

# **Pinheiro 600 Series**

## **Owners manual**



***PLANER/MOLDER***

**PMC**

*OWNER'S MANUAL*

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**MÁQUINAS PINHEIRO, LDA**

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SYMBOL EXPLANATION

Information



Paid attention



Danger (Careful with hands)



Electrical danger



Use eye protection



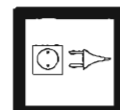
Use ear protection



Use mask protection



Installation and adjustments





# SYMBOLOLOGY

I

2

Maintenance's instruction



Repairer's instruction



Technical date



Telephone contact



Mail contact



Stipulate time period



Hazard of impact





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## 1 - Producer:

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## 2 - References.



Designation: **Planer / Matcher / Molder**

Model: **PMC4-450**

Machine n°: **6369**

Year of manufacture: **2002**



**General specifications.**Subject to technical alterations

General specifications	PMC-2	PMC-2MS	PMC-2MS-HD	PMC-4	PMC-5
Planing width	450 mm	450 mm	450 mm	38-450 mm	38-450 mm
Planing thickness	3-200 mm	3-200 mm	3-200 mm	12-150 mm	12-150 mm
Planing thickness (optional)				8-200 mm	8-200 mm
Sawing width		450 mm	450 mm		180 mm
Sawing thickness		75 mm	105 mm		180 mm
Side spindles vertical adjustment				100 mm	100 mm
Max. chip removal-bottom & top head	10 mm	10 mm	10 mm	10 mm	10 mm
Max. chip removal-side heads right				17 mm	12 mm
Max. chip removal-side heads left				20 mm	20 mm
Max. profile depth-top head	25 mm	25 mm	25 mm	25 mm	25 mm
Max. profile depth-side heads				25 mm	25 mm
Side heads tooling diameter capacity				110-180 mm	110-180 mm
Cutterheads diameter x #knives	125 x 4	125 x 4	125 x 4	125 x 4	125 x 4
Side arbors diameter				40 mm	40 mm
Saws diameter		200-300 mm	200-300 mm		130-200 mm
Saw arbor diameter		55 mm	55 mm		35 mm
Saw sleeve/saw bore diameter		70 mm	70 mm		60 mm
Saw spacers diameter		95 mm	95 mm		80 mm
Feed speed	10&20 m/min	10&20 m/min	10&20 m/min	10&20 m/min	10&20 m/min
Feed speed (optional)	6 to 30 m/min	6 to 30 m/min	6 to 30 m/min	6 to 30 m/min	6 to 30 m/min
Horizontal heads speed	5000 rpm	5000 rpm	5000 rpm	5000 rpm	5000 rpm
Vertical heads speed				5000 rpm	5000 rpm
Saw arbor speed		2950 rpm	2950 rpm		5000 rpm
Head motor power (W)	7.5+11	7.5+11+18	7.5+11+30	7.5+11+5.5+5.5	7.5+11+5.5+5.5+5.5
Motor power-thickness adjustment	0.37 kW	0.37 kW	0.37 kW	0.37 kW	0.37 kW
Head motor power (kW)(optional)	11+15	11+15+22	11+15+37	11+15+7.5+7.5	11+15+7.5+7.5+7.5
Head motor power (kW)(optional)	11+15	11+15+22	11+15+37	11+15+11+11	11+15+11+11+11
dimensions (Meters)	1.8x1.95x1.8	2.3x1.95x1.8	2.8x2x1.8	2.3x1.95x1.8	2.6x1.95x1.8
Net weight (Kg)	1600	2250	2900	1900	2100
Gross weight	1800	2500	3200	2150	2350

## 1. INTRODUCTION TO THE MANUAL



This manual is designed to instruct you and your staff in the proper operation of your machine. It will help your company achieve maximum results in the areas of safety, production, and long term performance of the machine. **It is important to remember that the best built machine will perform only as well as the people who operate and service it.**

In order to achieve quality machine performance it is crucial that machine operators and service technicians thoroughly understand all the individual machine systems and their interaction.

You should insist that the operators and technicians;

1. Be thoroughly trained by designated Pineiro Technicians.
2. Keep the machine and the area around it very clean.
3. Lubricate the machine at designated intervals.
4. Maintain accurate lubrication and maintenance records.
5. Keep the machine in good repair using quality parts only.
6. Keep the knives and tooling sharp and in balance.
7. Keep the machine properly aligned.

If these basic guidelines are followed regularly, the performance of this machine will be greatly enhanced. It is the intent of the manufacturer, Pineiro Machinery that this machine serves your company to the fullest extent of its design. Please read this entire manual carefully and follow the practices set forth in it. Do not hesitate to call our service department at anytime if you have questions or if you need assistance.

**We are here to serve each and every one of our valued customers!**



1 - HOW INTERPRET THIS MANUAL?

Logotype



Description



Chapter



Page



GENERAL INFORMATION

III

1

Ref.



Machine designation



Version



PMC2-4(I)

PMC

01/02

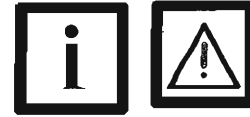
PMC2-4(I)

PMC

01/02



## 2 - HOW TO USE THIS MANUAL



This Operator's Manual has been designed to cover the entire Pinheiro PMC Series of machines. You will sometimes find information that may not pertain to your exact model, but you can quickly pass over it and go on to the next area that requires your attention. A total review of this manual will benefit you considerably in understanding your machine, planers and molders in general and well proven woodworking practices.

Since the PMC4 PLANER/MATCHER/MOLDER is the most common model, this manual is focused on this four head model. If you own a PMC2 double surfacer, you can choose to pass over the sections and material dedicated to side head and fence systems, but familiarity with this material will make you a more knowledgeable and more valuable machine operator. Remember, if your company should ever need to expand into a four sided planer or molder, a complete side head section, with or without a bottom profile head, can be easily added to the back end of your PMC2 double surfacer. This flexibility was designed with you in mind.

If you own the PMC5 (PMC4 with bottom right profile head) or the PMC/2MS (combination double surfacer/rip saw), you will find special sections in this manual dedicated to each of these two models. You will need to cover the basic machine up front in the manual then you will go to the special sections to locate whatever other information you may require. Remember, all the PMC models are basically the same up to the outfeed table area of the PMC2. From that point, either the side heads, bottom right profiler or gang saw system have been added to expand the PMC2 into the other more complex models.

We have worked long and hard to create an Owner's Manual that will serve each of our customers needs very well, from the one man shop to the 1000 employee manufacturing facility, including saw mills, log cabin plants, custom planing mills, architectural millwork shops, pallet operations, landscape tie mills, fencing manufacturers, furniture plants and on and on and on! This was a very difficult challenge since we have such a wide variety of customers who also range in experience from ZERO to well over 50 years in the wood industry. We sincerely hope that our hard work will help YOU become a very skilled and accomplished planer/molder operator.

We have broken this manual down into many sections to make it easy to locate the information you may need at anytime. We have included some general information areas to help educate our customers to be



very proficient in many areas of both the primary and secondary wood industries. We sincerely hope that this Owner's Manual will be a very valuable and effective tool that will serve you for many years to come. We always welcome feedback and suggestions on our products and hope you will feel free to help us develop even better future manuals. We are always at your service and hope you will call us if you need assistance and this manual cannot answer your questions. Good health, good luck and good planing to you and your company.



Pinheiro Warranty

The Pinheiro machinery company through its distributors warrants that any part or product thereof that is manufactured by Pinheiro, which under normal operating conditions in the plant of the original purchaser thereof. Proves defective in material or workmanship within 12 months or 2000 hours of operating time, whichever comes first, from the date of shipment from Pinheiro's distributor, to the purchaser, will be replaced free or charge, f.o.b. Factory or distributor, provided that purchaser properly sends to Pinheiro's distributor, notice of the defect and establishes that the products have been properly installed, maintained and operated within the limits of rated and normal usage. All component parts and material not manufactures by Pinheiro shall be guaranteed by the manufacturers of all such purchased component parts and material.

Pinheiro is obligation (as determined by an inspection by Pinheiro through the distributor) under this warranty is limited to and shall be fully discharged by repairing any defective part, or supplying without charge, f.o.b. Its works, a similar part to replace any which within the above stated time from date of shipment is shown to have been defective as to material or workmanship. Pinheiro and the distributor shall have the option of requiring the return of these defective materials, transportation prepaid, to establish the warranty claim.

Pinheiro or distributor shall in no event be held liable for damages or delay caused by the defective material, and no allowance will be given by Pinheiro or the distributor for repairs or alterations unless made pursuant to its written consent and approval. Pinheiro or the distributor shall not be held responsible for work done, apparatus furnished or repairs made by unauthorized persons unless specifically agreed to and authorized in writing.

Except as stated above, there are no warranties, express or implied, including the warranties of merchantability and fitness for a particular purpose. Pinheiro acknowledges that purchaser's sole and exclusive remedy against company shall be for the repair or replacement of defective parts as provided for herein and the warranty as stated above is in lieu of any other warranty or remedy. In no event, be it due to a breach of performance of the goods sold hereunder, shall the seller be obligated or liable to purchaser in any manner for consequential or incidental damages, including, but not limited to, lost profits, plant downtime or suits by third parties.

## 1. RECEIVING/PACKING LIST



The handling, moving and lifting of this machine is dangerous work that should only be performed by professionals.



**BEFORE** accepting this machine from the carrier, the person receiving the machine should carefully check for damage. If there is visible damage, no matter how minor, make a notation of the damage on the bill of lading, then contact the nearest representative of the delivering carrier to file a claim

**IF DAMAGE** has occurred, carefully look around, **ON THE TRUCK**, for any items that may have broken off, come loose or fallen out of a package.

**AS SOON AS** the machine is received do a complete inventory of all materials against the packing list. Contact the shipper immediately if there are any discrepancies.

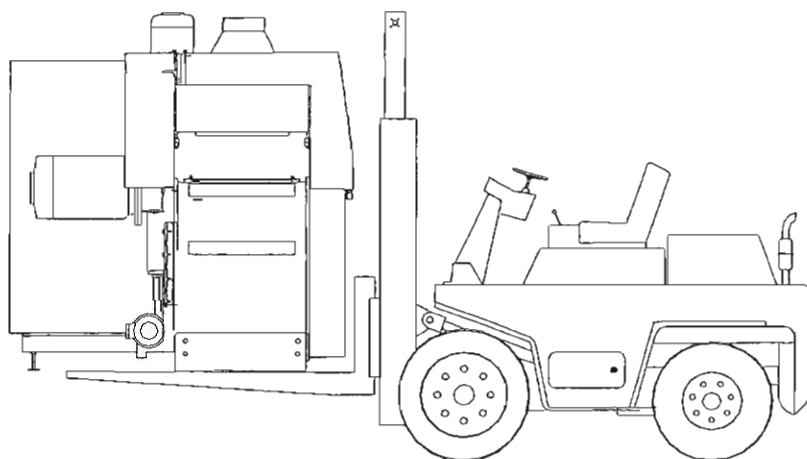
## 2. UNLOADING



After arrival, carefully unload and transfer the unit to where it will be installed. Make sure that the machine is lifted properly. **CARELESS HANDLING** can easily cause expensive damage and or serious injury.

### **SIMPLE RULES FOR THE SAFE HANDLING OF THE MACHINE**

1. When lifting the machine, always use equipment rated at 50% higher than the shipping weight of the machine (i.e. fork lift, chains, slings, etc).
2. Leave the machine on the shipping skid until final placement.
3. When lifting the machine, always be sure to center the weight.
4. When using a fork lift, the forks must be six feet or longer.
5. Work slowly and carefully to avoid damage to the machine or injury to the personnel.
6. Hire professional riggers to insure safe quality installation.
7. Do not attempt to lift on any part of the machine other than the main base. **NEVER** attempt to pass cables or ropes through the machine frame, under motor brackets or tables.



### 3. MACHINE INSTALLATION



As long as there is a CLEAN, STURDY, FLAT and LEVEL location to locate the machine, the machine can be set directly on the floor, on machine pads, or on wood or steel plates. Auburn Machinery Inc. recommends the machine be set level on four machine pads (one on each corner). The space between the machine frame and the floor will allow you to clean the bottom cavity of the machine more efficiently. Bolting the machine to the floor is optional. Leave the machine on the shipping skid until it is positioned at its permanent location.

#### ASSEMBLY

Once the machine is located in its permanent setting, assemble or install any units that were shipped separate from the machine. Be careful to assemble, install, wire and adjust properly.

#### CLEANING

**CAUTION:** Be sure to wear industrial grade work gloves and eye protection while cleaning this machine in order to prevent serious injury, cuts and scrapes from **EXTREMELY** sharp knives protruding from the planer heads.

With the machine in position, wipe off rust preventative compound with a clean cloth or rag moistened in solvent.

**USE EVERY REASONABLE PRECAUTION AGAINST FIRE WHEN USING FLAMMABLE LIQUIDS.**

Go over all scraped or polished surfaces with 10W oil, then wipe off excess oil with a clean rag so that the it is not transferred to the wood. Take extra precaution with cleaning solutions as they may remove paint.



## 1 - SAFETY SECTION



**STOP/CAUTION: Do not operate, adjust or service this machine until:**

- 1) You have read this entire owner's manual, have been properly instructed and are very comfortable with both your task and your level or skill in that area.

### REMEMBER

- 1) "**When in doubt**" shut the machine completely off, think the problem completely through, look in the owners manual for the solution and be sure that you are comfortable with the proper procedure before you start the machine.
- 2) A wrong decision by untrained operators and service people can cause a safety hazard, expensive repairs, down time, loss of profits and "lots of aggravation."
- 3) "**When necessary**" the technical staff at the Pinheiro service center is always very willing and able to assist you in locating and solving your operation and maintenance problems.

### NEVER

- 1) "**Never**" operate, service or go near the machine with loose clothing, or without required safety clothing, safety glasses, safety shoes, and additional items, as your company requires.
- 2) "**Never**" service or maintain the machine without the electrical power being completely shut off all switches, and locked off if possible, (unless power is required for the particular job.)
- 3) "**Never**" change knives, grind knives, or work in area of heads without first switching or locking off all power controls, engaging the head locking devices, when available, and wearing all required safety items. (the power must be on and the heads unlocked only when jointing the knives.)
- 4) "**Never**" clear broken and/or jammed material from the machine while feed rolls and Cutterheads are turning.
- 5) "**Never**" reach inside or lean into machine when power is switched on or machine is operating.
- 6) "**Never**" operate machine while tools or other materials are on, in or around the machine or general work area. A clean machine and a clean work area allow for less safety hazards, unnecessary breakdowns and lost tools.

- 7) **"Never"** operate machine without all covers, hoods, safety devices, anti kickback fingers and proper electrical equipment in place and in good working order.



**Remember** this machine is only as good as the persons responsible for it's upkeep and operation. This machine can either be a very valuable and profitable asset to your company, or it can be a source of aggravation.

**It's success or failure is up to all of us !**

## 2 - SAFETY PROCEDURES:



Insist that all people working on or around the machine use safety equipment, even if they are not directly involved in the operation of the machine.

We recommend the following safety equipment:

- \* Industrial eye protection
- \* Industrial grade work gloves
- \* Breathing apparatus (suited for the application)
- \* Industrial clothing
- \* Industrial ear protection
- \* Highly visible warning signs on all machinery. Signs have been placed by the manufacturer and should be replaced immediately by the owner/operator when they become worn or faded. Replacement signs are available from the manufacturer.
- \* Quality Lighting for good visibility
- \* Fire protection equipment. Consult your local fire department, fire equipment company or insurance company.
- \* First Aid equipment and proper training.



Implementing safety practices will enhance your operation, improve employee attitude and performance and help to avoid costly accidents.

Each operation section of this manual will also cover the related **SAFETY RULES**. Following the rules in each section will help to insure safe operation when working in or around the machine.

The primary safety components on the PMC machines are the Emergency locking stop buttons located at the front control panel and at the rear of the machine. These buttons enable either the operator or the take-away person to shut down the machine in an emergency situation. These devices are rugged and can be engaged quickly. Once pressed in, all motors will immediately shut down.

Although the power is off once the emergency stop button is engaged, **THE HEADS WILL CONTINUE TO COAST**, eventually coming to a complete stop.



**Do not attempt to perform any operation on or around the machine until all heads come to a complete stop.**

**Do not attempt to operate this machine until you have read and understand all portions of this operator's manual.**

**Always engage both front and back emergency stop switches before performing any work on or around the machine.**



## 1 - WASTE REMOVAL GUIDELINES



The removal of shavings is the most important external system that will effect your planing quality and production. The size, proper construction, layout and installation are all crucial to the performance of the planer. The blower system, like any machine, will not perform properly unless each line or pipe is laid out and installed in the correct manner. Much of the rated capacity of a blower can be lost if the lines are not correct. It is always advisable to seek the assistance of a qualified industrial ventilation engineer.

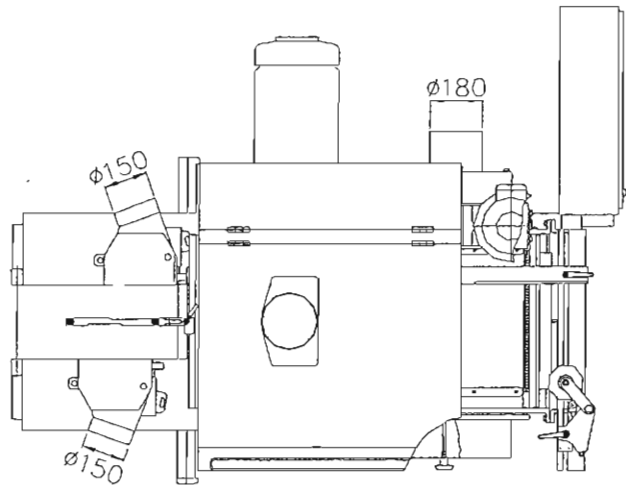
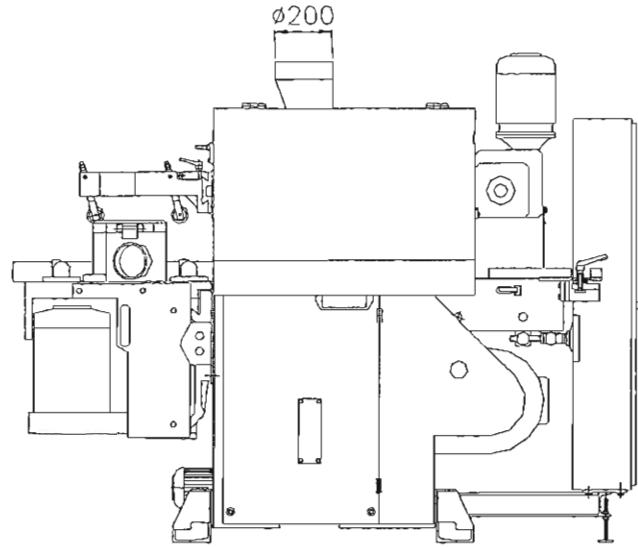
To properly determine size and horsepower of the blower, it is **CRITICAL** that the person designing this entire system take into consideration the machine, the ductwork from the machine to the main trunk line, the distance from the machine to the blower, the distance from the blower to wear the waste material will be deposited, the velocity of the air moving through this system (4,000 to 4,500 fpm), and the static pressure created within this system.

The following guidelines are to help you in sizing your system and components for each model in this PMC series.



**Please!** Each and every component in a waste removal system plays a critical role in its total performance. A simple mistake like using a "tee" intersection instead of a "y", can reduce suction to almost nothing. Reducing the outlet size of the blower can create enough resistance to drastically decrease the amount of suction at the machine, allowing the shavings to accumulate at the cutter heads causing the chips to mark the finished lumber.

**Please!** This is not the place to cut corners - hire a pro.



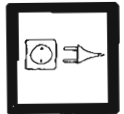
HEADS	OUTLET DIAMETER	CFM REQUIRED
BOTTOM HEAD	7" - 180 mm	1100 CFM - 1870 m3/h
TOP HEAD	8" - 200 mm	1400 CFM - 2380 m3/h
RIGHT SIDEHEAD	5" - 150 mm	800 CFM - 1360 m3/h
LEFT SIDEHEAD	5" - 150 mm	800 CFM - 1360 m3/h
BOTTOM RIGHT PROFILER	7" - 180 mm	1100 CFM - 1870 m3/h
24" GANG SAW ARBOR	8" - 200 mm	1400 CFM - 2380 m3/h



1. The area of the main exhaust line to the blower should be equal to or slightly larger than the total area of all the connecting pipes combined.
2. Elbows should never bend sharply, they should always have a bend radius equal to or greater than two and one half times its diameter.
3. Some type of flexible pipe is necessary to allow for the movement of the heads. This flexible pipe is usually very inefficient and expensive so use only enough to allow for the total movement of each head. Two to four feet is usually adequate. Straight steel pipe is the most efficient and cost effective and should be used as much as possible.
4. When connecting branch pipes to the main line the branch should enter at 30 to 45 degrees to the main. Never enter at 90 degrees and never place two branch lines directly opposite each other.
5. Straight steel pipe should be used throughout the system for greatest efficiency. It should be screwed, taped and properly supported.
6. It is recommended that guillotine type shut off be installed near the dust hoods so the exhaust air can be concentrated only on the heads in use. Always check to be sure the gates are open on the heads being used, and always make sure that at least one line is open to allow air flow when the blower is started or the entire system may collapse under tremendous vacuum load.
7. It is advisable to build extra capacity into your system to allow for future growth.



## 1 - MACHINE ORIENTATION - ELECTRICAL SYSTEM



## INTRODUCTION:



**Caution:** This planer utilizes high voltage. Any electrical work should be performed by a licensed industrial electrician or serious electrical shock and/or death can result.

The electrical system for the Pinheiro PMS series has been engineered to provide the utmost efficiency. It includes quality magnetic starters, fuses, overloads, and part-start motors.

A wiring diagram conforming to IEC standards is provided and includes a legend depicting all fuses, starters, lamps, push buttons, etc.

## ELECTRICAL ENCLOSURES:

The electrical enclosure for the PMS series of machines is connected directly to the machine. There are several important items contained on the enclosure that deserve attention.

- 1) **GREEN INDICATOR LIGHT:** A red light indicates that power is present at the transformer, and fuses are operational, and that 24VAC is present at the light, overloads, and door safety switch.



**Caution:** though the red indicator light is illuminated when the on/off switch is in the "on" position, an unlighted indicator light does not necessarily mean that power is "off"

- 2) **LOCKING DOOR HANDLE:** A locking device is installed on the main electrical entrance so that whenever maintenance is being performed on the machine the system can be locked in the "Power Off" position.
- 2) **MAIN ON/OFF SWITCH:** A locking main on/off switch, when in the "on" position will feed power directly to the fuse holders. This should also be locked in the off position and the key removed during any maintenance.

- 4) **HOUR METER:** An hour meter is located just above the main on/off switch in order to monitor run-time and to schedule lubrication and maintenance.
- 5) **DOOR SAFETY SWITCH:** A safety switch is located on the bottom inside of the enclosure. It shuts off low voltage 24VAC power to the planers push-button panel.



**Caution:** High voltage power is still present inside the enclosure regardless of the safety switch's position.

- 6) **FUSES/FUSE HOLDERS:** Every circuit is fused to protect the wiring and motor. The overloads are designed to protect the motors from being overworked. In the event of a short, fuses would react quickly to shut down the planer long before overloads could react. The fuses used in the Pinheiro planer are European and may not be readily available at your local supplier and so an extra set has been provided with the machine. Always keep an extra set on hand to prevent needless and costly delays. A chart is located in your electrical information booklet and provides you with correct fuse size for your machine.
- 7) **MAGNETIC STARTERS:** As mentioned previously, part-start motors are used on these in order to lower electrical demand during start-up. In order to accomplish this without having to manually switch the motors, a series of three magnetic starters are used in conjunction with a timer. The starters are clearly identified with numbers that correspond to those in your Electrical Information Booklet, and with the wiring diagram provided, any licensed industrial electrician can understand the system. All magnetic starters utilize 24VAC low voltage coil for safety purposes and in order to facilitate voltage changeover.





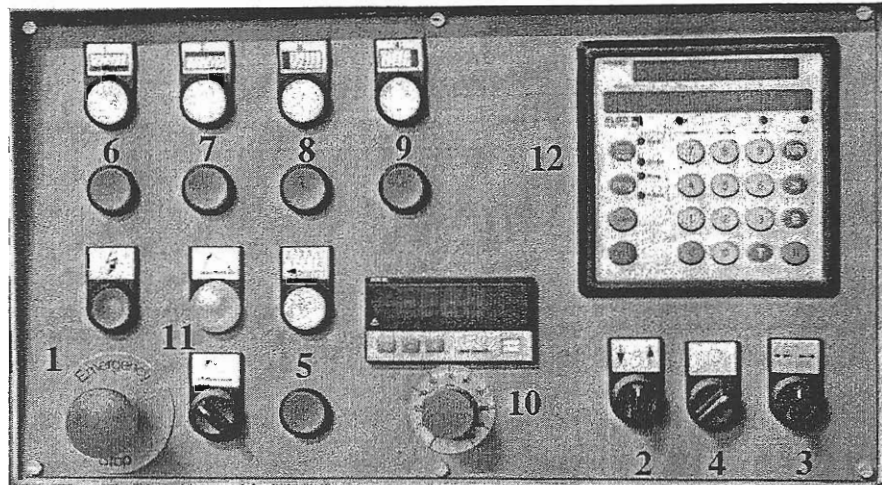
- 8) **OVERLOADS:** In conjunction with the fuses your PMS planer also uses electrical well. For this reason it is important to tell your Pinheiro representative immediately if you plan to use a phase converter so that the correct overloads can be installed to accommodate the phase imbalances normally inherent with phase converters.



Neither Pinheiro nor any of its representatives will warranty motors or any electrical components if a phase converter is used.

- 9) **TRANSFORMER:** In the interest of personal safety and efficiency a low voltage control circuit is used. This circuit is powered by a transformer and provides 27VAC to the control circuit.
- 10) **PRIMARY TERMINAL CONNECTOR:** Three terminal connectors and a ground connector are provided to attach the primary power lines to the main electrical enclosure.
- 11) **TERMINAL CONNECTORS:** Individual terminal connectors are provided to efficiently connect the main electrical enclosure to the machine mounted distribution box.
- 12) **MACHINE MOUNTED DISTRIBUTION BOX** Some models include a distribution box on the machine to connect all of the wires coming from the main electrical entrance to all of the electrical components on the planer. All of the terminals located in this box are clearly marked and match those mounted in the electrical entrance.

CONTROL PANEL



The motor control panel is placed just to the left of the infeed table in order to provide easy and quick access for the operator.

Green illuminated buttons are used to start each motor, these are momentary buttons and do not require continuous engagement in order to start the motor.

Red momentary buttons are used to stop each motor and, like the start buttons, do not require continuous engagement.

i

When shutting down a machine always use the emergency stop button to ensure the power to the machine is shut off.

- 1) **Front Emergency Mushroom Stop Switch.** When pushed in it will lock into the off position shutting off power to all the motors. It can only be released by turning the knob clockwise.
- 2) **Thickness Setting Control.** The directions of this button are clearly marked with arrows indicating that the direction of travel for setting the desired thickness. Two limit switches are located at the left rear of the machine and have been pre-set at the factory to limit the minimum and maximum travel of the top section and to protect it from being damaged when powered up and down.
- 3) **Width Setting Control.** The directions of the width setting button are clearly marked with arrows indicating that the direction of travel for setting the desired Width. Three limit switches are located at the rear of the machine and have been pre-set at the factory to limit the minimum and maximum travel of the left spindle and to protect it from being damaged when powered up and down.



- 4) **Automatic/Manual Setting Control.** The directions of this button are clearly marked with AUT and MAN indicating that the direction to work the width and thickness, with manual mode or automatic mode (Two Axis Position Controller - ELGO).
- 5) **Feed System Controls.** These buttons are used to start and stop the feed motor **which cannot be started until the top head is running.**
- 6) **Bottom Head Controls.** These buttons are used to start and stop the bottom head.
- 7) **Top Head Controls.** These buttons are used to start and stop the top head.
- 8) **Left Sidehead Controls.** These buttons are used to start and stop the left sidehead.
- 9) **Right Sidehead Controls.** These buttons are used to start and stop the right sidehead.
- 10) **Feed Speed Control.** This button is used to control the speed of the feed system. The speed (m/s) is indicated in the digital display located above of this button.
- 11) **Covers Open Controls (CE Models).** To open the covers it is necessary to switch the button marked with open cover, then wait that the motor brakes will stop the motors.  
The yellow light indicates that this button is switch to the open position.
- 12) **Two Axis Position Controller – ELGO.**

**MOTORS:** All motors on the Pinheiro planer the best quality available. They are wound to accept some different voltage.

The correct voltage has been installed to your specifications. If it become necessary to change voltage please contact your dealer or Máquinas Pinheiro for guidance.

**LIMIT/SAFETY SWITCHES:**

Limit/Safety switches are designed to protect man and machine, please do not attempt to bypass or override them as serious injury and or damage may occur.

The powered top section of your PMC has two limit switches that prevent the operator from raising or lowering the table beyond its safe limits while under power. This is done in the interest of the operator so that the top section is not inadvertently run into the bottom table.

A safety switch has been placed inside the door of the electrical enclosure preventing inadvertent starting of a motor while the door is open.

The main sound enclosure and guard (top cover) of the planer is also protected by a safety switch. When the cover is in the raised position the motors will not operate.

**FEEDING LIMIT SWITCHES**

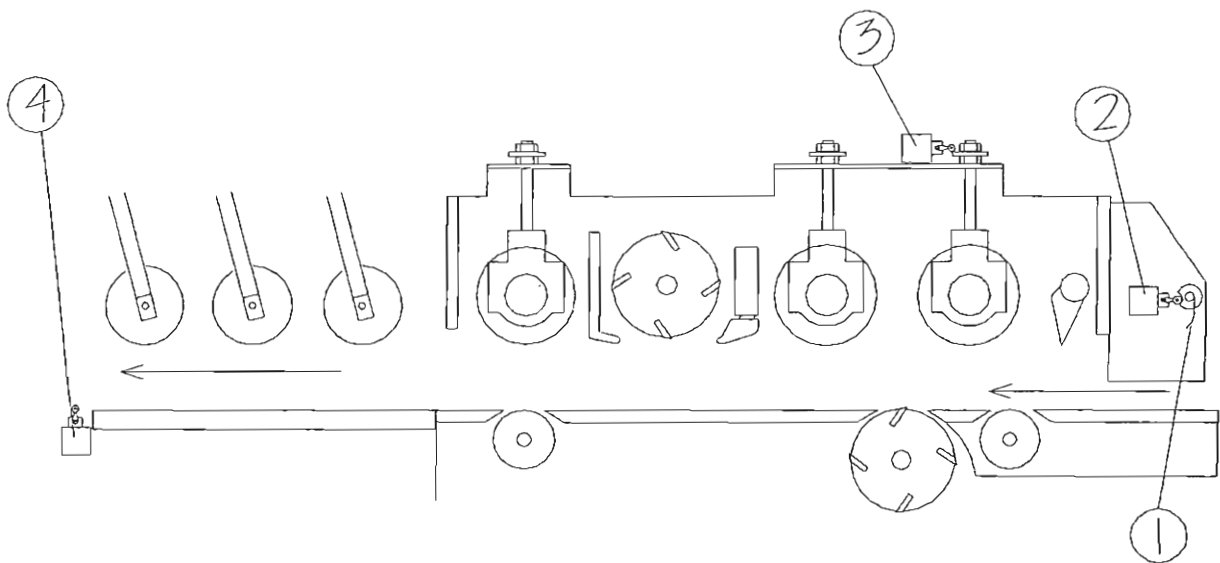
**Limit switch of the infeed opening:**

This limit switch (pos. 2) turn off the feeding motor when the trip device (pos. 1) raising 25 mm above the cutting circle.

**Limit switches of the first top infeed roll and the bottom outfeed of the machine (right table rail):**

On automatic mode: These (three) limit switches (pos. 3 and 4) stop the height (thickness) and width (spindles) movements, two axis positions controller (ELGO).

On manual mode: These (three) limit switches stop only the approach movements (close) of the thickness and spindles.



## 1 - LUBRICATION



### INTRODUCTION

The lubrication schedule supplied with manual illustrates the points of lubrication, types of grease or oil and recommended frequency of lubrication for each point. A simple check list is supplied with this manual to assist you in maintaining records of when, what, and by whom the lubrication was applied.

This lubrication section has been written to cover the entire PMC series of planers, planer/molders and planer/ripsaws. Simply use only the details that refer to your specific model of PMC machine. If you should add any of the modular sections to your existing model in the future, this lubrication schedule has been designed to cover that situation..

### HOW TO USE THE CHECK LIST

- 1-) Write in the first line the date and your initials
- 2-) Then check of the components you have lubricated with an X across the corresponding square.
- 3-) Return check list to proper place
- 4-) When you have completed your check list file it away and begin on your next one.



Proper lubrication is a simple matter and will help eliminate premature wear of the components being lubricated.

Be careful not to over grease the bearings because too much grease can cause damage also.



Follow the lubrication schedule carefully on greasing.

## 2 - SUGGESTIONS

**FEED ROLL CHAINS:** It is recommended that all of this feed system chains be lubricated every 8 to 16 hours of operation. A high quality chain and cable lubricant works very well and the aerosol can type is easy to apply.



**RAISING SCREWS:** It is highly recommended that, if you raise and lower the top section frequently, that you oil the raising screws on the lubrication schedule on a daily basis. These particular parts are under great stress and this extra attention will benefit both the machine & operator.

**RAISING SLIDES:** If you frequently raise and lower the top head section, it is recommended that you lubricate the slides on a daily basis. Simply raise the top section to the maximum open position and lubricate both sides of the ways. Then lower the section all the way down and back up again, making certain that lubricant has covered the entire ways. Always wipe the entire slide clean before lubricating.

**SIDE HEAD SLIDES:** If you frequently raise and lower the side head spindles and move them left and right, it is recommended that you lubricate them on a daily basis. As with the raising slides, make certain that you cover the ways with lubricant from end to end.

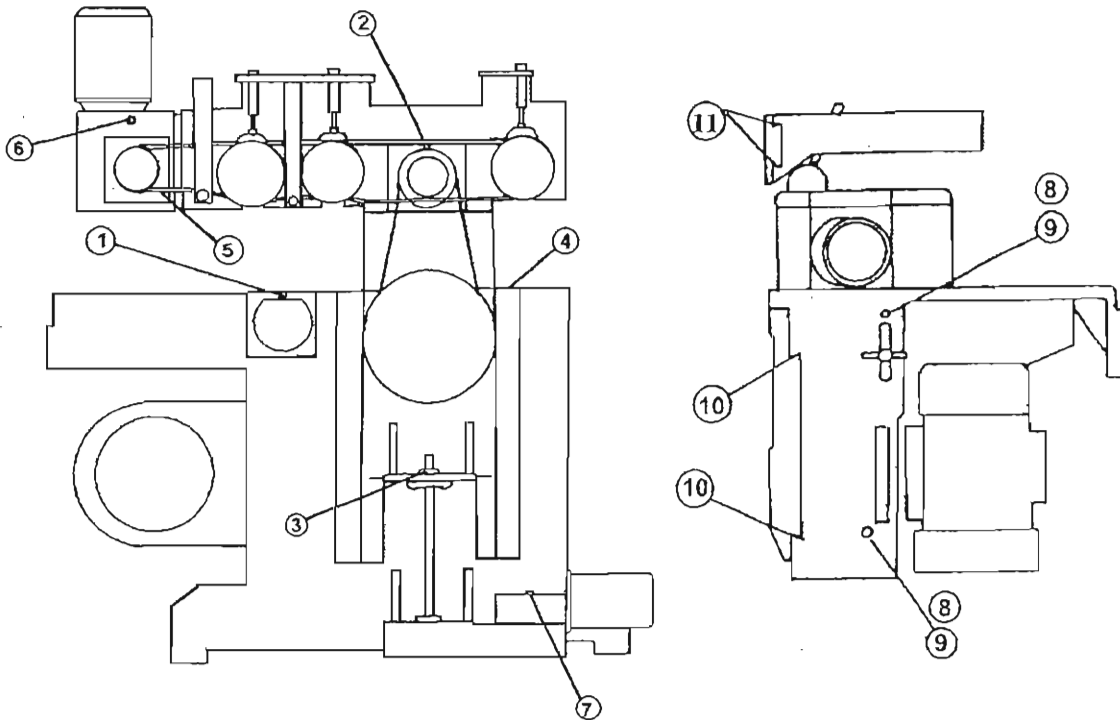
Always wipe the entire slide clean before lubricating.

**CUTTER HEAD BEARINGS:** Be careful to only use 2 pumps of the proper grease in these bearings during your scheduled maintenance. Too much grease can cause rapid and severe damage to these bearings.

**FEED ROLLS:** In order to simplify maintenance, all of the feed roll bearings are sealed. Because the feed rolls turn at a slower RPM and these are quality bearings, these bearings should give you years of dependable service.

**GEAR BOXES:** In order to maximize the life of your gearboxes, it is recommended that you check the oil level once a month and change the oil once a year. This is a very inexpensive way to minimize downtime and very costly repairs.

3 - LUBRICATION PLAN



Pos	Points do be lubricated	Qt	Period	Remarks	Lubricant (Shell)
1	Bottom arbor bearings	2	Monthly	2 pumps R/L	Alvania grease R3
2	Top arbor bearings	2	Monthly	2 pumps R/L/B	Alvania grease R3
3	Raising screws and chain	3	Weekly	Put oil directly R/L	Tona T 68 (oil)
4	Raising ways	4	Weekly	Put oil directly R/L	Tona T 68 (oil)
5	Feed chain	4	Weekly	Put oil directly	Tona T 68 (oil)
6	Feed gear box	1	Monthly Yearly	See the level Changing oil	Omala oil 220 (oil)
7	Raising gear box	1	Monthly Yearly	See the level Changing oil	Omala oil 220 (oil)
8	Left side head	2	Monthly	2 pumps T/B	Alvania grease R3
9	Right side head	2	Monthly	2 pumps T/B	Alvania grease R3
10	Side head ways and screw	2	Weekly	Put oil directly T/B	Tona T 68 (oil)
11	Holddown rolls ways	2	Weekly	Put oil directly T/B	Tona T 68 (oil)

LEGEND: R/L = Similar lubrication point on Right and Left side  
 T/B = Top and Bottom lubrication points

## 1 - INTRODUCTION:

In the manufacture of wood products, the planer and molder are often necessary to produce dimensional products with a consistently smooth finish.

Planers are sometimes called upon to remove large amounts of excess material quickly and efficiently to transform rough lumber into blanks for secondary operations or even finished products. These types of units are known as a roughing planers.

The fact that planers must often perform as work horses, (being fed continuously, removing large amounts of material, and required to produce a quality finish) it is most critical that the owner/ operator completely understand proper set up, operating and maintenance procedures for all the systems within his particular machine.



**REMEMBER THIS RULE OF THUMB:** The attitude and skill of the operator critically determines the performance of any machine he operates. The investment into a quality machine **MUST** be followed by an investment into a quality operator and an investment into their ongoing education.

The purpose of this manual is to give you, the operator, a better understanding of planers and planing in general, how to maintain, align, set up, operate, and trouble shoot them. Categories have been outlined below in order to help you better understand planing concepts and how planers are adjusted for special jobs and for the differences in material.

## 2 - TYPES OF PLANING:

1. **Rough Planing:** (Roughing, Sizing) Rough planing generally means sizing lumber, with sometimes serious thickness variations, to a uniform thickness that is greater than the finished thickness of the end product to be produced from this material.
2. **Hit or Miss:** (Skimming, Skip Planing) The same as rough planing, except that light cuts are made to keep the lumber as close to original thickness as possible, leaving area's on some boards unplanned.
3. **Finish Planing:** (Finishing) Finish Planing generally means a final more precise pass through a planer. Usually this results in a higher quality surface appearance and a standard finished thickness.



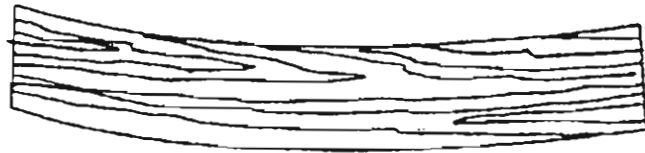


4. **Molding:** (Profiling) Molding or Profiling generally means to apply a special shape or pattern to the faces (top or bottom or both) and or edges of the lumber.
5. **Matcher:** Matching generally means shaping or profiling the edges of a piece of lumber where two edges will interlock, like a tongue and groove pattern.
6. **S1S:** (Surface One Side) Single surfacing.
7. **S2S:** (Surface Two Sides) Double surfacing.
8. **S3S:** (Surface Three Sides) Double surfacing and planing one edge or double surfacing and ripping one edge.
9. **S4S:** (Surface Four Sides) Four siding.
10. **Jointing:** Generally refers to removing all high spots on the bottom face of a board leaving a flat uniform unstressed surface. This is accomplished by passing a board over a bottom planing head with a minimum amount of down pressure.
11. **Facing:** (Flattening) generally refers to a special endless bed or carpet fed jointing planer that helps to flatten the bottom surface of a board by using a minimum amount of down pressure while feeding the stock through the machine. Some jointers are equipped with a special feeding device consisting of an endless track with many individual spring loaded fingers that feed the wood into the machine and over the bottom cutterhead while applying a light down pressure. This system offers the benefits of hand jointing while providing more safety to the operator and significantly increasing production. There are also facing planers built that use a combination of spring loaded fingers and standard feed rolls. These machines both flatten the bottom face of a board with a bottom head and then plane a uniform thickness with a rear top head in one pass.
12. **Pre-Straightening:** A process where a rabbet is cut into the lower right edge of a board, on the infeed table before the board enters the planer. The inside edge of the rabbet is then guided along a straight edge through the machine and to the right side head. It should be noted that these systems are limited to eliminating small crooks, usually ranging from zero to one half inch over the length of a board.

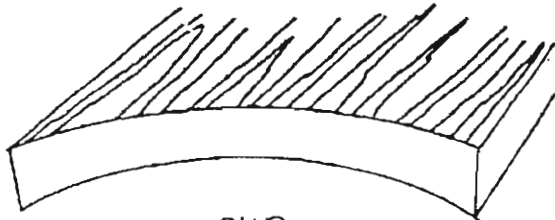
**NOTE:** The most efficient machines used to straighten lumber are either a straight-line rip saw or dip chain gang saw.

Now that we have looked at the different type's of planing lets look at the types of defects encountered in lumber so that we can best determine the proper planing operation.

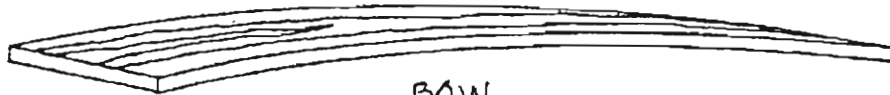
3 - LUMBER DEFECTS:



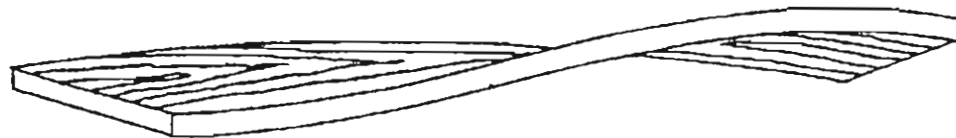
SWEEP



CUP



BOW



TWIST

Sawing, Drying and Natural Conditions

1. **Bow:** A bow is a long gradual curve along the face of the board with the greatest difference in the middle of the piece gradually decreasing toward the ends.
2. **Twist:** A distortion of a board into a shape suggestive of an airplane propeller.
3. **CROOK:** (Sweep) A sweep is a curve along the edge's of the board causing the piece not to be straight. Sweep's can be long and gradual or short and hard like a kink.
4. **Cup:** A bend running from one edge of the board across to the other edge.



5. **Thick and Thin:** This is a condition most commonly caused by poor sawing practices. In some cases a one inch thick rough sawn board can range from 7/8" to 1-1/2" thick over the length of a single board.

These conditions that exist in lumber, especially hardwoods, only make the planer's job more difficult and often create a need for secondary machinery to produce quality finished products. It would be nice to be able to feed any piece of rough lumber into a planer/molder and have a perfect finished product, free from defects, coming out the other end, but this seldom happens.

There are some products produced in this manner, mostly in softwoods, such as siding, decking, and dimension lumber. These products, although accurate in dimension, are by no means consistently straight, flat and true. But, for these type's of products, a good planer/molder will produce an acceptable finish. When more accuracy is required, such as moldings, flooring, furniture parts and architectural millwork, many more machining steps are needed to ensure a consistent quality product. Thus, we have some of the reason for the many different types of planing and secondary machining operations.

The many process' needed to work lumber free of defects and prepared for final machining into high quality products are well known to the furniture, molding, flooring, and architectural millwork industries. For this reason many larger company's split their manufacturing space into a rough mill and a finish mill. What about small plants that can't afford all the extra capital equipment, space and people needed? The answer is flexible manufacturing and the key is a planer/molder that can both rough out lumber quickly and efficiently and finish it properly.

This type of flexible manufacturing is made even more attractive by a new concept in planers. The Planer/Molder, which offers wider and thicker capacities than the conventional molder, can efficiently rough and finish plane, as well as profile, mold and match a very wide range of products. These machines are set up with the bottom head first to help joint the bottom surface flat before it enters onto the main table. Because the wood is flat against the main table as it passes under the top head, dimensional accuracy and flatness of the lumber is improved.



#### 4 - ADVANTAGES OF ROUGH PLANING:

Although some woodworkers will insist that the extra process of rough planing is not cost effective, let's look at the potential advantages that can be gained.

1. **Knife Wear:** Rough planing cleans lumber surfaces of dirt and grit thereby eliminating nicking and premature wearing of your finishing machine knives during important set ups and production runs.
2. **Defecting:** Rough planing cleans lumber surfaces, helps detect defects, and improves the grading and selecting process.
3. **Uniform Size:** Rough planing will produce a product that is more uniform in size and help the performance of secondary machines such as gang rips, molders and sanders, as well as significantly reducing the wear and tear factor. The uniform size of the lumber will allow for better feeding and will increase production dramatically on all machines by reducing jam-ups, eliminating knife and saw burn marks that cause defects in the finished product and prematurely wear the cutting edges of these tools.
4. **Improved Flatness:** If rough planed properly, a board has a flat bottom and requires lighter cut during finishing and molding operations.
5. **Sorting Widths:** When working with random width lumber, rough planing allows the tail person to sort out the most common widths that best fit your products for more efficient break down of the lumber into blanks or parts.
6. **Waste Reduction:** Rough planing allows you to sort lumber widths to fit your product there by eliminating waste at the rip saw. Another advantage is that inventorying a stack of single widths is made easier by just counting the pieces and multiplying that number by their average length.

The ability to grade and select lumber before final processing will eliminate running stock that was no good to begin with. Clean stock being fed to finishing planers or molders will **REDUCE EXPENSIVE DOWNTIME, EXTEND TOOL LIFE AND MINIMIZE GRINDING COSTS.**

Many small manufacturers argue that the extra handling and processing cannot be cost effective for their operations, but in reality, it can actually improve overall production, quality and reduce waste and maintenance expenses. Remember that quality is number one and a quality product will sell itself, build customer loyalty and separate yourself from your competition. In manufacturing you always want to eliminate ineffective process,' but never skip necessary one's, because every process has an effect on your finished product. Test all process' thoroughly before making your decisions and listen to your customers.



Although there are numerous types of planers, the most standard type is the roll feed machine. These machines can be built specifically for roughing, finishing or both, however, they require different setup adjustments.

## 5 - DIFFERENCES BETWEEN ROUGH AND FINISH PLANERS:

Roughing planers are usually massively built and equipped with large motors, rugged and very flexible sectional feed roll and chipbreaker systems that allow for the removal of large amounts of material at high speeds. These machines are engineered to handle excessive thick and thin variations in rough lumber. The concept is to produce a board with a uniform thickness and a reasonable finish.

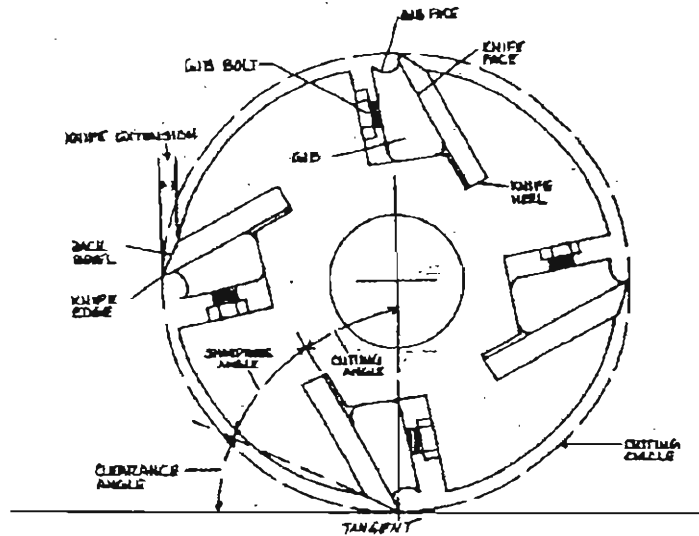
Rough stock has many hills and valleys, so raising the bottom feed rolls (when installed) will improve the feeding. Sometimes lowering the top feed rolls provides for better feeding if the rough lumber is thinner than normal.

**RULE OF THUMB:** Setting the bottom rolls higher improves feeding, but each advancement in height reduces the finished surface quality.

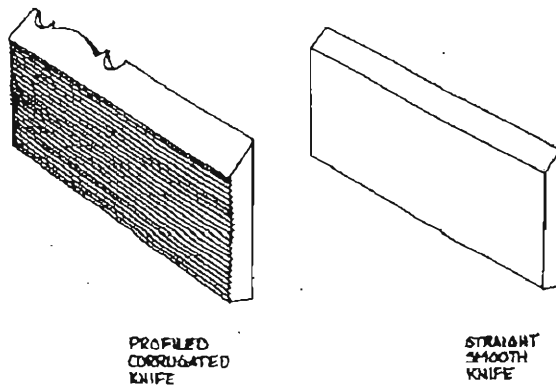
Finish planers tend to be more compact, efficient and usually designed to remove less material at lower feed speeds. Most planers, large or small, have the same basic components but are designed and laid out differently. The setting or adjusting of these components determines the finish that the machine will produce. Since the bottom feed rollers (when installed) are set much closer to the table surface, the biggest difference in machine adjustments between rough and finish planing is the position of the feed system components.

The settings given in this manual for the proper positioning of the feed and guide system components can be used on many other conventional planers and molders, but you should check with the machines manufacturer before making adjustments.

1 - TOOLING SECTION



CUTTER HEAD TERMINOLOGY



TERMINOLOGY:

NOTE: For more detailed technical information we recommend that you consult the "KNIFE GRINDING AND WOODWORKING MANUAL" by Charles G. Monnett.

- 1) GIBB: The gibb is a holding bar used to distribute uniform pressure against the knife to hold it firmly in place against the curtterhead.
- 2) GIBB BOLT: Gibb bolts are closely spaced and used to wedge the gibb against the knife for a firm hold.
- 3) GIBB FACE: The gibb face is the top edge that is exposed and is usually machined out specially to help deflect the chips.



- 4) **KNIFE FACE:** The knife face is the surface that contacts the gibb and extends out past the gibb to the cutting edge of the knife.
- 5) **CUTTING ANGLE:** The cutting angle is the angle formed by the face of the knife and a line extending from its cutting edge through the center of the head.
- 6) **CLEARANCE ANGLE:** The clearance angle is the angle between the grinding bevel of the knife and a line drawn tangent to the cutting circle at the knives cutting edge.
- 7) **SHARPNESS ANGLE:** The sharpness angle is the angle between the knife face and the knife grinding bevel.
- 8) **KNIFE EXTENSION:** The knife extension is the amount that the knife edge extends out beyond the body of cutterhead.
- 9) **CUTTING CIRCLE:** The cutting circle is the diameter of the cutterhead plus the total of two knife extensions.

EXAMPLE: Diameter of head = 125 mm / 5"

Knife extension = 1.5 mm / 1/16"

Cutting Circle = 125 + 1.5 + 1.5 = 128 mm / 5" + 1/16" + 1/16" = 5-1/8"

- 10) **KNIFE MARKS PER INCH:** Determined by the number of knives in a cutterhead, the RPM of the cutterhead, and the feed speed of the machine. To find knife marks per inch take the number of knives in the cutterhead and multiply by the cutterhead RPM, then divided by the feed speed (FPM), then divide by 12, which is the number of inches in each foot.

EXAMPLE: 4 KNIVES x 5500 RPM X 50 FPM = 22,000 KNIFE MARKS/MINUTE

22,000 KMPM / 50 FPM / 12" PER FOOT = 36 KMPI

**PITCH KNIFE MARKS: (PKM)** It's the distance between knife marks.

EXAMPLE: N° KNIVES = 4

CUTTERHEAD RPM. = 5500

FEED SPEED = 10 METERS/Min.

$$PKM (mm) = \frac{FEED SPEED \times 1000}{CUTTERHEAD RPM. \times N^{\circ} KNIVES} = \frac{10 \times 1000}{5500 \times 4} = 0.45 mm$$



**Remember**, in order to get the best planing finish possible and the maximum number of knife marks per inch for any given planer or molder, the cutting edge of each and every knife must be precisely positioned to each other in the cutterhead. If the cutting edge of any one knife protrudes further out than any other knife, the highest knife in the cutterhead will make the deepest cut and leave the only finish mark, giving you a one knife finish no matter how many knives are used. The only way to achieve the maximum number of knife marks per inch and the best possible planing finish is to carefully set each knife within .004" of each other, and then to carefully joint the cutterhead.

- 11) **MINIMUM CUTTING CIRCLE:** Determined by both the spindle diameter, (since a certain amount of metal is required between the bore and the cutting edge to give the cutter body adequate strength) and the closest possible position of the fence to the spindle, (since the cutting edge of the tool must go beyond the face of the fence and penetrate into the wood a designed depth of cut).



When changing from minimum diameter tooling to larger diameter sets be sure to re-adjust fences, and hand rotate the spindle, so that the cutters clear the fence systems by a safe distance. If the machine is started and the larger diameter cutters crash into the steel fence system, serious bodily injury and machine damage can occur instantly!

- 12) **Maximum cutting circle:** Determined by the distance between the spindle, the fence system, the dust hood and other machine parts. Any cutter with a larger diameter than the maximum cutting circle of any machine will end up crashing into machine parts.

## 2 - HIGH SPEED STEEL TOOLING:

Although the set up and alignment of planing and molding machines is very critical to their performance ONE OF THE MOST

important factors in successful planing is SHARP KNIVES. The maintenance and up keep of your knives and cutter heads is a never ending task. Once new knives are installed and working you must be preparing the next set. If you are sending them out you need a minimum of three sets, one in the





machine, another in transit to or from the grinder, and one on the shelf ready for installation. Whether you're grinding your own knives or sending them out, a few strict rules must be maintained for success.

1. **Quality stock:** When new knives arrive from the supplier you should check them carefully, on the infeed bed of the planer, for flatness, straightness, height and length in complete sets.
2. **Keep in sets:** In order to maintain the balance of each cutter head, knives should be kept and ground in sets of two, three or four, depending on the number of knives used in the head.
3. **Proper Knife Grinding:** Knives should be ground slowly and an abundant amount of flood coolant applied in order to avoid burning that will warp and shorten the life of the knife.
4. **Clean Knife Edge:** Always clean the knife edge after grinding and jointing. WHILE WEARING INDUSTRIAL SAFETY GLOVES, press a block of hardwood directly into the knife edge and rub it back and forth along the full length of the knife until it is free of all contamination and grinding burrs.
5. **Knife Storage:** Keep knives in a safe clean area to prevent unnecessary loss or damage.

### 3 - CARBIDE TOOLING:

Today, the cost of quality tooling is very high and requires proper selection, proper use and proper maintenance to extract the maximum amount of profit and service from each set of cutters. Before purchasing any carbide tooling it is very important that you consult with a very experienced and dependable supplier that can guaranty the best design, quality and price for the tooling required. There are several critical factors to consider before issuing your purchase order. Remember, there are many vendors trying to sell carbide tooling that range in design, quality, price, delivery, dependability and service after the sale, and believe me, you will require service after the sale. The next time you are ready to purchase carbide cutters, consider the following:

- 1) Determine how you intend to use this set. Is this a onetime job or are you going to use this set on a more ongoing basis. Carbide cutters come in several grades. A C-2 grade carbide is most commonly used in lower priced cutters, and a harder C-3 grade is used in cutters that require a longer life. C-4 or HO4 grade is available, but usually is used for machining high density materials and not soft or hard woods.
- 2) Feed rate should be determined to decide if a three, four or six wing cutter will be necessary.



- 3) Estimate how downtime will be handled. If this set will be a standard tool, a backup set may be required to reduce downtime in the event the first set gets damaged, or simply requires scheduled maintenance, right in the middle of an important production run.
- 4) Another decision that can reduce downtime to a minimum is to have your tooling designed to a constant cutting circle. This strategy allows the set-up man to quickly change the cutters sets without having to re-adjust the fence systems, a very time consuming task, or even to stack multiple sets on the spindle for very rapid changeover.
- 5) ALWAYS inspect cutters as soon as they arrive from the supplier to make certain that they meet your "EXACT" design specifications and have not been damaged in shipping. Waiting until the last minute to inspect tooling can often lead to some very UGLY and unnecessary telephone and fax communication!

After you have received your tooling, your purchase can be better protected by making certain that your cutters are stored and maintained properly. A small investment of time and caring can extend the life of your tooling significantly.

- A) Carbide is very hard and brittle and extra care is advised when handling. Cutters should never be placed on any metal surfaces. Always place them on cardboard or wood.
- B) Avoid stacking cutters with different cutting diameters, since they could easily crash into machine parts when adjusting spindles. (See Tooling Section/Terminology/Maximum cutting circle).
- C) Avoid excessive dulling of you cutters. This kind of abuse will require more grinding then normal, will possibly damage the carbide by the intense impacting, not cutting, of the wood, and will significantly shorten the life of the cutter set.
- D) Unused carbide cutters should be stored in a safe environment until needed. It is advisable to coat them with a light oil during short or long term storage.
- E) Keep your cutters clean, as gum and pitch accumulations on wings can contribute to a reduced service life. To help increase cutter life, place cutter sets in a common household powered detergent with warm water for at least one hour and then clean with a soft bristle brush (not a wire brush) to loosen pitch and gum. Wipe dry, coat with light oil and store properly.
- F) In order to achieve constant profile specifications, always return the cutter set to the original supplier to rebuild.
- G) Always clean the cutting edge after grinding or honing, WHILE WEARING INDUSTRIAL SAFETY GLOVES, by rubbing a honing stone or block of hardwood over it, until it is free of all contamination and grinding burrs.



## 1 - KNIFE SETTING

### INTRODUCTION:

Setting knives in a planer is the most frequent task performed on this machine. Maintaining a sharp and balanced cutter head is the most important factor when it comes to achieving a quality finish and minimizing long term wear and tear on the equipment. Dull knives or out of balanced heads create stress on the cutter head and bearings, and cause vibration that will, over time, effect many parts on the machine. So, it is very important that the person, or persons, responsible for the set-up and maintenance of your planer use the proper techniques and follow simple guidelines to ensure it's top performance and long life.

**TO ATTAIN MAXIMUM EFFICIENCY AND SPEED AT THIS TASK, FOLLOW THESE RULES OF THUMB RELIGIOUSLY.**

- 1) **QUALITY KNIFE STOCK;** Insist on an M2, or better, grade of high speed steel knives, unless your particular job requires something different.
- 2) **FLAT & STRAIGHT KNIFE STOCK;** When receiving knife stock, either new or re-ground, set it on your planer infeed table and make sure that each knife, when standing on it's heel, ( the side opposite the cutting edge ), is flat against the table. If not, it should be returned to either your supplier for replacement or to the grinding shop for repair.

**USING ONLY STRAIGHT QUALITY STOCK WILL GREATLY IMPROVE YOUR SPEED AND ACCURACY IN SETTING KNIVES.**

- 3) **BALANCE SETS;** Knives should be kept and ground in balanced sets. To check, set 2 knives on their heels and back to back on the infeed table. They should be EXACTLY the same height and length. If available, a weight scale is more accurate and will give better results.
- 4) **ACCURATE KNIFE SETTING;** With the new gages available today, it is possible to quickly set a QUALITY set of knives within a few thousandths of an inch. Therefore, this set can be run in without an initial jointing on the head, giving you a longer knife life and less set-up time.

**2 - KNIFE SETTING PROCEDURE FOR TOP HEAD:**

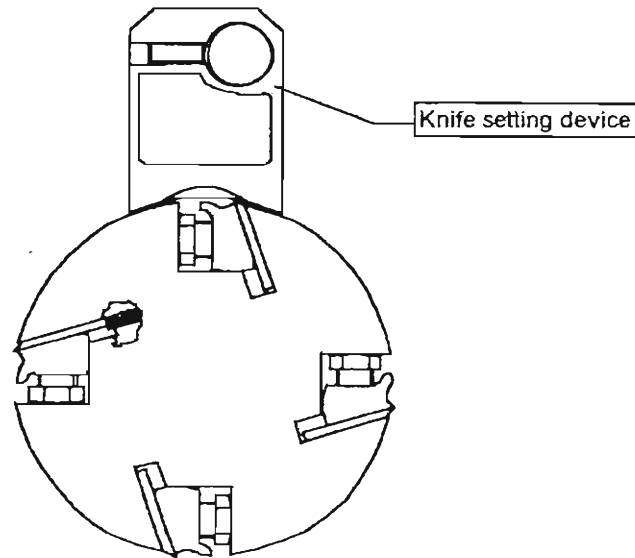
**Assemble the following tools before starting knife maintenance.**

- a. A portable rolling work table.
- b. 17MM gibb bolt wrench (supplied with machine)
- c. Magnetic knife setting blocks (supplied with machine)
- d. Screw driver or 5MM allen wrench (supplied with machine)
- e. KG-1 dial Indicator knife setting gauge (machine accessory)
- f. 17MM torque wrench (machine accessory)
- g. Safety glasses
- h. Industrial Work gloves
- i. One set of quality, balanced knives.
- j. A small 1" x 1" x 3" block of hardwood.

The following techniques can be useful in setting knives in other machines, but always consult the particular machine manufactures' recommendations to ensure the proper setting of their machines.

- 1) Carefully place the portable work table in a comfortable working location near the machine. Make sure that all tools are laid out in an organized fashion and that the set of knives to be installed has been properly inspected and are ready for installation.
- 2) PRESS BOTH FRONT AND REAR EMERGENCY STOP BUTTONS TO THE OFF POSITION AND SWITCH THE MAIN DISCONNECT SWITCH OFF.
- 3) Raise the main cover and position the support brace in order to keep the cover open to its maximum height.
- 4) PUT ON SAFETY GLASSES AND INDUSTRIAL WORK GLOVES BEFORE BEGINNING THIS PROCEDURE.
- 5) Remove the deflector from the top of the chip breaker bar.
- 6) Loosen each gibb bolt in the top slot, and as soon as the wrench starts to move, stop and go on to the next one before completely loosening the others. Tightening and loosening the gibbs evenly will increase the speed of the operation and eliminate unnecessary wear and tear on the entire head assembly.
- 7) After all of the gibb bolts are properly loosened, the knife setting springs will push the knife out about one half inch.
- 8) Remove the knife, gibb, and knife springs from the slot and CAREFULLY place them onto the work table.

- 9) Clean out the slot with either compressed air or a stiff brush to ensure complete safe and efficient seating of all the components of the system. PROPER EYE PROTECTION IS ESSENTIAL FOR THIS OPERATION.
- 10) Make certain that the knives, gibbs and springs are thoroughly clean and then CAREFULLY begin the installation procedure.
- 11) Insert new or re-sharpened knives into the slot.



- 12) CAREFULLY place magnetic knife setting blocks at each end of the head.
- 13) Starting with the second bolt in from each end, snug up all the bolts evenly and then back them off just enough so that the knife moves freely.
- 14) Place the knife setting dial indicator on the head, loosen the thumb screw and raise or lower the indicator until the stem contacts the body of the head and registers about .020" (twenty thousandths of an inch.) Reset the scale to zero and lock it in.
- 15) Rotate the indicator over the knife until the highest number registers on the scale. This point is called top dead center (TDC) and represents the position of the knife in relation to the bottom head.
- 16) Set each end of the knife, near each magnetic block, to .070" above the head. This is accomplished by placing the indicator nearest the block and using the adjusting thumb screw on each block to raise or lower the knife against the compressed knife spring.
- 17) Once .070" is established at each block, slightly tighten the second gibb bolt from each end just enough to keep the knife from moving while turning the thumb screw. By lightly tapping on the thumb screw with your wrench you will be able to make very minor adjustments. Practice and experience will give you a better feeling for the proper resistance so the knife will remain in place as you fine tune its setting.

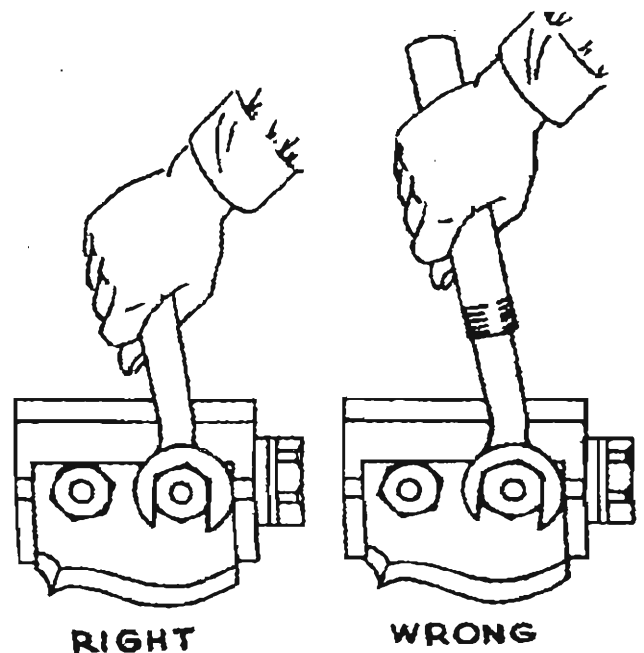
- 18) Bring each end down to .060" by lowering the brass block only a few thousandths of an inch at a time. A partial turn of the thumb screw and a very light tap on this same screw will ease the knife down into position.
- 19) Once you have the knife properly set at .060" above the head, CAREFULLY check the areas between the blocks for uniformity. If these areas are within +/- .004" snug up the remaining gibb bolts so that you have uniform pressure across the entire length of the gibb.
- 20) Remove magnetic blocks and snug end bolts evenly with the rest.
- 21) Before the final tightening of all the gibb bolts, CAREFULLY check the entire length of the knife for a uniform .060" setting, with no more variation than +/- .004" Once the setting is correct, tighten each gibb bolt, a little at a time, until a maximum pressure of 400 inch pounds is obtained. This system helps to establish uniform pressure that eliminates a lot of potential problems when changing knives in the future. A preset gibb bolt torque wrench is available and makes this task much easier.
- 22) Before setting the next knife, WHILE WEARING INDUSTRIAL SAFETY GLOVES, take the block of hardwood and CAREFULLY slide it along the cutting edge of knife to remove all burrs from the grinding process. BE SURE THAT INDUSTRIAL SAFETY GLOVES ARE WORN DURING THIS OPERATION.
- 23) CAREFULLY rotate the head 90 degrees to the next knife and repeat the entire procedure as explained and illustrated above until all knives are replaced and tensioned properly.



**Do not ever use a wrench larger than that supplied with the machine for tightening the knives.**

**Many knives have been broken and heads ruined by excessive and uneven gibb bolt pressure.**

**Caution your operator against using such a wrench, as too much pressure may be applied.**





### 3 - KNIFE SETTING PROCEDURE FOR BOTTOM HEAD:

Assemble the following tools before starting knife maintenance.

- a. A portable rolling work table.
- b. 17MM gibb bolt wrench (supplied with machine)
- c. Screw driver or 5MM allen wrench (supplied with machine)
- d. PG-1 Universal Planer Gage (machine accessory)
- e. 17MM torque wrench (machine accessory)
- f. Safety glasses
- g. Industrial Work gloves
- h. One set of quality, balanced knives.
- i. A small 1" x 1" x 3" block of hardwood.

The following techniques can be useful in setting knives in other machines, but always consult the particular machine manufactures' recommendations to ensure the proper setting of their machines.

**Introduction:** The bottom cutterhead parts are the same as the top, the major difference is in the way we gauge the knife height. On the bottom head we set the knives to the main table instead of the head, although we do check that the head is level to the main table first. The same general practices for the top head apply to the bottom head and the same tools are used.

**Procedure:**

- 1) Carefully place the portable work table in a comfortable working location near the machine. Make sure that all tools are laid out in an organized fashion and that the set of knives to be installed has been properly inspected and are ready for installation.
- 2) Raise the top section of the machine to the maximum open position.
- 3) PUSH IN BOTH EMERGENCY STOP BUTTONS.
- 4) Raise the machine cover and CAREFULLY position the support bracket into the first notch.
- 5) PUT ON SAFETY GLASSES AND INDUSTRIAL WORK GLOVES BEFORE BEGINNING THIS PROCEDURE.
- 6) If the side heads fences are mounted on the machine, remove them from the machine and place them in secure area where they will not get walked on or otherwise damaged.



- 7) If the knives are still in the head, loosen, remove and clean them following the same procedure as outlined in steps #6 through #11 in the "Knife Setting-Top Head" section.
- 8) Lower the infeed table, as if to set a maximum depth of cut for the bottom head.
- 9) Rotate the dial indicator on the "PG-1" planer gage until it is pointing down and re-tighten the thumb screw.
- 10) To prepare the PG-1 Gage for working on the bottom head, set it on the infeed table and lower the indicator until the stem touches the table and the needle moves. Tighten the thumb screw and set the dial to zero. Loosen the thumb screw, lower the indicator until it reads approximately .080", tighten the thumb screw and set the dial to zero.
- 11) Set the PG-1 Gage on the main table, just after the bottom head, and slide the gage forward so that it is in contact with the body of the bottom cutterhead, not the knife or gibb. Move the indicator front to back over the head until the highest point is obtained (TDC -TOP DEAD CENTER.) It is critical that the body of the bottom cutterhead be .060" lower than the main table and parallel to the table from end to end.
- 12) WHILE WEARING INDUSTRIAL SAFETY GLOVES, Clean the edge of a new or re-sharpened knife thoroughly with a hardwood block until free of burrs and contamination.
- 13) Insert cleaned knife springs, gibb, and knife into the slot. Make sure that the knife is centered lengthwise on the head.
- 14) CAREFULLY place either the magnetic knife setting blocks or the knife setting jig, which ever is supplied with the machine, onto the knife edge at each end of the cutterhead.
- 15) Slide the gage so that the stem is over the knife edge and set each end of the knife at minus .010". Lightly snug the second gibb bolt from each end until the magnetic gage cannot advance the knife freely, but by lightly tapping on the thumb screw the knife should advance .001" at a time. This will take a little practice at first but when achieved will give maximum control.
- 16) Now lower the knife a few thousandths at a time on each end, until both ends read minus .015". When obtaining this reading make sure that any slack in the spindle lock is taken up in a forward direction toward the infeed table. Snug the same bolts a little more and recheck your reading.
- 17) Snug the middle bolt and check the middle of the knife. If it is within 2 or 3 thousandths of the ends snug up the rest of the bolts lightly and remove the magnetic blocks and snug the end bolts.
- 19) Tighten all bolts evenly to 400 inch pounds.
- 20) Repeat this procedure until all knives are replaced and properly tensioned.
- 21) After all the knives have been properly installed, place the PG-1 gage on the main table just behind the bottom cutterhead (PG-1 gage should still be set to zero). Slide the gage so that the stem is over the body of the cutterhead, not the knife or gibb. Move the indicator front to back over the head until the highest point is obtained (TDC -TOP DEAD CENTER.)





22) With the PG-1 gage located at this TDC point, rotate the head until the knife contacts the indicator stem and raises it to its highest point on the scale. CAREFULLY rotate the head and repeat this procedure until the highest knife is located. The highest knife should register from zero to 2 to 3 thousandths above the main table. If the knife is not set in this range, across the main table, you may have to re-set the right and left bottom head adjusting bolts,( see #20 ON THE CUTTERHEAD, FEEDING & HOLDDOWN COMPONENTS ILLUSTRATION), until the proper setting is obtained.

This means the knife is level with the main table or a few thousandths of an inch higher. To put this in perspective, if you set a precision straight edge on the main table and extended it over the head and rotated the head by hand, the highest knife should lightly scrape the bottom surface of the straight edge. The bottom head knives are now set.

#### 4 - KNIFE SETTING PROCEDURE FOR SIDE HEADS:

To set the side head knives you must remove the heads from the machine and place them onto a wooden work bench or equivalent to protect the knives from damage.

Assemble the following tools:

- a) Heavy duty Industrial Work gloves
  - b) 55 MM tee handle wrench (supplied with machine)
  - c) 17MM head wrench (supplied with machine)
  - d) 17MM torque wrench (machine accessory)
  - e) KG-1 knife setting dial indicator (machine accessory)
  - f) Large screw driver (supplied with machine)
  - g) Block of hardwood
  - h) 1 set of sharp balanced replacement knives
  - i) 1 set magnetic gage blocks (supplied with machine)
1. WHILE WEARING YOUR INDUSTRIAL SAFETY GLOVES, locate the spindle lock on the outside of the side head assembly, pull out the black tee handle and rotate it 90degrees. CAREFULLY Rotate the head until the spindle lock engages.
  2. Remove the hex nut that locks the head to the spindle by using the tee handle wrench supplied. The nut on each head loosens in the direction the head turns while cutting. The right head is a right hand thread, the left head is a left hand thread. Keep nuts separate to avoid damaging threads.
  3. If installed on the top of each side head, remove the tapered split ring by carefully pressing a screwdriver into the slot to release the pressure on the shaft.

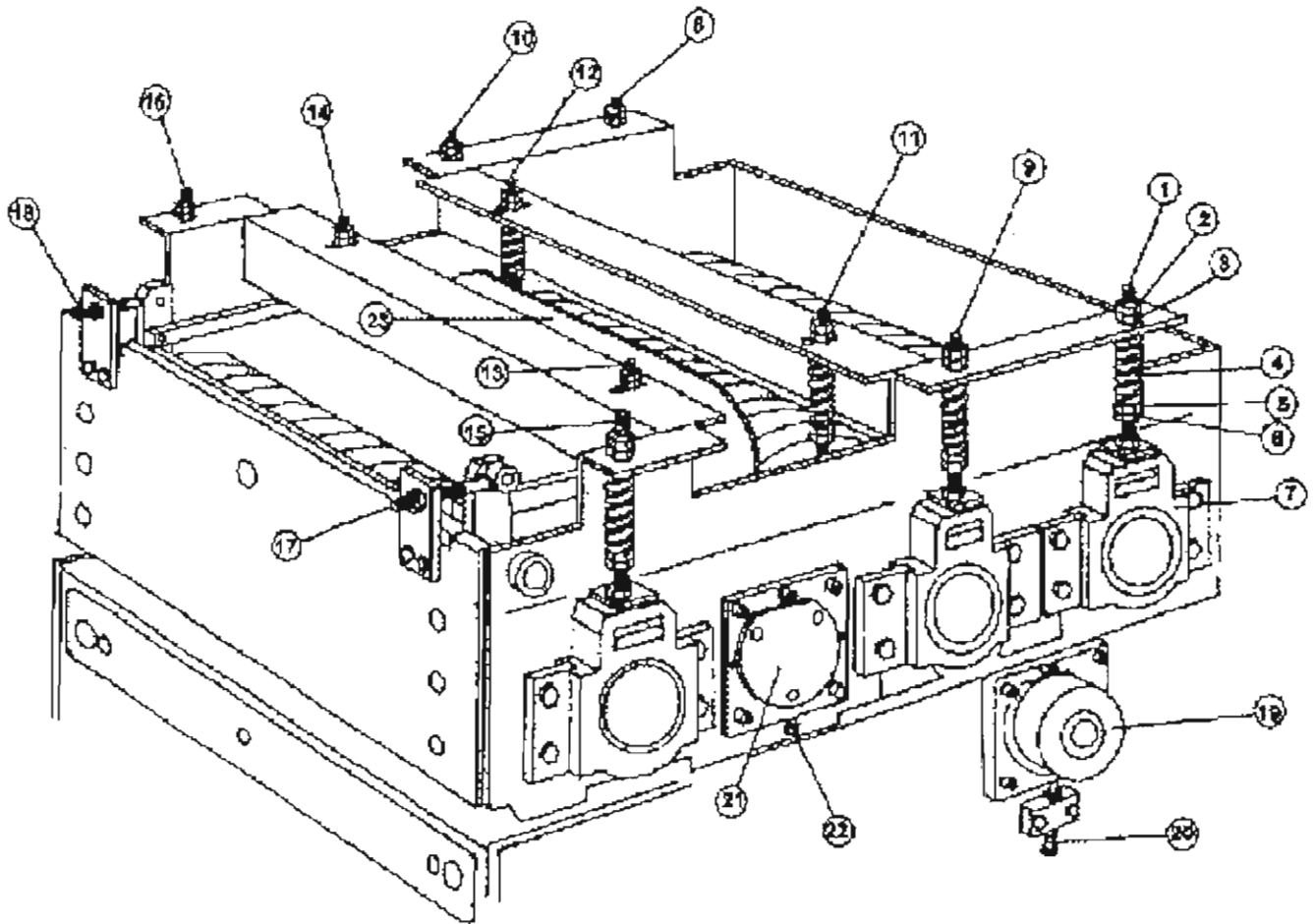


4. CAREFULLY remove the head and place it onto a wooden work bench or other non damaging surface. USE HEAVY DUTY INDUSTRIAL WORK GLOVES TO PREVENT INJURY.
5. Set the head vertically on the bench and loosen all the gibb bolts evenly, as described in KNIFE SETTING PROCEDURE FOR TOP HEAD. Do not loosen completely. Repeat on all knives.
6. Lay the head horizontally onto the bench and finish loosening a gibb until the knife springs up.
7. Remove the knife, springs, and gibb. Thoroughly clean all of these items and the cutterhead slot. Repeat for all four knives.
8. WHILE WEARING INDUSTRIAL SAFETY GLOVES, CAREFULLY clean all new or re-ground knife edges thoroughly by sliding a wooden block back and forth across the length of the knife until free of contamination. Repeat process until all knives are clean.
9. CAREFULLY install springs, gibb and knife into one cutterhead slot.
10. Place the magnetic gage block at each end of the knife.
11. Place the knife setting dial indicator on the head and lower the indicator until the stem touches the body of the cutterhead and registers .020" movement on the dial. Lock the indicator in place.. Reset the dial to zero and lock it in.
12. Rotate the gage until the stem is centered on the tip of the knife edge or the highest reading is registered on the dial.
13. Using the magnetic gage blocks set each end of the knife to .060"
14. Snug up the center gibb bolts lightly and recheck your reading. If a good reading is achieved remove the magnetic blocks and snug up the end bolts. If not, loosen the bolts and reset.
15. Tighten all bolts evenly to 400 inch pounds and repeat the process until all knives are properly changed, adjusted and tightened.
16. CAREFULLY replace head on shaft. Heads can be used on either side by turning them end over end 180 degrees. If required, be sure that the top and bottom split rings are in place before installing the lock nut.
17. Install and firmly tension the nut onto the shaft. Do not use a pipe or any leverage device on the tee handle wrench.
18. Place the spindle lock securely in the free position so that the head turns freely. The spindle lock has machined notches to hold it in place. Always be sure it is in the proper notch to avoid serious damage to the machine.
19. Once both sideheads have been properly re-installed, reset the fences and guides to the cutting circle of each head.

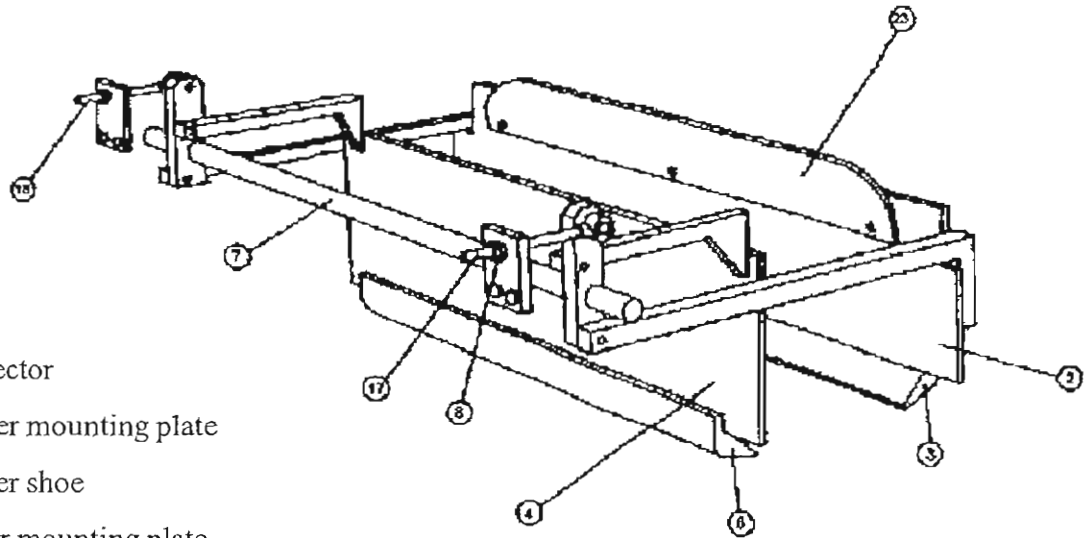
#### **5 - KNIFE WEAR TIP:**

Set each side head scale to zero and run in this position until the knives wear, then lower each head until the unused portion of knife is positioned at the required working height. When the heads can no longer be lowered (approx. 4" of travel) rotate the heads to the opposite side, start at zero and repeat the process.

1 - PMC FEEDING, HOLDDOWN & GUIDE SYSTEM COMPONENTS



- |  |   |
|--|---|
| 1. 1st top feed roll left side adjustment rod  | 13. Pressure bar left side adjusting rod              |
| 2. Locking nut                                 | 14. Pressure bar adjusting rod                        |
| 3. Adjusting nut                               | 15. Outfeed roll left side adjusting rod              |
| 4. Spring                                      | 16. Outfeed roll right side adjusting rod             |
| 5. Spring tension adjusting nut                | 17. Chip breaker/pressure bar left side setting rod   |
| 6. Spring tension locking nut                  | 18. Chip breaker/ pressure bar right side setting rod |
| 7. Feed roll bearing housing                   | 19. Bottom cutterhead left side bearing housing       |
| 8. 1st top feed roll right side adjusting rod  | 20. Bottom cutterhead left side adjusting bolt        |
| 9. 2nd top feed roll left side adjusting rod   | 21. Top cutterhead left side bearing housing          |
| 10. 2nd top feed roll right side adjusting rod | 22. Top cutterhead left side adjusting bolt           |
| 11. Chip breaker left side adjusting rod       | 23. Top cutterhead chip deflector                     |
| 12. Chip breaker right side adjusting rod      |   |



- ✓ 23. Chip deflector
- ✓ 2. Chip breaker mounting plate
- ✓ 3. Chip breaker shoe
- ✓ 4. Pressure bar mounting plate
- ✓ 6. Pressure bar shoe
- ✓ 17. Left side setting rod
- ✓ 18. Right side setting rod
- ✓ 8. Outside adjusting/ locking nut
- ✓ 7. Assembly pivot rod

1. **Top infeed rolls:** Solid or sectional round cylinders, usually sharp edged or serrated, used to advance lumber up to the cutterheads. These rolls are spring loaded to allow for movement up and down, accommodating thick and thin lumber variations. Sectional feed rolls are available and allow for several boards to be fed, side by side, at one time, even though there may be slight thickness variations between the individual boards. Urethane feed rolls are available to feed materials without marking the surfaces, especially when re-manufacturing already surfaced lumber.
2. **Bottom Infeed Rolls:** (When Installed) These solid rolls are set slightly above the table surface to reduce friction. The round cylinders are usually smooth but can be sharp edged on some machine designs. These rolls usually have a small degree of adjustment and are not spring loaded.
3. **Outfeed Rolls:** Smooth round cylinders so they do not mark or damage the planed surface of the lumber. They are used to pull the wood through the machine after it has lost contact with infeed rolls.
4. **Infeed Table:** An extension table used to guide the lumber level into the machine. Some infeed tables are adjustable up and down from zero to one-half inch in order to set a fixed depth of cut over the bottom cutter head.



5. **Main Table:** (Platen) The surface that runs directly under the top cutterhead, feed rolls, chip breaker and pressure bar, where the finish thickness is set, and is usually the surface that all major feed system components are set parallel to.
6. **Cutter Head:** A round cylinder with replaceable or permanent knives that protrude beyond the body of the cylinder. These heads usually rotate opposite, or against, the feeding system at high r.p.m.'s.
7. **Chip Breaker/Top Head:** A spring loaded solid or sectional pressure bar located in front of the top cutter. It is designed to break the chips off without splintering and tearing the lumber and to hold the lumber firmly down onto the main table for a quality finish. Sectional chipbreakers are available, in conjunction with top sectional feed rolls, to allow for several boards to be fed, side by side, at one time, even though there may be slight thickness variations between the individual boards.  
A solid chip breaker system uses one solid bar across the with of the machine to hold the lumber down onto the main table. A sectional system uses individual shoes form over the top surface of the lumber and to hold it securely down onto the table.
8. **Pressure bar/Top Head:** A solid bar located behind the top cutter head. It is designed to hold lumber firmly down onto the main table until completely clear of the top head.
9. **Right Infeed Fence:** A fixed or adjustable straight edge that guides lumber straight through the machine and into the right sidehead. This fence is preset to allow for a fixed depth of cut from the right sidehead.
10. **Left Sidehead Infeed Guide:** An adjustable and spring loaded plate, located in front of the left sidehead, used to guide varying width lumber against the right sidehead and to limit the maximum width of material entering between the two sideheads.
11. **Left Infeed Guide Roll:** An adjustable spring loaded roll positioned in front of the machine to guide the lumber over against the right infeed fence and to limit the maximum width of lumber entering the machine.
12. **Sidehead Holddown:** Adjustable and spring loaded rolls to hold lumber firmly down onto the table, or table rails, when the sideheads are machining the edges of the lumber.
13. **Right Outfeed Fence:** An adjustable guide after right sidehead used to keep lumber straight and secure as it is being machined.
14. **Left Outfeed Fence:** An adjustable guide after the left sidehead used to keep lumber straight and secure, as it is being machined.



## 2 - FEEDING & HOLDDOWN SYSTEM SET-UP

### GENERAL INTRODUCTION:

The Feed system, like the cutter head system, is important to the success of the Planing operation. There are many variables that can affect the feeding process such as green, dry, thick, thin or tapered lumber. The adjustments given in this section are designed to work under many conditions and will give positive results, but in some cases certain special adjustments may be necessary. If you are having difficulty in getting your machine to feed properly be sure to thoroughly review this entire section, then check the trouble shooting section of this manual and then, if you are still not able to solve your feeding problem call your Pinheiro service technician.

Before proceeding make sure that your knives are in good condition and properly set (See Knife Setting Section).

It is very important that you always do your best to consistently adjust your machine as close as possible to the tolerances listed below. Because there are so many variables in the real work place, some allowance must be given to compensate for them. At any given time, once you have done your best to set your machine up to the exact recommended specifications, you can allow a plus or minus .003" tolerance.

### PREPARATION:

1. Assemble the following items:
  - a. One set of metric open/box end wrenches.
  - b. Two special narrow open end 19 MM wrenches .
  - c. One set metric allen wrenches
  - d. One PG-1 universal planer gage.
  - e. One large screw driver.
2. Raise the top section of the machine to the maximum open position.
3. Press both front & rear Emergency stop buttons to the OFF position and switch the main disconnect to the OFF position.
4. Remove the following items from the machine.
  - a. Left and right infeed fences, (when installed).
  - b. Outfeed holddowns, (when installed)
5. Spread the sideheads apart to their maximum open position,(when installed).



6. CAREFULLY raise the main cover/sound enclosure and CAREFULLY secure it in the maximum open position.
7. IT IS ABSOLUTELY CRITICAL that before you continue in this section that you make certain that there is adequate spring tension on all the adjusting rods for the top feed rolls, chipbreaker and pressure bar. If there is not enough spring tension on each of these adjusting rods, you may have to start the entire setup and adjusting procedure from the beginning as you proceed through this section. To do this, first thoroughly review the CUTTERHEAD, FEEDING AND HOLDDOWN COMPONENT ILLUSTRATION SHEET, and then;
  - a) Release the spring tension locking nut and the spring tension adjusting nut on each of the adjusting rods. Once there is no longer any tension on each spring, simply turn the adjusting nut hand tight.
  - b) On the adjusting rods for the top two infeed rolls, the chipbreaker bar and the solid pressure bar, turn each adjusting nut up twenty  $1/4$  turns (5 full turns). Now tighten each spring tension locking nut on these adjusting rods.
  - c) On the top outfeed roll, turn each adjusting nut up forty  $1/4$  turns (ten full turns). Now tighten the spring tension locking nuts on these adjusting rods.

The reason for this preliminary step is to make certain that there is adequate spring pressure to allow you to make the proper settings, as we go through this feed system setup and alignment section, without running out of spring tension.

**3 - PMC SERIES FEEDING & HOLDDOWN SYSTEM SETTINGS**

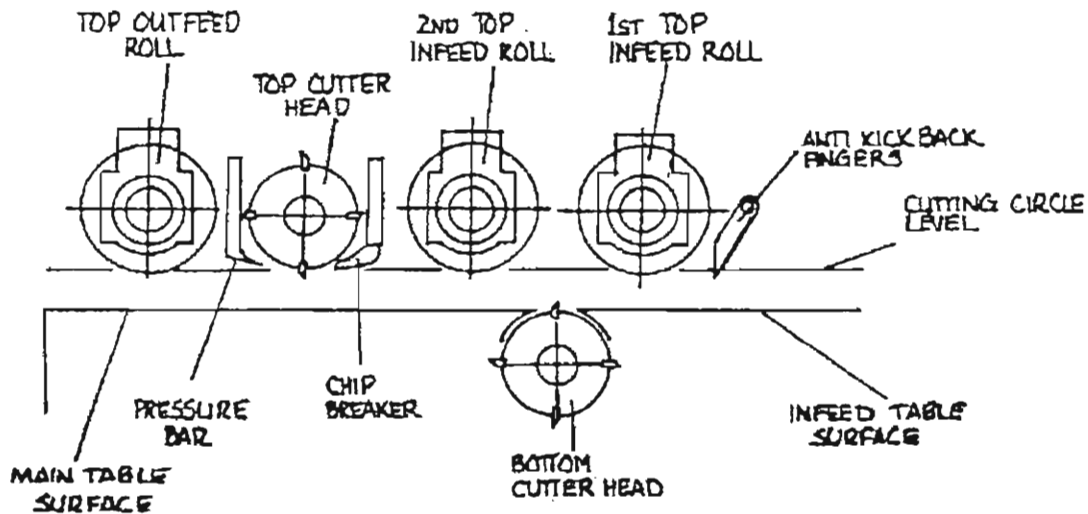
1) CAREFULLY follow the knife setting instructions in this manual and properly install a quality set of knives in the top head.

REMEMBER, ALL OTHER SETTINGS WILL BE ALIGNED WITH THE TOP HEAD CUTTING CIRCLE

2) CAREFULLY follow the feeding and holddown system setting instructions in this manual.

**3) SETTINGS:**

- 1st top infeed roll.....035" below the cutting circle
- 2nd top infeed roll.....035" below the cutting circle
- Chip breaker.....010" below the cutting circle
- Pressure bar.....010" below the cutting circle
- Top outfeed roll.....050" below the cutting circle
- Outfeed holddown assembly.....1/8" below the cutting circle







#### 4 - SETTING THE CHIPBREAKER AND PRESSURE BAR:

**INTRODUCTION:** Before starting this section be sure that you thoroughly understand the concept of a chipbreaker and a pressure bar, AS DESCRIBED IN THE FEEDING, HOLDDOWN AND GUIDE SYSTEM COMPONENT section of this manual. Before beginning the adjustments on the chipbreaker and pressure bar, be certain that both the chipbreaker and pressure bar are positioned properly. There are two types of adjustments in these systems, vertical and horizontal. Both adjustments must be properly made in order for the feed system to function properly and for you to attain the best possible finish.

**HORIZONTAL ADJUSTMENT PROCEDURE:** The closer these bars are to the cutting circle, the better finish you will attain on the top surface of the board. You must always keep a minimum of 1/8" between the maximum cutting circle of the top head and the inside face of both the chipbreaker and pressure bar.

- 1) To adjust the horizontal position of the chipbreaker/pressure bar assembly, loosen the locking nuts on both the right and left chip breaker/pressure bar setting rods.
- 2) Now, either screw in or out on these adjusting rods to properly set the chipbreaker and pressure bar for the proper clearance to the top cutterhead. Try to keep both components as parallel to the cutterhead body as possible.
- 3) Now, tighten the locking nuts on the horizontal adjusting rods and proceed to adjust the vertical position of these components.

**VERTICAL ADJUSTMENT PROCEDURE:** In order to keep a uniform down pressure on each board as it enters and exits the top cutterhead, the chipbreaker and pressure bar systems be positioned properly. If the setting is too high the board can chatter as it passes under the top cutterhead and give you a washboard finish. If the setting is too low the board may get jammed while passing through the machine. Generally, the bottom most surface of the chipbreaker and pressure bars are set at about .010" below the cutting circle.

- 1) Turn both front & rear emergency stop buttons to the ON position and switch the main disconnect to ON
- 2) Lower the top section of the machine to approximately 5" on the table scale.

**CAUTION: PMC/2MS Planer/rip saw:** Before trying to lower the table below 4" on the table scale, remove the saw arbor insert plate frame and then lower the table to the 5" position on the table scale.

- 3) Press both front & rear emergency stop buttons to the off position and switch the main disconnect to the off position.
- 4) Place the PG-1 Universal set up gage on the main table, on the left hand side, directly under the top head with the contact point in the up position. Loosen the thumb screw on the indicator holder and raise the indicator until the contact point touches the body of the top cutterhead and the needle moves about .020". Move the indicator assembly in and out under the cutterhead body until you locate top dead center (the highest reading on the dial). While holding the gage firmly in this position, CAREFULLY rotate the cutterhead clockwise (while facing the cutterhead pulley) to find the highest



reading on the dial. At this point, you have located top dead center of the cutting circle, and you must now set the dial to zero.

Now that you have zeroed in on your top head cutting circle, you will use this exact zero point to set all of the components of the feeding and holddown systems.

- 5) Move the gage forward and under the left end of the chipbreaker bar. Move the gage in and out until you get the highest reading on the gage, this is TDC. Since you are looking to position the bottom of the chipbreaker bar .010" below the cutting circle, you must read, from your established zero point on the dial, **+.010"**. Since the needle on the dial may rotate past zero more than one time while you are moving from the cutterhead to the chipbreaker bar, be very careful that you take your .010" reading from your established zero point on the dial.
- 6) Now, move the gage under the right end of the chipbreaker bar and get your TDC reading. If your left and right readings are within .020" you can lock the chipbreaker bar into place. If the left and right readings are more than .020" apart, you must now adjust the chipbreaker bar more parallel to the main table
- 7) To position the chipbreaker bar parallel to the main table, loosen the left and right side chipbreaker adjusting rod lock nuts and adjust the chipbreaker bar up and down, using the adjusting nuts, until you have positioned the left and right ends of the bar parallel to the main table. Now, tighten the locking nuts and check to make sure that the chipbreaker bar has not moved and you still have a **+.010"** reading on the dial.

Before continuing on, make sure that all adjusting and locking nuts are properly secure.

**CAUTION:** Always rotate the top cutterhead by hand once your Chipbreaker has been set to make sure that you have a 1/8" minimum clearance before starting the cutterhead motor.

## 5 - SETTING THE PRESSURE BAR:

To set the pressure bar assembly, simply follow each and every step as described to set the chipbreaker bar.

**CAUTION:** Always rotate the top cutterhead by hand once your Pressure bar has been set to make sure that you have 1/8" minimum clearance before starting the cutterhead motor.



## 6 - SETTING TOP INFEED ROLLS

**INTRODUCTION:** There are two top infeed rolls in the PMC series of machines. The first infeed roll is designed to feed the wood over the bottom jointing head and can be adjusted to apply a minimum amount of down pressure to help joint out any cupping without flattening your lumber. The second feed roll is designed to drive the wood from the first roll up to the top cutterhead. These two rolls can be made of urethane and have a smooth surface or can be made of steel and have very aggressive teeth. Both designs have been engineered to handle most all types of both hardwood and softwood. These rolls should be set at approximately .035" below the top head cutting circle.

### SECOND TOP INFEED ROLL:

- 1) Place the gage under the left end of the second top infeed roll. Make sure that you are keeping track of your established zero point on the dial (See Chipbreaker section). Slide the gage in and out until you get the highest reading on the dial. Move the gage over to the right outside section of this feed roll and slide it in and out until you get the highest reading on the dial. If the left and right reading on your dial is within .020" of each other, continue on to step #3. If the left and right readings are more than .020" apart, go to step #2 and adjust this feed roll to be parallel with the main table.
- 2) To adjust this feed roll parallel to the main table, loosen the left and right side top feed roll adjusting rod locking nuts and turn the adjusting nut to raise or lower each end of this roll until it is parallel to the main table.
- 3) To properly set this top infeed roll to the cutting circle, place gage under the left end of the feed roll at the highest point on the dial. Loosen the left and right locking nuts, and adjust the feed roll up and down using the adjusting nuts to raise or lower the feed roll until you have a reading of **+.035"**, from your established zero point, on your dial. Now, tighten the locking nut and check to make sure that the feed roll has not moved and you still have a **+.035" reading on the dial**.
- 4) Move the gage over to the right end of the feed roll section and repeat step #3.

Before continuing on, make sure that all adjusting and locking nuts are tightened properly.

### FIRST TOP INFEED ROLL

- 1) Make sure that the infeed table is in the highest position, even and parallel with the main table.
- 2) CAREFULLY follow each step as described to set the second top infeed roll.

## 6 - SETTING TOP OUTFEED ROLL

**INTRODUCTION:** The top outfeed roll is used to pull the work away from the top cutterhead. This roll must have a very smooth finish in order not to mark the top surface of the lumber that has been finish planed by the top cutterhead. Since the smooth finish offers much less traction, it is important to understand that this top outfeed roll requires much more spring pressure and is set lower than the infeed rolls, .050" below the top head cutting circle.

Also, it is critical that this roll is kept very clean and free from foreign matter, or else, whatever has collected on this roll will be imprinted into the top finished surface of your planed lumber.

**PMC2 NOTE:** When operating the PMC2 double surface, this feed roll, if adjusted properly, will push the wood out onto the back takeaway conveyer.

**PMC/2MS NOTE:** When operating the PMC/2MS COMBINATION PLANER/RIP SAW this feed roll, if adjusted properly, will push the wood out onto the rear insert plate and under the last powered outfeed rolls.

**PMC4 NOTE:** When operating the PMC4 PLANER/MATCHER/MOLDER, this feed roll, if adjusted properly, will push the wood out onto the rear support rails just before the right side head. To continue feeding this board beyond the side heads, you must either be butt feeding your material so the incoming board will push the outgoing board clear of the sideheads, or you must have an outfeed device pulling the wood past the sideheads and clear of the machine.

### **PROCEDURE:**

1) To set the top outfeed roll, simply follow each step described to set the top infeed rolls, except the this roll will be set at .050" below the cutting circle.

**PMC/2MS NOTE:** If you own a PMC/2MS COMBINATION PLANER/RIP SAW, you can set the last top outfeed roll according to the description to set the first top outfeed roll.

You can also go now to the MS section of the manual for details on setting up the saw sleeve, installing the insert table plate and other information pertaining to gang saw section of the machine.

**PMC4/5 NOTE:** If you own a PMC4 or PMC5 PLANER/MATCHER/MOLDER, you can now proceed to the SIDEHEAD AND FENCE SYSTEMS SECTION of this manual.



## 7 - ALIGNMENT SECTION - INFEED AND OUTFEED FENCES

### Introduction:

When planing on four sides (S4S) the alignment of the infeed and outfeed fences in relation to the side head cutters is crucial for a quality product. The key to the whole system is aligning the right side infeed fence to the front and back table scales and aligning the outfeed fences EXACTLY PARALLEL to the right infeed fence. Once this is achieved the daily task of setting up the machine will be quick and accurate.

### Procedure: ADJUSTMENTS

1. Assemble the following items.
  - a. One set of metric allen wrenches.
  - b. One 4' to 8' straight edge
  - c. Flashlight
2. Install the standard sideheads, included with the machine, and fasten securely to the spindle.
3. TURN OFF THE FRONT AND REAR EMERGENCY STOP BUTTONS. BE SURE THAT THE MAIN POWER SWITCH IS SHUT OFF ON THE ELECTRICAL ENTRANCE.
4. Raise the infeed table to zero.
5. Install the right infeed fence by positioning the rear connecting rod into to the right sidehead dust hood. CAREFULLY turn the adjusting knob clockwise several full turns, to draw the fence connecting rod securely into the housing.
6. Attach the front connecting rod to the right infeed fence using the bolt provided.
7. Set the left face of the right infeed fence slightly beyond the cutting circle of the right sidehead.
8. Set the right infeed fence straight through the machine by aligning the left face of the fence in the same position on the rear, then the front, table scales.
9. Once the right infeed fence is accurately set, slide a long straight edge firmly against the fence, past the cutter head and completely past the full length of the outfeed fence. IT IS CRITICAL THAT THE OUTFEED FENCE IS EXACTLY PARALLEL TO THE INFEED FENCE IN ORDER TO PRODUCE STRAIGHT AND QUALITY PRODUCTS.
10. Once the straight edge is properly in place, loosen the locking handle on the right outfeed fence assembly, and adjust the right outfeed fence by turning the adjusting knob until it makes contact with the straight edge.



11. If the outfeed fence is touching the straight edge evenly, front to back, the setting is correct and does not need adjustment. Tighten locking handle on outfeed fence assembly and double check the alignment CAREFULLY WITH FLASHLIGHT.
12. If the outfeed fence is touching only the front or back of the straight edge, loosen the allen cap screws that secure the outfeed fence assembly to the table. Then, CAREFULLY set the face of the outfeed fence evenly against the straight edge. Lightly tighten the cap screw and double check the alignment. When the alignment is properly set tighten the cap screws for long term holding. Tighten locking handle on outfeed fence assembly and double check the alignment CAREFULLY WITH FLASHLIGHT. CAREFULLY remove the straight edge and store it properly.
13. IT IS CRITICAL THAT BOTH OUTFEED FENCES ARE EXACTLY PARALLEL TO EACH OTHER. To align these two fences properly, you will need a piece of either S4S lumber or aluminum that has been machined with both edges square and parallel to a minimum of 5" wide. CAREFULLY crank the left sidehead section over so that the left outfeed fence is approximately 5" from the right outfeed fence.
14. Place this gage block firmly against the right outfeed fence. Loosen the locking device on the left outfeed fence assembly and CAREFULLY adjust the left outfeed fence to make contact with the gage block. If the left outfeed fence is touching the block evenly, front to back, no other adjustment is needed.
15. If the left outfeed fence is touching only the front or back of the gage block, loosen the allen cap screws that secure the left outfeed fence assembly to the table. Then, CAREFULLY set the face of the outfeed fence evenly against the gage block. Lightly tighten the cap screw and double check the alignment. When the alignment is properly set tighten the cap screws for long term holding. Tighten locking handle on outfeed fence assembly and double check the alignment CAREFULLY WITH FLASHLIGHT. CAREFULLY remove the gage block and store it properly.
16. The spring loaded left infeed fence, (if available) will be aligned only after the left outfeed fence is set to the cutting circle of the left sidehead.

## 8 - SET UP AND ADJUSTMENT SECTION - SIDE HEAD AND FENCES

### INTRODUCTION:

Once you have completed the alignment section, the task of setting heads and fences is relatively simple. We will cover square edge planing (S4S) first to better understand the concept, then we will go on to setting up molding cutters and establishing job charts. The only unusual thing about this procedure is that you will be working from the back of the machine to the front, as you set up jobs.

### SET UP PROCEDURE:

1. Assemble the following items:
  - a. 17 MM wrench.



- b. One set of metric allen wrenches .
- c. 18" to 24" aluminum straight edge.
2. TURN OFF THE FRONT AND REAR EMERGENCY STOP BUTTONS. BE SURE THAT THE MAIN POWER SWITCH IS SHUT OFF ON THE ELECTRICAL ENTRANCE.
3. Loosen the locking handle on the right outfeed fence.
4. Set straight edge against right out feed fence and slide over the right cutter head.
5. Rotate head slowly until a knife contacts straight edge. Adjust fence until knife scrapes the straight edge very lightly, then lock fence.
6. Check clearance between fence and cutter head. It should be approximately 1/4". If not loosen 2 17 MM bolts on back of fence and slide into proper position. Then tension bolts.
7. Slide straight edge on right fence past cutter head and up to rear table scale and read number. Using hand adjuster on right side head dust cover set the cutting depth of right head against the reading on the straight edge. Moving the fence to the corresponding number on the table scale.  
Example: Desired cut 1/8" -- straight edge = 1" on scale.  
Right side infeed fence = 7/8" on table scale.
8. Loosen lock on front side of right side infeed fence and set to same number on front table scale as in back. The right side is now set.
9. Loosen left outfeed fence lock.
10. Set straight edge against left outfeed fence and slide over left head. Rotate head until knife contacts straight edge. Adjust fence until knife just scrapes straight edge very lightly. Then lock fence.  
Note: This adjustment will be checked at the start of production run.
11. Check clearance between cutting circle and fence. It should be 1/4". If not loosen 28mm socket cap screws on front of fence and slide into position. Then tension bolts.
12. Slide straight edge past cutter and over the left side anvil plate and adjust even with outfeed fence. To adjust loosen 4 8 MM socket screws and slide up to straight edge. Then tension bolts.
13. Set the desired width between the side heads using the wrench that fits the exposed end of the lateral adjusting screws. Wrench is supplied with the machine.  
The right side head is already set and does not need adjustment. The left side head must be moved in and out to set the dimensions. To do this install the proper wrench on bottom shaft on left side of machine. Rotate clock wise to increase the width. Counter clockwise to decrease the width. Use the scale rule attached to the outfeed fences to set your width. Then check the opening between the outfeed fences with a precision rule for final adjustment.



Note: The distance between the left and right outfeed fences will determine your finished width.

14. Unlock the left infeed alignment roll and set the opening between this roll and the right infeed fence to be slightly narrower than the material to be run, and then lock in position. This will allow for the spring tension to push material over against the right fence.

15. Turn power on and position top section to the desired finish thickness. Turn power off.

16. Install right hand outfeed holddown (wheels facing head) and center it between the black table rails, then tension.

Note: If stock is over 7 inches finished width 2 holddowns can be used. When using both holddowns position the wheels directly over the rails. Always rotate heads to insure they do not contact the holddowns. If they do, re-position. Special holddown and rail is required for stock under 3 1/2" finished width.

17. Set up to run test pieces.

a. Set cut on bottom head to desired level and lock.

b. Double check that all parts are properly set, locked in position and have proper clearances.

c. Turn power on and start heads one at a time. Listen carefully to each head for smooth operation.

d. Start feed and adjust to slow speed.

e. Cut about six 3 foot pieces of the stock you will be running. Also cut six pusher sticks. Use square of the same thickness as stock.

Example: 1" squares for 1" stock, 2" squares for 2" stock, etc.

f. Start feed and slide one piece of stock between infeed fences until it feeds automatically. Then center your pusher stick on the back end of the stock and slide until it feeds automatically. Then walk to the back of machine. Be ready to hit the emergency stop button if the machine jams or something goes wrong.

g. Check after the piece clears through the machine for proper dimension.

(1) Check thickness. If sample was not finished to the desired thickness, re-adjust the top section to the proper setting.

(2) Check width. To reset move left head assembly. One revolution equals approximately 3/16 of an inch. Do not move head unless you have proper clearance between cutter and holddown. If not turn power off and wait for heads to stop rotating. Reset head and holddown and check clearance.

(3) Restart machine and repeat process until all dimensions are accurate.

18. Once the dimension are accurate, check that the left outfeed fence is contacting the wood with light pressure. To check loosen the lock and turn counter clockwise until you feel light resistance, then





re-lock. If to right turn clockwise until loose then reset and lock. Stock should feed smoothly without vibration or jamming.

### Special adjustments and notes

1. Width expansion. The width dimension will try to expand as you run. For best results set the job at 1/64 under finished dimension and engage center lock on side head screw shafts. As you run the first couple of pieces it should expand to fill out the desired dimension and take up the back lash of the screws and center lock and should stay good for regular production runs. This dimension should be checked periodically during the production run especially where tight tolerances are required.

**NOTE:** Save a piece of every job at each width you produce the is a 0.4 mm (1/64") under the target size. Cut this piece approximately 300 mm (12") long and mark job number and spec's clearly on piece. When you are at step #12, place the piece between the outfeed guide fences and set the width until the piece is lightly compressed between the fence's. "Do not over tension." Then engage the center lock on the lateral adjusting screws of the side heads. Leave the piece in the machine and let the first sample push it out. "Put the piece away so you can use it another day."

2. Start the feed motor and feed the board far enough forward to CAREFULLY take a second measurement. If more adjustments are required, CAREFULLY repeat your earlier steps.
3. Once you have achieved your desired final product, CAREFULLY proceed with your entire production run.

### 9 - SET UP PROCEDURE: (MOLDINGS & PROFILED/SAWN PRODUCTS)

If you are required to produce a product where profiles on the top and bottom surface must be aligned properly or you are producing multiple profiled products from one board, like eased edge 2x2's from wider dimensional lumber, THOROUGHLY follow steps 1 through 21.

To make your set up easier and quicker, try and have the top head, right and left heads set and aligned properly before bringing the 5th spindle into play. If you can accomplish this task properly, then the only other adjustment that will be different from the earlier steps will be to align the 5th spindle profile with the top head profile. Most often, this can be accomplished by simply using the 5th spindle horizontal adjusting handle.

- NOTE:**
- 1) If the top profile is aligned properly with the right side head cutter, but the bottom profile is miss aligned, move the 5th spindle assembly left or right to properly set the bottom cutter head.
  - 2) If the bottom profile is aligned properly with the right side head cutter, but the top profile is mis-aligned, move the complete right sidehead assembly left or right to properly align to the top head profile knife. If the left side head and left outfeed fence are already properly set to the right head, simple press in the black locking knob between the left and right side head adjusting screws. This way, as you move the 5th spindle left or right to align it properly with



the top head, both side heads will move together, keeping the same distance between them as before they were moved.

- 3) If you are changing the finish dimension on the bottom face of your product with the 5th spindle, you will have to adjust the 5th spindle outfeed plate height accordingly so the finished product will have proper support as it exits the cutter head. Failure to set this plate properly can cause the product to stop feeding or top and or bottom sniping, depending if the plate is too high or too low.

### 10 - SET UP PROCEDURE: (SAW BLADES)

When single or gang ripping is to be accomplished with this 5th spindle assembly, a removable saw sleeve is used to mount the blades onto. Extra sleeves with the blades already mounted can be prepared to minimize down time during scheduled tooling change over or between different product runs.

**NOTE:** 1. The saw sleeve assembly can be mounted onto the 5th spindle, using this spindle as a work station. Once this sleeve is secured onto the spindle, the spanner wrench can be used to release or tighten the sleeve nut when removing or installing spacers and saw blades onto the saw sleeve.

2. If the spanner nut on the saw sleeve does not slip off over the hex spindle nut, simply turn the corners off from the hex nut, in a machine lathe, just enough to allow the spanner nut to clear the corners of the hex nut.

1) Assemble the following items;

- a) Arbor wrench for 5th spindle
- b) One saw sleeve properly loaded with spacers and blades
- c) Two saw sleeve tapered bushings
- d) One anti kickback finger assembly
- e) One holddown device

2) PRESS IN THE FRONT AND REAR EMERGENCY STOP BUTTONS AND TURN THE MAIN SWITCH OFF AT THE MACHINE ENTRANCE PANEL.

3) PUT ON SAFETY GLASSES AND SAFETY WORK GLOVES

4) Loosen the two locking screws and remove the end cover from the spindle assembly dust hood.

5) Rotate the spindle until you can press in the spindle lock and secure it into this locking position.

6) Use the arbor wrench to remove the arbor nut. Turn the nut clockwise to loosen.

7) CAREFULLY remove any heads, saw sleeves or spacers that are already installed on the spindle.



- 8) Use a clean wiping cloth to thoroughly clean the spindle from any build up of pitch, sawdust or other foreign matter.
- 9) Remove one SAFETY GLOVE AND SLOWLY AND VERY CAREFULLY FEEL THE ENTIRE SPINDLE TO MAKE CERTAIN THAT IT IS CLEAN AND FREE OF BURRS. PUT THE SAFETY GLOVE BACK ON.
- 10) Using the horizontal adjusting handle, screw the spindle all the way to one end of the travel capacity and screw it back about 1". This will position the spindle about center of it's horizontal adjustment and will give you adequate left and right adjustment capacity as you finish set your tooling.
- 11) Release the vertical adjusting locking device and use the vertical adjusting handle to lower the spindle down to its lowest position. This will allow adequate space to mount the prepared saw sleeve without contacting the 5th spindle infeed and outfeed plates.
- 12) Slide one of the saw sleeve tapered bushings onto the spindle and up against the shoulder located at the back end of the spindle, with the tapered side towards you.
- 13) CAREFULLY mount your prepared saw sleeve and set it against the tapered bushing.

**NOTE;** 1. IF YOU EXPERIENCE ANY RESISTANCE WHEN SLIDING THE SPACERS OR CUTTER HEAD ONTO THE SPINDLE, "STOP"! CAREFULLY REMOVE THE PART AND CLOSELY INSPECT THE SPINDLE FOR BURRS OR OTHER FOREIGN MATTER.

2. IF YOU FORCE THIS PART ONTO THE SPINDLE, YOU MAY HAVE A VERY DIFFICULT TIME TRYING TO REMOVE IT, WHICH MAY LEAD TO A LOT OF DOWNTIME, MUCH AGGRAVATION AND A VERY EXPENSIVE REPAIR PROJECT.

- 14) Slide the second tapered bushing onto the spindle with the tapered side towards the sleeve.
- 15) Install the arbor nut and tighten counter clockwise. If necessary fill the remaining exposed spindle up with spacers, covering at least two threads before you securely tighten the arbor nut back onto the spindle. This will insure that the arbor nut will have more threads remaining once it has securely seated the spacers and cutter head against the shoulder of the spindle.

**NOTE:**

1. IF YOU HAVE ANY DOUBT THAT THE SAW SLEEVE IS NOT SECURED PROPERLY ONTO THE SPINDLE, REMOVE THE NUT AND INSTALL ONE MORE THIN SPACER. APPLY THE ARBOR NUT AND RE-TIGHTEN.
2. ALWAYS MAKE CERTAIN THAT YOU HAVE THREADS EXPOSED BEHIND THE ARBOR NUT ONCE THE SAW SLEEVE HAS BEEN INSTALLED. FAILURE TO FOLLOW THIS SIMPLE SAFETY RULE CAN CAUSE SERIOUS DAMAGE TO THE MACHINE AND POSSIBLE BODILY INJURY.

- 16) Release the spindle lock and make certain that the spindle spins freely.



- 17) Check to make certain that the infeed and outfeed plates are exactly the same height and parallel to the main planer table.
- 18) If not, use the allen wrench to loosen the 5th spindle infeed and outfeed plate supports, and using the straight edge for alignment, adjust these plates to the same exact height and parallel to the main table of the planer, which should be the same height as the side head table rails.
- 19) Once both plates are properly set, be certain to securely lock them into position.
- 20) Install the 5th spindle holddown assembly and make certain that you have adequate downward spring pressure before you lock it into place. Place the holddown shoe about center between both fences.
- 21) Install the anti-kickback finger assembly between the right and left outfeed fences.

**SAFETY NOTE** 1. IF YOUR MATERIAL TO BE RIPPED IS NO WIDER THEN 8", THEN FILL THE AREA BETWEEN THE LEFT AND RIGHT OUTFEED FENCES WITH ANTI-KICKBACK FINGERS.

2. IF YOUR MATERIAL TO BE RIPPED IS WIDER THEN 8", THEN INSTALL 9" OF ANTI-KICKBACK FINGERS ON THE SUPPORT ROD AND USE THE LOCKING COLLAR TO HOLD THEM SECURELY INTO PLACE AGAINST THE RIGHT OUTFEED FENCE.

- 22) Replace the dust hood cover and make certain that locking handles are secured properly.
- 23) Install the spindle guard to the outside face of the left outfeed fence.  
CAREFULLY FOLLOWING THE START UP INSTRUCTIONS EXPLAINED IN THE "SET UP" SECTION OF THIS MANUAL, START THE MACHINE AND CAREFULLY RAISE THE 5TH SPINDLE UNTIL THE SAW BLADES HAVE CUT THROUGH THE INFEED AND OUTFEED PLATES AND ARE SET TO THE PROPER SAWING HEIGHT.
- 24) Once the spindle has been raised to the proper working height, securely tighten the vertical adjusting locking device.
- 25) Remove all tools, extra machine parts and foreign objects from the machine. Visually check to make certain that everything is installed properly and the machine is clean.
- 26) You are now ready to proceed with your production run.

**NOTE:** 1. IF THE WIDTH DIMENSION BETWEEN THE RIGHT OUTFEED FENCE AND THE FIRST SAW BLADE IS NOT CORRECT, SIMPLE ADJUST THE SPINDLE HORIZONTALLY TO THE PROPER SETTING.



## 11 - SAW ARBOR INSERT PLATE PREPARATION

### INTRODUCTION

For the purpose of pre-cutting the insert plate to fit exactly over the blades mounted on the saw arbor and for this pre-cut plate to align properly with the threaded mounting holes, it requires two people to accomplish this task properly. In order to achieve the best possible finished product in the shortest amount of time, and without damage to the machine or injury to the operators, it is critical that the following instructions are followed thoroughly and VERY CAREFULLY!

The insert plate serves as the support table for the material being sawn to smoothly slide over while being ripped. The material most often used is phenolic due to its low friction characteristics, stiffness and durability. Without a rugged insert plate in place, the wood being ripped, especially thinner boards, would easily be forced downward by the cutting action of the saw blades and could cause the wood to contact the arbor spacers or the frame behind the blades. Either way, feeding problems and or machine damage can occur without the proper table insert in place.

DO NOT ATTEMPT THIS PROCEDURE FOR THE FIRST TIME WITHOUT COMPLETELY READING THIS ENTIRE SECTION AND FAMILIARIZING YOURSELF WITH THE PROPER PROCEDURE, THE TOOLS AND THE COMPONENTS INVOLVED.

### PROCEDURE:

- 1) Raise the top section of the machine up to the maximum open position.
- 2) Shut the power off at the main electrical entrance on the machine and press in both the front and rear EMERGENCY STOP BUTTONS (E BUTTONS).
- 3) Lift the left side machine cover and make certain that it is securely positioned in the open position.
- 4) Remove the left side cover that supports the outboard bearing for the saw arbor and CAREFULLY place it in a SAFE and clean area.
- 5) Pull out and lock in the open position the saw sleeve work station shaft at the back of the machine.
- 6) If there are a set of saws and an insert plate already in place, then, while WEARING LONG CUFF SAFETY GLOVES and using the proper tools;
  - a) CAREFULLY remove the insert plate and place it in a safe and clean area.
  - b) CAREFULLY remove the saw sleeve from the arbor and mount it on the saw sleeve work station, securely locking it onto this shaft.
  - c) CAREFULLY remove the nut, spacers and blades from the sleeve and place them in a safe and clean area.



- d) CAREFULLY mount the new arrangement of blades and spacers onto the sleeve and securely lock this assembly into place.
- 7) Take a new insert plate, that has already been properly milled to fit the machine, and mount it onto the set up frame that is provided with the machine to prepare the insert plates. To accomplish this task properly;
- a) Review the INSERT PLATE SET UP ILLUSTRATION in this section.
  - b) Place the set up frame down on a clean and secure work surface with the extension pads down on the work surface.
  - c) Place the new insert plate face down onto the set up frame and bolt it SECURELY to this frame. All of the counter sunk holes that are used to fasten the plate to the frame will only align properly in one way, insuring a proper fit when the prepared plate is permanently installed over the blades. The same bolts that are used to fasten the plate into the machine tables are used to fasten the plate onto the set up frame.
- 8) With one person on each side of the machine, and using the four bolts that are supplied with the set up frame, CAREFULLY mount the set up frame to the four set up frame hangers that are permanently attached to the machine, making certain that the beveled edge of the insert plate is facing towards the front of the machine, as it must be during normal operation.
- 9) With SAFETY WORK GLOVES ON, CAREFULLY remove the prepared saw sleeve assembly from the work station and mount it onto the machine arbor. Use the proper nuts, locking washer and tools to install this assembly securely onto the arbor.
- 10) Install the outboard bearing support plate securely into place, making certain that this assembly aligns properly with the slot machined into the end of the arbor. with safety work gloves on, carefully rotate the arbor by hand to make certain that the outboard bearing is mounted properly. If there is any resistance, remove the outboard bearing support plate, check the bearing and re-mount this assembly. if there is still resistance, immediately call for a qualified technician to repair the problem.
- 11) Unlock and push the work station shaft back into the closed position and securely lock it into place.
- 12) CAREFULLY remove all tools and materials and clean any debris from inside the machine.
- 13) Close the main machine cover.
- 14) With eye and hearing protection on, switch ON the power at the main electrical entrance and twist open both the front and rear BUTTONS. Start the saw arbor motor.



- 15) With one operator watching through the left side saw arbor inspection window and always prepared to press in the rear E BUTTON, in case of a problem, the other operator can begin to lower the top section of the machine.
- 16) Turn the blower on and make certain that the shut off gate dedicated to the saw arbor outlet is open.
- 17) Once the top of the saw blades come in contact with the new insert plate, the lowering should stop for a moment. From this point on, the lowering of the top section should be done in about 1/4" increments. Once the insert plate has been lowered about another 1/4", based on the thickness scale located at the front of the machine, the power raising button is released and the saw arbor is allowed to rotate back up to full RPM and to clear itself from any material cut from the insert plate.
- 18) CAREFULLY continue this process, always listening for any odd sounds that may indicate a problem, until the insert plate is seated down onto the main table, where it will be secured during production.
- 19) The operator on the left side of the machine should keep the front operator informed of the progress and indicate when the insert is getting close to being seated on the table.
- 20) AT THIS POINT, IT IS CRITICAL THAT THIS PROCESS CONTINUE VERY SLOWLY AND CAREFULLY SINCE THE POWER RAISING SYSTEM SHOULD NOT BE FORCED TO OVERLOAD IN THE EVENT THAT THE TOP AND BOTTOM SECTIONS OF THE MACHINE ARE PRESSED AGAINST EACH OTHER.  
A limited amount of compression has been provided by attaching the hangers to a spring loaded mounting system to keep them from bottoming out immediately when the insert plate contacts the main table.
- 21) Once the insert plate has seated on the main table, the operator on the left side should indicate to the front operator that the job is done and to raise the top section of the machine to the maximum open position.
- 22) Once the top section has been raised, the blower can be turned off, both E BUTTONS should be pressed in to the OFF position and the main electrical panel switched OFF.
- 23) The main machine cover can be lifted and the saw arbor outboard bearing support plate removed.
- 24) WITH SAFETY WORK GLOVES ON, remove the prepared insert plate from the machine and separate it from the set up frame. Store the set up frame and four installation bolts together in a safe and dry area.
- 25) WITH SAFETY GLOVES ON, CAREFULLY install the prepared insert plate into place, with the beveled edge facing towards the front of the machine, and fasten it securely to the tables. The fastening holes in the insert plate are slotted in order to properly fit the plate over the saw blades. IT IS CRITICAL THAT, ONCE THE BOLTS ARE HAND TIGHT, THAT THE ARBOR IS ROTATED OCCASIONALLY WHILE THE BOLTS ARE BEING TIGHTENED TO MAKE CERTAIN THAT THE BLADES DO NOT BIND UP AGAINST THE INSERT PLATE. If the blades bind up against the insert plate, once the plate is secured in place, the plate



was probably not lowered to the point where the saws could cut their slots long enough for full clearance. Remove the plate and use a hand saw in the front and back of each slot to open each slot far enough to allow the blades adequate clearance to rotate freely.

- 26) Once the new insert plate has been properly installed and the machine cleaned of tools and other materials, the main cover can be lowered.



## 12 – WORK WITH MINIMUM WIDTH

Working with a minimum width of 30 mm at the vertical spindles.

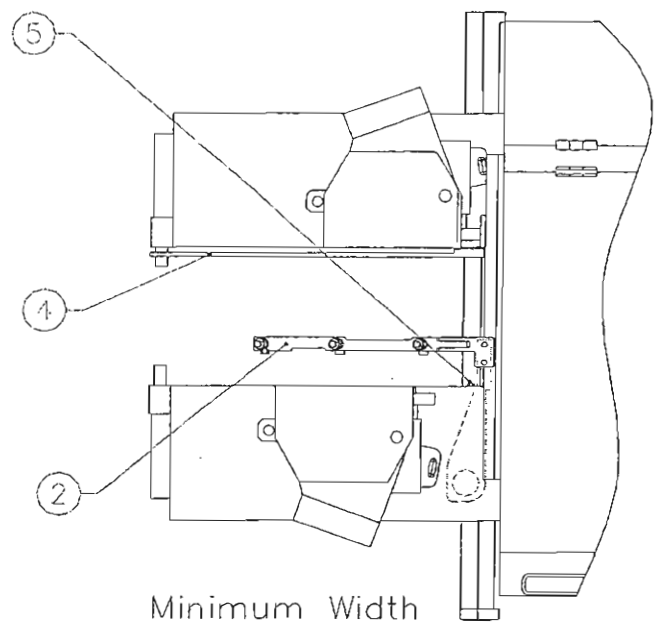
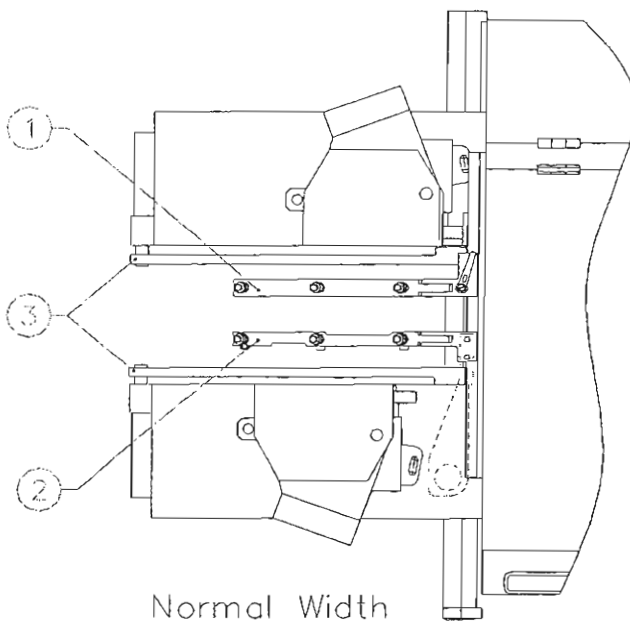
In order to be able to work with a minimum width of 30 mm it is necessary to do the following.

**First:** To remove the large roll top holddown (pos. 1). The narrow roller top holddown (pos. 2) stays on the machine.

**Second:** To remove the two outfeed table rails (pos.3).

**Third:** To remove the screw bolt of the left outfeed table rail (pos 5).

**Forth:** Assemble on the right spindle the narrow outfeed table rail (pos. 2).



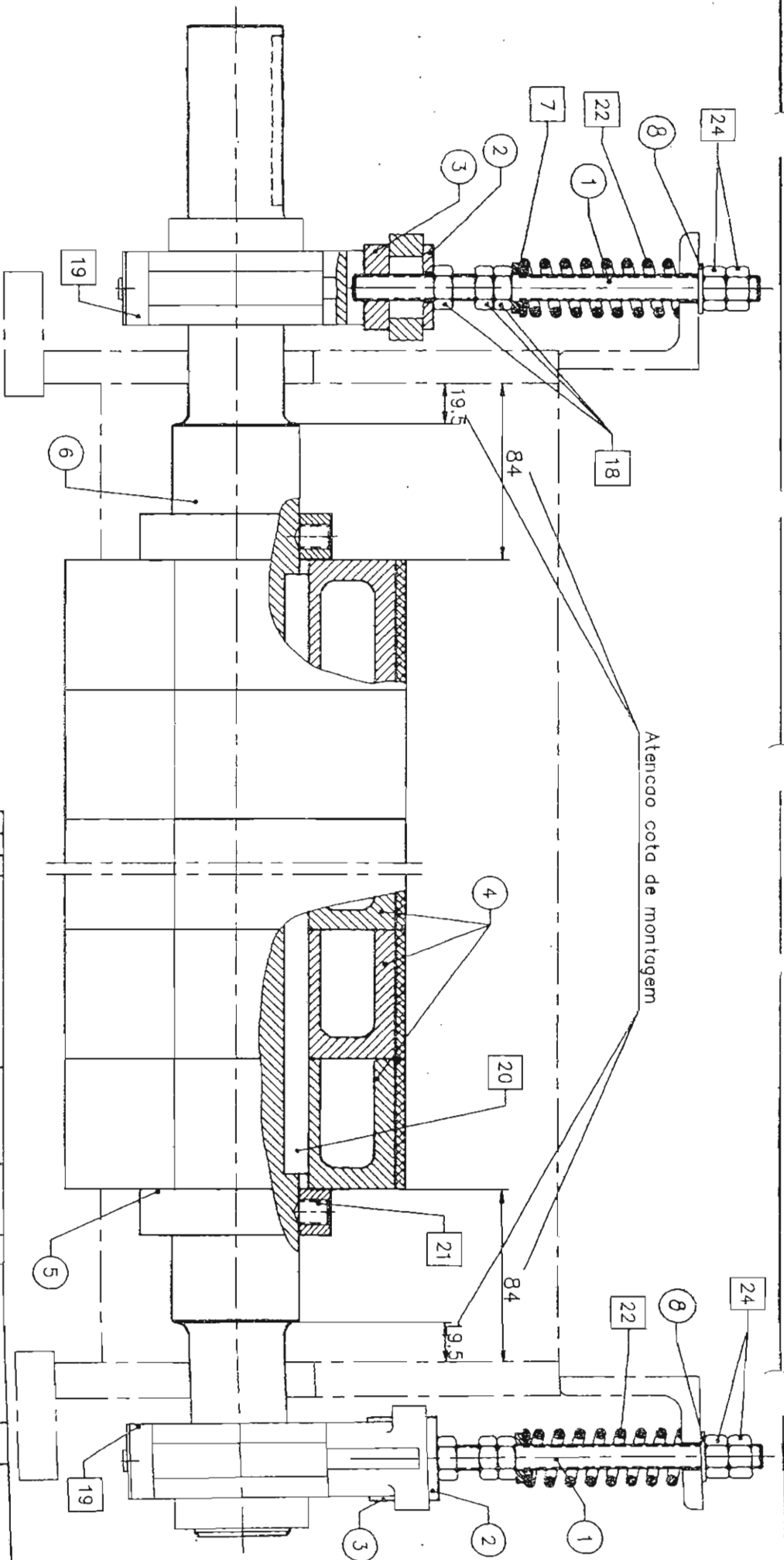


### 13 - START UP PROCEDURE

- 1) Switch ON the power at the main electrical entrance and twist open both the front and back E BUTTONS.
- 2) Start the blower, making certain that the saw arbor outlet gate is open.
- 3) WITH EYE AND HEARING PROTECTION ON, LOWER THE TOP SECTION OF THE MACHINE TO 1" ON THE THICKNESS SCALE. THIS STEP IS TAKEN TO MINIMIZE THE OPENING IN THE MACHINE AND TO LOWER THE FRONT ANTI KICKBACK FINGERS DOWN CLOSE TO THE INFEED TABLE IN THE EVENT THAT ANY PIECE OF THE NEW INSERT PLATE SHOULD BREAK AWAY DURING START UP.
- 4) START THE ARBOR MOTOR AND **BE PREPARED TO QUICKLY PRESS IN THE EMERGENCY STOP BUTTON IF THE ARBOR MOTOR DOES NOT QUICKLY ROTATE UP TO FULL SPEED OR IF ANY QUESTIONABLE NOISES ARE HEARD DURING THE START UP PROCEDURE.**  
IF THE BLADES ARE RUBBING AGAINST THE NEW INSERT PLATE, THERE WILL BE A HIGH PITCH SOUND HEARD UNTIL THE BLADES HAVE CLEARED OUT EACH SLOT.
- 5) If the arbor rotated up to speed properly and the saws are turning freely, then the machine is ready to be set to the proper thickness for your next product run.

**REMARK:** To significantly reduce set up time when the same set up will be used in the future, carefully record the exact sequence of saw blades and spacer sizes used in a given set up and exactly duplicate this same sequence the next time this product is run. This approach will help to set up a job quickly and will give a much longer useful life to a prepared insert plate.

BE CAREFUL NOT TO USE THE SAME INSERT PLATE FOR TOO MANY DIFFERENT SAW SET UPS. ONCE TOO MANY SLOTS ARE CUT THROUGH THE INSERT PLATE, THE SLIVERS BETWEEN EACH SLOT MAY GET WEAK AND BREAK OFF, POSSIBLY CAUSING A JAM UP, DAMAGE TO THE MACHINE AND OR AN INJURY TO THE OPERATOR.



2	Anilha Lisa	4-4188	56-33	7	5201004188	5201004188	1	5201004188	1
5	Parafuso	4-4188	56-33	8	5201004188	5201004188	1	5201004188	1
6	Porca Sext.	DIN-4339		18	M12	1050300043	1	1050300043	1
2	Chumbeiro	INA		19	PIUE-45	1050900048	1	1050900048	1
1	Chaveta	4-39171		20	M12x20	5202039171	1	5202039171	1
2	Perno c/ sext. int.	DIN-913		21	M12x20	1050200102	1	1050200102	1
2	Mold helic. compr. cil.	4C-BECH4		22	Ø4xØ28xØ5x100	1051200273	1	1051200273	1
4	Porca sext.	DIN-934		23	M12	1050300008	1	1050300008	1
27				27			1		1
28				28			1		1
26				26			1		1
25				25			1		1
24				24			1		1
23				23			1		1
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15				15			1		1
14				14			1		1
13				13			1		1
12				12			1		1
11				11			1		1
10				10			1		1
9				9			1		1
8				8			1		1
7				7			1		1
6				6			1		1
5				5			1		1
4				4			1		1
3				3			1		1
2				2			1		1
1				1			1		1
0				0			1		1

PMc-450

Projeto: 920312U, Pnto

Verificou: Meda

Indicadas: NP.285

Substitui: 3P-5190

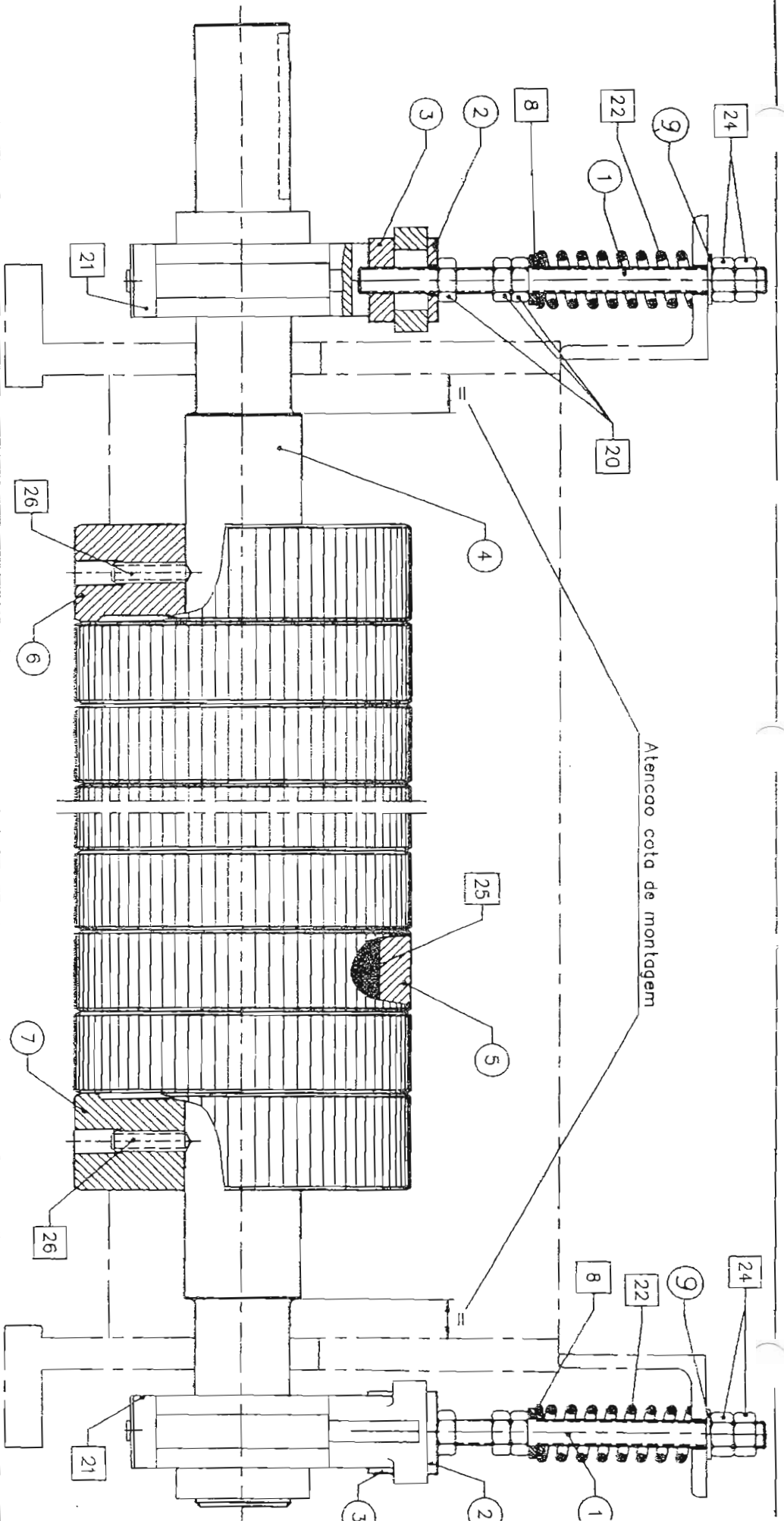
Substituido por: PMC

Sub-conjunto (Rolo de arrasto fracionado borracha)

5105034707

3-34707





2	Perno rosçado sexl. int.	DIN-914	27	M10x30	1050200318	9	Roda estriado	3-37033	Fund. nod	5	5205037033
54	Amortecedor	4C-950020	26	M12	1092000101	1	Velo estriado	3-35338	CR-45	4	5202035338
4	Porco sexl.	DIN-934	25		1050300008	2	Porco	4-34696	SI-33	3	5201034696
2	Mola helic. confor. cil.	4C-280141	24		1051200275	2	Anilha	4-34697	SI-33	2	5201034697
2	Chumacera	INA	23		1050900048	2	Perno rosçado	4-4115	CI	2	5201004115
8	Porco Sexl.	DIN-435	22		1050300043	2	Designaçõ			1	M12x300 (HMF-600)
			21				Designaçõ			1	M12x300 (HMF-600)
			20				Designaçõ			1	M12x300 (HMF-600)
			19				Designaçõ			1	M12x300 (HMF-600)
			18				Designaçõ			1	M12x300 (HMF-600)
			17				Designaçõ			1	M12x300 (HMF-600)
			16				Designaçõ			1	M12x300 (HMF-600)
			15				Designaçõ			1	M12x300 (HMF-600)
			14				Designaçõ			1	M12x300 (HMF-600)
			13				Designaçõ			1	M12x300 (HMF-600)
			12				Designaçõ			1	M12x300 (HMF-600)
			11				Designaçõ			1	M12x300 (HMF-600)
			10				Designaçõ			1	M12x300 (HMF-600)
2	Anilha Lisa	4-4188	9		5201004188						
2	Anilha c/ Biotente	4-36483	8		5201036483						
1	Roda estriado	3-650243	7		5205650243						
1	Roda estriado	3-650240	6		5205650240						

Aplicação: Q1 Máquina Pos. 17  
 FMC-AE-0 173

Projeto: 92.10.20J Pntg  
 Desenho: Verificou  
 Data: 9/2/2000  
 Nome: Pntg  
 Escala: 1:2  
 Substituído por:

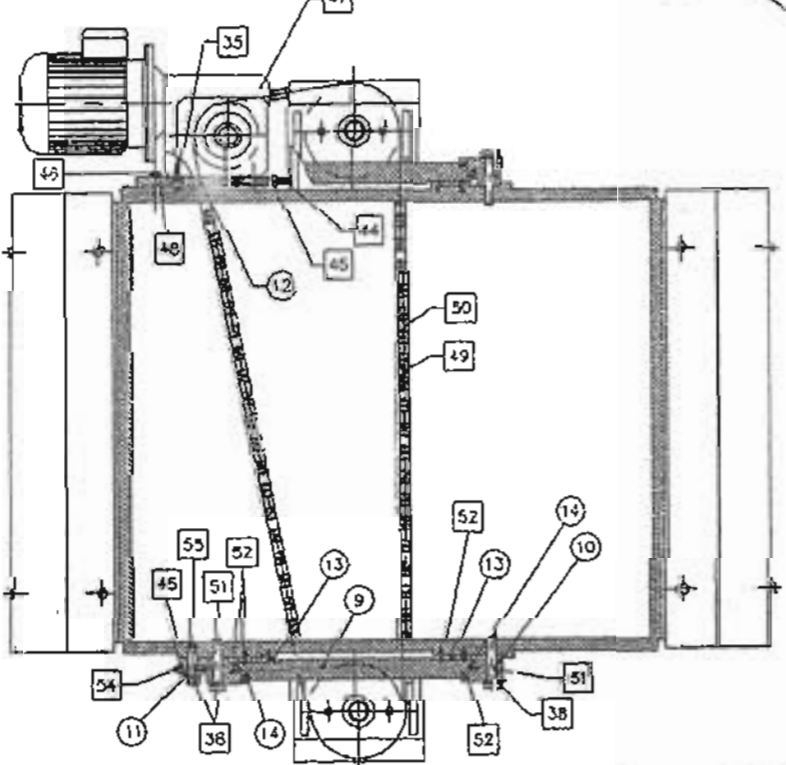
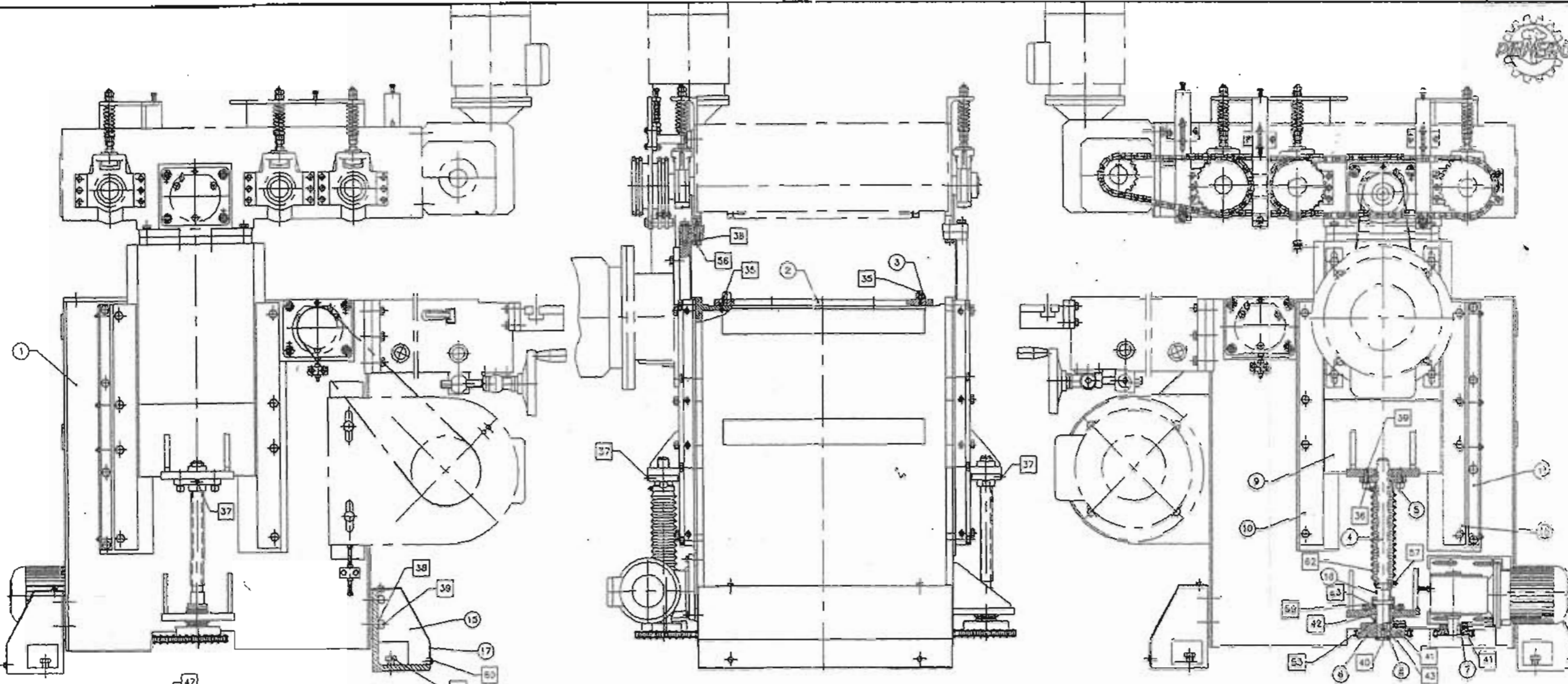
Tolerancias: r10 indicadas  
 Meio: NP.285  
 Material:

Substituído por:

5105035337  
 3-35337

Sub-conjunto  
 (Rolo de arrasto fracionado)



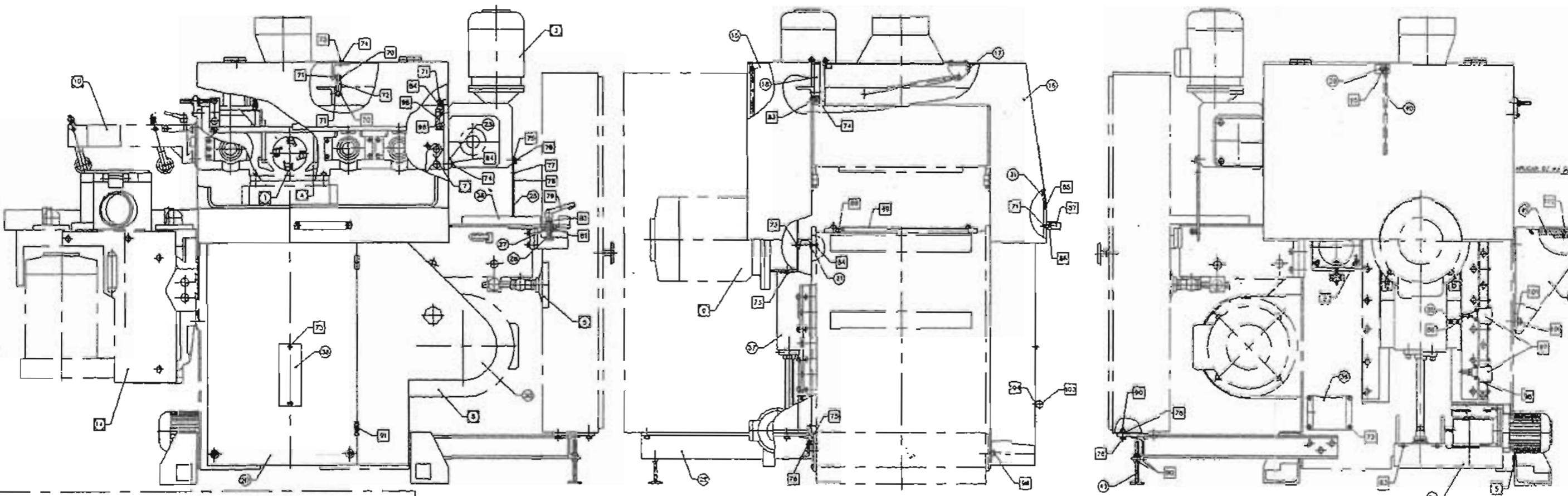


Qt.	Qt. ou na l. In.	Designação	Norma Designo. M.	Material	Pos.	Parte M. Ferramenta
77						
70						
69						
68						
67						
66						
65						
64						
63						
62	H-347	105200060				
81						
8	Paraf. cob. sext.	DIN-558	60 M8x10	1050100264		
2	Paraf. cob. sext.	DIN-558	59 M8x10	1050100267		
4	Paraf. cob. sext.	DIN-558	58 M16x30	1050100353		
2	Abracadeira		57 32/52 Banda B	1052100064		
8	Paraf. cob. sext.	DIN-558	56 M12x40 (10.9)	1050101143		
8	Paraf. cob. sext.	DIN-501	55 M12x50	1050100480		
8	Paraf. cob. sext. int.	DIN-913	54 M8x40	1050100085		
4	Rolamento axial		53 51106 (ø30x47x11)	1051000394		
52	Cavilha elastica	DIN-1481	52 9,5x10	1050800390		
16	Paraf. cob. sext.	DIN-501	51 M12x80	1050100482		
1	Corrente simples c/ 135elos	DIN-8187	50 1x5/8"x3/8" (2143mm)	1000800002		
1	Elo ligac. corrente simples	DIN-8187	49 1x3/8"x3/8"	1050800053		
4	Anilha de chapa	DIN-125	48 ø8.4	1050300103		
1	Molaredutor	LEROU BOUFR	47 M8201 c/ motor 0.37kw	1050800045		
4	Paraf. cob. sext.	DIN-558	46 M8x30	1050100269		
9	Paraf. sext.	DIN-914	45 18	1050300005		
1	Paraf. cob. sext.	DIN-558	44 18x75	1050100278		
2	Chave de paraf. o		43 8x7x30	1052100025		
2	Cosquinho auto-lubrl.		42 ø 30x34x25	1050400106		
3	Paraf. sext. int.	DIN-913	41 18x15	1050200062		
2	Paraf. cob. emb. sext. int.	DIN-7991	40 M10x25	1050100016		
1	Paraf. cob. cil. sext. int.	DIN-912	39 M12x35	1050100748		
1	Anilha de pressao	DIN-127	38 B12	1050100146		
1	Lubrificador	L-485	37 1/8"	1052500312		
4	Anilha de chapa	DIN-125	36 ø13	1050300106		
1	Paraf. cob. cil. sext. int.	DIN-6912	35 M8x20 (M6x20/M6x25/M6x30/M6x35)	1052100081		
2	Blindagem				4-35 65	18
	Suporte				4-35 28	17
	Perna				3-35 84	16
	Calca				3-34 92	15
	Calca				3-34 93	14
	Calca				3-34 94	13
	Placa do motor				3-34 95	12
	Calca				4-34 94	11
	Calca alinacoez trapéz.				4-34 532	10
	Corredico				3-34 59	9
	Anilha lisa				4-52 58	8
	Carreta de corrente				4-34 88	7
	Carreta de corrente				4-34 87	6
	Suporte parca				4-8 33	5
	Fuso c/ rosca trapéz.				4-34 58	4
	Paraf. o				4-34 47	3
	Mesa				2-34 49	2
	Fixe				1-34 23	1

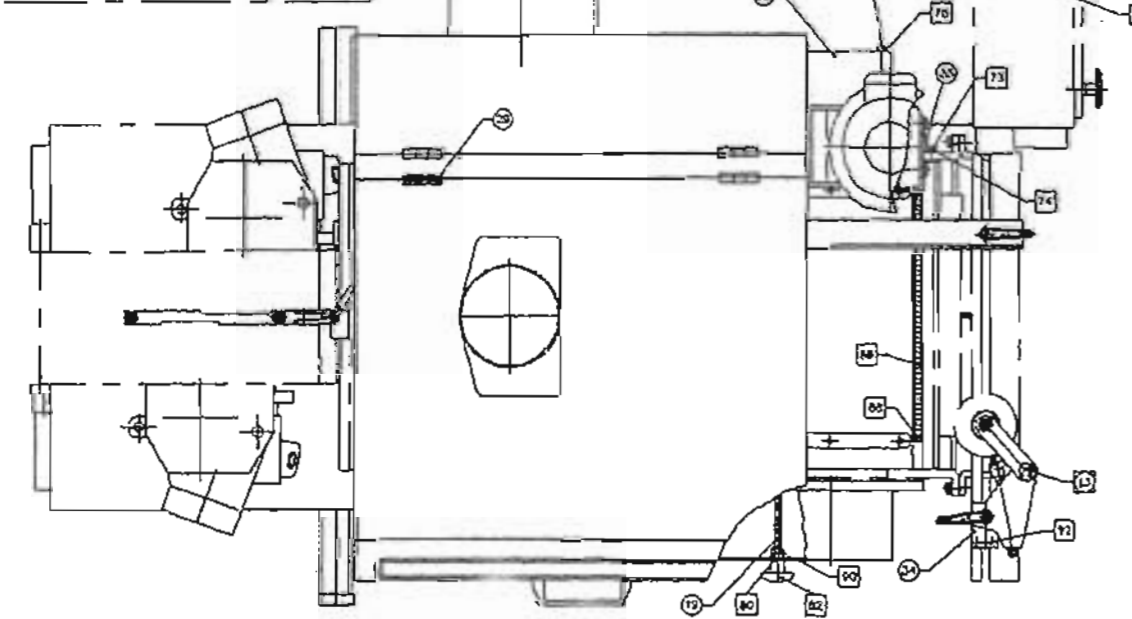
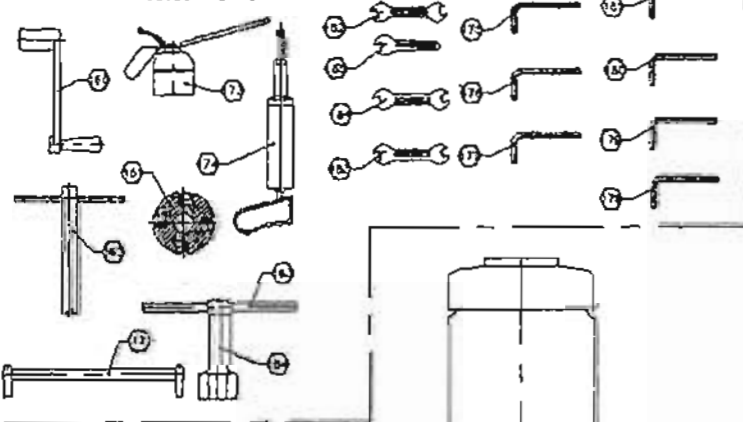
PNC-450

1-34725

FRAME



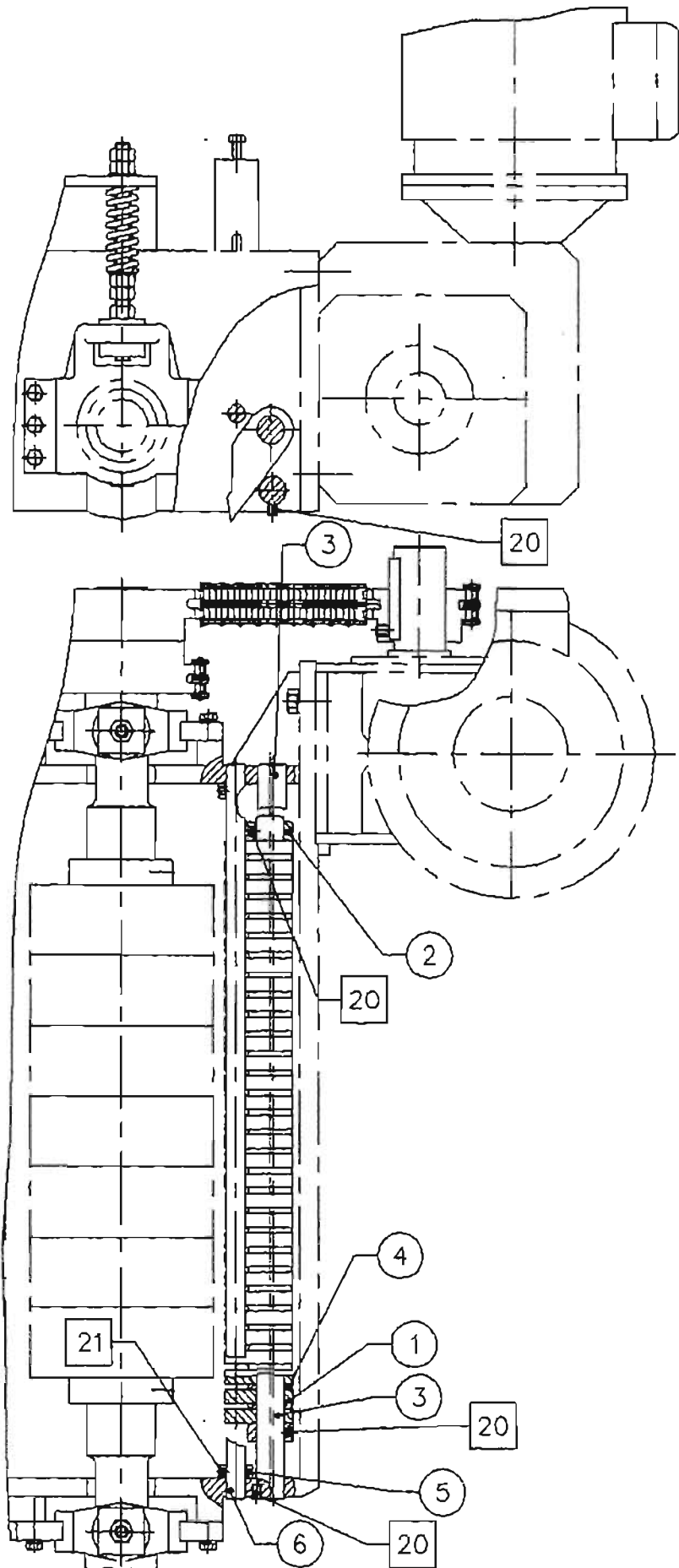
ACESSÓRIOS NORMAIS



Qtd	Desc	Mat	Med	Obs	Qtd	Desc	Mat	Med	Obs
1	Chave de 18	894			1	Chave de 18	894		
1	Chave de 20	894			1	Chave de 20	894		
1	Chave de 22	894			1	Chave de 22	894		
1	Chave de 24	894			1	Chave de 24	894		
1	Chave de 26	894			1	Chave de 26	894		
1	Chave de 28	894			1	Chave de 28	894		
1	Chave de 30	894			1	Chave de 30	894		
1	Chave de 32	894			1	Chave de 32	894		
1	Chave de 34	894			1	Chave de 34	894		
1	Chave de 36	894			1	Chave de 36	894		
1	Chave de 38	894			1	Chave de 38	894		
1	Chave de 40	894			1	Chave de 40	894		
1	Chave de 42	894			1	Chave de 42	894		
1	Chave de 44	894			1	Chave de 44	894		
1	Chave de 46	894			1	Chave de 46	894		
1	Chave de 48	894			1	Chave de 48	894		
1	Chave de 50	894			1	Chave de 50	894		
1	Chave de 52	894			1	Chave de 52	894		
1	Chave de 54	894			1	Chave de 54	894		
1	Chave de 56	894			1	Chave de 56	894		
1	Chave de 58	894			1	Chave de 58	894		
1	Chave de 60	894			1	Chave de 60	894		
1	Chave de 62	894			1	Chave de 62	894		
1	Chave de 64	894			1	Chave de 64	894		
1	Chave de 66	894			1	Chave de 66	894		
1	Chave de 68	894			1	Chave de 68	894		
1	Chave de 70	894			1	Chave de 70	894		
1	Chave de 72	894			1	Chave de 72	894		
1	Chave de 74	894			1	Chave de 74	894		
1	Chave de 76	894			1	Chave de 76	894		
1	Chave de 78	894			1	Chave de 78	894		
1	Chave de 80	894			1	Chave de 80	894		
1	Chave de 82	894			1	Chave de 82	894		
1	Chave de 84	894			1	Chave de 84	894		
1	Chave de 86	894			1	Chave de 86	894		
1	Chave de 88	894			1	Chave de 88	894		
1	Chave de 90	894			1	Chave de 90	894		
1	Chave de 92	894			1	Chave de 92	894		
1	Chave de 94	894			1	Chave de 94	894		
1	Chave de 96	894			1	Chave de 96	894		
1	Chave de 98	894			1	Chave de 98	894		
1	Chave de 100	894			1	Chave de 100	894		







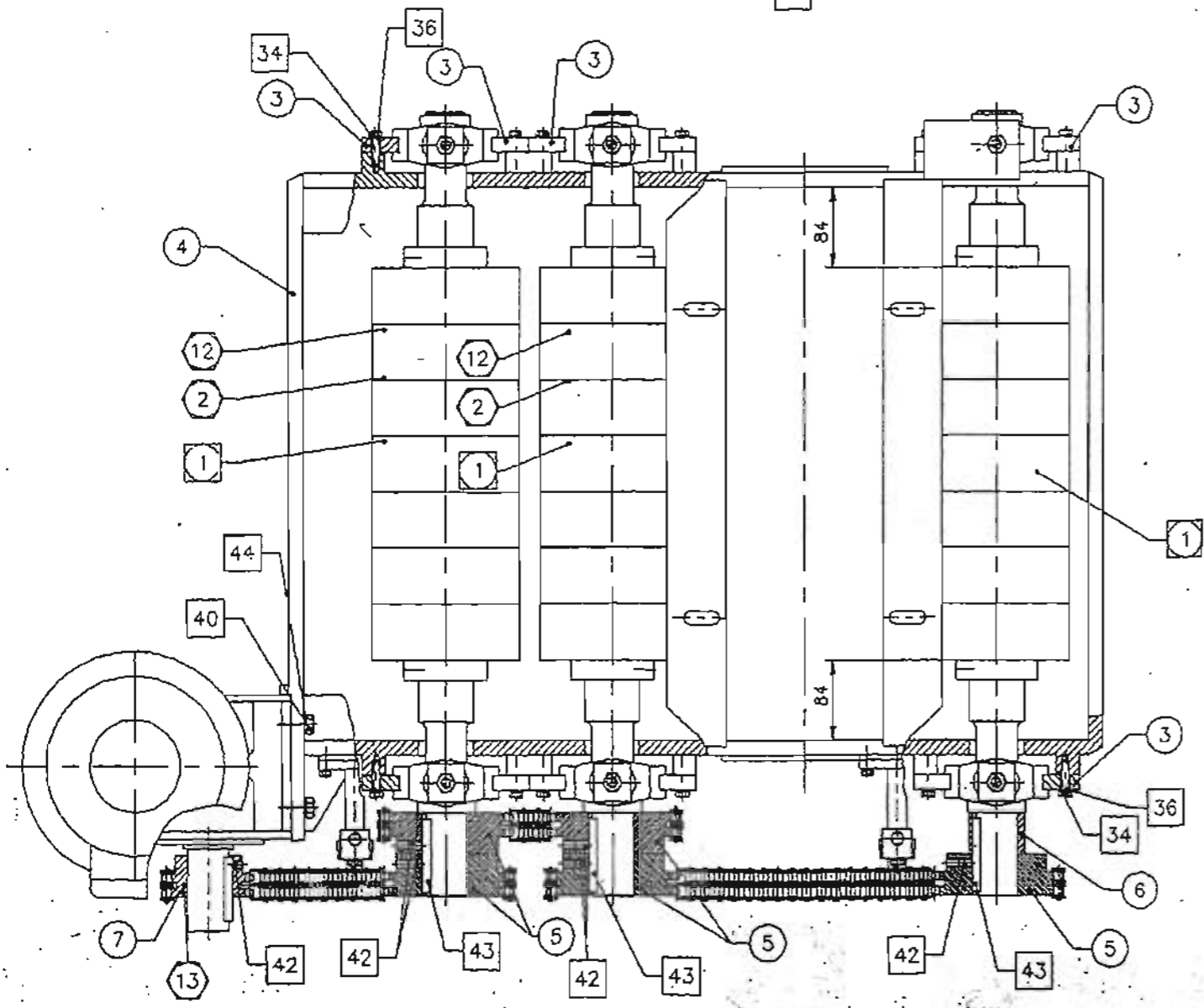
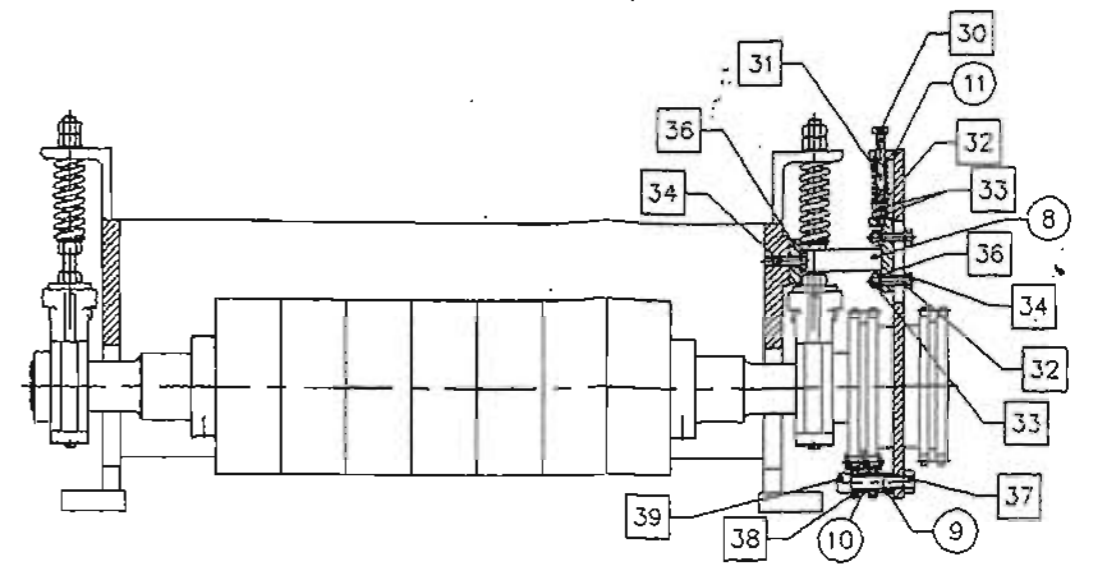
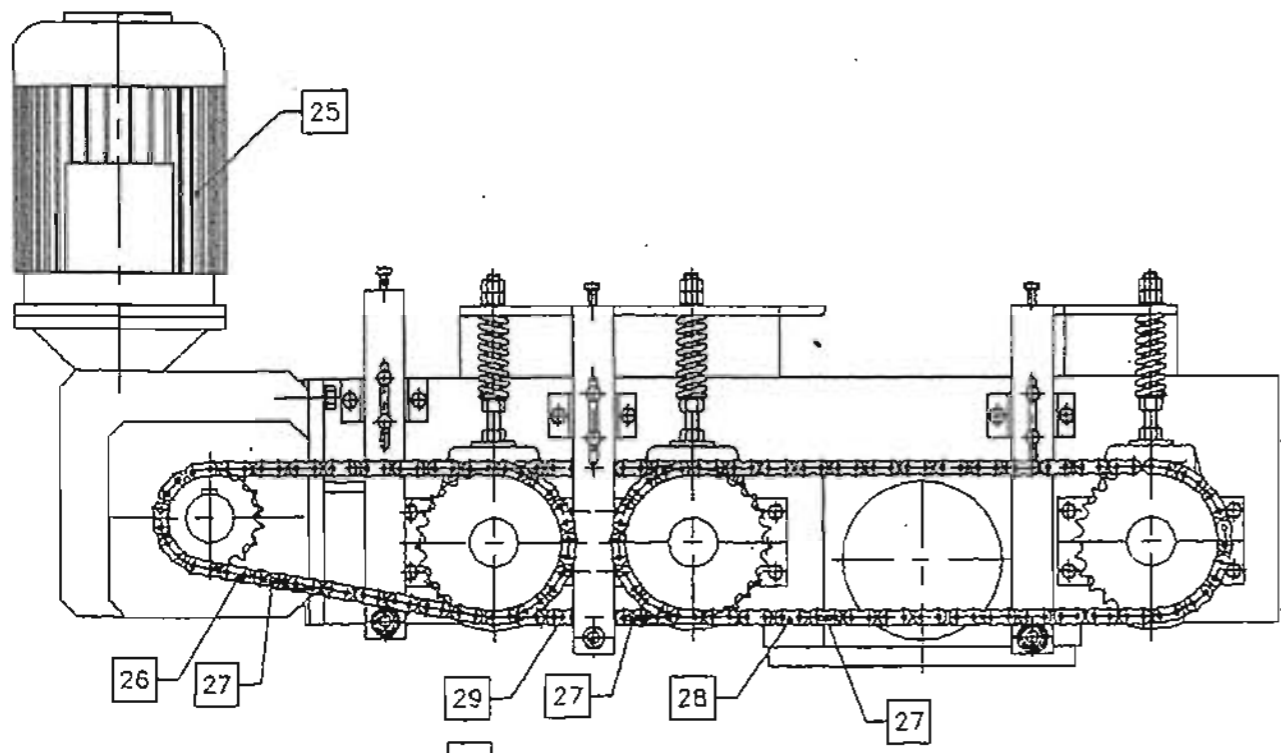
						34				
						33				
						32				
						31				
						30				
						29				
						28				
						27				
						26				
						25				
						24				
						23				
						22				
2	Screw	DIN-913		21	M6x8					1050200036
3	Screw	DIN-913		20	M8x10					1050200058
				19						
				18						
				17						
				16						
				15						
				14						
				13						
				12						
				11						
				10						
				9						
				8						
				7						
1	Shaft	4-34682	CEAX	6						
2	Spacer	4-50117	C1	5	A-16					NMP-706
29	Washer	4-28381	St-35.29	4						HTAF
2	Shaft	4-34681	CEAX	3						
2	Spacer	4-50127	C1	2	A-25					NMP-706
30	Antikick back finger	4-28376	Fund.nad.	1						HTAF
Qt.	Designação	Norma	Material	Pos.	Molde N.º	Semi-produto	Peso Kg			
Un.		Desenho N.º			Placa mol. N.º	Ferramenta	Pega-ler.			

Aplicações		ALTERAÇÕES			
Qt.	Máquina		Pos.		
1	PMC	7			
1	PMC-2MS	7			

Projectou	Data	Name	ESCALAS	Substituí:
Desenhou	92027	D. L.	1.5	
Verificou				
Tolerancias não indicadas				

3-34747

**ANTI KICKBACK FINGERS**



				46		
				47		
				46		
				45		
4	Anilha de pressao	DIN-127	44	B12	1050300146	
3	Chaveta paralelo		43	14x9x70	1052700077	
6	Perno sext. int.	DIN-913	42	M12x15	1050200101	
			41			
4	Paraf. cab. sext.	DIN-553	40	M12x35	1050100316	
3	Paraf. cab. cil. sext. int.	DIN-912	39	M12x60	1050100751	
6	Rolamento de esferas	DIN-625	38	6001 2RS(ø12xø28x8)	1051000130	
3	Porca sext.	DIN-934	37	M12	1050300008	
36	Anilha de pressao	DIN-127	36	B8	1050300143	
			35			
36	Paraf. cab. sext.	DIN-553	34	M8x35	1050100270	
12	Porca sext.	DIN-934	33	M8	1050300005	
9	Anilha liso	DIN-125	32	ø8.4	1050300103	
3	Mola helic. compr. cil.	4C-27025	55si7	31	ø2xø16x6.5x66	1051200050
3	Paraf. cab. sext.	DIN-601	30	M8x110	1050100438	
1	Corrente dupla c/ 49 elos	DIN-8187	29	2x5/8"x3/8" (778mm)	1050800021	
1	Corrente dupla c/ 79 elos	DIN-8187	28	2x5/8"x3/8" (1254mm)	1050800021	
3	Elo ligac. corrente dupla	DIN-8187	27	2x5/8"x3/8"	1050800056	
1	Corrente dupla c/ 55 elos	DIN-8187	26	2x5/8"x3/8" (873mm)	1050800021	
1	Motoreductor	LEROY SOMER	25	MB 2501 J/2cv 58/29rpm	1080800046	
			16			
			15			
			14			
1	Carreta corrente dupla	4-35339	Ck-45	13	Q/ p/ motor 60 HZ	PMC-AE-0
2	Sub-conjunto	3-35337		12	Rolo fraccionado	PMC-AE-0
3	Suporte	4-34638		11		
3	Casquilho de separacao	4-34680	C1	10		
3	Casquilho de separacao	4-34698	C1	9		
3	Suporte	4-34639	St-33	8		
1	Carreta corrente dupla	4-34680	Ck-45	7		
1	Casquilho escalonado	4-34657	St-35.29	6	So p/ 2 e 4 faces	
5	Carreta corrente dupla	4-34689	Ck-45	5		
				4		
1	Fixe	2-34644	St-33			
12	Guia	4-34637	St-33	3		
2	Sub-conjunto	3-34708		2	Rolo estriado	PMC-AE-0
3	Sub-conjunto	3-34707		1	Rolo de borracha	

Qtz	Designação	Norma	Material	Pos	Molda	Semi-produto	Proca mol. R°	Ferramenta
1	Fixe	2-34644	St-33					
12	Guia	4-34637	St-33	3				
2	Sub-conjunto	3-34708		2	Rolo estriado	PMC-AE-0		
3	Sub-conjunto	3-34707		1	Rolo de borracha			

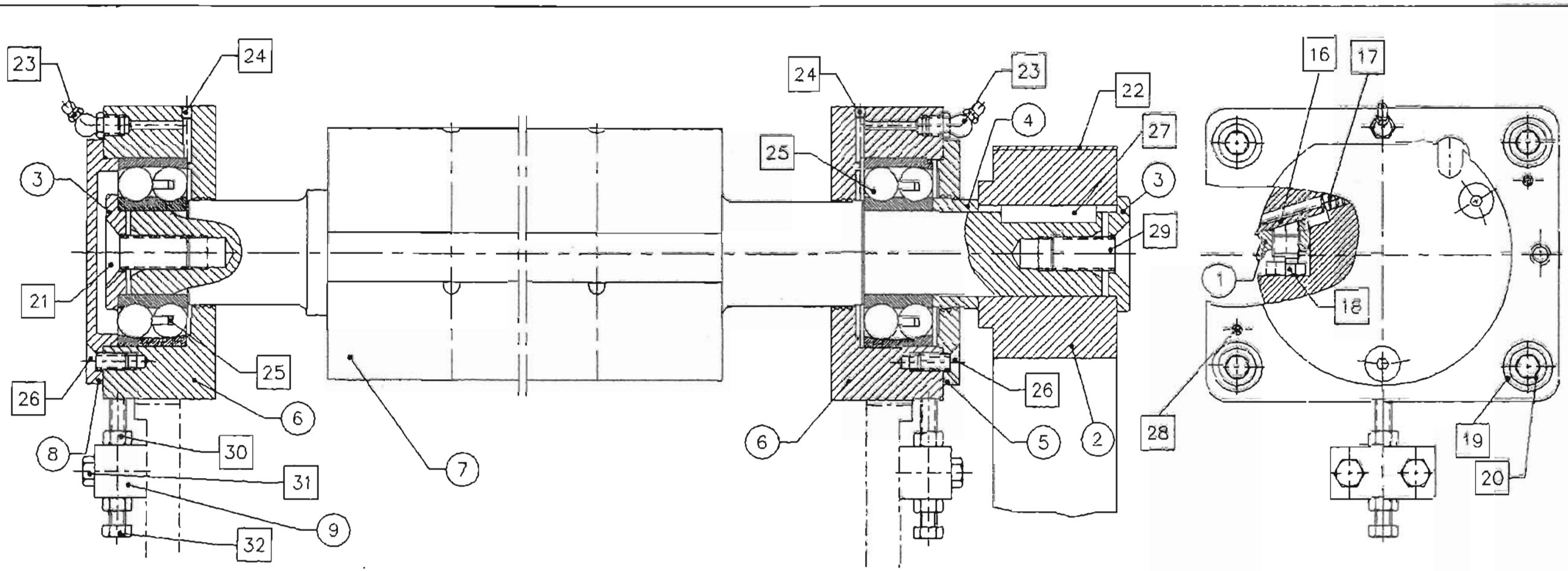
Qtz	Aplicação	Máquina	Pos
1	PMC		
1	PMC-2MS-		

2-34712  
FEED SYSTEM









Qt.	Designação	Nome (Desenho N.º)	Material	Pos.	Máq. N.º	Ser. N.º	Peso Kg.	PMF
2	Bracket	4-34701	C1	9				
1	Bearing cover	4-34628	GG-12	8				
1	Cutter head	3-34653	CK-45	7				
2	Bearing house	4-34635	GG-12	6				
1	Bearing cover	4-34629	GG-12	5				
1	Spacer	4-34686	C1	4				
2	Washer	4-52567	C1	3			ø40	NMP-713
1	Pulley	4-34631		2				
4	Gibb	4-32527	CK-75	1				PMF
2	Bolt	DIN-558		32	M8x70	1050100275		
4	Bolt	DIN-558		31	M8x35	1050100268		
4	Nut	DIN-934		30	M8	1050300005		
1	Bolt	DIN-7991		29	M16x40 Esq.	1050100960		
2	Pin	DIN-1481		28	ø5x30	1050600384		
1	Key			27	12x8x45	1052700059		
6	Bolt	DIN-7991		26	M8x20	1050100923		
2	Bearing			25	2308(ø40xø90x33)	1051000071		
2	Screw	DIN-913		24	M5x8	1050200020		
2	Grease fitting	L-429		23	1/8"	1052500009		
1	Belt	habasit		22	F2-60x1370			
1	Bolt	DIN-7991		21	M16x40	1050100959		
8	Bolt	DIN-912		20	M12x40	1050100747		
8	Washer	DIN-125		19	ø13	1050300106		
28	Gibb bolt	4C-350057		18				
8	Spring	4C-220008	55si7	17	ø0.75xø7.5x3.5x51	1051200238		
4	Lamina			16	460x35x3			

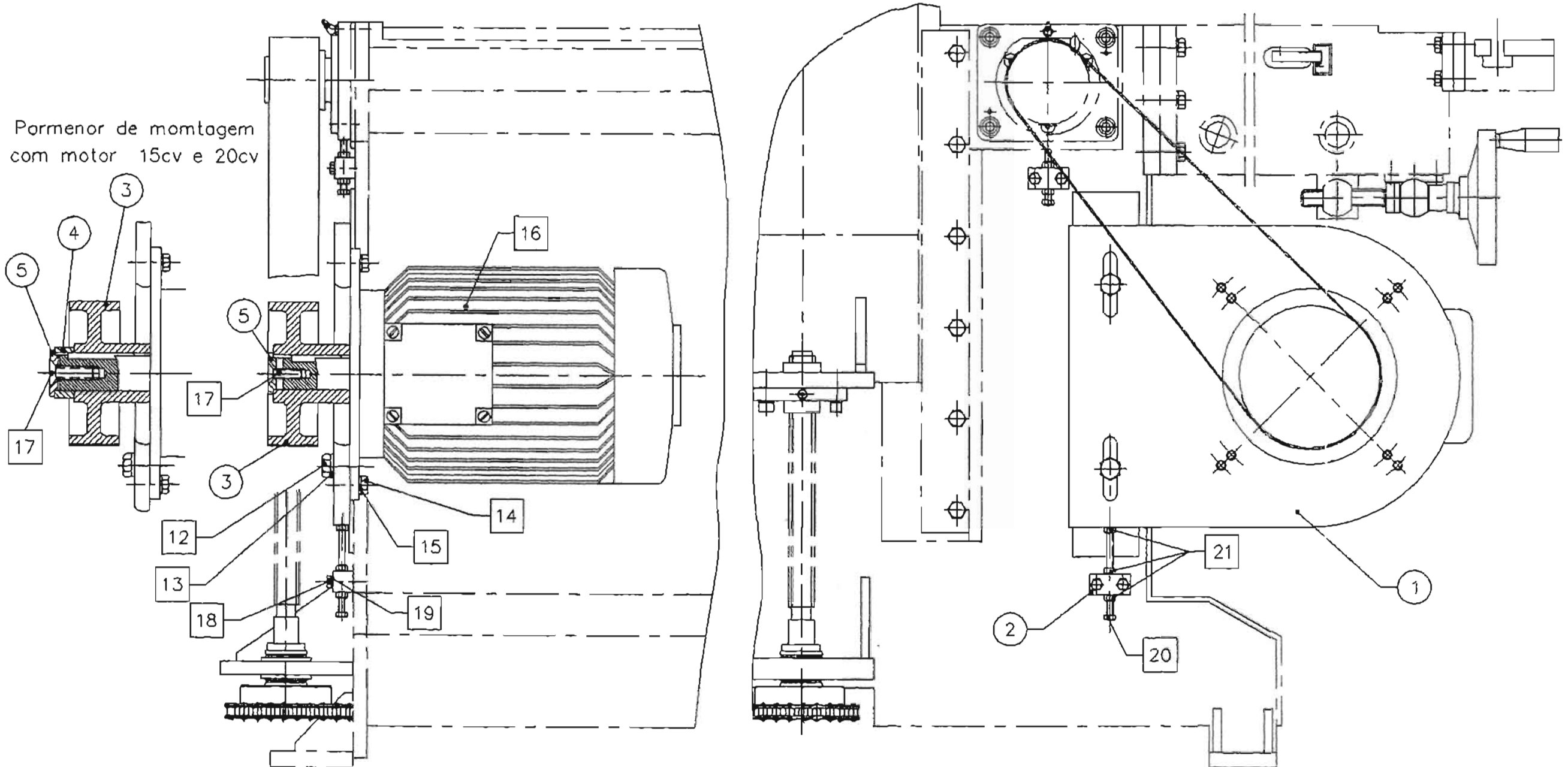
Qt. Máquina Pos.  
 1 PMC 2  
 1 PMC-2MS 2

Alterações:  
 1  
 2  
 3  
 4

Projectou	Data	Nome	ESCALAS	SUBST. Nº
Desenhou	9/20/73	Pinto	1:2	3P--5180
Verificou				
Tolerancias				
Não Indicad.				

3-34710  
 BOTTOM CUTTER HEAD SYSTEM

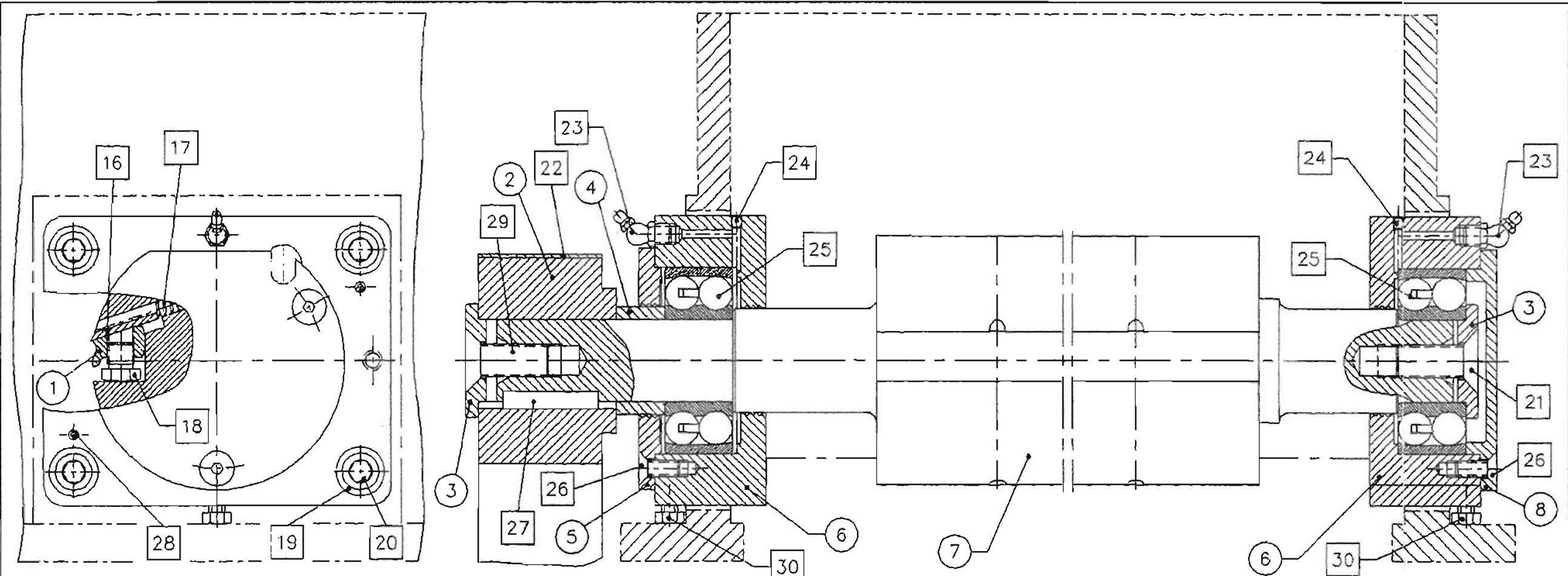
Pormenor de montagem com motor 15cv e 20cv



Qtd.	Un.	Designação	Norma Desenho N°	Material	Pos.	Molde N° Placa mol. N°	Semi-produto Ferramenta	Peso Kg. Peca-ter	
1	1	Washer	4-52568	C1	5	Ø42		NMP-713	
1	1	Washer	4-52566	C1	5	Ø38		NMP-713	
1	1	Spacer	4-34685	St-35.29	4				
1	1	Pulley	4-34634	GG-12	3				
1	1	Pulley	4-34700	GG-12	3				
1	1	Bracket	4-34701	C1	2				
1	1	Motor mount	3-34713	St-33	1				
1	1	Motor							
1	1	Motor							
1	1	Motor							
1	1	Motor							
4	4	Washer	DIN-127						
4	4	Bolt	DIN-558						
2	2	Washer	DIN-125						
2	2	Bolt	DIN-558						
1	1	15cv 3000rpm BS 50HZ 1/2 galo de centragem							
1	1	10cv 3000rpm BS 60HZ 1/2 galo de centragem							
1	1	15cv 3000rpm BS 50HZ 1/2 galo de centragem							
1	1	10cv 3000rpm BS 30HZ 1/2 galo de centragem							
15	B12	1050300146							
14	M12x35	1050100316							
13	Ø17	1050300108							
12	M16x50	1050100358							
11									
9									
8									
7									
6									

3-34748

BOTTOM HEAD MOTOR



Qt.	Un.	Un.	Un.	Un.	Qt.	Un.	Un.	Un.	Un.	Qt.	Un.	Un.	Un.	Un.
				42										12
				41										11
				40										10
				39										9
				38	1	Bearing cover	4-34628	GG-12						8
				37										
				36										
				35										
				34	1	Cutter head	3-34653	CK-45						
				33	2	Bearing house	4-34635	GG-12						6
				32	1	Bearing cover	4-34629	GG-12						5
				31	1	Spacer	4-34684	C1						4
2	Bolt	DIN-558	30	M8x10	1050100264	2	Washer	4-52567	C1	3	ø40		NMP-713	
1	Bolt	DIN-7991	29	M16x40 Esq.	1050100960	1	Pulley	4-34631		2				
2	Pin	DIN-1481	28	ø5x30	1050600384									
1	Key		27	12x8x45	1052700059									
6	Bolt	DIN-7991	26	M8x20	1050100923									
2	Bearing		25	2308(ø40xø90x33)	1051000071	4	Calco de laminas	4-32527	CK-70					
2	Screw	DIN-913	24	M5x8	1050200020									
2	Grease fitting	L-429	23	1/8"	1052500009									
1	Belt	hgbasit	22	F2-60x1030										
1	Bolt	DIN-7991	21	M16x40	1050100959									
8	Bolt	DIN-912	20	M12x40	1050100747									
8	Washer	DIN-125	19	ø13	1050300106									
28	Bolt	4C-350057	18											
4	Spring	4C-220008	55si7	17	ø0.75xø7.5x3.5x51	1051200238								
				16										
4	Knife				460x35x3									
				15										
				14										
				13										

Designação	Norma Desenho N°	Material	Pos.	Molde N°	Semi-produto	Peso Kg.	Ferramenta	Piso mol. N°	Piso-ter.	PMF
1 Bearing cover	4-34628	GG-12	8							
1 Cutter head	3-34653	CK-45	7							
2 Bearing house	4-34635	GG-12	6							
1 Bearing cover	4-34629	GG-12	5							
1 Spacer	4-34684	C1	4							
2 Washer	4-52567	C1	3	ø40						NMP-713
1 Pulley	4-34631		2							

Aplicações		Máquina	Pos.	ALTIFRÊNCIAS
Qt.	Un.			
1	PMC			
1	PMC-2MS			

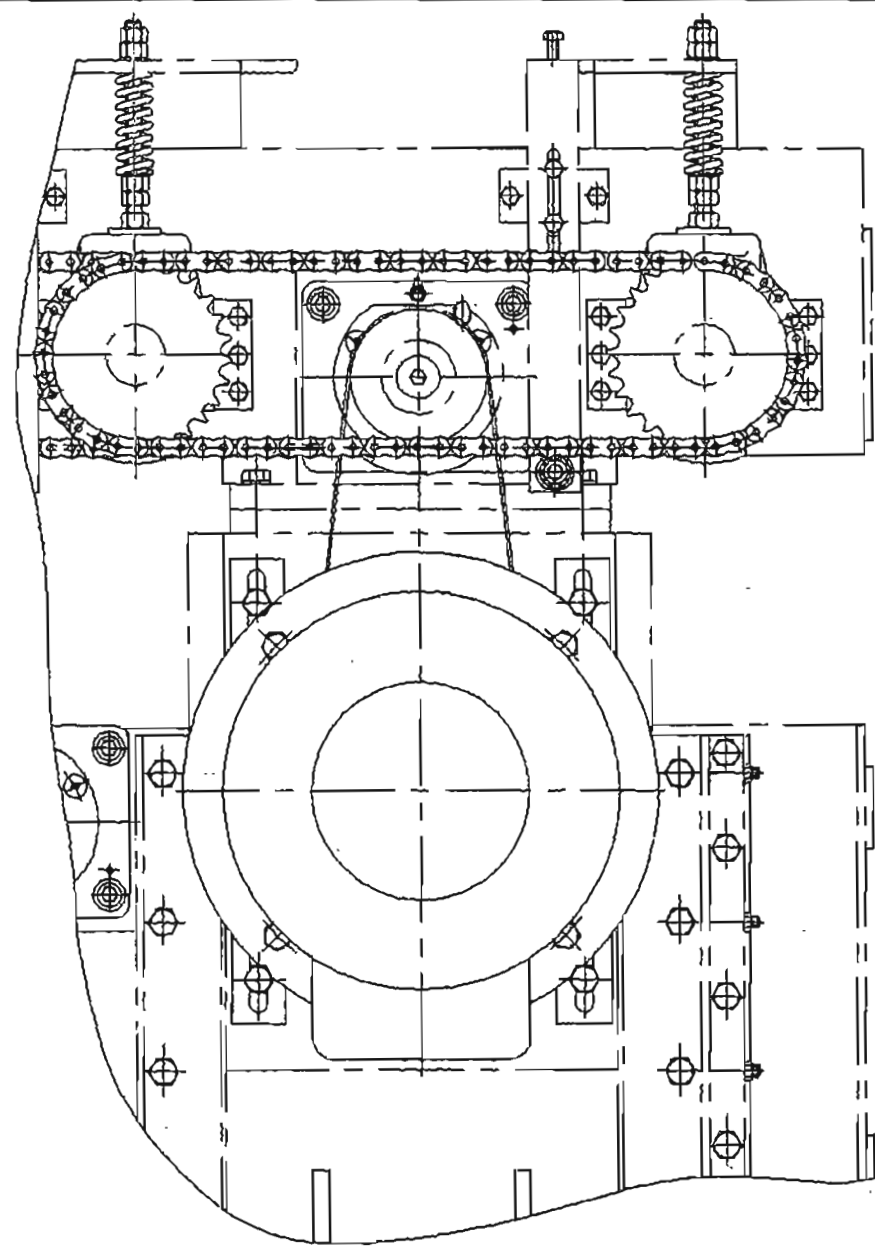
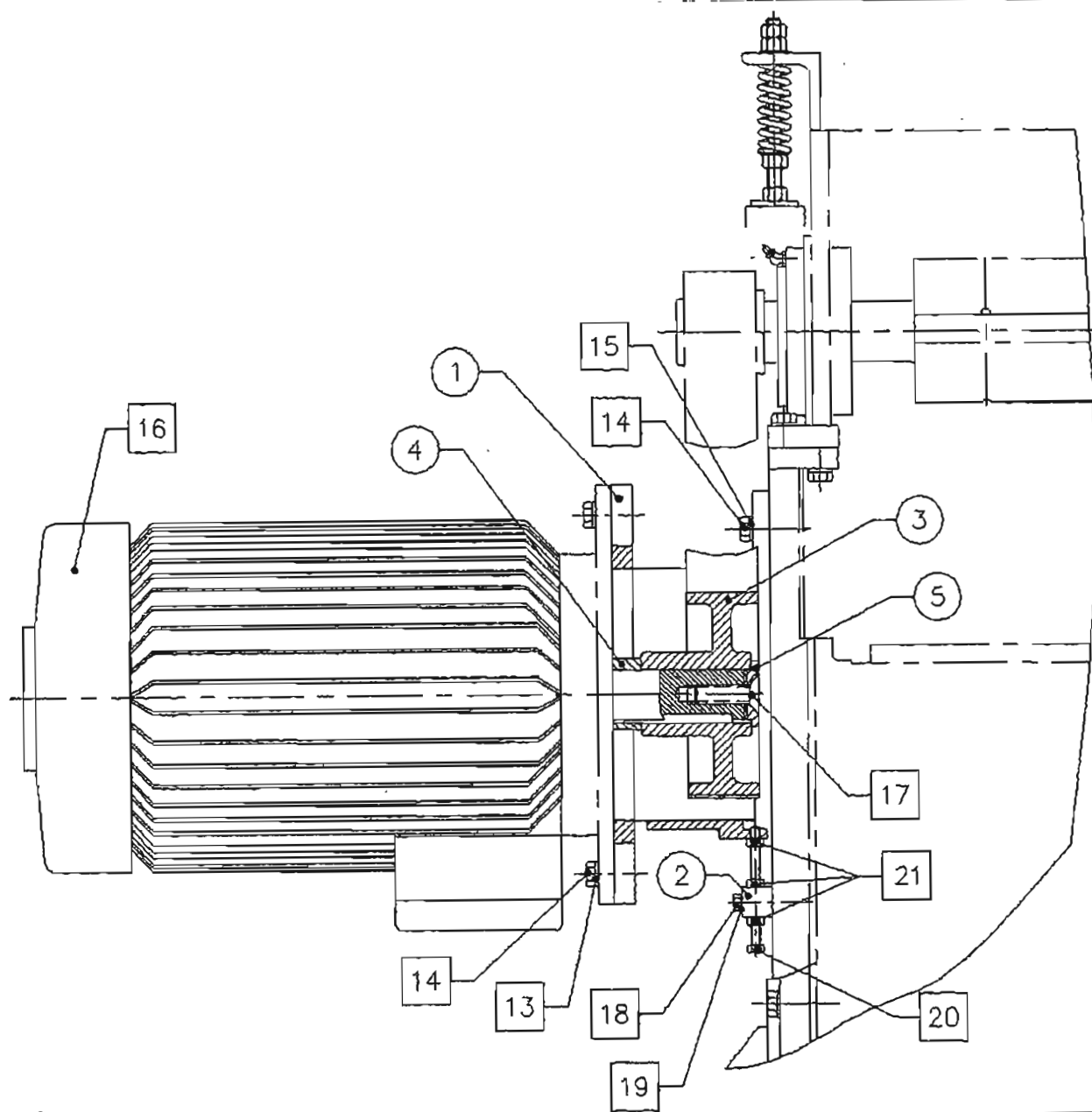
  

Projectou	Data	Nome	ESCALAS	Substitui:
Desenhou	9202		1:2	3P-5179
Verificou				3-34708

Tolerancias não indicadas	
TOP CUTTER HEAD SYSTEM	





Qt.	Un.	Un.	Un.	Un.	Designação	Norma Desenho N°	Material	Pos.	Molde N°	Semi-produto Placa mol. N°	Ferramenta	Peso Kg. Peca-ler.
1	1	1	1	1	Washer	4-52568	C1	5				
1	1	1	1	1	Spacer	4-34685	St-35.29	4				NMP-713
3	3	3	3	3	Nut	DIN-934						
1	1	1	1	1	Bolt	DIN-558						
2	2	2	2	2	Washer	DIN-127						
2	2	2	2	2	Bolt	DIN-558						
1	1	1	1	1	Bolt	DIN-7991						
1	-	-	-	-	Motor							
-	1	-	-	-	Motor							
-	-	1	-	-	Motor							
-	-	-	1	-	Motor							
4	4	4	4	4	Washer	DIN-125						
8	8	8	8	8	Bolt	DIN-558						
4	4	4	4	4	Washer	DIN-127						
					12							
					11							
					10							
					9							
					8							
					7							
					6							
					5							
					4							
					3							
					2							
					1							
					16	20cv 3000rpm B5 60HZ 57 golo de centragem						
					16	15cv 3000rpm B5 60HZ 57 golo de centragem						
					16	30cv 3000rpm B5 60HZ 57 golo de centragem						
					16	15cv 3000rpm B5 60HZ 57 golo de centragem						
					17	M16x40	1050100959					
					15	Ø13	1050300106					
					14	M12x35	1050100316					
					13	B12	1050300146					
					21	M8	1050300005					
					20	M8x110						
					19	B8	1050300143					
					18	M8x40	1050100270					
					17	M16x40	1050100959					
					16	M16x40	1050100959					
					15	M16x40	1050100959					
					14	M16x40	1050100959					
					13	M16x40	1050100959					
					12	M16x40	1050100959					
					11	M16x40	1050100959					
					10	M16x40	1050100959					
					9	M16x40	1050100959					
					8	M16x40	1050100959					
					7	M16x40	1050100959					
					6	M16x40	1050100959					
					5	M16x40	1050100959					
					4	M16x40	1050100959					
					3	M16x40	1050100959					
					2	M16x40	1050100959					
					1	M16x40	1050100959					

Qt.	Un.	Un.	Un.	Un.	Designação	Norma Desenho N°	Material	Pos.	Molde N°	Semi-produto Placa mol. N°	Ferramenta	Peso Kg. Peca-ler.
1	1	1	1	1	Washer	4-52568	C1	5				
1	1	1	1	1	Spacer	4-34685	St-35.29	4				
1	1	1	1	1	Pulley	4-34634	GG-12	3				
1	1	1	1	1	Bracket	4-34701	C1	2				
1	1	1	1	1	Motor Mount	3-34656	St-33	1				

Qt.	Un.	Un.	Un.	Un.	Designação	Norma Desenho N°	Material	Pos.	Molde N°	Semi-produto Placa mol. N°	Ferramenta	Peso Kg. Peca-ler.
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							

Qt.	Un.	Un.	Un.	Un.	Designação	Norma Desenho N°	Material	Pos.	Molde N°	Semi-produto Placa mol. N°	Ferramenta	Peso Kg. Peca-ler.
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							

Qt.	Un.	Un.	Un.	Un.	Designação	Norma Desenho N°	Material	Pos.	Molde N°	Semi-produto Placa mol. N°	Ferramenta	Peso Kg. Peca-ler.
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							

Qt.	Un.	Un.	Un.	Un.	Designação	Norma Desenho N°	Material	Pos.	Molde N°	Semi-produto Placa mol. N°	Ferramenta	Peso Kg. Peca-ler.
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							

Qt.	Un.	Un.	Un.	Un.	Designação	Norma Desenho N°	Material	Pos.	Molde N°	Semi-produto Placa mol. N°	Ferramenta	Peso Kg. Peca-ler.
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							

Qt.	Un.	Un.	Un.	Un.	Designação	Norma Desenho N°	Material	Pos.	Molde N°	Semi-produto Placa mol. N°	Ferramenta	Peso Kg. Peca-ler.
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							

Qt.	Un.	Un.	Un.	Un.	Designação	Norma Desenho N°	Material	Pos.	Molde N°	Semi-produto Placa mol. N°	Ferramenta	Peso Kg. Peca-ler.
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							

Qt.	Un.	Un.	Un.	Un.	Designação	Norma Desenho N°	Material	Pos.	Molde N°	Semi-produto Placa mol. N°	Ferramenta	Peso Kg. Peca-ler.
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							

Qt.	Un.	Un.	Un.	Un.	Designação	Norma Desenho N°	Material	Pos.	Molde N°	Semi-produto Placa mol. N°	Ferramenta	Peso Kg. Peca-ler.
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							

Qt.	Un.	Un.	Un.	Un.	Designação	Norma Desenho N°	Material	Pos.	Molde N°	Semi-produto Placa mol. N°	Ferramenta	Peso Kg. Peca-ler.
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							

Qt.	Un.	Un.	Un.	Un.	Designação	Norma Desenho N°	Material	Pos.	Molde N°	Semi-produto Placa mol. N°	Ferramenta	Peso Kg. Peca-ler.
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							

Qt.	Un.	Un.	Un.	Un.	Designação	Norma Desenho N°	Material	Pos.	Molde N°	Semi-produto Placa mol. N°	Ferramenta	Peso Kg. Peca-ler.
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							

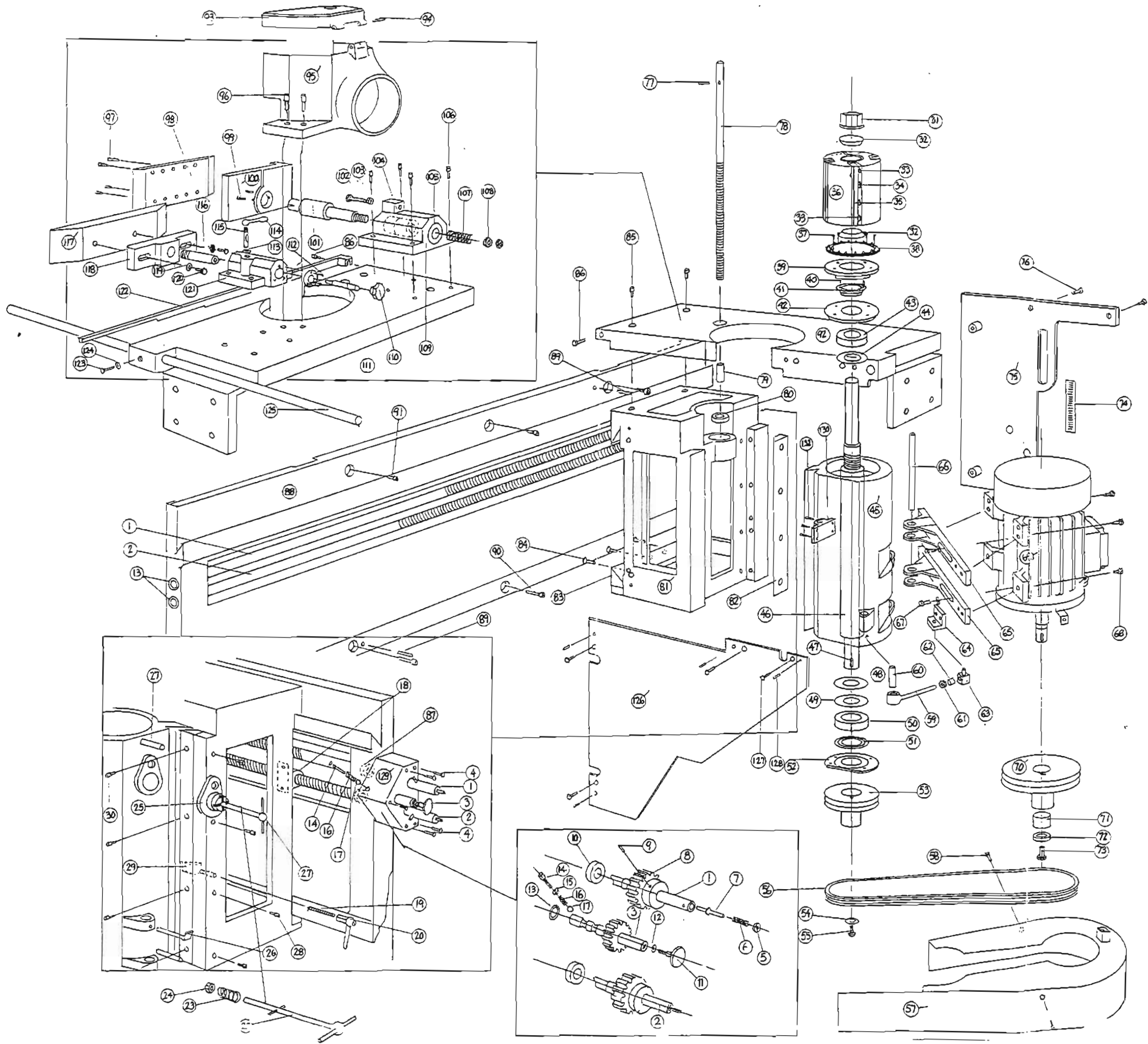
  

Qt.	Un.	Un.	Un.	Un.	Designação	Norma Desenho N°	Material	Pos.	Molde N°	Semi-produto Placa mol. N°	Ferramenta	Peso Kg. Peca-ler.
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							

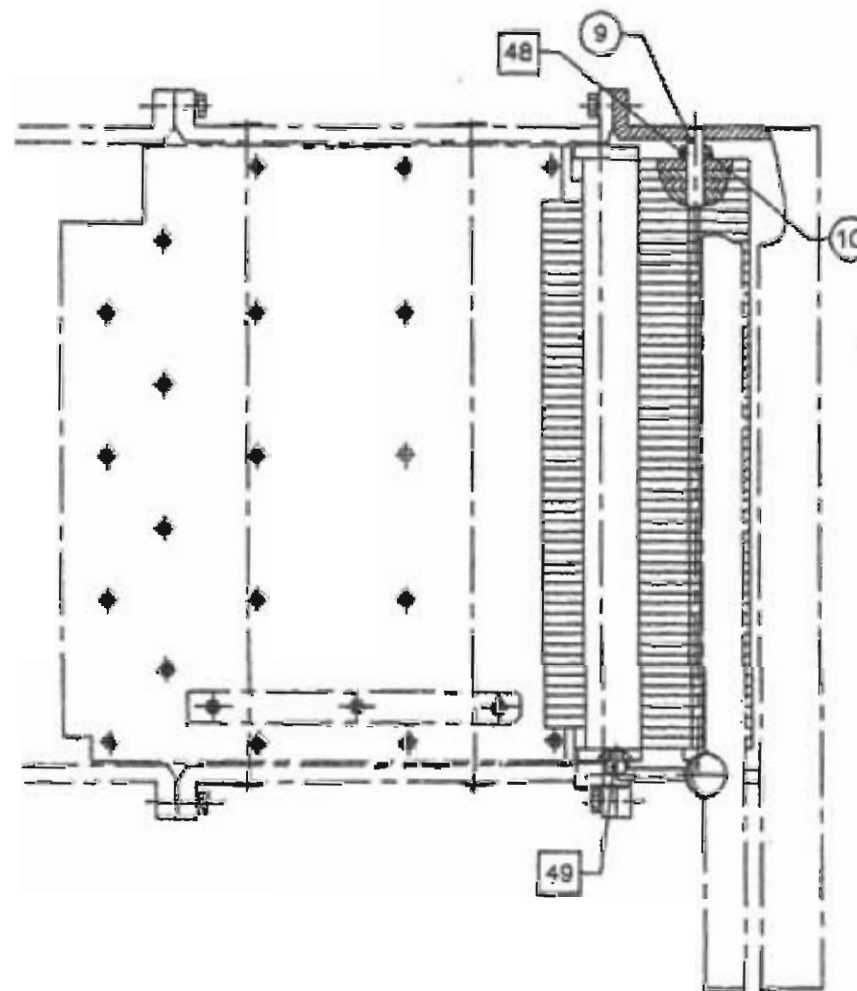
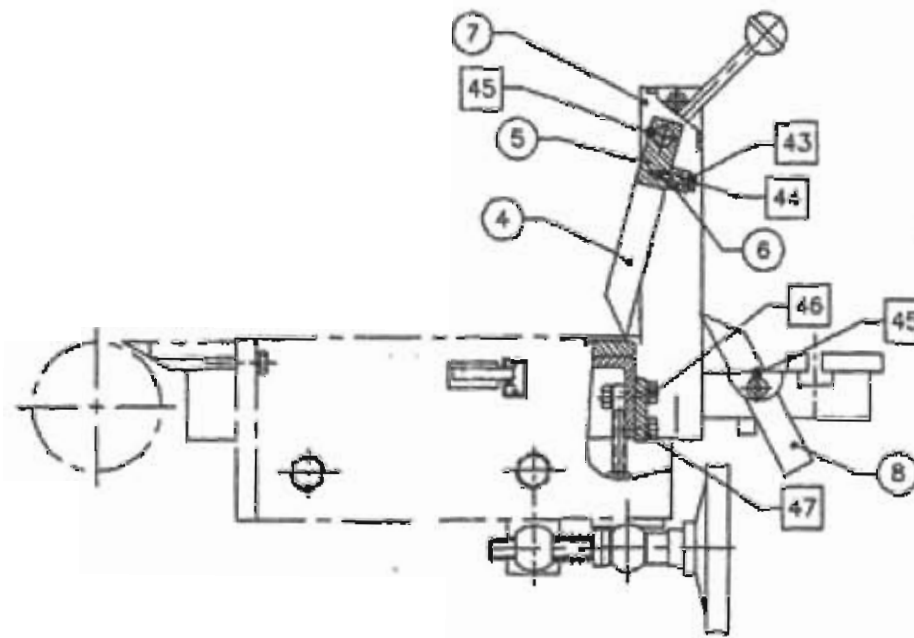
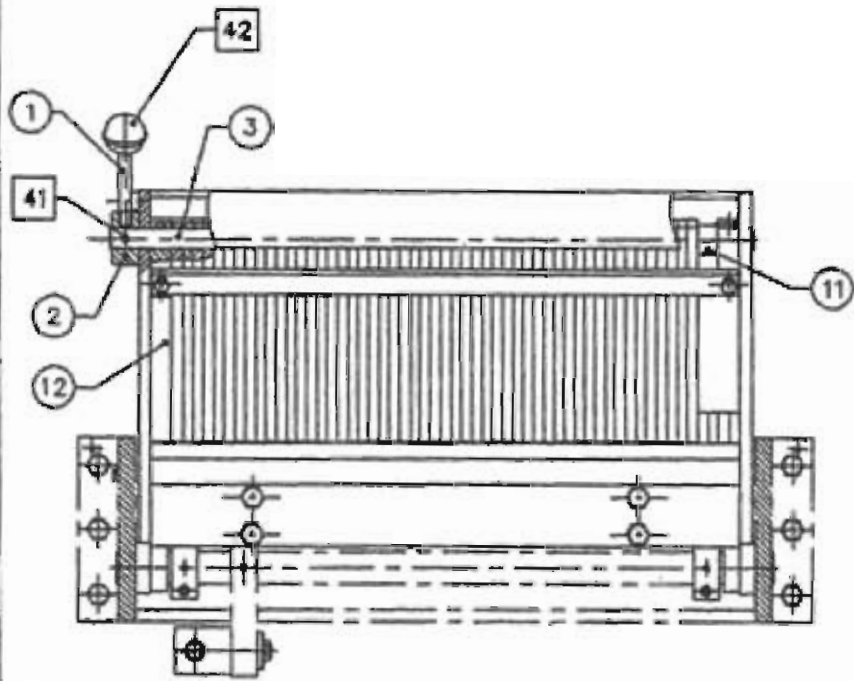
Qt.	Un.	Un.	Un.	Un.	Designação	Norma Desenho N°	Material	Pos.	Molde N°	Semi-produto Placa mol. N°	Ferramenta	Peso Kg. Peca-ler.
1	1	1	1	1	Motor							
1	1	1	1	1	Motor							





SIDE HEAD SYSTEM





1	Screw	DIN-912	49	M12x15	1050100742
2	Screw	DIN-913	48	M8x8	1050200038
4	Washer	DIN-127	47	B12	1050300148
4	Screw	DIN-558	46	M12x25	1050100318
2	Screw	DIN-913	45	M8x10	1050200058
2	Bolt	DIN-558	44	M8x30	1050100289
2	Washer	DIN-127	43	B8	1050300148
1	Handle		42	M10	1051300092
1	Pin	DIN-1481	41	Ø8x50	1050400409
40					
39					
38					
37					
36					
35					
34					
33					
32					
31					
30					
29					
28					
27					
26					
25					
24					
23					
22					
21					
20					
19					
18					
17					
16					
15					
14					
13					
12					
1	Anti-kick back finger	4-35237	C1		
2	Spacer	4-55233	C1	11	Ø20xØ28x20
2	Spacer	4-50121	C1	10	A-20
1	Shaft	4-35238	PEAX	9	
5	Bottom anti-kick back finger	4-34818	C1	8	
1	Support	3-34953	St-33	7	
1	Bar	4-34954	C1	6	
2	Pivot arm	4-30087	St-33	5	
5	Anti-kick back finger	4-34820	C1	4	
1	Shaft	4-8877	C1	3	
1	Spacer	4-30083	C1	2	
1	Shaft	4-53153	C1	1	M10x10

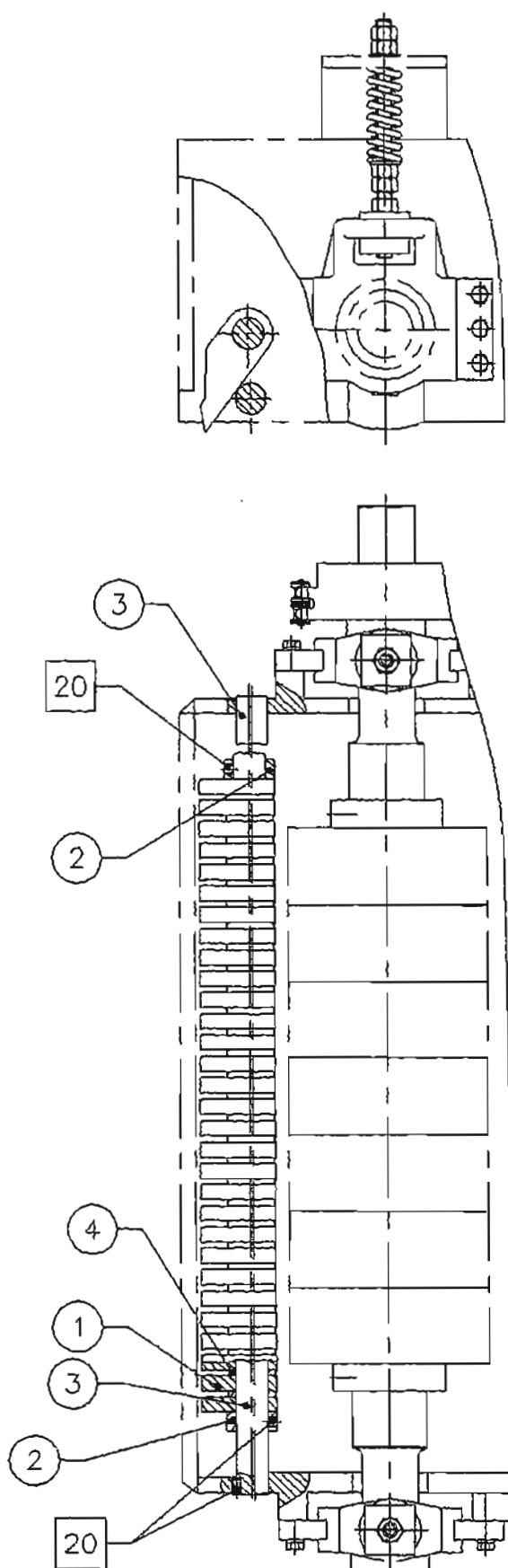
Qt. de desenhos	Designação		Material	Pos	Módulo nº	Semi-produto	Ferramenta
	Nome	Descrição					


  

Qt. de desenhos	Aplicação		Material	Pos
	Nome	Descrição		
1	PNC-3MS	MS		

2-34974

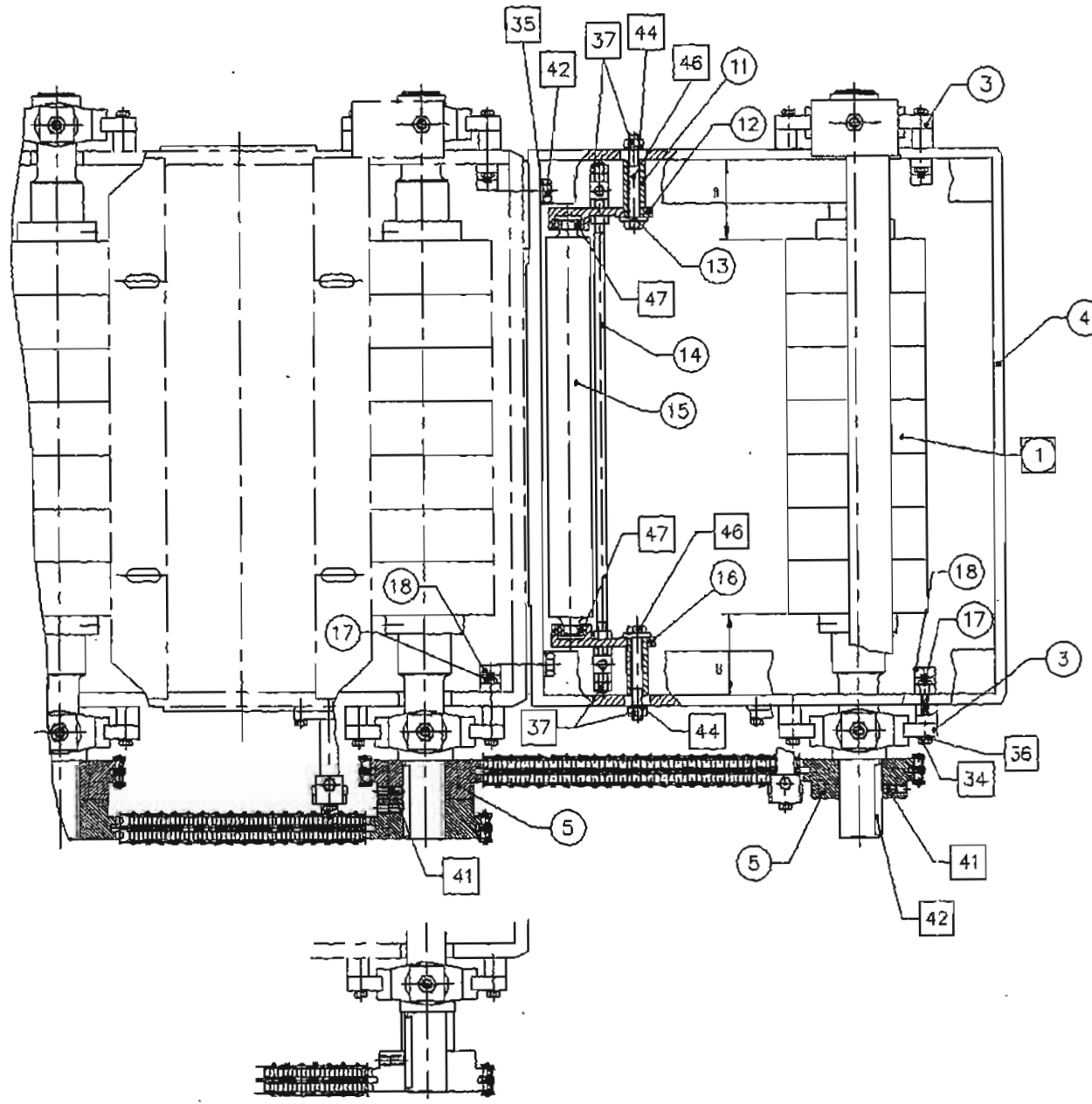
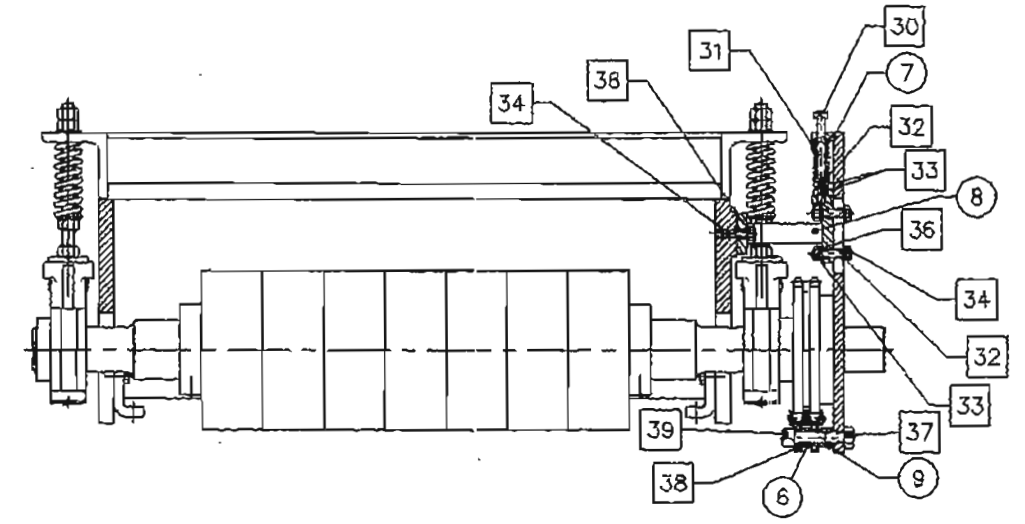
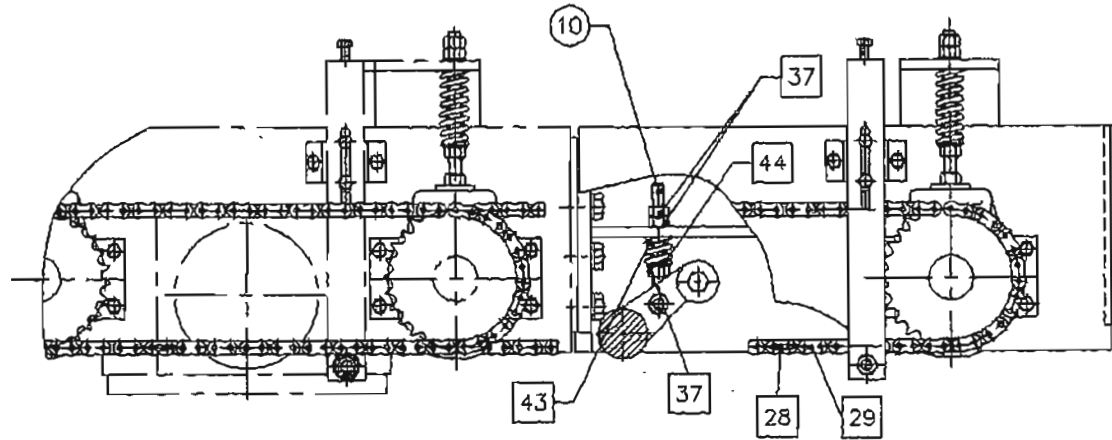
ANTI KICKBACK FINGERS /  
GS INFED



				34					
				33					
				32					
				31					
				30					
				29					
				28					
				27					
				26					
				25					
				24					
				23					
				22					
				21					
4	Screw	DIN-913		20	M8x10				1050200058
				19					
				18					
				17					
				16					
				15					
				14					
				13					
				12					
				11					
				10					
				9					
				8					
				7					
				6					
				5					
29	Washer	4-28381	St-35.29	4					HTAF
2	Shaft	4-34681	CEAX	3					
2	Spacer	4-50127	C1	2	A-25				NMP-708
30	Antikick back finger	4-28376	Fund.ned.	1					HTAF
Qt.	Designação	Norma	Material	Pos.	Molde N.º	Semi-produto	Peso Kg.		
Un.	Desenho N.º	Desenho N.º			Placa mol. N.º	Ferramenta	Peso-ter.		
Aplicações									
Qt.	Máquina	Pos.	ALTERAÇÕES						
1	PMC-2MS-MD	3							
				Data		Nome		ESCALAS	
				Projectou				1.5	
				Desenhou		920514 J. Pinto		Substituí:	
				Verificou				Substituído por:	
				Tolerâncias não indicadas		Medio NP.265		PMC-2MS-MD	
									

2-34974

ANTI KICKBACK FINGERS/GS SECTION



MONTAGEM P/ PMC-4 e 2 FACES  
 leva casquilho 4-34657  
 PMC-2MS-MD nao leva casquilho

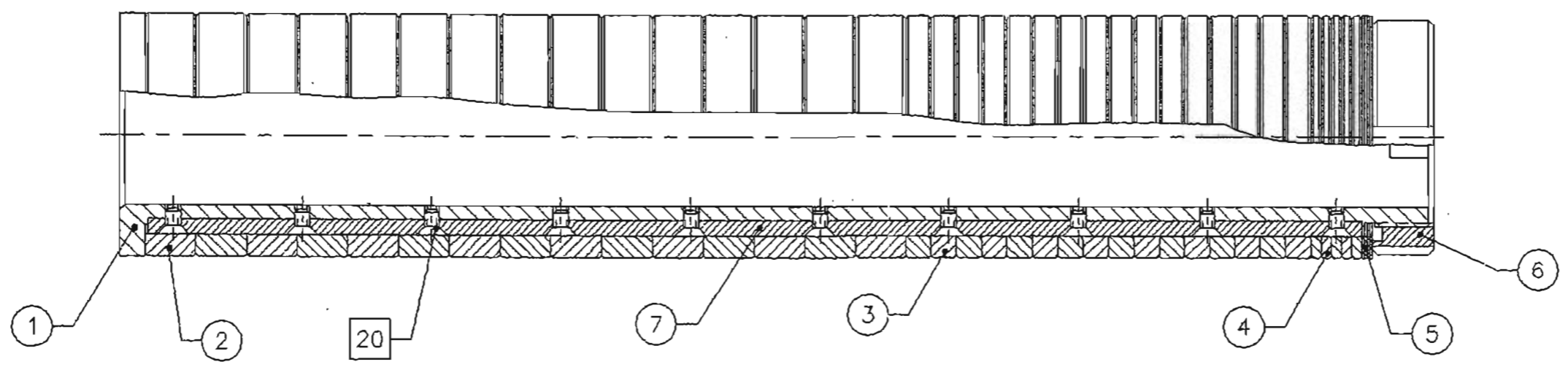
				49	
				48	
2	Bearing	DIN-625		47	6202 2RS (@15x35x11)
2	Bolt	DIN-601		46	M12x100
				45	
4	Washer	DIN-125		44	ø13
2	Spring	4C-225004		43	ø2xø18x7x56
8	Screw	DIN-558		42	M18x35
1	Key			41	14x9x70
2	Screw	DIN-913		40	M12x15
1	Bolt	DIN-912		39	M12x60
2	Bearing	DIN-625		38	6001 2RS(ø12x28x8)
17	Nut	DIN-934		37	M12
12	Washer	DIN-127		36	ø8
6	Washer	DIN-127		35	ø16
12	Bolt	DIN-558		34	M8x35
4	Nut	DIN-934		33	M8
3	Washer	DIN-125		32	ø8.4
1	Spring	4C-220023	55s7	31	ø2xø16x6.5x68
1	Bolt	DIN-601		30	M8x110
1	Chain	DIN-8187		29	2x3/8"x3/8"(1413mm)
1	Chain link	DIN-8187		28	2x5/8"x3/8"
				27	
				26	
				25	
				24	
				23	
				22	
				21	
				20	
				19	
4	Bracket	4-35126	C1	18	
4	Shoulder bolt	4-485	C1	17	GD1
1	Bearing house	4-8831	Fund. nod	16	HTAF
				15	
1	Roll	4-35248	C1	14	
				13	
1	Rod	4-35249	C1	12	FC-2
2	Washer	4-8016	C1	11	HTAF
1	Bearing house	4-8842	Fund. nod	10	
2	Spacer	4-35247	C1	9	PMC
2	Screw	4-34627	C1	8	PMC
1	Spacer	4-34688	C1	7	PMC
1	Support	4-34639	St-33	6	PMC
1	Support	4-34638		5	PMC
1	Spacer	4-34660	C1	4	PMC
2	Sproket	4-34689	Ck-45	3	PMC
				2	PMC
				1	PMC
1	Frame	2-34844	St-33		
4	Guide	4-34637	St-33		
1	Sub-conjunto	3-34707			PMC
Qt. Un. Qt. Un. Qt. Un.	Designação	Norma Desenho N°	Material	Pos	Molde N° Placa md. N°
	Aplicação				Semi-produto Ferramenta
Qt. Máquina	Pos.				
1	PMC-2MS-MD	34			
ALTERNATIVAS					
PMC-2MS-MD-150					

2-34972

FEED SYSTEM/GS







				23			
				22			
				21			
				20			
				19			
				18			
				17			
				16			
1	Bolt	DIN-7991		15	M6x10	1050100905	
				14			
				13			
				12			
				11			
				10			
				9			
				8			
2	Key	4-34946	C1	7			
1	Nut	4-34936	Ck-45	6			
4	Spacer	4-30370	Ck-45	5		MF2-MS	
5	Spacer	4-30371	Ck-45	4		MF2-MS	
16	Spacer	4-30369	Dur.Aluminio	3		MF2-MS	
15	Spacer	4-30372	Dur.Aluminio	2		MF2-MS	
1	Sleeve	3-34937	Fund.Nod.	1			
Qt. Un.	Designação	Norma Desenho N°	Material	Pos	Molde N° Placo mol. N°	Semi-praduto Ferramenta	Peso Kg. Peça-ter.
	Aplicações						
Qt.	Máquina	Pos.					
1	PMC-2MS-MD	162					
		ALTERAÇÕES					
		Data	Nome	ESCALAS		Substituí:	
	Projectou			1:2		Substituído por:	
	Desenhou	920606J.	Pinto				
	Verificou						
	Tolerancias não indicadas		Medio NP.265				
				PMC-2MS-MD			

3-35010

SLEEVE & SPACERS/GS