, but more so with CNC and PNC lathes, Habegger guide bushes have provided an interesting alternative to revolving bushes.

The ever growing demands in modern small parts turning, removal of chips, difficult materials, exceptionally tough operations, such as thread chasing on very hard materials (rapid axial displacement and slow rotation), are but some of the stringent challenges facing mechanical engineering. The Habegger guide bush provides a solution to such problems.

This guide bush uses carbide rollers which are in direct contact with the material, thus avoiding those problems linked with faulty concentricity or circularity which are commonly associated with revolving bushes.

According to the manufacturer, the following are the main benefits of roller guide bushes:

- ◆ they eliminate the risks associated with axial seizure
- ◆ they are exceptionally precise
- ◆ they provide increased safety as a result of pre-stressing
- ◆ they are 100 % compatible with emulsion work
- ◆ they provide the facility to machine materials ranging from plastic to the highly exotic (excluding shaped materials)
- ◆ they meet the most challenging of demands.

The new short, C type guide bush is roughly 50 % shorter than the current bushes, thus reducing the overall length of the drop and providing the possibility of extraction from the front.

This new bush can be adjusted at the front. Because of the design of the DECO 2000, where access is good from the front and "headstock bush" space is reduced, adjustment has been considerably simplified.

All the other main features of roller guide bushes are obviously found on this model.

The oscillating guide bush

With changing client demand, the company also investigated tolerance issues concerning available material, precision and the exceptionally precise surface finishes demanded in small parts turning. The solution was found in the oscillating guide bush – the alternative to ground bars and very tight tolerances.

Extruded h11 material can be used with this bush, whilst providing the most exacting tolerances and surface finishes. (This bush will require specific adaptation. If you are interested, please contact the producer directly at the address shown at the end of the article).

Threading

There are two types of thread rolling dies – those models, which can be adjusted, and those which cannot. The adjustable thread rolling dies are gaining in importance. Their economic use, coupled with the possibility of compensating for wear and producing all tolerances with the same unit, is playing an ever greater part.

The company holds sufficient stock to meet fluctuating requirements.

Thread rolling provides a range of special shapes and sections, especially for the dental and jewellery industries.

Knurling and roller burnishing

The third major product of the range offered by Harold

Habegger SA concerns end knurling die stocks and knurling heads. Knurling operations with these products provide an alternative to radial knurling with its known pressures.

Its vast experience in all these sectors linked to the small parts turning industry is also attributable to the fact that the company readily listens to its clients and the machine tool producers. The trends in precision and the perfect finish demanded by the micro-engineering industries resulting from the numerous contacts with the Habegger company and its partners, stimulated the latter to develop a different option to the milling operation demanded to guarantee a perfect surface finish: the thread rolling die! With its three smooth rollers, this system is both fast and simple. It dispenses with grinding and guarantees the minimum roughness demanded.

It can be adapted to any machine and does not require cumbersome conversion.

The company

Harold Habegger SA has an exceptionally low rate of staff turnover, since the company is formed of skilled professionals, nearly all of whom came from micro-engineering backgrounds in the region. The workforce (some having been with the company since it was founded) is a motivated team. The wide range of skills is seen throughout the company and the common desire to get to the top meant that the company was able to keep up with technological developments. The modest attitude and feeling of wanting to promote the team as a whole rather than individuals, is felt throughout, to the point where those persons having kindly helped in editing the DECO Magazine, are not even mentioned here by name.

Co-operation with the design offices of machine tool manufacturers (including TORNOS-BECHLER) has likewise grown over the course of the years because technological solutions are

becoming more and more standard with less fear of outsiders looking in. Also manufacturers have realised that customer/partner satisfaction is the only way of going forward in today's highly competitive world.

Conclusion

To conclude, this co-operation enabled companies i.e. "de facto partners" to create products which are perfectly adapted to certain requirements which are fully incorporated in our solutions...and hence to reinforce the strengths of the DECO 2000.



The motto of the Habegger company can be summarised in a single sentence:

"We want to offer the best solution in terms of quality and profitability for the machining sector, for which we developed our products".

Using Habegger products for machining without stresses is not always justified, but for some applications, it is absolutely essential.

Should you require further information, please do not hesitate to contact Harold Habegger SA
2738 Court, Switzerland

Tel.: ++41 (0) 32 497 97 55

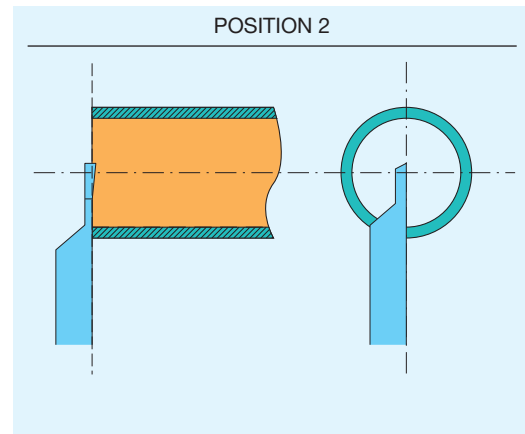
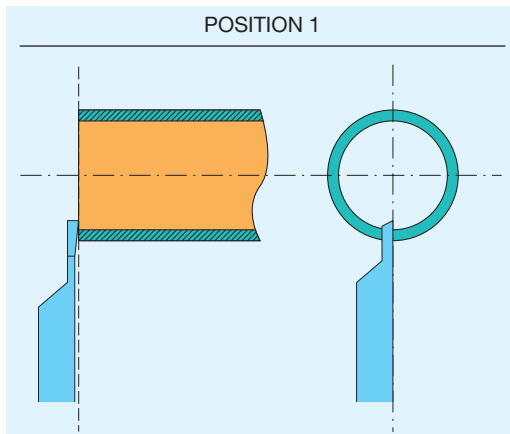
Fax: ++41 (0) 32 497 93 08

Producing parts made from thin-walled piping material:

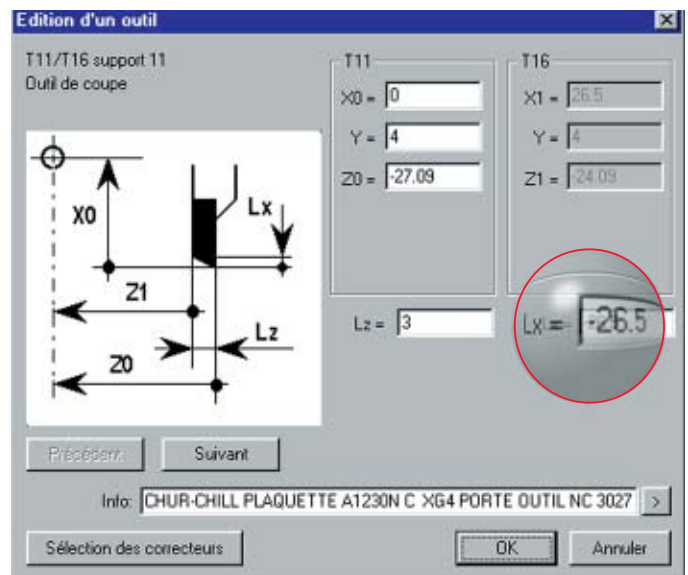
Description: The standard macros of TB-DECO used at the time of the initialisation programme and when feeding a new bar always direct the cutting tool past the bar centre at the end of the cut (to a negative X position depending on

the Lx value of the tool geometry). With regard to machining pipe material, when using an angled part off insert tool, it is imperative that the cut be stopped as soon as the internal diameter of the pipe is reached (position 1).

If this is not the case, then, if the part off tool stops its run past the theoretical centre of the bar (position 2), the insert will no longer be able to rest against the pipe wall, which could cause problems with length when feeding the next part.



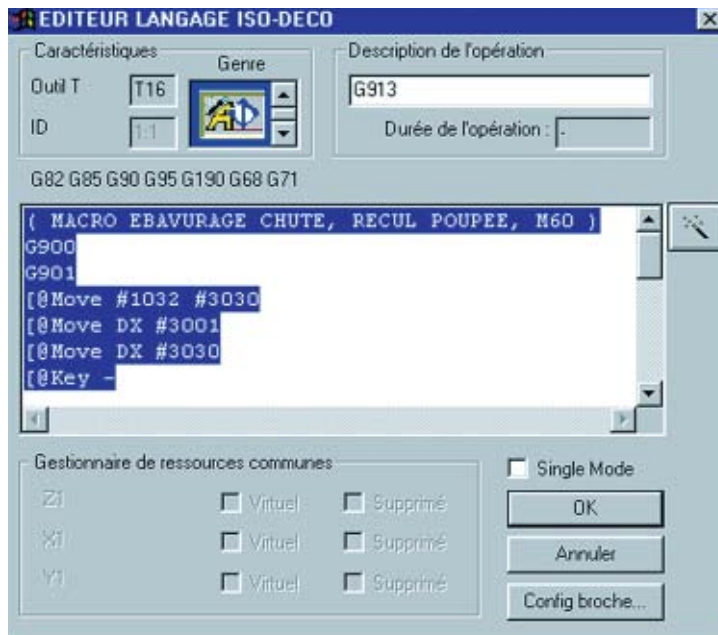
Tip: One can get around this problem by juggling the cutting tool geometry and by inserting a series of small arithmetical calculations in one operation of the END_BAR.PGM program which manages deburring of the ejected part.



1. Geometry of the cutting tool:

It is sufficient to input a negative value in the Lx field, so as to prevent the tool tip from stopping its run past the centre of the part at the end of the cut.

For example Lx= -26.5.



2. Modification of operation 1:1 of the END_BAR.PGM program:

In the standard ISO code for this operation, the lines shown below have to be added before and after the G913 line, whilst adhering to the wording.

ISO code of operation 1:1:

(MACRO DEBURRING EJECTED PART, TAILSTOCK RETURN, M60)

```
G900
G901
[@Move #1032 #3030 recopies the value of Lx in #1032
[@Move DX #3001
[@Move DX #3030
[@Key - subtracts the Lx value from the bar Ø
[@Move #3001 DX
[@Move #3030 0 Lx set to 0
G913
[@Move #3030 #1032 restores the initial Lx value
[@Move DX #3001
[@Move DX #3030
[@Key + restores the initial value of the bar Ø
[@Move #3001 DX
```

We would suggest that those persons requiring further details on extended programming should refer to the programming instruction, Chapter 6.6

For example: let us take a pipe bar with an ext. dia. of 30.3 and an internal diameter of 28.

1. So that the cutting tool stops immediately on reaching the internal diameter, a negative Lx should be inserted in the geometry of said cutting tool. Its value is determined as follows:

$Lx = \emptyset$ at which cutting is to stop.
In this case, $\emptyset 26.5 \text{ mm}$



2. Modify the 1:1 operation of the END_BAR.PGM program as described above.

And Bob's your uncle!

We shall come back to extended programming in a future edition...

Comments:

This tip applies to any program used on the DECO 2000 – capacity 7/10, 13 or 20/26.

The paths to perfection

*Meeting
with
Messrs. Kugel
of the company
bearing the
same name,
located at
Wiersheim
(Germany)*

The company has been renewing its fleet of machines in favour of the DECO 2000 for more than a year now.

Selling prices in the small parts turning industry have already been stagnant for several years, whilst production costs have been constantly rising. For a production plant, solving this problem is extremely tricky. The high precision, small parts turning company, Kugel GmbH, in Wiersheim, Germany, tackled this problem by looking at ways of improving productivity.



Thirteen years ago, its founders, Messrs. Richard Kugel and his son Jochen, replaced the machines and proceeded with the installation of the first of thirty MS-7 TORNOS-BECHLER cam operated machines. Both directors were convinced that they had hit upon the best choice with respect to precision, reliability and productivity for bar diameters up 7 mm. This choice proved highly judicious since these machines are still operating today and will continue with large series small parts turning as long as they are in demand by the trade.

The Kugel company, which was established in 1962, is a small to medium sized production plant

employing 30 workers with its own in-house specialist training. (cf. Image 1) The company produces small turned parts, ranging from the straight forward to the highly complex, for its international customers in the car, electronics, electrical, medical and dental, aeronautical and aerospace industries, as well as the micro-mechanical sector.

The machined diameters range from 1.5 to 20 mm. On average, the company is involved in the large series production of several million parts, with production stretching over several years. Recently, it also started producing small series samples of 100 parts

on the newly purchased DECO 2000 turning machines. The entire range of possible materials has been machined – ranging from hardened steel to copper, brass, aluminium, right to the special materials which are difficult to machine, such as titanium materials. Messrs. Kugel discovered a trend regarding the parts being machined – they were getting smaller yet more complex, whilst precision requirements were more demanding.

In order to have the capacity to machine the entire range of parts and thus provide an overall and flexible solution to its clients, Kugel has acquired a fleet of machines made up of roughly 70 small part turning machines, which are constantly being upgraded in line with technical progress and growing market demands. The emphasis is placed on the productivity of these machines, so as to balance out the constantly rising production costs. Prices have been stagnant for several years for the regular series parts, irrespective of production costs. The people responsible for ordering refuse to pay any increased production costs unless the parts in question are new.

The only way to remain competitive in the world market is constantly to upgrade the means of production.

A small to medium sized supplier whose main priority is to provide customer satisfaction with respect to the quality supplied, must look after his financial interests. The way to achieve this in the present climate, is to increase productivity by having production runs over several weeks and to substantially reduce the preparation and starting-up times for small series runs.

To increase productivity, the Kugel company purchased its first SAS 16.6 multi-spindle lathes four years ago. The second wave of renewal started a year ago with the installation of the first DECO 2000 as a replacement for an ENC machine. This replacement was essential, because although the small parts CNC turning machines purchased in the 80s provided the necessary flexibility, they could no longer meet the current demands of productivity and flexibility. When the DECO 2000, 20 mm capacity machine was first presented at Moutier, the precision small-parts turning company, Kugel GmbH, seized the opportunity of ordering one of the first machines.

Mr. Jochen Kugel told us: *"We wanted to gain some experience with this new concept of small parts turning. Once we saw that the machine proved itself in practice, we went ahead and purchased four other 20 mm machines in one year."*

We are going to replace all our ENC numeric control machines because the DECO 2000 works twice as fast whilst retaining the same flexibility.

With practice, the DECO 2000 concept and adapted kinematics revealed some very useful benefits. A trained setter, for example, recently set up the DECO 2000 for a complete new series run within less than one hour.

According to the schedules, the ENC 162 and ENC 164 machines are also earmarked for replacement – not purely for reasons of productivity but also on account of the complexity of

parts requiring machining. It is far easier and quicker to machine these parts on a DECO 2000 with 10 axes than on an ENC 164."

The Kugel company places considerable emphasis on production quality. A quality manager was appointed several years ago to ensure that deliveries were made without margin of error. This "quality assurance" system includes the following CAQ: a measuring station for statistical process control (SPC), a central operating station, managing inspection means, monitoring the inspection means, processing complaints, possible fault and impact analyses (FMEA). The QAC department is supplied and run by its own network.



Every machine operator is responsible for his work and must guarantee the production quality expected by the client. The QA department provides him with assistance with respect to any specific order, so that he can adjust his production process to the quality required.

The production statistics for the Kugel company over the last year, clearly demonstrate very high levels of production and quality. These statistics show a constant improvement in quality to the point where deliveries are completely fault-free. It hardly came as a surprise when, in February 1999, the Kugel quality management system was accredited by Daimler-Chrysler according to VDA 6.1 regulations.

The importance of growth continues

Kugel advocates development and recently inaugurated a new production shop for the SAS 16.6 multi-spindle machines. Mr. Jochen Kugel has also acquired considerable information on the MULTI-DECO machines. He is very interested in the latter, because they cover all capacities up to 26 (32) mm. The technical qualities coupled with the high degree of flexibility provided by the DECO 2000 concept, have certainly impressed him a lot!

Mr. Jochen Kugel believes that the DECO concept, whether single or multi-spindle, will represent a means of profitable production in

Germany for the future. This concept will allow him to reach his goal far more quickly and easily: to produce high quality parts in the quantities and at the times required, in one complete and automated production run, so as to rule out human error.

His motto is not to be the largest supplier – but rather the best!

Kugel has put in place the means to face the future calmly. Efficient management, a clear vision of the company's mission and modern means of production will guarantee that the company can adapt well to the market. We wish Kugel every success.

It is now becoming quite a regular feature for us to present new options or units to our machines in each edition.

New options

In this summer edition, we uncover the air conditioning system to guarantee electrical operation in hot working environments as well as a long parts extraction unit, which has been designed by our French subsidiary (the options and equipment presented here only represent extracts of our wide range of possibilities. If you have specific requirements, please do not hesitate to contact us).



To start, let's look at this cooling system:

Option 5440

Electric cabinet air-conditioning unit, type "Mclean Slimboy"

Characteristic:

Cooling: 100 % without CFCs

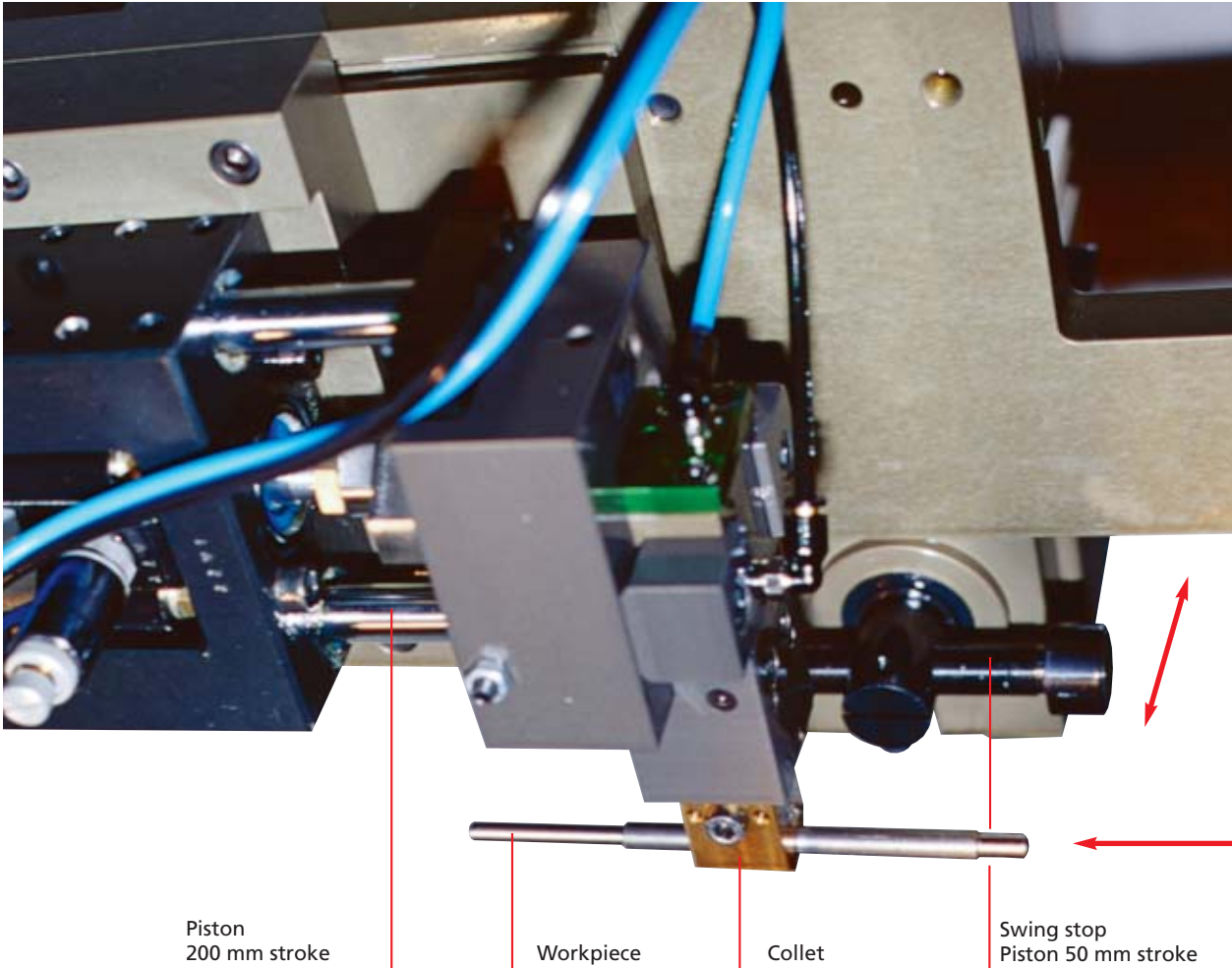
Good access to the components

Maximum operating temperature: 52°C

This unit is recommended when the ambient temperatures exceed 35°C and entails a change to the electric cabinet door, reinforcement to the machine cowling and electric wiring.

This new option is available ex-works.

Table summarising the innovations			DECO		
Option	Designation	DECO Mag. no	10	20	26
5430	Oil and emulsion mist suction device	7	x		
4900	Long parts extractor	7	x		
0940	Spindle lock				
3800	Internal thread miller for counter-operation	8	x		
3810	Fixing system for the whirl cutting spindle	8	x		
4400	Internal thread miller	8	x		
4410	Fixing system for the whirl cutting spindle	8	x		
4950	Pneumatic device for extracting and evacuating long parts with bar pusher	10	x		
1650	Revolving spindle unit for ESX 25 chuck	1/98		x	
2100	High frequency drilling spindle revolving at 15,000 rpm	1/98		x	
3240	Triple end tool holder	1/98		x	
5010	High pressure drilling unit	2/98		x	
1800	Generation hobbing unit	2/98		x	
3300	Drilling/milling long spindle unit for ESX 25 chuck	3/98		x	
4550	S5 longitudinal motor for driving the revolving units in positions T41-T44	3/98		x	
3350	Differential spindle	3/98		x	
0940	Spindle lock	7		x	
1900	External thread miller with high tool rpm	8		x	
1910	Milling head with tool centring system	8		x	
5250	Coolant pump, 20 bar	8		x	
	Tilting tool holder for counter operation	9		x	x
	Geared down tool holder to increase torque	9		x	x
Special	Conveyor belt removal device	9		x	x
5440	Electric cabinet air-conditioning unit, type "Mclean Slimboy"	10	x	x	x



Piston
200 mm stroke

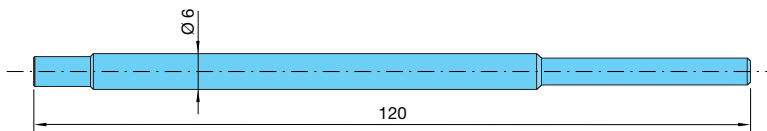
Workpiece

Collet

Swing stop
Piston 50 mm stroke

Guide bush

Option 4950 – Pneumatic device for extracting and evacuating long parts with bar pusher



Characteristics:

- Minimum part diameter* : 3 mm
- Minimum length* : 100 mm
- Maximum length* : 200 mm
- Compatibility* : DECO-7/10 mm – 5 axes version
- Pneumatic system* : Actuator Ø 20 mm
- Requirements* : Bar feeder which pushes the bar
Option 5001 for function control

Principle of the “bar pusher”

This system requires a bar feeder which pushes the part through the guide bush to the retractable stop. This principle is not compatible with the Robobar SSF 107. The part is pushed right to the stop which then retracts. The clamp (which is controlled by a second actuator) holds the part ready for removal.

The maximum part length is 200 mm, and based on the principle

of one bar pusher only, the maximum machinability is 2 x 60 mm (headstock travel), meaning that long parts worked at both ends can be achieved, a typical example being an engine axle.

This low cost device can execute long parts on a 5 axes machine (without the need for a counter-spindle to “draw the part”, which is a financial and technical alternative).

Advantages:

- ◆ Straight-forward and fast.
- ◆ Works long parts without the need for a counter spindle.
- ◆ Does not require options 2900 (bar clamping) and 4900 (removal device).
- ◆ Can be adapted to any DECO-7/10 5 axes machine already in service.

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Robobar MSF-832 for the MULTIDECO 26/6

A new team behind the successful launch.

As a result of the complete renewal, which affected the company as a whole over the past four years, its new product ranges and reorganisation, it was inevitable that the "bar feed" section would also undergo a "facelift".



A specialist team was involved, for the first time, in producing the essential parts for our machines. The fruits of their labour – these Robobar MSF-832 – proved so popular amongst our customers, to the point that the first model presented at the EMO in Paris, was sold within the first couple of hours.

We had a meeting with Mr. R. Hoffmeyer, head of the bar feed section, to learn a little more about this product and his department.

Hello Mr. Hoffmeyer! A breath of fresh air has swept through your department – what exactly happened?

R.H.: Well, in fact I happened to turn up on the scene during the changeover. Previously I was part of the project team for the DECO 2000, 20 and 26 mm capacity. I have now been at this job for a little more than a year.

D.M.: So, being somewhat new to the "bar feed" section, you obviously had a new outlook on this product family, but how did this affect your colleagues?

R.H.: At present, there are six of us involved in developing the bar feeders, including three who have already been working on this product family. We also have two electronics and software specialists helping us on a part time basis. We are building new products based

on the experience of our bar feed colleagues, my own experience with the DECO 2000 and, of course, on the professional advice of the other engineers and designers involved.

D.M.: In one year, how do you regard the work carried out by your team?

R.H.: I am extremely pleased. We have improved the reliability of existing bar feeders and concentrated on the DECO 2000 Robobar SSF 210 and 226. We also fully upgraded the MSF-832, 3 and 4 m integrated bar feeder for the MULTIDECO 26/6.

D.M.: This does seem to be a lot of work, but why did you go for this bar feeder option?

R.H.: Our main concern is to tackle the problems facing our clients

to the best of our ability, and the fact that we can offer a machine coupled with bar feeder specifically designed to interact is a good guarantee of security and reliability. We can really offer the best guarantees possible since our department is made up of staff, who are fully au-fait with all the intricacies of both components.

D.M.: *If I understand correctly, was there a real desire to start from “scratch” with this type of product?*

R.H.: Yes, of course, because for the first time, the company provided the means to realise its ambitions by creating this department.

D.M.: *Then why didn't the machine and bar feeder get launched at the same time?*

R.H.: Well we started on the bar feeder project quite late on in the day, because the company wanted to devote special attention to developing the DECO and MULTIDECO machines. With respect to the MSF-832 bar feeder and with the aim of guaranteeing a reliable product, we preferred to defer its launch rather than act in haste and produce a “sheep with 5 legs”.

Since this was a brand new concept, we gained from taking things in our stride and thinking through all aspects. The strengths of the MSF-832 bar feeder are:

- ◆ Ease of loading.
- ◆ Doing away with the hydraulics and high-precision calibration, thus dispensing with risks caused by a bar passing through too quickly.
- ◆ The bar stop is “incorporated in the machine”, thus completely eliminating short part risks.
- ◆ Interchangeable bar guides, made from synthetic material, which are completely enclosed and quiet, with mechanical lock.
- ◆ Direct bar feed control from the machine control – only one operator interface.
- ◆ Quiet running using belt transmission.

D.M.: *In terms of visual aspect, development is extremely important. How did you work on this?*

R.H.: All design aspects were thoroughly examined. It goes without saying that, as engineers, our priority was aimed at the technical aspect and reliability, manufacturing quality, the practical aspect and even autonomous operation.

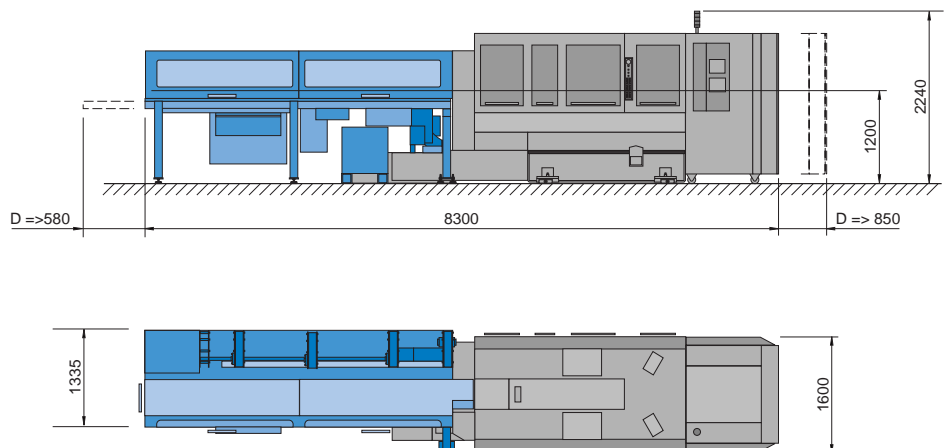
We then took account of the “human environment harmonisation” aspect and optimised the concept with regard to noise levels and visual appearance. Its incorporation in the “DECO and MULTIDECO look” has been most successful!

D.M.: *What projects have you on the go?*

R.H.: We work on several projects at the same time, but our priority is geared towards bringing out a new bar feeder to be integrated in the MULTIDECO 20/6, in the 3 and 4 metre version.

D.M.: *And looking well into the future, how do you see your work then?*

R.H.: In the (very) long term, I think that the future will lead to the design of an autonomous production unit (something like a combined machine/bar feeder, which cannot be separated).



D.M.: *It's true that the design isn't bad, but don't the feet look somewhat oversized?*

R.H.: To answer this question, I would say that you are not the first to comment on this – some of our colleagues have even referred to it as a grasshopper. Joking aside, the feet take account of the extreme complexity of positioning the machine on the ground, together with its numerous peripherals. It is clear that a bar feeder without machine is quite strange, but once it is fitted, it integrates well with the machine peripherals.

D.M.: *Mr. Hoffmeyer, we would like to thank you for this interesting conversation, and look forward to seeing you again when the next new products are launched. Would you like to say something to round off this discussion?*

R.H.: Yes, I would like to use this opportunity to thank my colleagues who really have put in their maximum efforts to ensure that our bar feeders are efficient, high performing and reliable – they have done an excellent job!

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