

DECO MAGAZINE

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A P R I L

EMO
PARIS
1999
Halle 5
Stand B16



NEW G904 MACRO FOR THE DECO 2000



IMPRESSUM DECO-MAGAZINE 2/99

**Industrial magazine dedicated
to turned parts:**

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Standing still means taking a step backwards – in other words, change is the only constant.

For all businesses, a period of dramatic technological development, rapidly changing market conditions and increasingly globalised competition, mean developing at an even faster rate. Changes and adjustments are best effected pro-actively, i.e. by looking forward, and not reactively, i.e. through being compelled by circumstances – which is usually too late.

We are delighted to inform you about the latest developments and new targets at TORNOS-BECHLER, based on the pro-active corporate strategy of the TORNOS Group.

Change of shareholder guarantees TORNOS-BECHLER additional funds to secure the long-term success of the company

The change of course put into effect three years ago by TORNOS-BECHLER completely transformed the company. For our customers, this transformation is most noticeable by the new DECO 2000 and MULTIDECO product lines. Internally, it has meant an entirely new production strategy, associated with large investments in infrastructure and new means of production. The result was an unexpectedly large rise in turnover for the TORNOS Group from CHF 169 million in 1996, to CHF 290 million in 1998.

The necessary investments were funded exclusively from the company's own resources, i.e. without additional bank loans or extra contributions from the shareholders.

In order to put into effect the next phase of development of the TORNOS Group, it was clear that additional finance would have to be pumped into the Group, since the potential for self-financing had already been relatively heavily utilised.

In Doughty Hanson & Co, a leading international investment group in Europe, TORNOS-BECHLER has found a new principal shareholder, which will support the company by carrying on the rapid and sustained growth and continuing to promote the development of new products with new technology. Modernisation of the means of production and renewal of the infrastructure can be continued as planned. Measures permanently to improve the customer and spares service can be speeded up.

The DECO product family continues to grow – the most important new products in brief

The DECO 2000 family is completed

Up to now, we have been able to offer you a graduated programme of DECO 2000 automatic lathes in the diameter range of 7mm, 10mm, 20mm (26mm) and 26mm (32mm). (The figure in brackets indicates the maximum bar capacity, including bar preparation)

We are pleased to be able to use this issue of the DECO Magazine to introduce an important edition to the DECO 2000 automatic turning lathe family:

**DECO 2000
13 mm (16mm) capacity**

The MULTIDECO family is growing

With respect to multi-spindle automatic lathes, we have, for the first time, applied the DECO concept to the MULTIDECO 26/6, the 6-spindle automatic lathe with up to 26 mm bar capacity.

We have the pleasure of introducing the latest offspring of our multi-spindle lathe development to you in this issue. We wish to put forward the evidence that new dimensions are achievable in multi-spindle applications, even in the smaller diameter range, with respect to flexibility and precision, without sacrificing productivity. We provide the proof in the form of the 6-spindle automatic lathes for a bar capacity of up to 20 mm:

MULTIDECO 20/6



The TB-DECO programming software is getting quicker and simpler

Release 5.0 sees the first fundamental revision of the TB-DECO programming software. Significant points of criticism and suggestions from users have been taken into account in this revised version. The changes in Release 5.0 can be summarised in three key words:

TB-DECO 5.0 – quicker, simpler, new functions

"Renouveau I" is followed by "Renouveau II"

Based on the corporate strategy and geared to the new world market situation, which is characterised by ever shorter demand cycles and global competition, an internal process of change and renewal, vital to the company's survival, was introduced at TORNOS-BECHLER in 1995. This programme, which consisted of a large number of individual projects was called "Renouveau", or as we now call it, "Renouveau I" and was completed at the end of 1998.

'As a reminder, the main objectives of "Renouveau I" were:

- ◆ Renewal of the product range.
- ◆ Improving the flexibility of the company so that it is better able to react quickly to market changes.
- ◆ Improving productivity and quality.
- ◆ Reducing the amount of capital tied up.
- ◆ Renewal of the infrastructure.
- ◆ Generation of cash flow for the future development of TORNOS-BECHLER.

Because standing still means taking a step backwards, because the underlying conditions continue to change and because the potential of the TORNOS Group is far

from being exhausted, we have created a new programme entitled: "Renouveau II".

The principal aims of "Renouveau II" are:

- ◆ **To reduce even further the throughput time from receiving the customer's order to successful installation of the machine at the customer's premises.** – On the one hand, we want to be able to react more quickly to rapidly changing market needs and, on the other, to reduce the lead times for our customers to a minimum.
- ◆ **To cut costs and hence further improve the price-to-benefit ratio of our products for our customers.** – Because the pressure on our customers to produce turned parts more quickly, precisely and cheaply is becoming greater all the time, we have to make corresponding improvements in the price-to-benefit ratio of our products.
- ◆ **To manufacture all strategic parts in-house.** – This should improve faithfulness to deadlines and the quality of our own products and increase the net product of TORNOS-BECHLER.
- ◆ **To improve the quality and speed of information flow in the TORNOS Group.** – At the forefront is the introduction of the SAP software and Intranet, as well as the extension of the Internet range.
- ◆ **To improve reaction time and quality and to expand our services to our customers.** – We are aware that the range and quality of our services have not kept pace with the dramatic growth of the company. We are now specifically concentrating on these areas.

- ◆ **To have the ability to finance continued qualitative and quantitative growth.** – An essential requirement if the long-term success of the company is to be secured.

We would like to thank all our customers for the confidence they have shown in us again and again. Their loyalty is a matter of the greatest importance to us. In the end, all the measures we take are intended to make us a better and more capable partner. This means, that we intend to offer our customers first class products and services at commercially attractive prices which create for the customer the competitive advantages needed to secure their own long-term future.



Erich Schmid
Marketing and Sales Director

New dimension

No less than 6 machines of the DECO generation exhibited at the last EMO of the millennium!



Hall 5
Stand B16



You must already have seen, read and heard that the EMO will be held in Paris this year, from the 5th to 12th May 1999 at the exhibition site in Paris-Nord Villepinte.

This EMO will be the occasion when TORNOS-BECHLER will unveil its latest developments, namely the

DECO 2000 – 13 mm capacity

MULTIDECO 20/6 – 20 mm capacity, 6 spindles

TB-DECO 5.0

(you will find the relevant information in this edition).

With an exhibition area of almost 400 m² available (Hall 5, Stand B16), everything will be done to help our visitors discover our products and provide them with the relevant information.

We shall be exhibiting the entire DECO 2000 and MULTIDECO family, with different machine axes versions, so as to provide as representative an impression as possible of the current range produced by the company (basic to complete machines), namely:

DECO 2000 – 7 mm capacity, 5 axes

DECO 2000 – 13 mm capacity, 10 axes

DECO 2000 – 20 mm capacity, 8 axes

DECO 2000 – 26 mm capacity, 10 axes

MULTIDECO 26/6 19 axes

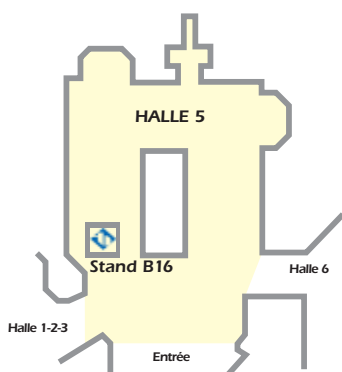
MULTIDECO 20/6 18 axes



The family of DECO 2000 automatics is growing:

A new addition is the 13 mm-capacity version of DECO 2000.

You will be welcomed at the stand by representatives of TORNOS-BECHLER Moutier and of all its subsidiaries (Germany, England, France, Italy, Spain and the United States). Some of our representatives and agents will also be present, providing you with the opportunity for direct discussion.



We are looking forward to presenting our innovations and putting our case regarding the solutions we can offer modern industry.

Unfortunately, at the time of printing this magazine, we did not have a schedule of those who will be available at the stand. This list will be available on the Internet from the 25th April on www.tornos.ch (where a surprise will also await you).

Modern small parts turning the TORNOS-BECHLER way, in other words, the "DECO 2000 concept", will provide you with new dimensions with regard to diameters, working methods and possibilities and will also help you conquer new ground, thanks to the coherent range of machines which is constantly being extended.

Welcome to Paris and see you soon...

This new machine will be launched by TORNOS-BECHLER during the EMO in Paris. The machine is based on the DECO 2000 design, already acclaimed as a lathe classic, combining in one machine the advantages of a cam-controlled machine with those of a CNC. It has been long awaited, but now with these advantages it meets the expectations of all those in bar machining of up to 13 mm or 16 mm diameters, the latter requiring bar preparation.



The mechanical design of 13 mm-capacity DECO 2000 is completely new and its elements meet market requirements. The advantages of the new design include, in addition to the traditional advantages of the DECO concept, better accessibility and simplified setups.

The 13mm-capacity DECO 2000 benefits fully from the experience of the previous DECO 2000 automatics, i.e. it has the same main features such as:

- ◆ developed kinematics
- ◆ PNC-DECO parallel numeric control
- ◆ TB-DECO programming software.

Its specification includes 10 axes with end-working attachment and

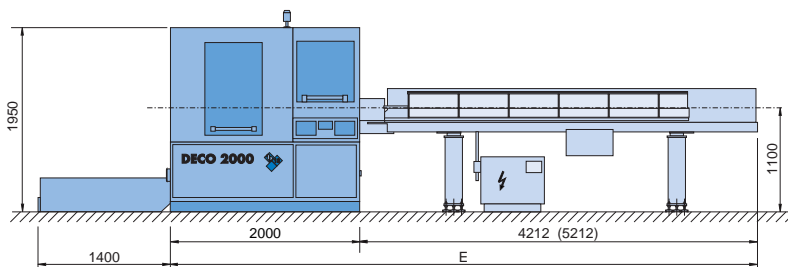
independent pickoff spindle. It can accommodate up to 20 tools, 15 of them driven and can be equipped optionally with C1 and C4-axes for main and pickoff spindles respectively.

Based on the same principles as its predecessors, the 13mm-capacity DECO 2000 works with a new version of the TB-DECO Software which takes full advantage of the power of the modern 32 bit operating systems (Windows NT, 95, 98, 2000) with 50 % to 200 % faster computing speeds.

The TORNOS-BECHLER experts will be there in Paris EMO, Hall 5, Stand B16, standing by to show you the new machine in detail.



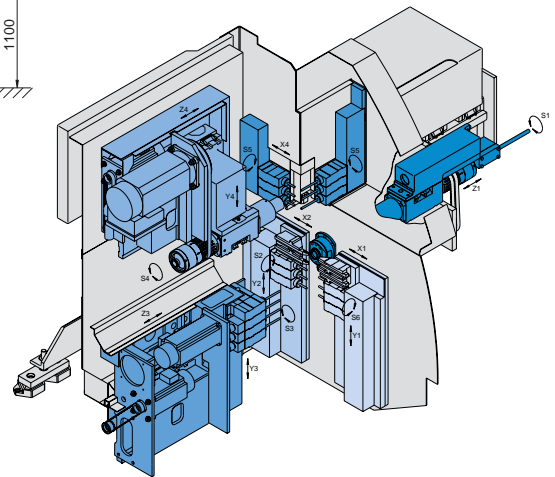
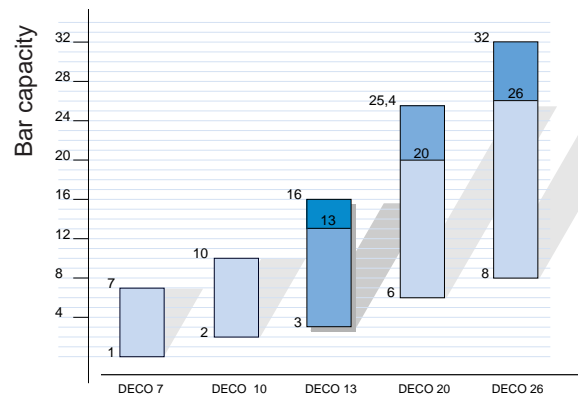
DECO 2000 capacity 13 mm



Main Specifications:

Bar capacity, max.	: 13 mm (16mm)
Part length per chucking	: 180 mm
Spindle speed	: 12000 rpm
Spindle power, max.	: 3.7 kW
No. tools for bush machining, max.	: 14
Pick-off spindle speed	: 12000 rpm
No. back operations, max.	: 6
No. axes max.	: 10 (+C-axis)

The DECO 2000 range in May 1999



MULTIDECO 20/6

After the successful MULTIDECO 26/6, TORNOS-BECHLER launches a new multi-spindle for machining smaller diameters.

The extraordinary versatility of the MULTIDECO, (thanks to the DECO 2000 concept) with its high production rates, is highly regarded on the market:

The need to:

- ◆ reduce the length of production runs
- ◆ increase precision requirements
- ◆ provide a practical, customised know-how

have been fully realised in the MULTIDECO.

The MULTIDECO system replaces mechanical cams with virtual electronic cams which allows profitable medium-size runs. With changeovers considerably shorter than for the cam-controlled lathes, similar production rates and turned parts being of a very high precision, the MULTIDECO family fits the current trends perfectly.

Based on the same principles as the MULTIDECO 26/6 (26 mm capacity, 6 spindles), the MULTIDECO 20/6 (20 mm capacity, 6 spindles) features 18 NC axes with

the parallel PNC-DECO control (including five numeric compound slides).

The MULTIDECO 20/6 is the perfect solution for a flexible 20 mm multi-spindle.

While benefiting from the advantages of the DECO 2000 concept and design (ergonomics, programming in hidden time off the machine, energy-optimisation, just-in-time motions, etc.), this new machine takes full advantage of the power of modern operating systems (Windows NT, 95, 98, 2000)



thanks to a new version of the TB-DECO Software.

The time savings in change-overs and setups and inherent flexibility are identical to the MULTIDECO 26/6.

The levels of precision have been seldom reached on a multisindle, prior to the MULTIDECO.

You can view our products at EMO in Paris from 5 to 12 May, 1999 on the TORNOS-BECHLER Stand (Hall 5, Stand B16) and have the performance of the MULTIDECO 20/6 demonstrated to you.



MULTIDECO precision: Your high demands are met !

Testing condition:

Warm up : 30 min

1 x six parts for dimensional adjustments

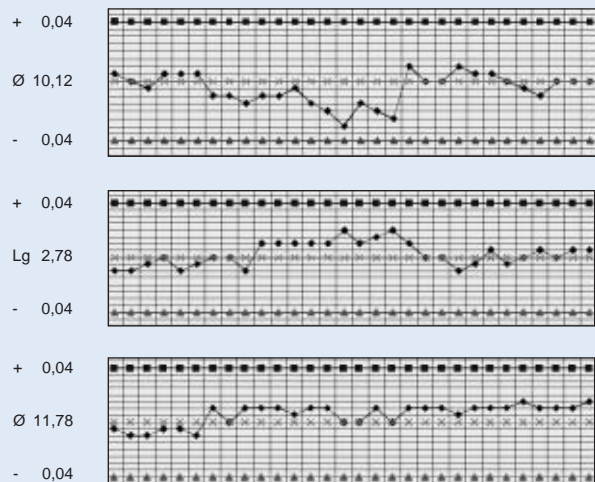
1 x six parts for checking and later first report

Every 30 minutes a 6-part report

After an hour, correction X5 Ø 10,12 = + 0,02 / Z25 lg 2,78 = -0,02

Stock: 5300 PB, Cutting oil: 5024 CF, Speed: 2500 rpm,

Production rate: 6.3 p/min



1 scale division = 0,005 mm

■ Upper tolerance limit
X Theoretical dimension
◆ Measured dimension
▲ Lower tolerance limit◆

Main Specifications:

Bar capacity	: 5-20 mm
Part length, max	: 100 mm
Spindle speed	: 6000 rpm
Spindle power, max.	: 15 kW
No. NC axes	: 18
No. cross slides	: 7
No. compound slides, max.	: 5
No. back-working slides	: 1
No. end-working units	: 5
End-working unit travel	: 160 mm
Pickoff spindles	: 1
No. tools per back operation	: 2
Production rate, max.	: 45 rpm
NC control	: PNC-DECO
Spindle carrier locking	: Hirth curvic coupling

Axes:

Compound slides	: Z 11,12,13,14,15 X 1, 2, 3, 4, 5
Cut-off and back-working slides	: X 6, 7
End-working units	: Z 21, 22, 23, 24, 25, 26

TB-DECO – release 5.0

A new version
with extraordinary
capabilities...



New part management and free position of the tool bar

Besides the new machines shown at the EMO, TORNOS-BECHLER S.A. presents a new release of the programming software for DECO 2000 and MULTIDECO automatics.

Since June 1996, after the first DECO 2000 machines capacity 10 mm had been supplied, the operating systems have been modernised and the software has been developed.

Like all products, there has been a succession of TB-DECO releases, in accordance with changes requested by our customers, and improving the available facilities.

The launch of new machine types, 13mm-capacity DECO 2000 and MULTIDECO 20/6- coincides with the presentation of a new TB-DECO release.

Based on 32 bit programming to take full advantage of the power of Windows 95, 98, NT4 and 2000, this version cannot be run under Windows 3.11.

Each generated part creates a TB-DECO (*.pdb) file which perfectly replaces numerous files (*.cat, *.pgm, *.pce) used in previous generations. The new TB-

DECO Version 5.0 opens old files and automatically generates programs in the new form.

The machine data that required many files (*.cfg, *.md) is now re-grouped in a single *.dbm file.

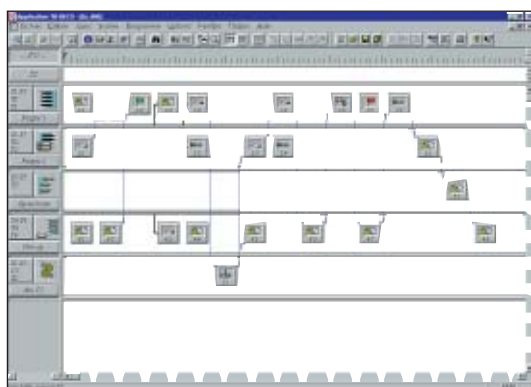
Using the new interface this application runs on a 32 bit operating system. TB-DECO version 5 allows "copying and pasting" from different turned part programmes.

The Windows environment gives you the advantage of such regular functions as floating toolbars, context menus, etc.

For programs requiring numerous operation lines (MULTIDECO), the software offers the advantage of a simplified display, allowing a greater number of operation lines on the screen.

If there are no big differences in the working method of this new version, then why has it been developed?

The new interface is more user friendly and is fully integrated in the Windows 95, NT and 98 logic allowing a better and more friendly programming method.



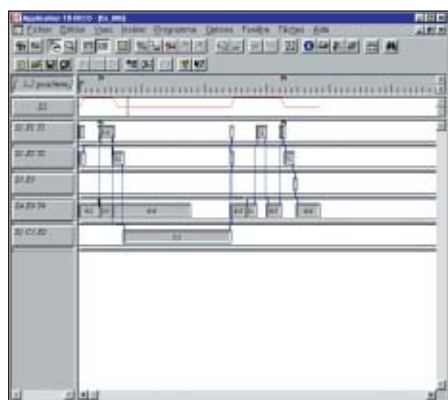
Standard interface



Open TB-DECO

A programming wizard features too. It consists of elements based on the same philosophy as Windows. An operation starts with an initialisation, then comes a rapid traverse, i.e. a tool call. The machining proper contains a succession of contouring motions and ends with a rapid retract.

The wizard makes available most of the contours used in bar machining.



Simplified display

Saving of time

After testing with several operating systems and various processor configurations, our engineers have found astounding results! Among the tests done, in the worst case, 50% of the time can be saved. In the best case, the calculation time is divided by 4!

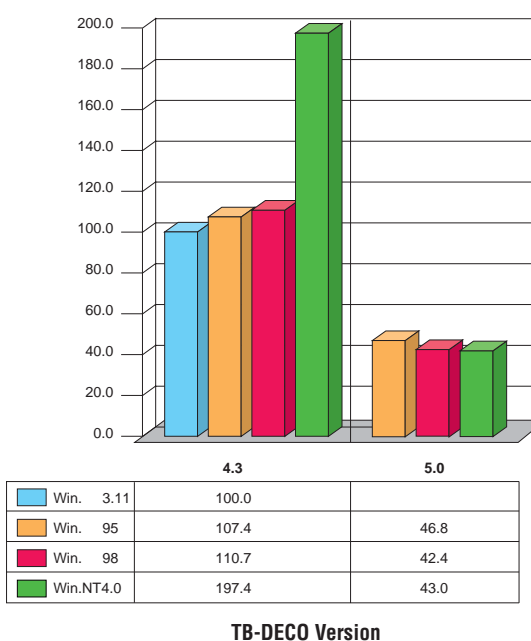
Moreover, in the case of program modifications, only the modified items are recompiled. Also here, a considerable time can be saved. For example (Win NT, Pentium 266 32 Mb ram):

	Version 4.32	Version 5.0
Creation of the program	1,15 min.	25 sec.
Modification and compilation	1,15 min.	5 sec.
Total time	2,30 min.	30 sec.

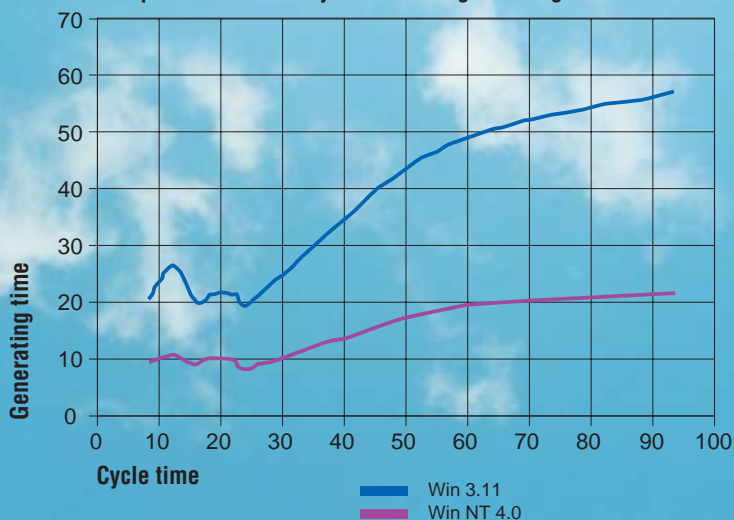
A specific document "from 4.32 to 5" will be available on Internet (<http://www.tornos.ch/rel5>) (may 99) explaining in details the operating difference between these

both versions. The same document can be obtained from your usual TORNOS-BECHLER correspondent.

Comparison of average generating times



Comparison between cycle time and generating time



This new version will be commercialised from June 99 along with the new machines, and it is fully compatible with the former machines and programs and obviously with the year 2000.

Our specialists will stay at your disposal on our stand (Hall 5 – Stand B16) at the EMO in Paris.

1. New G904 macro for the DECO 2000 – 20/26 mm capacity.

(This option is not available for the DECO 2000 - 7 and 10 mm capacity)

Description: Parting off with constant cutting speed

When working with large diameters, a constant cutting speed will save time and provide the best tool working conditions.

Use:

The G904 macro achieves part cutting at a constant rate.

Since the TB-DECO programming system and the PNC-DECO parallel numeric control do not control the speed of rotation in relation to the diameter being machined (hence the vast improvement in productivity of the DECO 2000 concept), it is possible to calculate a pseudo constant cutting speed for cutting operations.

This is achieved with the G904 macro.

This facility requires version 4.32 of the TB-DECO software.

For further information on the use of this new macro, please refer to the DECO 2000 – 20/26 mm capacity programming manual, section 6.2.2. Extracts of this section are also available from TORNOS-BECHLER or can be loaded remotely via the Internet.

Control syntax:

G904 P1=..., P2=..., P3=..., P4=..., P5=..., P6= ...

P1= required cutting speed [m/min] [feet/min]

P2= max. number of revolutions S1 [rpm]

P3= cutting feed [mm/rev.] [inch/rev.]

P4= start of cut diameter [mm] [inch]

P5= end of cut diameter [mm] [inch]

P6= distance to be covered in X before next speed change [mm] [inch]

Comment:

This macro only applies to parting off operations.

DECO Mag	N0.	Trick of the trade	Option required	
			DECO 20/26	DECO 10
3/97		Incorporated assistance	Standard	Standard
3/97		Faster programming	Standard	Standard
1/98		Compensation for wear	Standard	Standard
2/98		Cross tapping with thread miller on tool T24	Standard	n°1500
3/98	6	Deburring a cross hole using axis C	n°0916	n°1500 n°0916
7	4/98	G903 macro (indexing)	Standard	Standard
7	4/98	Milling a square in T31 with an end miller. Transmitted function	n°0916 n°0917	n°0916 n°0916
8	1/99	Milling a square with a circular miller on a polygoning unit. Transmitted function	n°0916 n°0917 n°1700	n°0916 n°0917 n°1700
9	2/99	G904 macro (constant cutting rate)	Standard	—
9	2/99	Increased long part machining	n°4900 n°2900	n°4900 n°2900

2. Saving time when machining a long part.

Machining a long part using the special device (option 4900)
can be improved by applying the following tip:

The use of bar clamping jaws (option 2900) is not essential to lock the bar during multiple bar feed operations. The counter-spindle

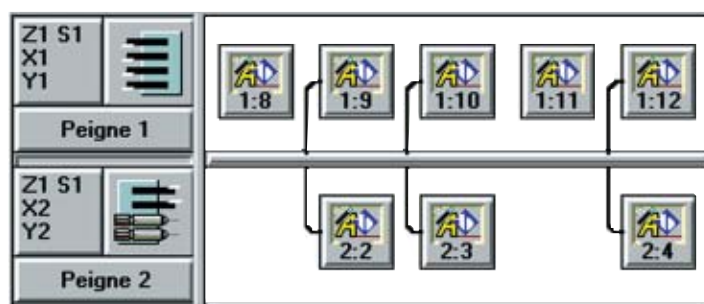
can do this equally well, bearing in mind the following restriction:

- The diameter of the counter spindle collet must be the same as the material diameter.

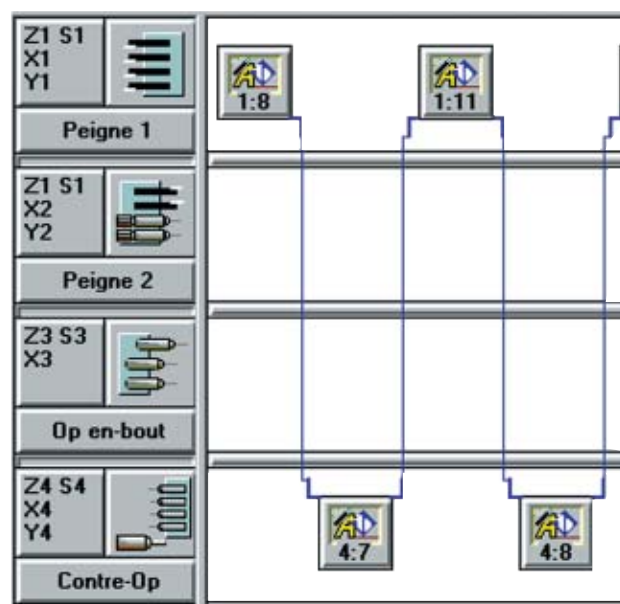
Programming:

Basic model V4_10_L, of the DECO_20 machine:

(Long part model supplied as standard in the TB-DECO software)



Operations 1:9, 1:10, 1:12, 2:2, 2:3 and 2:4 concerning bar clamping by tools T11 and T21 can be dispensed with and replaced by a counter-spindle clamping operation, as described below:



This method offers the following savings:

- ◆ It releases positions T11 and T21 which are normally occupied by the clamping jaws, thus saving two positions for tools.
- ◆ The facility of bar-feeding, without having to stop spindle S1, by synchronising spindle S4.

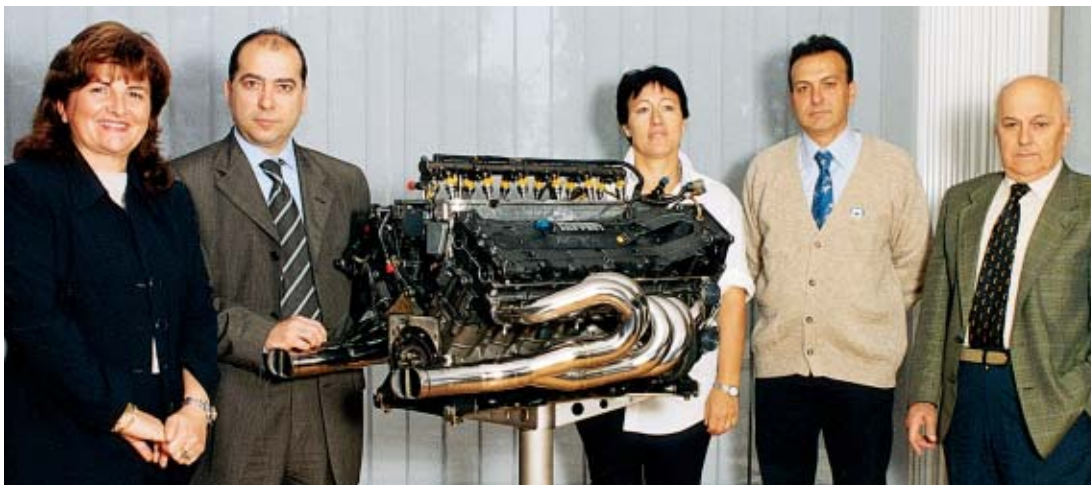
Operation 4:7 executes counter-spindle chuck clamping (M110), operation 1:11 executes bar feeding Z1 and finally, operation 4:8 executes the unclamping of the counter-spindle chuck (M111) once bar-feed has been completed. The other machining operations can continue in the normal way.

Axis Z4 now has to be correctly positioned to execute clamping. This position depends on part length. This position can also be simply determined directly in manual mode on the machine, at the time of start-up or, in theory, by adding the various programmed lengths (original offset and tool geometry).

E

THE DECO SYSTEM IS AN ADVANCED TECHNOLOGY TOOL

The POGGIPOLINI company are standard-bearers of high technology



Situated in an area renowned for technological innovations and inventiveness a small mechanical turning shop was founded in 1950 with the aim of serving the market requirements for small parts, turned using bar lathe, to customer specification.

The founder Callisto Poggipolini, driven by an unflagging spirit to innovate and succeed, manned the few machines that existed in the workshop, situated then as it is today in San Lazzaro di Savena, Bologna.

As time went by, with a watchful eye on the most up-to-date production processes, the POGGIPOLINI company expanded, concentrating not only on increasing the firm's size and capability, but more significantly, on constantly growing the level of technology. The older generation, which played such an important part in the company's expansion, have now handed over the task of continual modernisation, and bringing in new blood and new markets.

Today control of the company lies in the hands of Stefano Poggipolini and his wife Rosanna, respectively Commercial Director and Head

of Administration, and Marco Poggipolini and his wife Monica, responsible for Production and the Drawing Office.

Today, the POGGIPOLINI Company can undoubtedly be termed a "small ... big company", small in dimensions, but big in terms of technology. The means with which it has equipped itself through careful investment over the years have enabled POGGIPOLINI Srl to improve their position in all sectors of the market, from automobile to motorcycle manufacturing, aeronautics to medicine, and precision hydraulics to pneumatics. Choosing production equipment of the highest class has brought with it production flexibility and the ability to adapt to customer needs. Among this equipment are the TORNOS-BECHLER CNC machines and, more recently, the DECO 2000 system.

PRODUCTION MACHINERY

The POGGIPOLINI Srl company possesses:

4 sliding headstock automatic lathes, with capacity ranging from 1 to 26 mm

8 fixed headstock automatic lathes for bar and through-the-spindle machining

3 CNC work centres

2 multiple-spindle lathes

2 hot-pressing machines

1 roll threading machine

and a number of cam type machines for the machining of less complex parts in Ergal, Titanium and stainless steel.

PRODUCTION

It was in 1976 that the POGGIPOLINI Company addressed the aeronautical, automobile, medical and motor racing sectors, concentrating on the high-tech ma-

chining of special materials. The company has the ability to project, design and produce parts of any type to customer specification, from the production feasibility analysis, right through to delivery.

Its flexibility enables the company to satisfy requests for the mass production of large numbers of parts, for small part prototypes and small production runs. The wide variety of machines available lets them accommodate each and every specific requirement of a customer, while the production means used are chosen according to criteria of quality, precision, cost and quantity requested.

Final product inspection is carried out in a centralised, quality control area. To match its most advanced production technologies, POGGIPOLINI Srl also has a Quality Control department equipped with non-destructive and metallographic testing means. In 1994, the company obtained its first aeronautical qualification AQAP-4, followed by the DEN NORSKE VERITAS certification to ISO 9002 in 1997 and TUV certification in 1998.

CLASSES OF WORKPIECES AND MATERIALS MACHINED

POGGIPOLINI Srl's output ranges from standard series bolts and screws in Titanium 6A14V and Ergal 7075, to parts made to aeronautical drawing specification, in Titanium alloys, Multiphase MP35N high-speed steels, Inconel 718 and other special materials.

The company's first encounter with TORNOS-BECHLER technology came as the result of a market request for parts in Aisi 316 L Stainless Steel Titanium for applications in the medical and dental implants sector. In this particular sector, the world-leading TORNOS-BECHLER machines, initially with CNCs and lately with the DECO 2000 system, have given ample demonstration of how they can provide excellent technological collaboration, both in programming of the workpiece and in production, optimising the entire production process.

In addition, the Windows environment simulations let the operator verify in shared time each single operation on the workpiece, from the high production possibilities that a 10-axis machine with 21 tool positions can offer. In a company such as POGGIPOLINI Srl, where specialised, high-tech workpieces produced in small, medium and large quantities are the hallmark, it has always been important to be able to code workpieces, material, customers, tool geometry, suppliers of auxiliary materials and raw material characteristics, all while the machine is running, resulting in a database of information.

CUSTOMERS AND HUMAN RESOURCES

POGGIPOLINI Srl is one of the most important European manufacturers of parts used in the motor-racing world by the leading Formula 1 car and motorcycle makers.



For the aeronautical sector, the company supplies the leading American and European manufacturers with hydraulic couplings, high precision screws and screw studs, made of materials with hardness reaching 200 kg/mm².

The number of employees totals 40 people and sales globally in 1998 topped the 10 billion Lira mark.

CONCLUSION

Looking back over the developments and growth of POGGIPOLINI Srl with the founder Callisto Poggipolini and his sons

Stefano and Marco, significant gains have been made since the technological collaboration with TORNOS-BECHLER.

Using machinery that offered high versatility and adaptable to the specific market requirements for turned components, that the company was able to achieve the necessary flexibility and produce its extensive variety of parts for each market sector.

The link between POGGIPOLINI and TORNOS-BECHLER was intensified by the DECO 2000 system, making machining possible with 4 tools simultaneously, allowing synchronisation between the 10 axes and offering a tailstock-spindle working in hidden time.

The road ahead for POGGIPOLINI Srl is set for demanding targets, and requires constant technological change. With regard to the human resources, we feel that the company in itself is a guarantee for its customers; as for the production means, we would

merely like to confirm that the DECO 2000 system, with its constant software and hardware upgradability, will most certainly follow the times, providing a guarantee for the immediate technological future, at least.

By
Enzo Pitton

New devices

We continue with each edition, to present you with the options and accessories so that you can "doctor" your production.

These options, which, in fact, extend machine capacity by increasing its potential, will help you execute parts ranging from the simple to the highly complex.

This edition covers two special tool holders for the DECO 2000 – 20 mm and 26 mm capacity (these tools holders do not have option numbers as yet; they will be notified in our next edition) and the part removal conveyor belt system on the DECO 2000 – 20 mm and 26 mm capacity.

Option – Tilting tool holder for counter-operation
Can be fitted for positions T51, T52 and T53.

Characteristics:

Tilt from : 0-90°

(degree by degree adjustment, or larger)

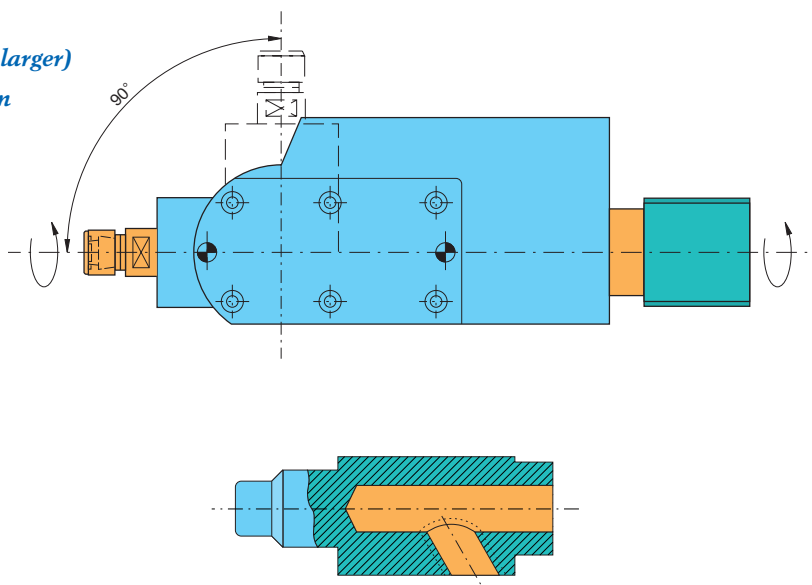
Max. speed of rotation: 8,000 rpm

Max. clamping diameter: 7 mm

This device can be used for machining inclined transverse operations in counter-operation mode, such as, for example, drilling, milling, tapping or slitting.

Given the maximum clamping diameter, this device is mainly used for lighter operations.

This new device will be available from June 1999.



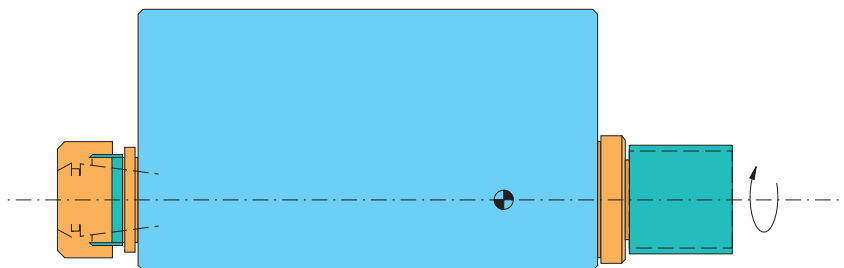
Option – Geared down tool holder to increase torque
Can be fitted in positions T22, T23 and T24
Uses 2 positions

Characteristics:

Is available for the ratios: 1:2, 1:3

This device considerably increases the torque available and allows operations to be carried out, requiring the power of the DECO 2000. Machining difficult materials (stainless steel, titanium) has been made easier by increasing torque.

This unit is available now.





Part removal conveyor belt for the DECO 2000 – 20 mm and 26 mm capacity

This is not a standard option provided by TORNOS-BECHLER.

There are several, tailor-made models. If you are interested in this unit, our engineers will be pleased to work out the feasibility of adaptation.

Characteristics:

Since our customer requirements regarding removal and the solutions provided are very specific, it is impossible to provide standard characteristics. However, several devices can be adapted to the DECO 2000 - 20 mm and 26 mm capacity. Some degree of incompatibility is possible (with the long part unit, for example).

The purpose of this accessory is merely to provide optimum part removal and hence improved autonomy of the DECO 2000.

This device may also be incorporated in a production line.

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		
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