



1468 Armour Blvd.
Mundelein IL 60060
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**LIVRE D'INSTRUCTION
BEDIENUNGSANLEITUNG
MAINTENANCE BOOK**



**LIVRE D'INSTRUCTION
BEDIENUNGSANLEITUNG
MAINTENANCE BOOK**

Client :
Kunde :
Customer :

PIBOMULTI N.A.

Multiplicateur de vitesse :
Schnellaufspindel :
Spindle speeder :

Commande interne :
Bestellnummer :
Order n° :



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WARRANTY

Order N° :

TIME OF WARRANTY:

- 1 year from the arrival at the user
- or max. 18 month after leaving our company
- or 2.000 working hours

To get a warranty from the company PIBOMULTI, it is absolutely necessary that the user familiarize himself with the maintenance book for the Pibomulti spindle speeder.

We, the company _____, assure with this document that one of our competent collaborators familiarized himself with the maintenance book for Pibomulti spindle speeder.

Company name : _____

Adress : _____

Phonenumber : _____

Faxnumbre : _____

Place, date _____

Stamp / signature _____



In case of returning a spindle speeder to our company under guarantee don't forget to joint the nut of the spindle and the clamp.

SOMMAIRE / INHALTSVERZEICHNIS / FEATURES

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11-17-2006

FICHE SIGNALÉTIQUE POUR MULTIPLICATEUR DE VITESSE SCHNELLAUFSPINDEL BESCHREIBUNG SPINDLE SPEEDER DESCRIPTION

Client / Kunde / Customer : PIBOMULTI N.A.

Commande / Bestellung / Ordre N° : 261056

Type d'appareil et N° :

Apparate Typ Nr. : X9810-4007-00A Nr. 500
Appliance N° :

Adaption / Anpassung / Attachment : BT 40

Poids / Gewicht / Weight :

Indexion :

Indexierung :

Location system :

Indexion automatique

X986-206-00

Rapport de vitesse :

Geschwindigkeitsverhältnis :

Speed ratio :

à
1 zu 10
to

Graissage à vie :

Dauerfettsschmierung :

Greased for life :

ISO FLEX NBU-15 (KLUBER)

Puissance maxi sur la broche :

Maximale Leistung auf der Spindel :

Maximum power on the spindle :

à
2 kW bei 36'000 U/min
at
RPM

(voir graphique page 5)
(siehe Graphik Seite 5)
(see graphics page 5)

Vitesse de pointe max :

Spitzendrehzahl :

Short time max. speed :

T/min
40'000 U/min
RPM

Pince / Spannzange / Collet type :

DIN 6499

ETS 14

Capacité de serrage des pinces :

Spannzangenkapazität :

Clamping capacity of the collet

à
0.5 zu 8 mm
to

Doigt d'indexage et dispositif de verrouillage du boîtier :

- Voir dessin et lire les instructions avant 1. mise en service.

Positionierungsstift und Verriegelungsvorrichtung des Gehäuses :

- Vor Inbetriebnahme Zeichnung und Handbuch beachten

Orientation location and locking device of the body :

- Pay attention to drawings & instructions before beginning the work.

Arrosage par le centre

Innere Kühlmittelzufuhr

Coolant through the centre

Ne jamais tourner sans l'arrosage

Spindel nie ohne Kühlmittel betreiben

Never use spindle without cooling



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LIVRE D'INSTRUCTION BEDIENUNGSANLEITUNG MAINTENANCE BOOK

PREFACE / VORWORT / PREFACE

➤ Particularité d'un multiplicateur de vitesse Pibomulti

le multiplicateur de vitesse est un accessoire de machine qui a pour fonction d'augmenter la vitesse de rotation de vos outils.

Ces principaux atouts sont :

- haute précision
- grande rigidité
- minimum d'encombrement
- diminue l'usure de vos machines
- usinage à haute vitesse jusqu'à 40.000 tr/min pour le X 9810
- vitesse mieux adaptée aux outils de nouvelle génération tel que le Metal Dur.

➤ Besonderheiten der Pibomulti Schnellaufspindel

*die Schnellaufspindel ist ein Zubehörteil der Maschine und keine Maschinenspindel
Sie hat die Aufgabe die Geschwindigkeit Ihrer Werkzeuge zu vergrößern*

Die Hauptargumente sind :

- *hohe Präzision*
- *hohe Steifheit*
- *ein Minimum an Platzbedarf*
- *weniger Maschinenverschleiss*
- *einsatzbereit bis zu einer Geschwindigkeit von 40.000 U/min für X 9810*
- *Geschwindigkeit besser auf die Werkzeuge der neuen Generation übersetzt, so wie bei Hartmetall*

➤ Particularity of the Pibomulti spindle speeder

the spindle speeder is an accessory of the machine and not a spindle of it.
The function of it is to rise the speed of your cutter.

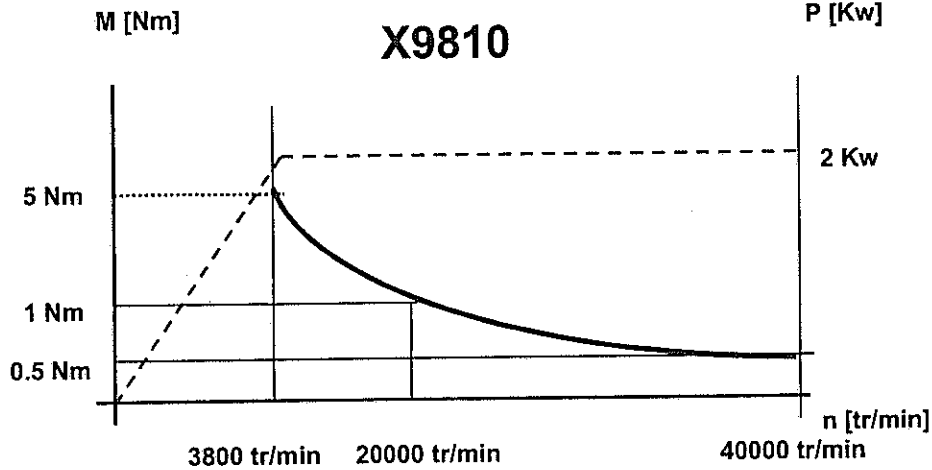
The main arguments are :

- high precision
- high stiffness
- minimum size
- less wear at your machine
- used for high speed up to 40.000 rpm for the X 9810
- better adaption of the speed to the tools of the new generation just like the hard metal

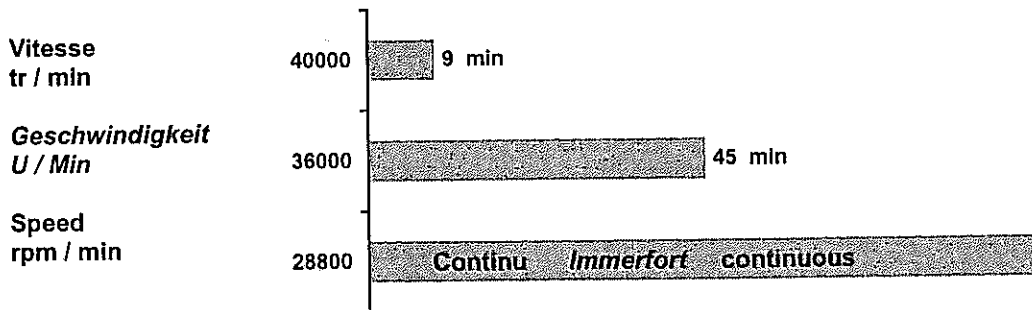
**Graphiques de puissance-couple et « n » en continu
Leistungs-Drehmomenten und Dauerlauf-Diagramm
power-torque and « n » in continuous diagram**

Puissance et couple max.
Leistung und Drehmoment max.
Power and torque max.

Coefficient de sécurité s=3
Sicherheitskoeffizient s=3
Security coefficient s=3



Temps d'utilisation en fonction de la vitesse
Arbeitszeit je nach Umdrehungsgeschwindigkeit
Using time in terms of speed



11-17-2006

**Protocole de contrôle multiplicateur
Prüfprotokoll Schnellaufspindel
Test certificate spindle speeder**

CONTRÔLE CONCENTRICITE BROCHE

CONTRÔLE GEOMETRIE MULTIPLICATEUR
DEPUIS CONE A

LE CONTRÔLE DU MULTIPLICATEUR EN
MAINTENANT LE SORP FIXE NE DONNE
PAS LA VALEUR GEOMETRIQUE. LE
CONTRÔLE EST FAUX.

RUNDLAUF DER SPINDEL

RUNDLAUF DER SPINDEL BEZÜGLICH
ANTRIEBSKEGEL

DIE KONTROLLE DURCH FESTHALTEN DES
KÖRPERS ERGIBT NICHT DEN GEOMETR.
WERT. DIESE KONTROLLE IST FALSCH !

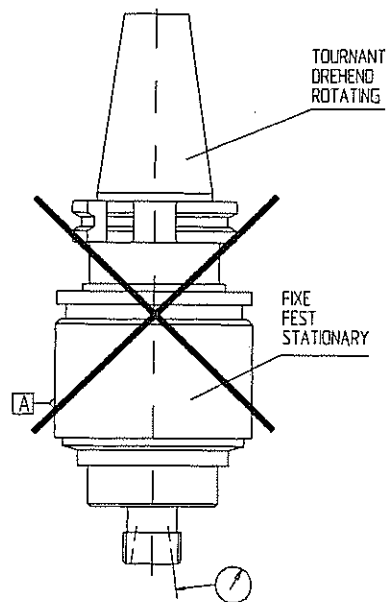
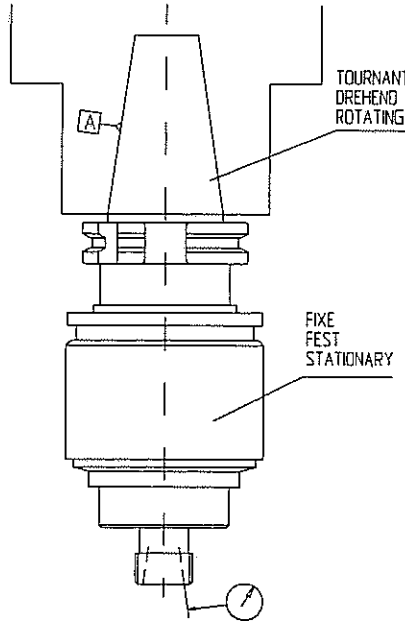
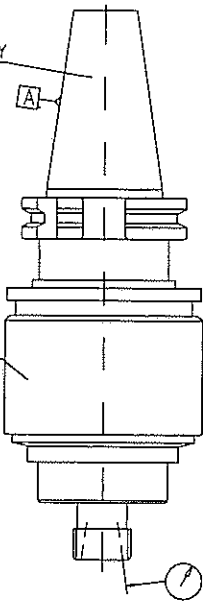
CONCENTRICITY OF THE SPINDLE

CONCENTRICITY OF THE SPINDEL WITH
RESPECT TO DRIVING TAPER

THE CONTROLL WITH THE FIXED BODY
DOES NOT GIVE THE RIGHT GEOMETRIC
VALUE. THIS CONTROLL IS WRONG !

FIXE
FEST
STATIONARY

TOURNANT
DREHEND
ROTATING



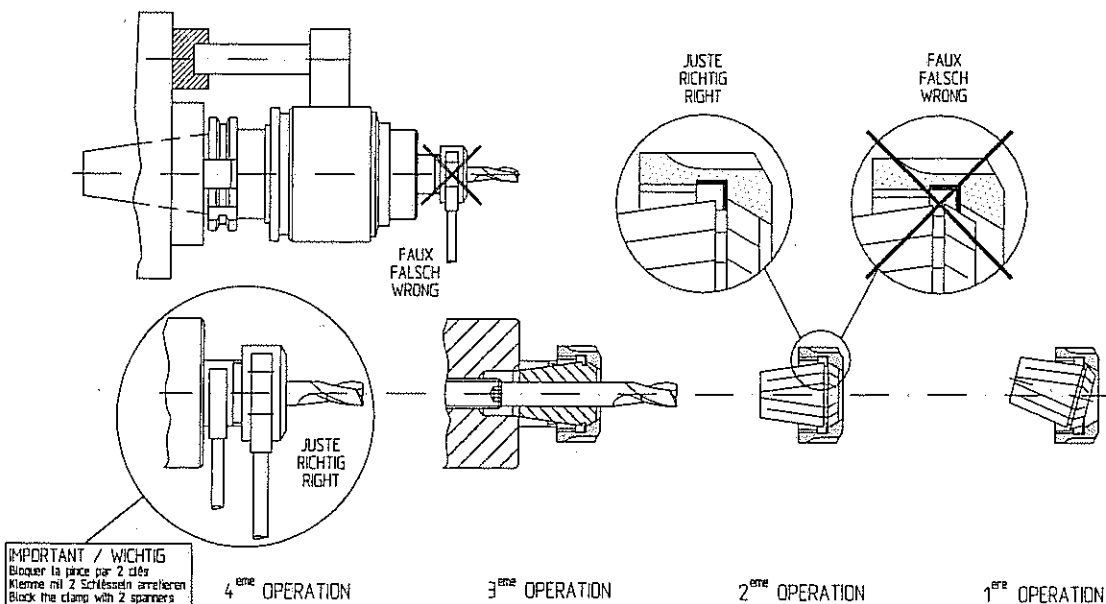
| | |
|-------------------------------------------------------|-------|
| VALEUR ADMISE ZULÄSSIGER WERT PERMISSIBLE VALUE | 0.005 |
| VALEUR EFFECTIVE MESSWERT MEASURED VALUE | 0.004 |

| | |
|-------------------------------------------------------|-------|
| VALEUR ADMISE ZULÄSSIGER WERT PERMISSIBLE VALUE | 0.01 |
| VALEUR EFFECTIVE MESSWERT MEASURED VALUE | 0.008 |

fidl

**Serrage des outils
Werkzeugeinspannung
Collet chucking**

Très important



Remarques : toujours serrer un outil avec une pince adéquate.

ex : * pour un outil \varnothing 12.2 il faut une pince de 12-13 et non une pince 11-12

* pour un outil \varnothing 7 il faut une pince de 7-6.5 et non une pince de 8-7

Bemerkung : Bestücken Sie immer ein Werkzeug mit der entsprechenden Klemme.

z.B. : * für ein Werkzeug mit \varnothing 12.2 benötigt man eine Klemme der Grösse 12-13 und nicht der Grösse 11-12.

* für ein Werkzeug mit \varnothing 7, benötigt man eine Klemme der Grösse 7-6.5 und nicht der Grösse 8-7.

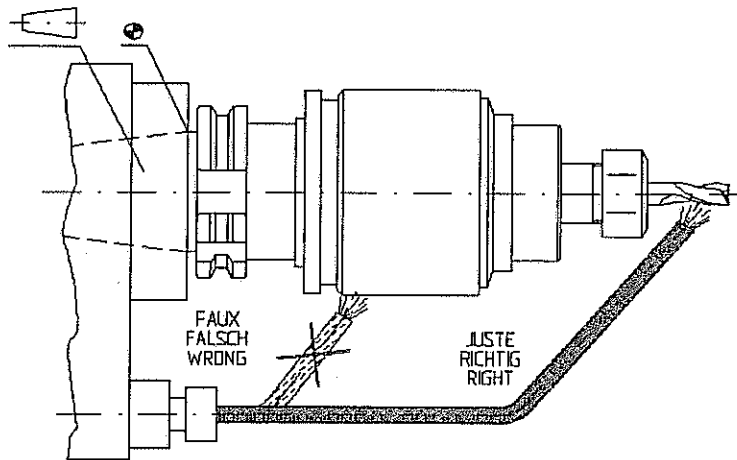
Remark : Always have a tool equipped with the adequate clamps.

e.g : * for a tool with \varnothing 12.2 you need a clamp size 12-13, not size 11-12.

* for a tool with \varnothing 7, you need a clamp size 7-6.5, not size 8-7

**Arrosage
Kühlmittel
Coolant**

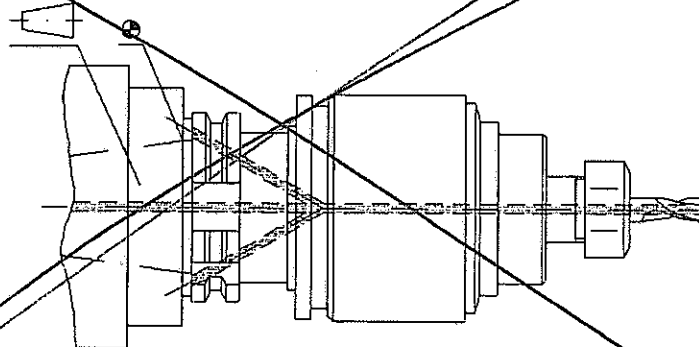
Arrosage externe / externe Kühlmittelzufuhr / externe coolant



Arroser l'outil et non le multiplicateur
Kühlen Sie das Werkzeug nicht die Spindel
Coolant of the tool not of the speeder

Un bon arrosage prolonge la durée de vie de votre outil et celle de votre multiplicateur.
Eine gute Kühlung verlängert die Lebensdauer Ihres Werkzeugs und Ihrer Schnellaufspindel.
A good coolant prolongs the life of your tool and of your spindle speeder.

ARROSAGE PAR LE CENTRE / INNERE KÜHLMITTELZUFUHR / COOLANT THROUGH THE CENTRE



- Nettoyer souvent les indexions des têtes et vérifier le glissement de la goupille d'indexion avant utilisation (Huiler légèrement si nécessaire).
- Regelmäßig die Drehmomentabstützung reinigen und die Gängigkeit des Indexierstiftes vor Anwendung prüfen (wenn notwendig leicht einölen).
- Clean the head location devices frequently and check if the movement of the location pin (Put oil if location pin seems to be stucked).

La responsabilité de PIBOMULTI ne pourra être engagée en cas de mauvais fonctionnement de l'indexion du à un entretien non effectué. Le client sera seul responsable des conséquences engendrées.

Im Falle einer schlechten Funktion auf Grund eines nicht ausgeführten Unterhalts kann die Verantwortlichkeit von PIBOMULTI SA nicht belangt werden. Der Anwender trägt die volle Verantwortung für darausfolgende Schäden.

PIBOMULTI's responsibility will not be involved in case of malfunction of the location device due to a maintenance problem. Customers will be responsible of generated consequences.

- Dans le cas de la fixation d'une tirette sur le cône d'entrée de l'appareil, veillez à la coller à la colle LOCTITE pour éviter un éventuel desserrage du aux vibrations:
 - LOCTITE 243 pour les têtes sans option arrosage par le centre du cône d'entrée.
 - LOCTITE 542 pour les têtes avec option arrosage par le centre du cône d'entrée.
- Im Falle des Einbringens eines Anzugbolzens in den Eingangskegel, ist zu beachten dass dieser mit LOCTITE gegen ein Lösen durch eventuelle Schwingungen abgesichert wird:
 - LOCTITE 243 für Köpfe ohne Innenkühlmittelzuführung durch das Zentrum
 - LOCTITE 542 für Köpfe mit Innenkühlmittelzuführung durch das Zentrum
- In the case of the fixation of a pull stud on the back of input shank of the head, please glue the pull stud with LOCTITE to prevent it from untightment due to vibrations:
 - LOCTITE 243 for heads without internal coolant through the input shank option.
 - LOCTITE 542 for heads with internal coolant through the input shank option.

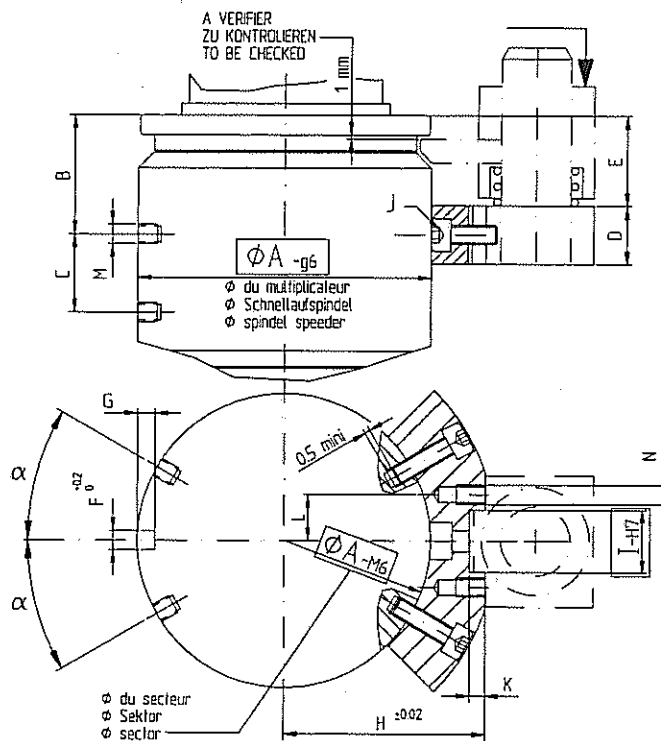
La responsabilité de PIBOMULTI ne pourra être engagée en cas de desserrage de la tirette. Le client sera seul responsable des conséquences engendrées.

Im Falle einer schlechten Funktion auf Grund eines LöSENS des Anzugbolzens kann die Verantwortlichkeit von PIBOMULTI SA nicht belangt werden. Der Anwender trägt die volle Verantwortung für darausfolgende Schäden.

PIBOMULTI's responsibility will not be involved in case of untightment of the pull stud. Customers will be responsible of generated consequences.

**Cotes pour indexion
Maße für Indexierung
Location dimension**

- Utiliser ces données pour fabriquer vous-même votre indexion
- Toutefois nous garantissons un bon fonctionnement du multiplicateur uniquement avec une indexion fournie par PIBOMULTI
- Nutzen Sie diese Angaben, um Ihre eigene Indexierung zu konstruieren
- Eine Funktionsgarantie erhalten Sie jedoch nur, wenn die Indexierung aus dem Hause PIBOMULTI stammt.
- You might use this document for manufacturing your own indexing unit.
- But we only guarantee a good function if the indexing unit supplied by PIBOMULTI.



| | | | | | | |
|---|---|---|---|---|---|----------|
| I | J | K | L | M | N | α |
|---|---|---|---|---|---|----------|

| | | | | | | |
|-------|----|------|--|----|----|---|
| X986 | 98 | 35.5 | | 15 | 28 | 5 |
| X9810 | | | | | | |

Un secteur mal ajusté sur son diamètre peut déformer la couronne du multiplicateur (point dur et échauffement).
Des vis trop longues peuvent déformer la couronne (point dur et échauffement)

Ein am ϕ schlecht angebrachter Sektor kann den Ring des Schnellläufers beschädigen (Blockage /Erhitzung)
Zu lange Schrauben deformieren den Ring (Blockage und Erhitzung)

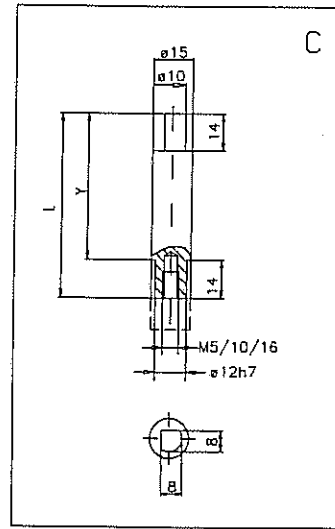
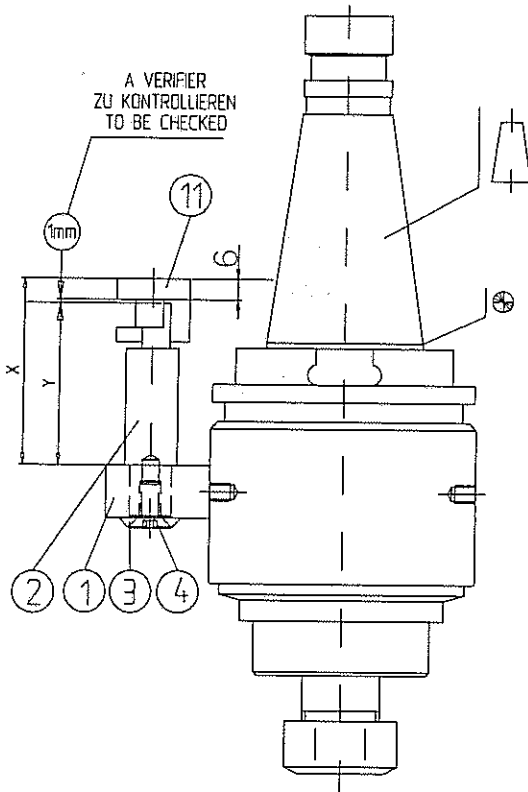
Badly adjusted sector might damage the ring gear of the speeder

MANUAL ORIENTATION LOCATION SYSTEM FOR SPINDLE SPEEDERX986
X9810

1. Assemble the sector N°1 with the screw N°7 to the speeder, make sure that the sector N°1 is well connected to the speeder and the play of 0.5 mm between the end of the thread and the screw N°7 is observed.
2. Fit the spindle speeder on the machine with the sector N°1, but without location pin N°2.
3. Note the distance X
X = distance between the face of the sector N°1 and the foot of the location block N°11
4. Adjust the length of the location pin as per enclosed drawing detail C. Turn the diameter, drill and tap according to the drawing.
5. Fit the location pin N°2 on the sector N°1, fix it with the washer N°3 and the screw N°4, but without locking.
6. Fit the spindle speeder on the machine with the orientation location system and the location block N°11. Verify the clearance of approx. 1mm between the pin N°2 and the block N°11.
7. Orientate the block N°11 correctly on the spindle nose of the machine.
8. Lock the screw N°4.
9. Mark the centres of the holes N°6 on the block N°11 by punch mark.
10. Remove the spindle speeder from the machine.
11. Drill and tap, fit the block N°11 with the screws N°6 on the machine.
12. Verify that all clearances are observed. – The unit is now ready to go.
 - If the indexing system is installed by the customer, it's necessary to regard the assembly instructions of our indexion system.
 - Besides, the diameter of the sector centre N°1 has to be precise. Take the nominal diameter of the wreath -001 / -002.
 - We don't give guarantee for a well working unit in case the indexing system is not from Pibomulti.

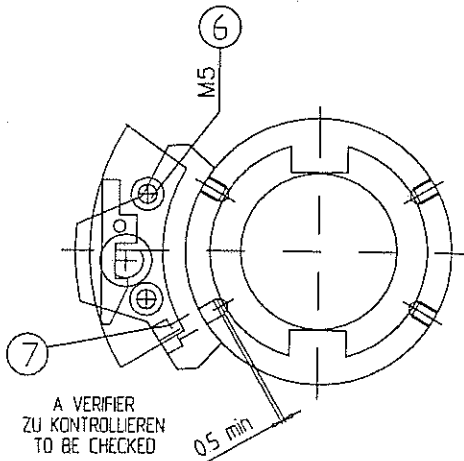
All screws have to be secured with Loctite threadstop.

**Indexion manuelle / Manuelle Indexierung / manual location system
X986 - X9810**



$$Y = X - 7$$

$$L = Y + 14$$



IMPORTANT / WICHTIG

Un secteur mal ajusté, des vis trop longues peuvent causer des dégâts importants au multiplicateur

Ein schlecht angebrachter Sektor, zu lange Schrauben können schwerwiegende Schäden an der Spindel zur Folge haben.

An incorrect assembled Sector, too long screws might damage the speeder badly.

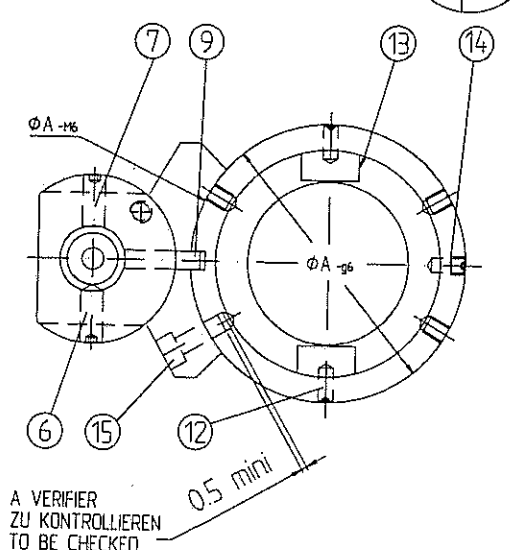
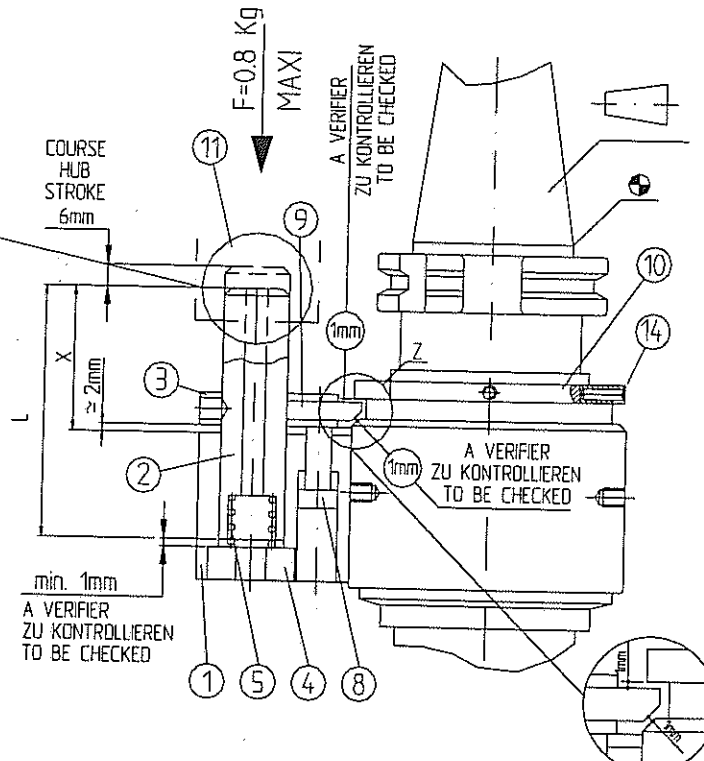
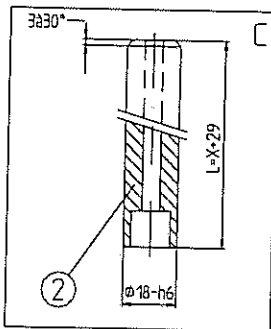
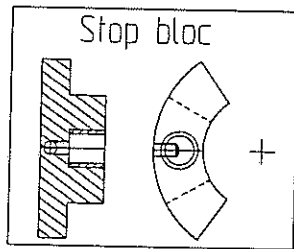
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AUTOMATIC INDEXING FOR SPINDLE SPEEDERX986
X9810

1. Assemble the sector N°1 with the screw N°15 to the spindle and make sure that the sector is well connected to the spindle speeder with a minimum security of 0.5 mm between the screw N°15 and the end of the thread.
2. Manually fit the spindle speeder on the machine with the sector N°1 but without the other pieces of orientation location.
3. Note the distance X
X = distance between the face of the sector N°1 and the surface of the orientation pin N°2 on locking block N°11.
4. Adjust the length of the orientation pin N°2 with carbide tools, according to the enclosed drawing detail C.
5. Fitting of location pin :
 - Lock the unit N°4 with « thread stop » product.
 - Place the spring N°5 and the pin N°2 in the sector pin N°1.
 - Place the locking finger support N°3 on the orientation N°2.
 - Tighten and glue the screw N°8.
 - Tighten the screw N°7 (flat) without locking it..
 - Release the locking ring N°10 through screws N°12.
6. Manually fit the spindle speeder on the machine with the complete orientation location system in the stop block N°11. Orientate the slot of the locking-ring N°10 on the pin N°9.
7. **Adjust the locking finger support N°3 in order to have approx. 1 mm clearance between the pin N°9 and the body of the spindle speeder.**
8. Lock and clue the flat screw N°7.
9. Check whether it is possible to push the orientation pin N°2 by approx. 1 mm to the bottom of the cover N°17.
10. Adjust the locking ring N°10 by pushing towards the couns; its slot must be in front of the pin N°9. Lock the two screws N°12. Check that the ring N°10 has no friction on the body.
11. Adjust another screw N°14 to the other score.
12. Remove the spindle speeder from the machine and put it in the tool magazine. Run the magazine in order to verify whether the spindle speeder has no friction with different guards. Check that the orientation location system does not interfere with the clamps of the tool-changer. Try an automatic tool changing at reduced speed, if possible, or by sharing the movements. Check whether the orientation location system works correctly when the spindle speeder is in place of the spindle shank. If everything works all right remove the spindle speeder from the machine. Make a point with a carbide drill for tightening the screws N°6 and N°12. The spindle speeder is ready to go.
 - If the indexing system is installed by the customer, it's necessary to regard the assembly instructions of our indexion system, page (10)
 - Besides, the diameter of the sector centre N°1 has to be precise. Take the nominal diameter of the wreath -001 / -002 and the length of the screws.
 - We do only give guarantee for a well working unit in case the indexing system is supplied by Pibomulti

**All screws must be secured with « Loctite thread stop » product !
A badly adjusted sector and too long screws might cause great damage to the speeder !**

Indexion automatique / Autom. Indexierung / autom. location system
X986
X9810



IMPORTANT / WICHTIG
Un secteur mal ajusté, des vis trop longues peuvent causer des dégâts importants au multiplicateur
Ein schlecht justierter Sektor oder zu lange Schrauben können grossen Schaden an der Sospindel hervorrufen.
Badly adjusted sector or too long screws might damage the speeder.

1)

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2
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REPAIRING GUIDE

| | SYMPTOMES | CAUSE | REMEDY |
|-----|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| 1. | Locking and unlocking works badly or not at all (only for autom. indexing unit) | spring not strong enough | change the spring F=0.8kg max. for spindle speeders except X1505 and X1506 (F=1.5kg) |
| 2. | | Screw N°6 and 7 come loose | adjust indexing unit according to explanations page (13). |
| 3. | | blocking ring N°10 comes loose | replace the blocking ring according to the explanations page (13) |
| 4. | | Nut N°4 or cover N°17 come loose | Screw nut N°4 and secure it with Loctite thread stop |
| 5. | | Screw N°8 comes loose | replace the pin-support of the blocking unit N°3 then block the screw N°8 with Loctite thread stop. |
| 6. | | bad positioning of the blocking ring N°11 | Replace the blocking ring until its radius corresponds with the one of the indexing unit. |
| 7. | | Contact rust between pin N°2 and sector N°1 because of storage | Disassemble the indexing unit and grind the sector N°1 until the rust is removed, reassemble the unit afterwards |
| 8. | | obstacle between the pin-support N°3 and the sector N°1 | Remove the obstacle (shaving) |
| 9. | | Indexpin N°2 too long | modify the pin according to explanations page (13) |
| 10. | | Blocking on the other side | put another screw N°14 in the other key way |
| 11. | | key way of the blocking ring N°10 badly orientated | orientate the blocking ring according to explanations page (13) |
| 12. | | Play between key way of the blocking ring N°10 and the indexpin N°9 too big. | Control the play between the two pieces N°9 and N°10 (max 0,3) Change the pin N°9 if the play is too big |
| 13. | | function play not considered | Control the play according to explanations page (13) |

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REPAIRING GUIDE

| | SYMPTOMES | CAUSE | REMEDY |
|-----|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| 1. | temperature too high - 60° C after 2 working hours | Indexing unit badly assembled, play not considered | See explanations page (13) |
| 2. | | Bad storage of the spindle speeder | Clean and grease before use |
| 3. | | Power too high | reduce speed |
| 4. | | Bad positioning of the blocking ring N°10, only for autom. index | connect the ring N°10 well to the wreath of the spindle speeder and block the screws N°12 (see thread pin) |
| 5. | | Too much load on the index pin N°2 | reduce the load |
| 6. | | Index pin N°2 too long | shorten the pin according to the explanations page (11) or (13) |
| 7. | | Deformation of the spindle speeder wreath because of too long blocking pins N°15 | shorten the pins and check the play min. 0.5mm between screw and end of the thread hole |
| 8. | | Deformation of the spindle speeder wreath because of bad adjustment of the sector N°1 and the spindle speeder | control the sector-Ø nominal-Ø of the spindle speeder -0.01/-0.02 (M6) |
| 9. | | Spindle movement | cool the spindle down to over 60°C after 2 working hours. In case the temperature stagnates, cool it longer. |
| 10. | | Bad lubrication (oilmist) in case the spindle is equipped with oil mist lubrication | Control the oil feeding and the air pressure at the end of the unit. See explanations page (9) |
| 1. | Spindle works badly or not at all | working play is not considered | Control the play, see explanations page (13) |
| 2. | | impurity inside the spindle speeder | send it back to Pibomulti for inspection |
| 3. | | deformation of turning piece of the ring gear | send it back to Pibomulti for inspection |
| 4. | | Marks on speeder shank | Send it back to Pibomulti for inspection |
| 5. | | Marks or deformation on machine shank | Rectify the machine shank |

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LIVRE D'INSTRUCTION BEDIENUNGSANLEITUNG MAINTENANCE BOOK

REPAIRING GUIDE

| | SYMPTOMES | CAUSE | REMEDY |
|-----|---------------------------------|------------------------------------------------------------------|--------------------------------------------------------|
| 1. | Vibrations while working | power too high | reduce power |
| 2. | | tools badly connected | change the tools |
| 3. | | distance between the end of the tool and the fixture is too long | reduce the length |
| 4. | | spindle speeder doesn't turn right | send the speeder back to Pibomulti for control |
| 5. | | spindle of the machine does not turn right | control the machine |
| 6. | | clamps badly connected | change clamps |
| 7. | | leaf not concentric | change the leaf |
| 8. | | the tools are badly lubricated | adjust the flow (see page 8) |
| 9. | | nuts of the clamps not balanced | balance the nuts by assembling them to the clamps |
| 10. | | tools are badly thightened | control the diameter of the clamp and tighten the tool |
| 11. | | spindle and bearings are damaged (collision) | send the speeder back for control |
| 12. | | screws are too long and the crown is damaged | shorten the screws (see page 10) |

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