



Numbering Head Primer

FOREWORD

Numbering heads are used by almost every printer, in either "Typographical Flat Bed" or "Rotary" style. Flat bed or "box" number heads are used in either windmill style or cylinder press style letterpresses. Rotary heads are used on offsets such as GTO, Hamada, Ryobi, Didde, and MONA heads, as well as offline forms collators such as Didde Speedklect.

Over the last twenty years, the industry has moved from "Roman" to "Gothic" faces. The Gothic face has a consistent thickness of characters, whereas the Roman has the fancy "serifs" that can easily cut through the stock, particularly when printing the 8, 6, and 4 characters.

Gothic faces now make up more than 90% of our sales.

DISCLAIMER: This booklet is intended as a primer for the novice numbering machine user and as a review for the experienced numbering machine user.

Please follow instructions that come with your numbering system, whatever the type. Various tips are presented here that reflect many years of experience, however remember that they could void a warranty.

Canadian Printing Equipment Ltd.. implies no responsibility for how long or how well a numbering head will work. This depends on how well the press person takes care of the numbering heads and follows proper setup procedure.

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TYPES OF NUMBERING

Numbering can either be consecutive, skip, or repeat in a forwards or backwards direction. Normally the numbering head prints “right reading” in a backward configuration, (i.e. No. 001000 down to No. 000001).

A “forwards” numbering head is used when the job is to be collated afterwards and a “backwards” numbering head is used for crash imprinting and other applications not requiring collating, i.e. tickets, claim stubs etc.

SPECIALTY NUMBERING MACHINES

SKIP NUMBERING

Every printer needs to be able to “skip” number, whereby each head will skip 2, 3, 4 or more numbers. A good example of this is a 3-up receipt book. The top head needs to print 1-4-7, the head below it needs to print 2-5-8, and the last head needs to print 3-6-9. This is called “skip 3 forward”, and a set of 3 heads would be required. Each skip format requires a different wheel. Therefore, the printer usually needs 2 skip 2 wheels, 3 skip 3 wheels, etc.

REPEAT NUMBERING

With a repeat job, such as a 3 part NCR job, each head must print the same number 3 times, and then index. Any number of heads can be used, so these are often ordered singly.

A printer may simply position a repeat disc (thereby having only a 5 wheel head), or a skip wheel to accomplish his skip and repeat jobs. Most prefer to have skip 2 and 3 heads ready to drop into position in the chase.

MIRROR IMAGE NUMBERING

If a printer needs to print numbers on decals for the inside of a windshield, i.e. a parking lot permit, he will need “mirror image” heads, so that the parking attendant can read the number correctly from outside the car.

TIERED NUMBERING

The printer may also need to print "tiered" numbers, such as on a file retrieval system. Each character is printed in a vertical row rather than in a horizontal row.

CENTER DRIVE ARRANGEMENTS

When a printer wants to print several across, and up, such as a 20 up ticket job, he would want to eliminate all of the plungers and have a “center drive” system. In this case, a remote plunger actuates a solid splined shaft that runs through the center of each head rather than each head having it's own plunger and shaft. The result is that all heads actuate identically, thereby reducing the possibility of numbers being printed out of sequence. Normally these heads are used in cylinder presses because of the remote plunger. In a “windmill” style platen press it is almost impossible to avoid the ink left on the “impact area” of the plunger because of the sweeping motion of the sheet over the platen.

MICR and OCR HEADS

Both Atlantic and Leibinger build heads for cheque printing and OCR applications.

LETTERPRESS NUMBERING HEADS

The industry standard letterpress head is a six wheel, 5/32" type face from COUNT ("Bimatic"), Atlantic Zeiser (used to be Atlantic Force), or Leibinger. The old names, like Blue Boy and Wetter, are now a thing of the past.

Larger typeface units, such as a 3/16" are also available.

The numbering heads are locked up in a chase, (see Lock Up and Setting Impression Page 7 for details), and the chase is mounted in the press. The letterpress operation works by having ink rollers run over the head on each cycle, and then the platen closes up on impression. The pressure applied prints the number and pushes the plunger on each head, so that the number indexes (moves up or down according to type of numbering head) when the platen backs away. The "No" indicia on top of the plunger can be replaced with A-Z "letterslides" as well as the * character.



BIMATIC heads are unique because they can be set to number forward or backward (reverse) which is also referred to up or down numbering. All other brands must be ordered to number as forward or reverse.

All can be specially ordered with 7 wheels instead of 6, but this is not common. Also, there are "midget" and "mini" heads which print 1/8 inch characters and can be used on jobs where positioning of the number within a box is a tight fit.

DROP ZEROS

All stock heads will normally have "drop zeroes" where the 5 zeros in front of the unit wheel can be set to drop below the surface into a groove and not print (No.000796 becomes No. 796).

The Bimatic head has a slightly different system where the center shaft has a selection wheel which controls the number of notches for the zeroes to drop into.

Bimatic heads must be ordered according to the Shaft Type specifications below.

SHAFT TYPES

- With the "standard shaft", all 5 zeroes will drop.
- With the "semi-solid" shaft, 3 zeros will drop.
- With the "solid shaft", no zeroes will drop.

Atlantic or Leibinger heads can have the shaft changed quite easily, however it is best to order as above. The difference is the non-dropping zeros are on solid wheels and the dropping zero wheels have a "tail" for latching the zero in the up position. Eventually the dropping zero "tails" will wear out even if using a solid shaft.

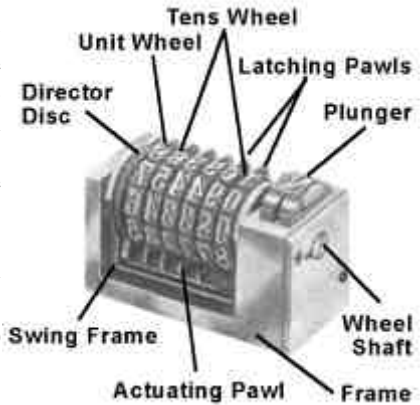
MECHANICS OF NUMBERING HEADS

A wheel set in a typical head consists of one “unit” wheel, and 5 “tens” wheels. The unit wheel is solid and the tens wheels can be solid or with drop zeros.

ATLANTIC and LEIBINGER heads are very similar to each other, and are easier to disassemble than the BIMATIC heads.

ATLANTIC and LEIBINGER heads basically are composed of a frame which holds the plunger and push springs in a machined cavity, a unit wheel and the tens wheels which ride inside a swing frame with an attached actuating pawl (comb) which moves the wheels and has spring loaded latching pawls for each wheel, and a wheel shaft (grooved according to drop zero specifications) which holds the parts together.

Disassembly (watch for all the little springs) and cleaning can be done by an experienced operator.



The BIMATIC numbering head has a complicated “transmission” inside because of the reversing system to number forwards or backwards and the “drop-zero” function.

WARNING: DISASSEMBLY OF BIMATIC NUMBERING HEADS MAY BE DETRIMENTAL TO YOUR POCKETBOOK AND MENTAL HEALTH
These heads require a qualified service technician to repair.

Most printers consider the Atlantic and Leibinger heads to be stronger than Bimatics, but almost all do use the Bimatic heads in some form.

Both Atlantic and Leibinger offer models with 3/16” and larger typefaces. These heads are built in Germany, and are stronger and more expensive.

When numbering on a “cylinder press”, such as a Heidelberg K, KS, KSBA, SBD, SBG, the press tends to drag the wheels, resulting in the wheels not being in true alignment when printed. For this reason, when ordering Leibinger, specify the “lock” wheel option. What happens is a lock holds the number wheels in position except immediately after the plunger is depressed. The up cycle of the plunger unlocks the wheels and allows indexing to occur. Also, when ordering Bimatics for cylinder presses, specify “IF” low plunger height, as the standard plunger heads will not work in a cylinder press. The low plunger head will work in windmill presses and is recommended if using multiple heads because of better inking of the heads and reduced wear on ink rollers. When using low plunger heads a “strike plate” must be mounted where the plunger (No.) hits to activate the head. Mount the strike plate(s) only after getting the correct position and impression of the numbering head(s). Position is determined by putting an impression on the tympan sheet. Then tape the strike plate into position, being careful not to have the strike plate or the tape get into the “numbering” area.

LAYOUT

Make sure that you pre-plot the easiest setups and supply this information to the layout department. Each job you do keep a record of positioning information, i.e. press used, spacing material used, distance from bottom of chase etc. to reduce makeready time on this and similar jobs.

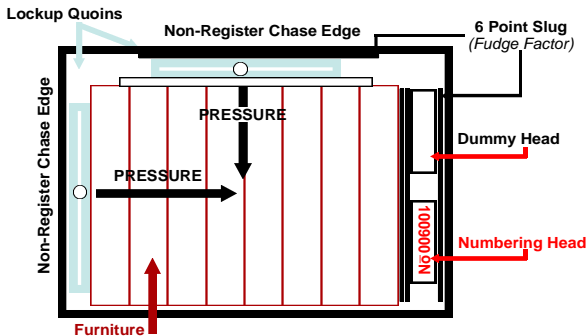
ALWAYS make sure you include a “fudge” factor for safety. What this means is determine where you can actually print the number and then add 6 points or more. For millennia, alchemists have tried unsuccessfully to change lead to gold, but as soon as the first numbering machine was invented graphic designers have assumed the pressman can “magically” enlarge or reduce solid steel to suit their esthetics.

CHASE LOCK UP

All heads can be “smashed” when too much platen pressure is applied or distorted when “locked up” wrong. In either case the result is permanent damage to the head.

To avoid frame distortion first make sure lock up pressure is parallel to the shaft. This generally means parallel to the numbers, and a “dummy” head cut to the same dimensions as the numbering head from furniture is in position to keep pressure equal. If pressure is applied on the shaft ends or is uneven the numbering head at the very least will experience frequent jams and other problems, and could be permanently distorted. The dummy heads are also very handy if removing a head for cleaning. Just place the dummy where the removed numbering head was and lock the chase until ready to start numbering again.

When doing a lockup in the chase, make sure that all furniture is secured from both directions. It is easy to do, similar to playing with a child’s blocks. Normal position for the quoins (lockup device) are on the top and non-gripper end of the chase for a platen press and on the sides opposite to the register guide and grippers for a cylinder press. Doing a lockup this way makes it very easy to accurately position the numbering head(s) by a simple addition or subtraction of furniture and/or leads, slugs or even cardboard.



CAUTION: If the chase is not “locked up” properly the furniture and numbering head(s) can be sprung resulting in damage to the rollers, press and anybody within Firing Range. This is not a joke, just imagine the size of gun required to fire a metal object the size of a numbering head at high velocity and the resulting damage!

MAINTENANCE OF NUMBERING HEADS

Often due to years of pounding, the zeroes and shafts will wear out and need to be replaced. If a lot of crash numbering is to be done then the semi-solid or solid shaft and appropriate number wheels should be specified. This type of wear is to be expected and should be planned for, i.e. getting an extra numbering head before it is desperately needed.

Most of the problems occurring with numbering heads are because they are dirty from dried ink, paper and powder dust. Even if not removing machines for a full cleaning, remember to use a blanket solvent to carefully wipe ink from the numbering head before leaving overnight.

Cleaning solutions are available and it is very important to read them carefully as some will cause even more problems if improperly used.

Another good way to clean letterpress numbering heads is with WD-40. At the end of the day remove the heads and wipe down with a blanket solvent. Then spray with the WD-40 using the nozzle tube which helps blow out particles.

With either typographical or rotary heads after cleaning wipe down with a clean lint-free cloth removing cleaner/solvent from all printing faces and manually activate the plunger to remove excess cleaner. Then wrap the numbering heads for the night in another clean lint-free cloth to absorb remaining cleaner and prevent the accumulation of dust and other particles.

Whichever way you use remember the cleaning solution generally will prevent ink from adhering to the printing surfaces. To overcome this wipe down well with minimal solvent, (rubbing alcohol will remove oily residues), and before using, hand ink the numbering head on a press roller by simply pressing on roller then move numbering wheels and repeat until the numbers are fully inked. This simple step does take a bit of time but will reduce frustration greatly on press. If you do not do this you could have un-inked numbers every time a wheel indexes with the end result being an irate client if not caught before delivery.

While running problems can occur from inadequate lubrication. The quickest and safest way to correct this is using a very light weight oil put a few drops on the back of your hand and then using a needle capture a TINY drop and then put the tip of the needle between the number wheels, frame etc. This is a very controlled way of oiling as opposed to the so-called needle oilers. Be careful, especially around the plunger as too much oil will cause problems while printing.

CRASH NUMBERING HEADS require more frequent care because of the increased load on the numbering head.

More paper dust and ink will embed in the numbering machine increasing the chances of paper jams. Regular cleaning is very important for proper operation.

Chances of bending a shaft through a “major” crash involving a poorly separated set, which is actually two or more sets, are possible. More often an extra sheet in a set here and there will very slowly bend the shaft over time. This results first in uneven density of the numbers and minor numbering head jams. Checking the height of the number wheels with a straight edge, and having slightly bent shafts replaced before total failure, will help reduce problems on the press and the cost of replacing numbering heads that have totally failed.

ROTARY HEADS

There is much more on-press numbering being done today, due to HAMADA, GTO and MONA equipped presses. The printer can often print, number, and perforate the job in one pass.

LAYOUT

Each different numbering system has limitations as to position of perforating and numbering. Luckily this information is readily available from the manufacturer of the numbering head. Generally you will find a sheet detailing positioning of the various components and the definite Do Not Use areas. These areas are there for a reason and ignoring them can lead to exceptionally expensive consequences.

Make sure that you pre-plot the easiest setups and supply this information to the layout department. As with letterpress, ALWAYS make sure you include a “fudge” factor for safety.

MECHANICS OF ROTARY NUMBERING HEADS

The industry standard rotary head is a 7 wheel 3/16” Gothic typeface. 8 and 9 wheel heads can be purchased, but they are very uncommon, and expensive. There are no brands of heads that “reverse direction” such as the Bimatic letterpress head. Some printers have a complete 7 wheel set with the engraving in reverse format.

Atlantic and Leibinger are the two dominant manufacturers, although occasionally you will see a Roberts heads. Heidelberg uses Leibinger exclusively. The GTO 46 and 52 use the same heads.

The single most important consideration is whether the job is to be numbered across the press (straight), or down the press (around the cylinder convex - also called barrel shaped).

Almost every brand of press has a different diameter of mounting ring. This sets up different circumferences. Some presses such as the Hamada, Mona, and Ryobi, have different circumferences on different models. For that reason, we need to know the press make and model to provide the right head.

Most heads have a “spring return” arm so that when the press runs, a cam indexes the head, and the spring resets the arm after the cam is passed. Some presses such as the GTO have an “enclosed cam”, whereby the operating arm stays trapped in a slot. For that reason, it does not use a spring arm return.

Different presses have different “Pull In Radius”. This refers to the movement on the operating arm to index the next number.

All have a drop zero system. When ordering parts, you need to know if the head has “drop cipher”, or the DWD Drop Wheel Design.

Some presses use a “pre” type operating arm, and some use an “at” arm. This refers to the position of the arm before the indexing takes place.

Rotary heads are easy to dismantle and repair. There is a special tool that clamps the head, and removes the pawl spring pressure on the wheels. After it is applied, the wheels can be replaced, or a skip or repeat wheel can be easily inserted.

Most repair parts are interchangeable, but we need to know the press type and whether straight or convex.

Again, when ordering rotary heads, we need to know:

- 1) Press make and model
- 2) Straight or Convex
- 3) Number forward (up), or reverse (down)
- 4) Gothic or Roman We also sell mounting rings, cams, and strike in blocks for most press brands, including Heidelberg and Hamada.



Convex Rotary Numbering Head



Straight Rotary Numbering Head



Convex Rotary Numbering Head mounted on a curved base ring



Straight Rotary Numbering Head mounted on a curved base ring

NUMBER HEAD ORDERING INFORMATION

For availability and current pricing of numbering heads and parts please contact Canadian Printers Supply Ltd. on the Web at canprint@total.net or at

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DISCOUNTS:

ON ORDERS OF 4-8 HEADS-	5%
ON ORDERS OF 9+ HEADS-	10%

LETTERPRESS

BIMATIC BSG Bimatic Standard Gothic	
ATLANTIC STANDARD MODEL 12	5/32"
ATLANTIC SUPER MODEL 50	3/16"
LEIBINGER MODEL 10	5/32"
LEIBINGER MODEL 10L	5/32" Lock Wheel

LETTERSLIDES- We keep a full A-Z selection of Bimatic letterslides in stock. Other brands are purchased as required. Price of each Bimatic letterslide on request.

ROTARY

We do get special prices for MONA heads. As such, they are lower priced than heads to fit other brands of presses.

ATLANTIC OR LEIBINGER with spring arm return STRAIGHT
ATLANTIC OR LEIBINGER with spring arm return CONVEX
LEIBINGER for MONA STRAIGHT
LEIBINGER for MONA CONVEX
ATLANTIC or LEIBINGER for GTO STRAIGHT
ATLANTIC or LEIBINGER for GTO CONVEX

ACCESSORIES

SkipWheel	RepeatWheel
Operating Arm- Spring Arm Return	Operating Arm - GTO

NOTE

- ALL HEADS COME FROM THE U.S.A.
- ONLY BIMATIC BSG HEADS ARE STOCKED.
- ALL COURIER COSTS ON RUSH ORDERS WILL BE PASSED ON TO THE CUSTOMER.



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